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The Distribution of Productive Assets and the Economics of Rural Development and Poverty Reduction

Michael R. Carter and Aleksandr Michuda

1 Introduction

The goal of this chapter is to give the reader an interpretive intellectual history of contemporary economic thinking on rural poverty and development. We organize the history around the agrarian questions of whether, when and how the initial distribution of productive assets (the means of production) shapes the dynamics of poverty and rural development. While these questions have been analyzed from a number of methodological perspectives, we concentrate here on literature that adopts a rational choice or neoclassical microeconomic stance. This choice in part reflects the authors' own predilections, which are themselves founded on the observation that this approach provides an open platform for exploring these agrarian questions, once we take the economics of asymmetric information and non-Walrasian market equilibria seriously (see Carter 1997).

M. R. Carter (✉)
University of California, Davis, CA, USA

University of Cape Town , Cape Town, South Africa

NBER, Cambridge, MA, USA

The Giannini Foundation, Davis, CA, USA
e-mail: mrcarter@ucdavis.edu

A. Michuda
University of California, Davis, CA, USA

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Harkening back to earlier European and Russian agrarian debates, we begin in Sect. 2 with the Chayanovian farm household model (Chayanov et al. 1966). Transported forward to the development economic debates of the 1960s and 1970s, this model was taken by many to reliably underwrite an economic case for asset redistribution that would reshape agrarian class structure, spur development and reduce rural poverty. Section 3 of this chapter then picks up the story of the farm household model once the understanding of technologies and markets was expanded beyond the simplifying assumptions of the Chayanovian model. Emblematic of this new approach, the 1986 paper by Eswaran and Kotwal showed that equivalent to asset redistribution, levels of poverty and productivity in a rural economy could be affected by altering the rules of access to capital (and with much less political fuss).

While the single time period analysis of Eswaran and Kotwal (1986) leaves open many dynamic questions (to which we return in Sect. 5), it provides a bridge to the subsequent "microfinance revolution" and other interventions intended to alter poverty and productivity without directly altering the underlying distribution of assets. As Sect. 4 elaborates, this intervention-centric perspective led quite naturally to a preoccupation with empirical impact evaluation. The spread of development economics as impact evaluation, powered by the "discovery" of randomized controlled trials (RCTs) as a reliable, mostly harmless econometric method, submerged traditional theoretical preoccupations, including questions about the distribution of means of production (Ravallion 2012).

Ironically, perhaps, one of the strongest findings to emerge from the wave of development experiments was the effectiveness of asset transfer programs as an intervention to alter poverty dynamics. Closing the circle, Sect. 5 reflects on what we have learned from these experiments and how they relate to the agrarian questions around which this chapter is organized. Drawing on the more recent theoretical developments around rural poverty dynamics and "poverty traps," Sect. 5 reconsiders the role that asset transfers play in lifting households above the minimum asset levels required before a successful transition out of poverty can take place. We also integrate into this discussion recent findings on the importance of what might be termed "psychological assets," and the role they play in poverty transitions. Section 6 concludes by reflecting on the extent to which our thinking on rural poverty has come full circle over the last 50 years of development economics.

2 The Distribution of Productive Assets and Rural Poverty: The Chayanovian Foundations

Introduced to the English-speaking world with the 1965 translation of his book *The Theory of Peasant Economy*, the Russian economist A.V. Chayanov was keenly interested in how agrarian class structure evolves as economies industrialize.[1] To inform his understanding of structural evolution, Chayanov offered microfoundations in the form of a theory of how the peasant household–understood as a joint production-consumption unit–allocates its resources. Building on the Sen (1966) subsequent formalization of Chayanov, we here write down a generalization of the Chayanovian model that will aid us in our discussion of assets, market access and rural poverty.

Following Chayanov, we assume that a household is composed of β consumers and α working-age individuals (with $\beta \geq \alpha$). The household is endowed with $\overline{T}$ units of a productive asset (land) and $\overline{L}$ units of labor. The household can allocate its resources to constant returns to scale agricultural production technology ($F(L_f, K, T_f)$), which depends on land allocated to the home production process (T_f); labor, measured in efficiency units (L_f); and purchased inputs, such as fertilizer (K). Depending on how factor markets operate, the household can also potentially rent out its land ($T_r < 0$) and labor (L_s) at prices w and r, respectively. It can also potentially rent land in ($T_r > 0$) and hire labor (L_h) at those same prices. As discussed in Sect. 3, when labor effort contracts are not costlessly enforceable, the household may have to devote supervisory time (S) to extract effort from hired workers. In the model below, we write the labor effort extraction function in general form as $L_f(L_o, L_h, S)$.

Finally because production is roundabout, the household faces a working capital constraint, meaning that the amount of funds it allocates to purchased inputs, hired labor and renting-in land can be no more than the capital it can leverage from financial markets ($B(\overline{T})$) plus any earnings from selling its own labor or renting out its land. To avoid further notational clutter, we will assume that the rate of interest on both borrowing and savings is zero.

Under the assumption that the households allocate resources in order to maximize the utility of per-capita consumption ($u(c)$ with $u' \geq 0$; $u'' \leq 0$) less the

[1] In his own day, Chayanov was involved in a debate with Lenin among others on whether or not the Russian peasantry was stable or whether it was differentiating into a structure of large farm capitalists and landless workers. Using his variant of the model developed below, Chayanov argued that the peasantry was stable despite regular cycles of farm growth and contraction, which he argued were explicable solely by demographic lifecycle factors.

disutility per-worker labor ($v(\ell)$ with $v', v'' \geq 0$),[2] our expanded Chayanovian household model of peasant resource allocation can be written as:

$$
\begin{aligned}
&\underset{\substack{c,\ \ell,\\ L_o, L_h, L_s, K, T_r}}{max} \quad \beta u(c) - \alpha v(\ell) \\
&\text{subject to:} \\
&\qquad c = \Big[pF(L_f, K, T_f) - wL_h + wL_w - K + rT_r \Big] \Big/ \beta \\
&\qquad \ell = \Big[L_o + L_w + S \Big] \Big/ \alpha \\
&\qquad L_f = L_f(L_o, L_h, S) \\
&\qquad K \leq B(\bar{T}) - rT_r - w(L_h - L_w) \\
&\qquad T_f = \bar{T} + T_r \\
&\qquad L_o + L_w + S \leq \bar{L} \\
&\qquad L_h, L_w, L_o, S \geq 0
\end{aligned}
\tag{11.1}
$$

Chayanov himself considered a world in which capital inputs were unimportant and land and labor markets did not exist (L_s, L_h, S, K, $T_r = 0$). Imposing these simplifying Chayanovian constraints, maximization problem (11.1) yields the following first-order condition for utility maximization:

$$pf'u' = v' \tag{11.2}$$

In Chayanov's own words, this condition implies that the household applies labor to their farm up to the point where the marginal utility value of the incremental output produced ($pf'u'$) is just offset by the additional drudgery of the labor required to produce it (v').

Note that the marginal disutility of work is simply the marginal utility of leisure and the ratio $\frac{v'}{u'}$ is the marginal rate of substitution between leisure and consumption. Using this ratio as a measure of the subjective cost of labor or shadow wage ($\tilde{w}$), first-order condition (11.2) can be rewritten as:

$$pf' = \tilde{w}(\bar{T}, \bar{L}, \beta/\alpha),$$

[2] The assumption that the utility of consumption and the disutility of work are additively separable is both faithful to Chayanov's discussion and rules out pesky cross-partial derivatives that add clutter but little additional insight to the model. Note also that the assumption that household well-being depends on per-capita values of consumption and works ignores the overwhelming evidence that neither consumption goods nor work hours are shared equally between members of the household (see Folbre 1984 for an early and still compelling exposition).

where the shadow wage, $\tilde{w}$, is a function of the household's endowments and its demographic structure, represented by its consumer-worker ratio (β/α). Writing the first-order condition in this way makes clear that the Chayanovian peasant household operates analogously to the profit-maximizing firm except that the marginal revenue product of the labor input is equated to a shadow wage rather than a market wage.

The implications of this model are rich. Chayanov himself was interested in how household resource allocation and living standards evolve as the consumer-worker ratio follows an inverted U-shaped time path over the family's lifecycle. For purposes of our discussion, the key implications of this model are two:

1. Holding demographic variables fixed, households with land endowments below a threshold level, $\overline{T}^{p}$, will be income poor; and,
2. Poor households, with low consumption levels, will have a high u' and a low shadow wage $\tilde{w}$. These households will optimally react to the desperation of their poverty by "self-exploiting" themselves by cultivating their land more intensively (producing more output per-unit area than better-off households), driving marginal returns to labor toward zero, effectively earning a lower shadow wage $\tilde{w}$.

Endowments become fate in this model, with the poverty of asset-poor households deepened by the fact that they obtain low marginal rates of return to their labor.[3] While this resource allocation logic of asset-poor households can be considered as an innate peasant mode of production, the Chayanovian household model shows that this behavior is consistent with an instrumentally rational choice—self-exploitation and a poor standard of living are the best the household can do, given market structures and its inherited wealth.[4]

These two implications of the Chayanovian model imply that redistribution of land from better-off to poor households can create a win-win scenario, reducing the poverty of the latter while boosting aggregate productivity of the rural economy by moving land from lower to higher productivity uses. Dorner and Kanel (1979) make precisely this argument in their aptly titled paper

[3] Access to labor markets at which they could sell their labor at a fixed $w > \tilde{w}$ would ameliorate the poverty of these households as would the option to exploit their cheap labor by renting-in land from land-abundant households with higher price labor (Feder 1985).

[4] In the language of Elster (1994), this peasant-like self-exploitation is an example of endowment necessitated behavior. That is, people are not born peasants, but they adopt peasant-like behavior when it is the best they can do given their endowments and the constraints they face (an observation also recorded by Lehmann 1986).

"The economic case for land reform." Despite the conventional wisdom that World War II era land reforms in East Asia had created a productive agricultural sector built on small-scale farms, efforts to apply the economic case for land reform in Latin America met with at best mixed success (see the discussion in Thiesenhusen 1989). Reasons behind this record include often fierce political opposition as well as the increasing complexity of agriculture which belies the simplifying assumptions of the original Chayanovian model.

3 The Economics of Asymmetric Information and Rural Poverty

Irrespective of whether redistributive land reform was undercut by contentious politics or faulty economics, the Chayanovian model which underpins the putative economic case for land rests on difficult-to-justify assumptions about the nature of technology ($K = 0$) and markets (L_s, L_h, $T_r = 0$). Labor exchange between households is found in most places, as are various forms of land exchange or rental. With the seed-fertilizer green revolution of the 1960s, and the expansion of capital-intensive agricultural export opportunities, ignoring the role of purchased inputs in production became increasingly objectionable as well.

The implications of relaxing the Chayanovian assumptions depend on what is assumed about the nature of the markets for labor, capital and land. At one extreme, we might make "Walrasian" assumptions that all behavior between parties that exchange labor, capital or land is fully and costlessly contractible. Specifically, these assumptions would imply the following:

- *In Labor Markets*, full contractibility would assume that employment contracts specify an amount of effort on the job in exchange for a wage. Along with the assumption of no search costs to finding labor to hire, these assumptions would imply that hired and family labor are perfect substitutes for each other, despite the fact that family labor enjoys the extra incentive of enjoying the residual income from the production process. Efficiency labor in the household model above can be written as $L_f = L_o + L_h$ with own and hired labor perfectly substituting for each other with no labor supervision required.
- *In Capital Markets*, full contractibility would imply that borrowers could credibly commit to use loans only as the lender desires and to always fully repay, implying that households could always borrow adequate capital to fully fund profitable investments in K.

- *In Land Markets*, full contractibility would imply that the agent would not leave the soil exhausted of nutrients after it is returned to its owner and that there would not be an attempt to take over ownership of the land through the assertion of squatter's rights.

Under these assumptions, the implications of the peasant household model change radically. Asset-poor households could rent-in additional units of land, boosting returns to their labor and changing the agrarian class structure as they transitioned from peasant to small-scale commercial production. They could also begin selling their labor on the market as pf' reached the market wage, w. Land productivity would be equalized across all operating farm units as marginal returns to all factors would be equated to their respective market prices.[5] Poverty would not be reinforced by low returns to labor, and redistribution of land would have no productivity impacts and would purely redistribute land rents.

While the win-win economic case for poverty reduction through asset redistribution evaporates under the Walrasian factor market assumptions, the economics of asymmetric information–developed systematically across the 1970s and 1980s–suggest that these Walrasian assumptions are no more credible than the Chayanovian assumption that factor markets simply do not exist. While this chapter cannot provide an exhaustive overview of the voluminous literature on asymmetric information, a few sentinel pieces suffice to communicate the importance of asymmetric information for rural poverty.

Regarding labor markets, a number of observers noted that asymmetric information makes it impossible for employers to costlessly observe workers' effort levels. The fact that incentives are imperfectly aligned between wage workers and employers (residual claimants) suddenly becomes relevant. Non-price rationing (equilibrium unemployment as a worker discipline device) with wage stickiness can result, as Shapiro and Stiglitz (1984) and Bowles (1985) show. Two kinds of outcomes emerge in this literature. Either overpay hired workers relative to their opportunity cost (using the unemployed as worker discipline device, allowing workers to collect enforcement rents, as in Shapiro and Stiglitz (1984) and Eswaran and Kotwal (1985), or spend resources on labor supervision, enforcing hard work commitments (Bowles 1985)). Either way, the full cost of employing a worker rises above the opportunity cost of labor.[6]

[5] In fact, as Feder (1985) suggests, there does not need to be full contractibility in all three markets, but rather only a working capital and land market. In that case, each household would lease enough land to maintain an operational size proportionate to the size of their family and achieve the social optimum.

[6] This point was actually made as early as John Brewster's "The Machine Process in Agriculture and Industry" in 1950, where it described moral hazard in labor hiring as being one of the reasons for the persistence of family farming even as agriculture became more mechanized (because on the family farm, all labor has residual claimant incentives to provide optimal effort).

Regarding credit markets, work such as Stiglitz and Weiss (1981) and Carter (1988) makes the point that an arm's length lender's inability to (i) observe borrower types (e.g., their intrinsic riskiness) and (ii) monitor how borrowers use credit exposes lenders to adverse selection and moral hazard. The root of the problem is again incentive misalignment. The result is non-price rationing and especially wealth-biased capital access. Only those with collateralizable wealth can borrow money–that is, it takes money to get money.[7]

As a whole, this work on the economics of asymmetric information suggests a set of factor market assumptions intermediate between the Chayanovian assumption that such markets simply do not exist and the Walrasian assumption that all contract features are costlessly enforceable. The Eswaran and Kotwal (1986) paper, "Access to Capital and Agrarian Production Organization," takes on this task of exploring the economics of asymmetric information in order to revisit key agrarian questions about rural poverty and the distribution of assets. Specifically, they make two key assumptions motivated by the economics of asymmetric information:

- *Unequal Access to Capital*: Access to capital is governed by a capital access function, $B(\overline{T}) = \phi + \theta \overline{T}$. While simple, varying the parameters of this function allows them to capture an array of scenarios. For example, Walrasian capital access untethered to collateral wealth implies $\phi > 0$, $\theta = 0$, while wealth-biased capital access of the sort described by Carter (1988) could be captured with $\phi \leq 0$, $\theta > 0$.
- *Agency Costs in Labor Markets*: Hired labor must be supervised by the residual claimant landowner if labor is to be productive. Specifically they assume that $L_f = L_o + L_h$, but only when the landowner dedicates time to labor supervision given by the function $S = s(L_h)$ (with s', $s'' \geq 0$).

After modifying the Chayanovian household model with these key assumptions,[8] Eswaran and Kotwal consider how the performance of a stylized agrarian economy, with N households and a fixed aggregate stock of land, is influenced by the distribution of land and by the rules of access to capital.

[7] Bardhan (1984) pushes this even further, asserting that imperfectly aligned incentives are also linked to how institutions form. Institutional formation is not just cursory to economic outcomes or should be seen as "just being there," but may be shaped by both information asymmetries and power asymmetries caused by these misaligned incentives. Economies with higher rates of moral hazard in labor can see sharecropping arrangements form. Or perhaps, high initial inequality in land and assets can lead to inefficiently large latifundia farms that can limit households' outside opportunities as in Conning (2002).

[8] As well as a few more, including that $u'' = 0; \alpha = \beta = 1$ and assuming a fixed cost to cultivate.

Their asymmetric information-based assumptions create two countervailing forces. Farms with small land endowments that rely on own labor may enjoy a labor cost advantage because they do not need to expend resources on labor supervision. At the same time, if access to capital is linked to owned land endowments, these same farms face a higher shadow price of capital potentially offsetting the small farm productivity advantage that was celebrated in the economic case for land reform. These offsetting cost advantages of large and small farms may create decreasing, increasing or even U-shaped relationships between land productivity and farm size (as discussed theoretically by Feder (1985) and explored empirically in the more recent literature such as Helfand and Taylor (2018)).

Turning specifically to the Eswaran and Kotwal model, note that increasingly wealthier households (those with larger land endowments) will find labor to be increasingly expensive if they choose to operate at large scale with hired labor. In contrast, less wealthy households who would rely on their own family labor will face effectively a lower wage should they choose to operate their small-scale landholdings.[9] While this arrangement preserves the key Chayanovian insight that poor households are also reservoirs of cheap labor, the Eswaran and Kotwal model allows households to potentially rent-in land. Given their labor cost advantage, we might expect cheap labor households to rent-in land from wealthier households, as in the Walrasian model just discussed.

However, it is here that unequal access to capital matters. If access to capital is wealth biased, then even a low-wealth household with a "bankable project" (renting-in land to profitably cultivate it using their less expensive labor) will not be able to front the capital needed to rent-in land. In other words, unequal access to capital generates a second, or countervailing, market failure that prevents rental market transactions from delinking economic performance from the initial distribution of land endowments. Under asymmetric information constrained factor markets, agrarian class structure, or what some literature calls "occupational choice,"[10] becomes relinked to individual endowments, which again become fate.

[9] Note that for the family labor farm, the opportunity cost of labor is w, while $w(1 + s')$ is for the larger farm that hires in labor that must be supervised.

[10] Models of occupational choice (e.g., Banerjee and Newman 1993; Ghatak and Jiang 2002; Buera et al. 2018) consider the sorting of a population into entrepreneurs and workers based on wealth endowments and access to capital. While this literature is not specifically agrarian in orientation, it revisits the same issue about whether and how the distribution of initial wealth shapes the structure of an economy and its performance.

Arraying households along the endowment continuum from richest to poorest, solution regimes to the household maximization problem, or classes, will emerge in the following order in the Eswaran and Kotwal model:

1. *Proletariat*: No agricultural production, only wage labor
2. *Semi-proletariat*: Agricultural production with only family labor, off-farm wage labor
3. *Autarkic peasants*: Agricultural production with family labor utilized, no off-farm wage labor
4. *Small-scale capitalists*: Agricultural production with family labor and hired labor, no off-farm wage labor
5. *Large-scale capitalists*: Agricultural production with only hired labor, no off-farm wage labor

In this model, the boundaries between these classes–that is, the endowment value at which it becomes optimal to shift from one solution class to the next–depend on the market prices for land and labor.[11] A higher wage, for example, will delay the shift from semi-proletarian to peasant producer to a higher endowment level.

Eswaran and Kotwal's approach builds directly on that of Roemer (1985). In the language of Elster (1994), class in this rational choice modeling approach is "endowment necessitated behavior." Ultimately, class is plastic, depending on endowments as well as technology and on the functioning of markets. While not always resting comfortably with other approaches to class, as we shall see, a virtue of this approach is that it opens the door to the analysis of mobility and poverty dynamics as economies evolve and the structure of markets changes.

Figure 11.1 displays a key finding from the Eswaran and Kotwal model under the assumption of wealth-biased access to capital. The horizontal axis measures how equally land assets are distributed, with the far right representing an egalitarian economy and the far left a completely inegalitarian land distribution. The vertical axis measures various measures of economic performance including poverty rates and aggregate social welfare.[12] As can be seen, land redistribution, understood as moving from light to right in the figure, generates a win-win, reducing rural poverty rates and boosting aggregate output. As in the Chayanovian model, but with more defensible factor market

[11] Indeed, not all classes will exist at all factor price configurations.

[12] Eswaran and Kotwal employ a Benthamite social welfare function, giving equal weight to all households in the economy, regardless of the distribution of initial endowments.

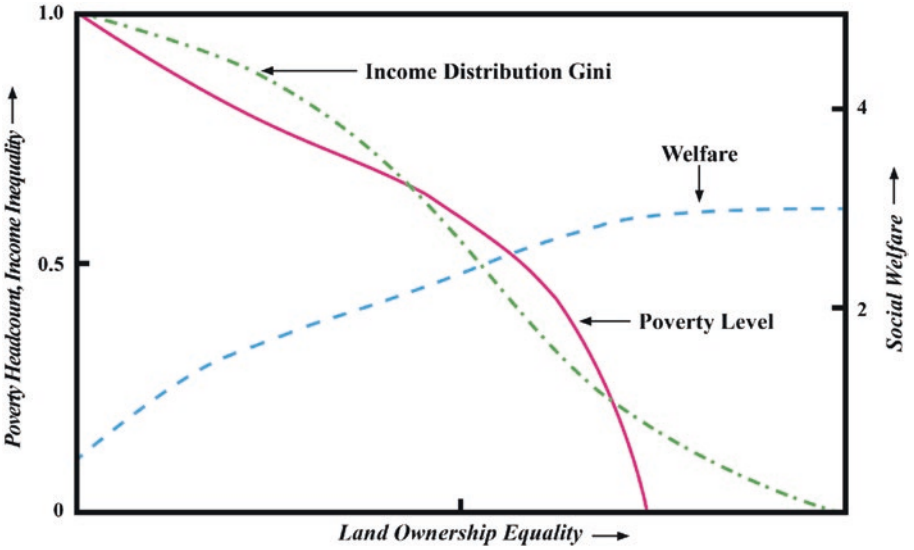

Fig. 11.1 Poverty and land distribution
Source: Eswaran and Kotwal 1986

assumptions, the understanding of rural poverty as rooted in unequal distribution of the means of production, and an economic case for land redistribution as growth with poverty reduction, reappears.

However, one key difference between this asymmetric information model and the classical Chayanovian treatment is that endowments only become fate in the presence of unequal access to capital. More equal access to capital should allow households to borrow their way out of poverty by renting-in needed means of production, capitalize a business and move forward economically. Figure 11.2 illustrates this approximate equivalence between land and credit market reforms. Drawn for an economy with a high level of asset inequality, the diagram explores what happens to the key economic performance measures as access to capital is delinked from land wealth (the left side of the figure, where the key capital leverage parameter $\theta = 0$) versus when capital access is tightly linked to land endowments (the right side of the figure). As can be seen, leveling the playing field in terms of access to capital also eradicates poverty and realizes social welfare levels similar to those obtainable when assets are distributed equally in Fig. 11.1.

Although Eswaran and Kotwal do not make it explicit, the shift in class structure from Fig. 11.2 can also be regarded as a shift in the occupational choice problem that households face. Households that are unable to become self-employed peasants or capitalists can now meet the conditions to make that choice, with greater access to capital. Entrepreneurs with high potential

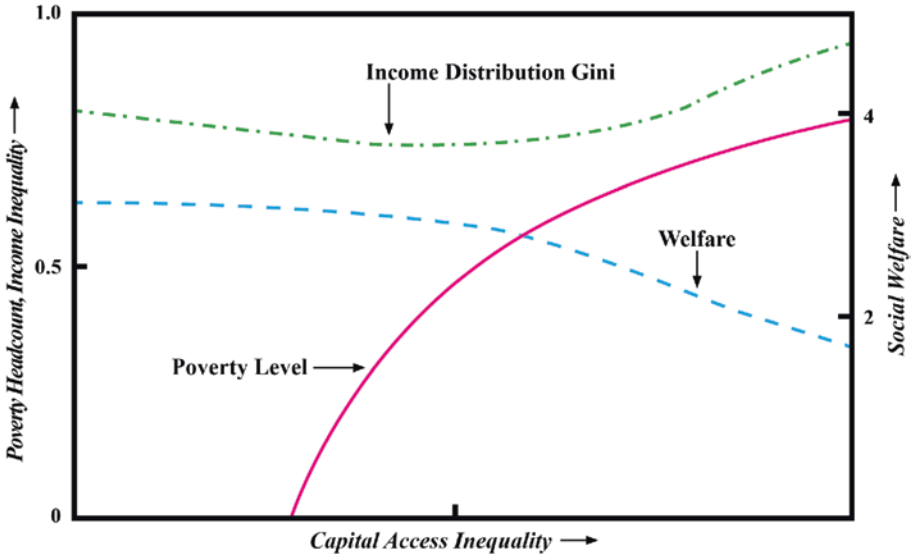

Fig. 11.2 Equivalence of credit market reform and asset redistribution
Source: Eswaran and Kotwal 1986

capabilities can select into occupations where that potential can be realized.[13] This is an important distinction as it opens up an array of supplemental interventions that can go along with credit access to alleviate rural poverty. As will be discussed below, if a household's potential capabilities can be released with, for example, coaching and psychological interventions, it can be pivotal to the success of an intervention that improves access to land and/or credit.

While powerful, the credit-land reform equivalence of Eswaran and Kotwal illustrated in Fig. 11.2 depends on the rather strong assumption that credit reform that delinks credit access from land wealth not only improves the credit access of the land poor but also restricts the credit access of the land rich.[14] In contrast, microfinance programs can more typically be seen as boosting ϕ (the amount that can be borrowed by a household without conventional real collateral) without necessarily reducing θ (the leverage value of conventional collateral). Thus, while there is a partial equivalence between full-scale land redistribution and credit access, the nature of the credit reform required to make that equivalence true is almost as radical as that of full-scale land redistribution. While not analyzed by Eswaran and Kotwal, a more mod-

[13] Indeed, what Eswaran and Kotwal (as well as Marxian economists like John Roemer) call class structure, neoclassical economics would call occupational choice.

[14] In order to keep aggregate credit constant when varying θ, Eswaran and Kotwal also vary ϕ, by the equation $\phi = B_T - \theta \bar{T}$, where B_T is the aggregate amount of credit in the economy.

est credit reform would be expected to weaken but not completely eliminate the linkage between initial asset distribution and poverty and economic performance.

These shortcomings notwithstanding, the at least partial equivalence between land reform and access to capital suggests promotion of improved access to capital for poor rural households may achieve many of the same objectives that had been hypothesized to attend efforts to redistribute land. Politically, it would certainly seem easier to pursue a policy that asks high wealth households to loan money to microfinance projects (where they would also get a return on their investment) to help the rural poor, rather than to give up a part of their asset holdings.[15]

4 Lending, Not Redistributing Wealth: The Microfinance Revolution and Impact Evaluation Economics

While the Eswaran and Kotwal (1986) paper demonstrates how delinking access to capital from collateral wealth as a tool to combat rural poverty (by placing land-scarce households on an entrepreneurial path to become medium-scale farmers), the practice of credit market reform preceded their theoretical work by a decade when Muhammad Yunnus began making uncollateralized loans to villagers in Bangladesh. Yunnus' efforts spawned the Grameen Bank and, eventually, the "microcredit revolution" built around the Grameen model of group, or joint liability, loans that did not require conventional collateral.

The early academic literature on microcredit largely focused on the logic of joint liability and group lending (e.g., Stiglitz 1990; Besley and Coate 1995). As development economics textbooks now routinely discuss (e.g., De Janvry and Sadoulet 2015), joint liability circumvents the asymmetric information problems that lead conventional lenders to rely on collateral assets to manage borrower adverse selection and moral hazard. More specifically, microcredit is founded on the idea that information is symmetric between neighbors, who know each other's characteristics (skill, work ethic, honesty, self-control, etc.)

[15] Another limitation of both the asymmetric information-based model of Eswaran and Kotwal and the original Chayanovian model is that they treat the distribution of land endowments as fixed. While that treatment is unobjectionable in the short run, it is less defensible over the longer term if we consider time as a degree of freedom that might also allow households to lower consumption and build up stocks of money to either self-finance production or purchase land and gain access to capital that way. We return to these dynamic issues in Sect. 5.

and who can monitor each other's behavior and credit use in real time at near-zero cost. Because they will be responsible for paying off the loans of any defaulters, joint liability group credit incentivizes neighbors to use the information they have on each other to perform the borrower selection and credit monitoring roles that traditionally fall to the lender.[16] In addition, social ties between neighbor borrowers give them potential leverage over each other should one take actions that reduce the likelihood of credit repayment. Effectively, social relationships (or capital) become a type of intangible collateral asset. Putting these pieces together, the miracle of microfinance is that it allows prudent lending to cost-effective individuals who lack conventional collateralizable assets. The efficacy of microfinance in agricultural economies is an issue to which we return in Sect. 5.

Beginning with the few loans offered by Yunnus in 1976, microcredit experienced a meteoric growth in both numbers and popularity. Yunnus' Grameen Bank grew to over 2.5 million members by 2002. The Microcredit Summit Campaign (2015) reported that by 1997 there were already 13.5 million microcredit borrowers, 7.6 million of whom they classified as being among the poorest strata of society. By 2013, these figures had reached 211 and 114 million, respectively. The 114 million borrowers classified as being among the poorest was actually a decline of 24 million from its peak of 138 million in 2010.

Accompanying and helping spur this growth in microcredit was an outpouring of anecdotal evidence on the transformative power of microfinance for poor households. However, more rigorous research evaluating the claims of the microfinance revolution was somewhat slow to evolve. Coupled with the rapid spread of microfinance, this evaluation lag made credible evaluation of the impacts of microfinance doubly difficult to achieve.

The key to any rigorous evaluation is the creation of a credible measure of what the economic status of microfinance beneficiaries would have counterfactually been without microfinance. Concretely, if microfinance borrowers had higher living standards than non-microfinance borrowers, and had transitioned from wage work to more remunerative entrepreneurial activity, was that because of the impact of microfinance, or would the type of person who participated in microfinance have been better off than the non-participating types even in the absence of the credit market intervention? Answering this question is especially hard in the case of microfinance. Because a key element

[16] In an important theoretical study, Conning 2005 asks whether the presumed benefits of joint liability lending (symmetric information and costless mutual monitoring) are in fact more imagined than real. Conning notes that Yunnus and the Grameen Bank itself began shifting to individual liability loans, closely monitored by bank officers. …

of joint liability lending is local selection of borrowers based on local information not easily available to outside lenders (or to econometrically inclined observers), individuals in communities with microfinance programs but who were not selected into microfinance are unlikely to be good control replicates for selected borrowers. Given that neighbor-based selection is as likely to be based as much on externally unobservable as observable characteristics, conventional econometric methods used to control for the differences between borrowers and non-borrowers are likely to be wobbly.

Given that microfinance non-participants are unlikely to be good controls for what would have happened to microfinance beneficiaries in the absence of microcredit, other places to look for good control replicates are of course communities without microfinance programs. However, the rapid spread of microfinance meant that untreated communities became fewer and farther between, raising the concern that communities without microfinance were somehow different (too isolated for small-scale enterprise to take off). If correct, inhabitants in these communities are unlikely to be good controls, meaning that their living standards and occupation choice could show what the counterfactual status of microfinance beneficiaries in more favored locations is. In other words, microfinance programs were endogenously placed geographically by their implementers, presumably in relation to the programs' expected impacts.

Armendariz and Morduch (2004) provide a thoughtful discussion of the early literature that tried to evaluate the impact of microfinance despite these challenges. The important study by Pitt and Khandker (1998) relied on data collected in the early 1990s from Bangladeshi communities with and without one of three flagship microfinance programs, including the Grameen Bank. They grappled with the aforementioned statistical identification problems and attempted to exploit wealth-based eligibility rules to help identify which households in untreated communities would have borrowed (had microfinance been available) and who could thus serve as a plausible control group for microfinance beneficiaries in treated communities. Their findings were quite striking as they estimated that women borrowers experienced an $0.18 increase in their income for every microfinance dollar borrowed. Leverage, rather than redistribution, seemed to go some distance toward closing the poverty gap.

However, leaving detailed discussion of the econometrics to Armendariz and Morduch (2004), subsequent studies that either analyzed the same data with different statistical approaches or added follow-up survey rounds to the original Pitt and Khandker (1998) data found smaller impacts. The Morduch (1998) study found no impact of microfinance on average incomes, although it did find evidence that microfinance helped insulate beneficiaries' consump-

tion from shocks. Khandker (2005) found some positive impacts of microfinance on income, but they were less than half the size of those estimated in the original Pitt and Khandker (1998) study. Despite the enormity of the question about whether access to capital could really alter poverty dynamics and class structure (and the billions of dollars spent on microfinance), these early studies that tried hard to harvest impact estimates despite the rapid spread of the microfinance revolution were unsatisfying in their ambiguity and imprecision.

This dissatisfaction with the microfinance literature intersected neatly with academic economics' rediscovery[17] of randomized controlled trials (RCTs) as a way to generate more reliable control groups for purposes of evaluating program impacts. Within development economics, the PROGRESA evaluation (e.g., Schultz 2001) along with the Miguel and Kremer (2004) more epidemiological study of deworming medicine attracted substantial attention for the simplicity and credibility with which they were able to estimate program impacts. One early study that employed RCT methods to evaluate the impacts of microfinance, Banerjee et al. (2015a),[18] worked with a microfinance lender (Spandana) expanding its program in India. The lender agreed to hold back a randomly selected subset of the communities where it intended to expand, to serve as a control group for an approximately two-year period. While this community-level randomization design solves the endogenous placement problem described above by assuring that areas with Spandana should be no different than areas without Spandana. However, Spandana's expansion took place against the background noise of the more general microfinance revolution. While the communities targeted by Spandana had low microfinance penetration at baseline, with less than 2% of households having microfinance loans, that figure had risen to 18% in "untreated" control communities in the follow-up survey conducted a year and a half later. In the Spandana expansion treatment areas, microfinance users rose by an additional 8% to 26% of households. This modest 8% net compliance rate with the Spandana treatment of course reduces the statistical prospects for detecting any impacts of the treatment.[19] Indeed, a second follow-up survey, conducted

[17] One of us attended graduate school in the late 1970s when a series of RCTs were implemented with US government sponsorship to study the impacts of different social welfare programs and work and labor supply incentives.

[18] Despite its lagged publication date, the RCT for this study was implemented beginning in 2006.

[19] The net compliance rate of an experiment is the difference between the fraction of individuals in the treatment group who took or complied with their treatment (e.g., a microfinance loan) and the fraction of individuals in the control group who also took the treatment. Note that in a classic well-controlled medical trial, the net compliance rate will be 100%, with all the treatment groups taking their medicine and the control group only taking a placebo. The ability to detect treatment impacts declines precipitously with net compliance.

two years after the first, revealed no difference at all between treated and untreated areas in terms of microfinance borrowing with about 35% of households in both areas having microfinance loans.

While lacking the *tabula rasa* of a world without microfinance, the Banerjee et al. (2015a) study uses the modest 8% differential in microcredit loan uptake in the first 18 months of the experiment to identify the value-added impacts of Spandana on top of what was already going on within control areas. Keeping this limitation in mind, the authors find essentially no impacts of the Spandana expansion at either the first or second follow-up surveys. Missing are impacts on income, assets and, most tellingly, business start-ups or expansion or other changes in occupational choice.

The character of these findings is matched by the other five RCT-based microfinance evaluations summarized in Banerjee et al. (2015c). Methodologically, like the Spandana study these studies also suffer from control groups affected by the uncontrolled expansion of microfinance. Similar to that study, the other analyses detect little to no impact of microfinance on occupational choice and the transition to more remunerative livelihoods. In short, despite the promise of microfinance, there is scant evidence that it impacted class structure and poverty. Unknown, and probably now unknowable, is whether this lack of evidence reflects the lack of impacts, or simply our inability to reliably detect them given the rapid spread of microfinance.

Before turning back to consider the role of asset transfers and redistribution on rural poverty, it is worth remarking on land titling interventions as a way to improve the capital access of low-wealth households, interventions that ran parallel to the microfinance revolution. As popularized by De Soto (2001), land titling programs were hypothesized to turn the "dead assets" of the poor into collateralizable capital. While the early study of Feder et al. (1988) found some positive impacts of land titling on investment and land values, the evidence is at best mixed regarding the impact of titling on the credit access of low-wealth rural households (Dower and Potamites (2014) provide a recent review of the literature). In a study of rural Paraguay for example, Carter and Olinto (2003) find that while land titling enhances investment demand for all, it only unlocks access to capital for the cohort of wealthier landowners. In their study of Indonesia, Dower and Potamites (2014) find more positive evidence that titling boosts credit access, but via signaling rather than a conventional collateral effect espoused by De Soto (2001) and others. Similar to microfinance, land titling is politically more palatable than redistributing assets. Nonetheless, also like microfinance there is spare evidence that land titling has opened a pathway of upward mobility for low wealth rural households.

5 The Return of Redistribution: Asset Transfers and the Economics of Accumulation by Poor Households

Even as academic economics was busy evaluating the impacts of microfinance, often eschewing theoretical perspective for a reactive impact evaluation culture,[20] one prominent microfinance institution–the Bangladesh-based NGO, BRAC–recognized the inadequacy of the leverage not redistribution model, at least for their poorest households. As described by Hulme and Moore (2008), BRAC realized that its microfinance program failed to reach the poorest, especially the poorest women. The reasons behind this failure are instructive about the limitations of improving access to capital as a solution to resolving poverty when productive assets are unequally distributed.

First, in a microfinance analogue to collateral-based quantity rationing by conventional lenders (see the discussion in Sect. 3), BRAC discovered that their borrowing groups tend to exclude the poorest households with the weakest social collateral. Second, and somewhat more subtly, Hulme and Moore (2008, page 196) note that, in addition, the poorest tended to *self*-exclude from BRAC's microfinance programs because they were worried "about the consequences of not being able to make weekly loan repayments."

This self-exclusion of the poorest is an example of what (Boucher et al. 2008) call risk rationing. As those authors demonstrate theoretically, in a world in which investment returns are uncertain, households with few assets may be loathed to collateralize those assets and risk losing them even when improved access to capital grants the opportunity to leverage their assets and invest in projects that are risky, but profitable in expectation. These authors find that like conventional quantity rationing, risk rationing is likely to weigh most heavily on poorer households with smaller endowments of productive assets.[21] They further show that increasing the collateralizability of the resources that poor households already have may simply shift those households from being quantity rationed to being risk rationed, with little change

[20] As Barrett and Carter 2010 discuss, one of the unfortunate, but avoidable, side effects of the shift of development to impact evaluation is that theoretical insights have often been left aside with the economics profession following the programming decisions of government and non-governmental organizations (NGOs).

[21] Boucher, Carter, and Guirkinger (2008) argue that risk rationed households are in a sense involuntarily rationed because they would be expected to borrow if the available contract offered higher interest rates but lower collateral requirements. A similar argument could be made for self-excluding microfinance borrowers who fear placing their few social relationships at risk as collateral for group loans.

in production or in their living standards.[22] While the collateral under microfinance loans are often intangible social assets, the insights of Hulme and Moore (2008) suggest another limitation of a microfinance-led approach to improving the economic circumstances of low-wealth households.

More generally, the risks that attend agricultural production have long been suspected to reduce the efficacy of microfinance in the small farm sector. Among other things, the reality that much of agricultural risk is a common or covariant risk within a community means that joint liability mechanisms do little to reduce default risk for lenders, as the members of a group will tend to all succeed or fail at the same time. This observation has led to efforts to interlink small farm credit with index insurance mechanisms designed to remove covariant risk (see Carter et al. 2016; Miranda and Farrin 2012).

Beyond discouraging taking advantage of opportunities to access capital, risk can also discourage from accumulating productive wealth itself. Before turning to this latter consideration, we first consider the rediscovery of asset transfers as a solution to rural poverty.

5.1 Asset Transfer and Asset Building Graduation Programs

Hulme and Moore (2008) and Hashemi and De Montesquiou (2011) explain the emergence of "graduation" program from BRAC's efforts to find a set of interventions that would work for households excluded from standard microfinance programs. Given the evidence that microfinance at best weakly promotes the creation of new businesses and has little impact on class structure and rural poverty, lessons from these programs become even more important. Figure 11.3, taken from Hashemi and De Montesquiou (2011) portrays the key elements of graduation programs as taken from BRAC's TUP (Targeting the Ultra-Poor) program.

As can be seen in the figure, the graduation program begins with a period of consumption support designed to stabilize the household economy, allowing the household to focus on the future freed from the preoccupation of securing immediate consumption. This intervention is then followed by a period of "coaching" intended to build up both conventional business and technical skills and soft skills, or psychological assets, including a sense of

[22] While the Boucher et al. (2008) results are theoretical, they also show empirical evidence from four countries showing that as much as 25% of the small farmer population is risk rationed and that their failure to exploit available loan contracts leaves them poorer than they need be and in a circumstance akin to that of households that are completely excluded from credit markets.

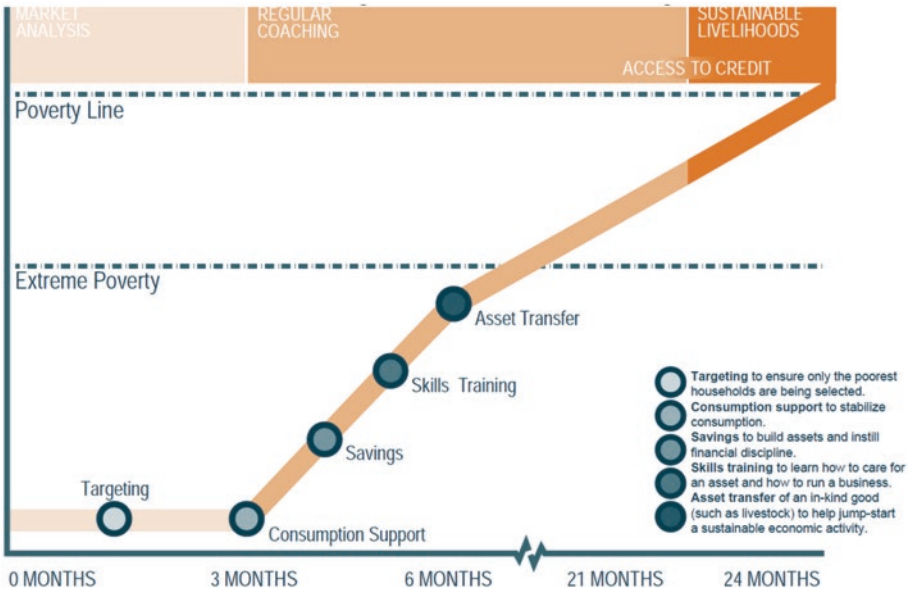

Fig. 11.3 Graduation programs
Source: Hashemi and De Montesquiou 2011

individual worth and self-efficacy. With these pieces in place, a transfer of a productive asset occurs (valued in the $500–$1000 range) with the hope of launching the household on a path of improved economic well-being and sustained asset accumulation and growth.

BRAC's own evaluation of its initial program found highly positive results on program beneficiaries as compared to a control group of near-eligible households.[23] As reported in Rabbani et al. (2006), three years after the initiation of the program, compared to the control group, participants had accumulated more assets (tangible, financial and social), improved their land access and moved up the livelihood or wealth ranking ladder, surpassing the level of the initially better-off control group. The fraction of treated households below a dollar-a-day poverty threshold fell by 30 percentage points. Participant households had also graduated to participate in regular BRAC microfinance groups by the end of the evaluation period.

These encouraging results motivated a set of studies across six different countries (Ethiopia, Ghana, Honduras, Indian, Pakistan and Peru) to test the robustness of the graduation model. As reported in Banerjee et al. (2015b),

[23] The BRAC analysis compares "selected" with "non-selected" ultra-poor households. Non-selected households passed the means test for inclusion in the program, but failed to otherwise qualify for the program based on other characteristics. At baseline, the non-selected control group was modestly better off than the group selected for inclusion in the TUP program.

three years after the productive asset transfer, program beneficiaries enjoyed consumption that was 5% higher than that of a randomly generated control group. Increases in income and assets were proportionately even higher. Savings and borrowing both increased as did hours worked and mental health indicators. Similar results are found by Gobin et al. (2017) who find that a graduation program targeted at the poorest women in the remote pastoralist regions of northern Kenya boosted incomes by almost 30% 18 months after program inception.

Reporting on the scaled-up BRAC TUP program in Bangladesh, Bandiera et al. (2017) study impacts two, four and seven years after program inception.[24] At baseline, study households allocated most of their time to low-paying, casual wage jobs. Participation in the graduation program fundamentally shifted the time allocation of the treatment group toward more remunerative entrepreneurial activities built on the initial asset transfer. The authors find that program impacts continued to grow between years two and four of the study, powered by an autonomous process of capital accumulation. At year two, income in the beneficiary population had grown some 25% compared to the control group, with that impact rising to 39% by year 4. Similarly, consumption rose by 5% after two years, with that impact doubling by year 4.

These growing impacts signal that the BRAC graduation program had indeed placed households on a trajectory of upward asset accumulation that sustained itself long after the initial asset transfer had been made. The poverty headcount among the beneficiary population fell 8 percentage points over 4 years relative to the control group off a baseline poverty headcount of 55%. Finally, the year 7 results show that these average impacts were sustained, although they did not grow any larger suggesting perhaps that the beneficiary households had reached a new equilibrium position.[25]

Compared to the estimated tepid impacts of microfinance, graduation programs built around the transfer of productive assets (and investment in human

[24] Four years after the study's inception, control group households were brought into the program. The seven-year results reported by Bandiera et al. (2017) assume that the control group replicated the pattern of the treatment group in the first years of the study and synthetically reduce downward the position of control households at year 7 in order to obtain estimates of the long-term impacts on the treatment group.

[25] Interestingly, Bandiera et al. (2017) show that these average impacts disguise a pattern of heterogeneity in which roughly 40% of households benefit modestly from the program, while the rest benefit substantially more than the average treatment effects indicate. In a study of small farm development program in Nicaragua, Carter et al. (2018) discuss in more detail the reasons why such heterogeneity exists in programs intended to address rural poverty with asset transfers and other interventions intended to place households on an entrepreneurial pathway.

and psychological assets) appear to be highly effective in reducing rural poverty. The programs are also highly expensive. The BRAC program studied by Bandiera et al. (2017) costs about $1200 per beneficiary household, while the six programs studied by Banerjee et al. (2015b) cost between $1500 and $6000 per beneficiary. These costs are split roughly equally between the direct cost of the asset transfer and the cost of the coaching intervention and program administration. How much of the impact of these programs is due to these different program components (and their potentially synergistic interaction) remains an open question. It is perhaps telling that the Escobal and Ponce (2016) study of a pure asset transfer program in Peru that lacked the coaching intervention found income impacts less than 10%, or about a third of the level seen in the other studies.

While the income benefits to beneficiary households generally outweigh the program expenditures under reasonable assumptions, the shift from a microfinance leverage model back to an asset redistribution model is striking. Indeed, they invite comparison with the Keswell and Carter (2014) impact evaluation of a more conventional South African land redistribution program implemented in the early 2000s.[26] The Land Redistribution and Development (LRAD) program provided an asset grant worth approximately $3000 that had to be used to purchase land on a willing-seller, willing-buyer basis. Program participants enjoyed business planning support from the South African government. Using a pipeline identification strategy, Keswell and Carter (2014) find that the land transfer boosted household per-capita consumption by 40% three years after the transfer. With control households hovering around the current $1.90 poverty line, an increase in this magnitude implies a substantial shift of poor households from just below to well above the poverty line. This increase in consumption is substantially higher than those recorded by the graduation program studies and bespeaks an income increase (not measured directly in the South African study) at least as large those found by these other studies. Keswell and Carter (2014) note that these large returns on the once-off land transfer suggest substantial additional accumulation by these households as well as a shift from lower to higher productivity uses of their labor time.

[26] As discussed by these authors, identification of the impact of such land reform programs has historically proven difficult because major redistribution efforts typically take place in the midst of a broader mix of political and economic changes (see, e.g., the studies in Thiesenhusen 1989).

5.2 Risk, Poverty and the Dynamics of Asset Accumulation

While the graduation program studies largely took place in an a-theoretic, impact evaluation vacuum, their findings invite a return to theoretically grounded understandings of rural poverty discussed in the earlier sections of this chapter. At the first level, they appear to confirm the most basic perspective that emerged from the Chayanovian literature, namely that households are poor because they lack ownership over assets and receive low returns to their labor endowments. Improving households' holding of productive assets allows them to shift to a more entrepreneurial strategy and earn higher returns to their labor. However, at a deeper level, the sustained and high impacts found in these studies also reveal that a once-off asset transfer sparks, over time, additional investment and asset accumulation that otherwise would not have taken place.

This revelation returns us to an issue left unresolved by the static models in the Chayanovian tradition. As noted in Sect. 3, these models assume that the distribution of owned land (or other productive assets) is fixed. And yet, in a world in which land-poor households have cheap labor but lack access to capital, there would appear to be incentives for the poor households to use time as their ally, allowing them over time to either accumulate financial wealth or purchase land from larger landowners, gaining leverage in financial markets.

A pair of papers (Carter and Zimmerman 2000; Zimmerman and Carter 2003) explicitly address the question of how the poor accumulate assets in a world of imperfect factor markets. Carter and Zimmerman (2000) show that, ignoring risk, low-wealth households will find it dynamically optimal to sacrifice consumption in the short term and purchase assets and eventually gain the financial market leverage needed to fully fund an efficient production process. While this process is slow and economically costly, it does show that initially poor agents will slowly save their way out of poverty and transition to a more entrepreneurial posture. In contrast, Zimmerman and Carter (2003) show that adding risk into this general problem can completely derail the poor's self-financed ascent from low living standards.

However missing from both of these models is the psychological dimension that has been brought into focus by the graduation studies. To gain purchase on the integrated problem, we draw on the following intertemporal choice model that has been more recently analyzed in the literature on asset accumulation by poor households:

$$\begin{aligned} \max_{c_{jt}} \quad & E_\theta \sum_{t=0}^{\infty} \beta^t u(c_{jt}) \\ \text{subject to:} \quad & \\ & c_{jt} \le T_{jt} + f(\psi_j, T_{jt}) \\ & f(\psi_j, T_{jt}) = \psi_j \max[f_H(T_{jt}), f_L(T_{jt})] \\ & T_{jt+1} = \left(T_{jt} + f(\psi_t, T_{jt}) - c_{jt}\right)\left(\theta_{jt+1} - \delta\right) \\ & T_{jt} \ge 0 \end{aligned} \tag{11.3}$$

In contrast to the Chayanovian model outlined in Sect. 2, the household in this model is forward looking, making a stream of consumption and investment decisions in order to maximize its discounted stream of expected utility. Specifically, consumption in each time period t is constrained to be less than the households' total wealth (or cash on hand) at that time, defined as the value of its productive assets (T_t) plus current income ($f(\psi_t, T_t)$). Next period's stock of productive assets evolves according to the third constraint, which says that next period's assets equal this period's plus net investment, adjusted for depreciation ($\delta \ge 0$) and stochastic shocks ($0 < \theta \le 1$). Importantly, borrowing is not permitted in this stylized model, and consumption and investment are restricted to current cash on hand. To keep things relatively simple, labor agency costs and working capital constraints are ignored.

An important addition to this model is that it gives the household the choice between a traditional, low-returning technology, f_L, and a higher-returning technology, f_H, that is characterized by fixed costs. In addition, the productivity of both technologies is shaped by the household's specific level of human capabilities, denoted as ψ_t. We can conceive of human capabilities in a very general sense so that it includes innate skill, human capital as well as psychological characteristics such as perceived self-efficacy. As stressed by de Quidt and Haushofer (2017), it is the household's own perception of its capabilities that matters for decision-making, and those perceptions are in turn shaped by depression and other psychological phenomena and perhaps by poverty directly (Dean et al. 2017).

As has been studied by a number of authors (e.g., Buera 2009; Carter and Barrett 2006), a model with a non-convex production set like this one can generate multiple equilibria, with some households optimally gravitating toward a "poor" equilibrium associated with the low technology and others gravitating toward a better-off equilibrium using the high technology. The key insight of these models is that there may exist a critical asset level or tipping point in asset space. Below that level, it makes no sense to try to escape poverty (the odds of escaping are too low and the time required too long), and

individuals or families who find themselves below the tipping point will remain persistently poor. Above that critical asset level, it makes economic sense (in these sense of optimization problem (11.3)) to strive to escape poverty and reach the higher equilibrium. In poverty trap models of this sort, initial asset holdings matter (endowments are fate) and shocks that push households below the critical asset level have permanent, irreversible consequences.

While the empirical existence of such a multiple equilibrium poverty trap has been a matter of some dispute (e.g., see the discussions in Barrett and Carter 2013; Kraay and McKenzie 2014), the model above provides a fairly general framing against which we can consider the ways in which asset transfer programs and psychological asset building might work. Figure 11.4 is a stylized representation of the solution to dynamic optimization problem (11.3).[27] The curve labeled $T_h^*(\psi)$ ($T_\ell^*(\psi)$) represents the steady-state equilibrium capital holdings for those that employ the high-returning (low-returning) technology. As we would expect, optimal capital holdings under either technology are increasing in capability level ψ. The dashed curve labeled $M(\psi, T)$ divides the space into those asset/capability positions from which it is optimal to move toward the non-poor equilibrium associated with the adoption of the high technology (asset combinations northeast of M) and

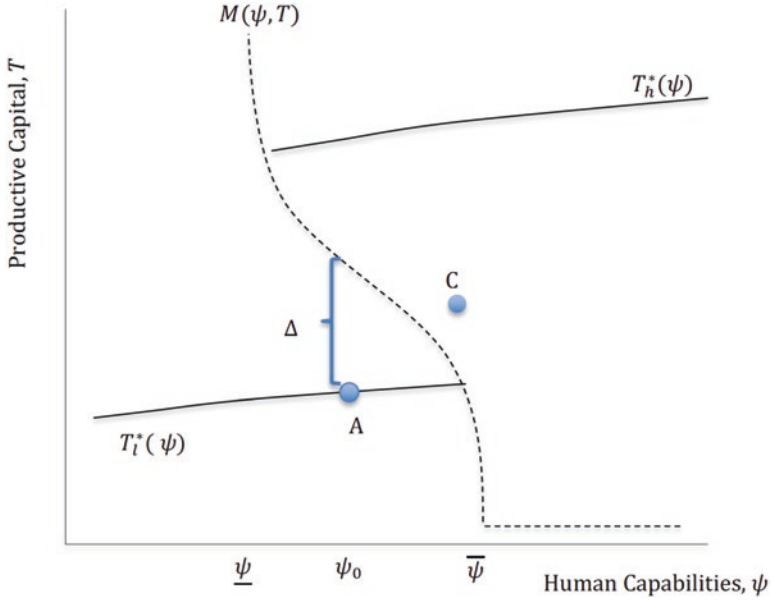

Fig. 11.4 Poverty and asset accumulation

[27] Numerical dynamic programming solutions to this type of model are found in Ikegami et al. (2017).

those from which it is not. That is, this "Micawber Frontier" (to use the terminology of Zimmerman and Carter 2003) maps a household's asset position into its dynamically optimal strategy. It is important to stress that not all households to the northeast of the frontier will succeed and reach the non-poor equilibrium in the long run. The prospect of a severe shock that destroys assets and pushes the household below the frontier makes it probabilistic that a household will not reach the high equilibrium even if they attempt to accumulate the assets required to reach it (see Ikegami et al. 2017). As can be seen, for households with capabilities below the critical level, $\underline{\psi}$ will never find it optimal to try to move to the high equilibrium irrespective of their initial holdings of tangible capital. Those with capabilities above $\overline{\psi}$ will always strive to reach the high equilibrium even if they begin with a zero endowment of productive capital.

Consider a household initially found at position A in Fig. 11.4, with initial capability level of ψ_0 and productive assets of $T_\ell^*(\psi_0)$. Absent of any intervention or other change, this household would be expected to remain at this steady-state position. The fact that the household is southeast of the Micawber Frontier signals that further efforts to accumulate additional assets and move to the high steady state $(T*)$ is not optimal.[28]

Imagine now an intervention that boosts the household's stock of productive assets, but leaves its capabilities unchanged. Any asset transfer $\varepsilon < \Delta$ will not be sufficient to lift the household out of poverty in the long run as the new, augmented asset position $(T_0 + \varepsilon)$ remains below $M(\psi_0, T)$. Under optimal behavior defined by optimization problem (11.3), the household will optimally revert to the poor steady state despite the asset transfer.

For this household to have any probability of escaping poverty, one of two things needs to take place. Either the overall asset transfer must exceed Δ, or the household's capabilities must be bolstered. Graphically, if a graduation program moves the household from A to B in Fig. 11.4, by transferring $\varepsilon_T < \Delta$ and boosts the household's capabilities (perhaps through coaching that reduces depression and bolsters the household's perceived self-efficacy), then the household will place itself on a path to try to escape poverty and reach the higher equilibrium.

While abstract, this theoretical framing helps make sense of some of the more interesting empirical findings in the literature. In a particularly provocative study, Macours and Vakis (2014) have the opportunity to study the

[28] Note that at the steady-state position, marginal returns to further investment are worth less than the certain cost of the foregone consumption required to finance the accumulation. Given that these costs are certain and that the gains from further accumulation are uncertain, it is suboptimal for the household to try to move beyond the low equilibrium steady-state value.

impact of modest asset transfers (valued at $400) to poor, rural Nicaraguan women when those transfers were or were not accompanied by a complementary intervention that boosted households' aspirations and beliefs in their own self-efficacy. Interestingly, when the asset transfer was not accompanied by the complementary intervention, its impact on household income and investment was nil. In contrast, when the asset transfer was accompanied by the strong exposure to leaders, its impact boosted earned income by 30% and livestock holdings by 77%.

While the studies of graduation programs discussed in Sect. 5.1 were unable to study the separate impacts of asset transfers (northward movements in Fig. 11.4) from coaching interventions (east movement in Fig. 11.4), the model does help shed light on one puzzling aspect of these interventions. The Bandiera et al. (2017) study finds substantial heterogeneity in program impacts. For example, the high average impacts reported above are driven by an uneven pattern of benefit. Their analysis of quantile treatment effects for productive capital shows that about 40% of the sample experienced no longer-term impact, while 15% to 20% of the households experienced extraordinarily high rates of capital accumulation.

From the perspective of the poverty trap model of accumulation, the strong heterogeneity of these results would be expected if the target population was distributed with different levels of capital and capabilities. For some, the intervention may well have lifted them above the Micawber threshold and placed on a self-sustaining trajectory to a higher equilibrium. For others, the program may have failed to adequately boost either the stock of productive assets or human capabilities to allow escape from the poverty trap equilibrium.

6 In Conclusion

The distribution of land has long been a central preoccupation in agrarian economics and the economics of rural poverty. Casual empirical comparison of the economic performance of East Asian economies with those of other world regions supports the notion that the egalitarian land distributions of the former explained their relatively rapid rates of economic growth and rural poverty reduction. While the economic case that land redistribution can be a win-win scenario, promoting both growth and poverty reduction, has deep roots, the politics of asset redistribution have of course never been easy. Even as the economic analysis of agrarian economies became more sophisticated suggesting that enhanced capital access could substitute for asset redistribution, the microfinance revolution took hold with the promise that poverty

could be eliminated by finding mechanisms that allow the poor to borrow the wealth of the rich, rather than redistributing it.

While the full merits of that argument may never be known, development economics became increasingly preoccupied and sophisticated in its effort to empirically evaluate this claim. Despite the hype surrounding the microfinance revolution, the empirical analysis found its impacts wanting. Ironically, attention turned to a new generation of graduation programs that provided modest asset transfers in combination with other interventions meant to stabilize households and allow them to build their self-confidence and psychological assets. In contrast to the tepid findings on the impacts of microfinance, evaluation of these next generation anti-poverty programs has found them to be remarkably impactful, on average and at least for a subset of beneficiaries.

Have we come full circle? Yes and no. Consistent with a new body of theory on asset accumulation, it seems that at least a minimum asset base is required to allow households to escape poverty. Improved access to capital by itself seems inadequate. While this sounds like an old story, deeper appreciation of the psychology of poverty suggests that the transfer of tangible assets alone may be inadequate to reduce rural poverty and that there are important synergies between efforts to simultaneously build up both the physical and psychological assets of poor rural households. Finally, in risk-prone rural regions, there is a set of questions about the stability of transitions out of poverty generated by asset building and asset transfer programs. Finding ways to secure those gains stands as a priority for future research and experimentation.

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