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Do Men and Women Accumulate Assets in Different Ways?

Evidence from Rural Bangladesh

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INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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ABSTRACT

This paper examines asset dynamics for husband-owned, wife-owned, and jointly owned assets, using unique longitudinal survey data from rural Bangladesh. Nonparametric and parametric methods are used to examine the shape of the dynamic asset frontier, the number of equilibria, and whether land and nonland asset stocks converge to such equilibria. The paper also investigates the differential impact of negative shocks and positive events on husbands', wives', and jointly owned assets. Husbands' and wives' asset stocks are drawn down for different kinds of shocks, with husbands' assets being liquidated in response to death of a household member and dowry and wedding expenses, and both husbands' and wives' assets being negatively affected by illness shocks. The paper concludes by drawing out implications for the design of gender-sensitive social protection mechanisms.

Keywords: asset dynamics, poverty traps, gender, Bangladesh

ACKNOWLEDGMENTS

1. INTRODUCTION

Households in developing countries use a variety of mechanisms to cope with shocks. While households employ a range of ex ante and ex post coping mechanisms such as drawing down assets (that is, employing a risk management mechanism that was put into place ex ante), accessing capital markets, reallocating labor, and receiving private or public transfers (examples of ex post responses), asset disposal is often used as a last resort, because irreversible asset losses may put the household at risk of future poverty. The responsiveness of asset holdings to shocks and positive events is therefore of interest to policymakers because of its implications for the evolution of household poverty and well-being over time.

Recent work on assets and poverty traps in developing countries has used household-level panel data on asset holdings to distinguish between structurally and stochastically poor households and to identify whether a bifurcation point exists at which assets tend toward high- or low-level equilibria (Carter and May 2001; Lybbert et al. 2004; Carter and Barrett 2006; Barrett et al. 2006; Carter et al. 2007; among others). While earlier work on Sub-Saharan Africa has found evidence for multiple equilibrium asset poverty traps, more recent work across a more diverse range of countries does not support this (Jalan and Ravallion 2004; Naschold 2006, 2008). Quisumbing and Baulch (2009) hypothesize that, in the context of rural Bangladesh, well-functioning factor markets facilitate consumption smoothing and informal insurance mechanisms protect households against short-term shocks. However, the persistence of large numbers of rural Bangladeshi households with minimal asset holdings is consistent with the existence of an underclass of chronically poor households. Moreover, there are indications that capital markets may work against the landless, and the exclusion of women from labor markets and other market-oriented activities may create different livelihood strategies for men and women. Given the history of gender discrimination in Bangladesh, it is likely that differential access to credit and labor markets leads to different asset dynamics for men and women in rural Bangladesh.

The existence of different asset dynamics for men and women is consistent with the growing empirical evidence that risk is not shared equally within the household. For example, Dercon and Krishnan (2000) tested whether individual illness shocks affect the evolution of body mass index, controlling for a variety of confounding factors. They find that although risk is shared efficiently in most of the Ethiopian highlands, poor women fare worst in the southern part of the country, where customary laws on settlement at divorce are biased against women. Duflo and Udry (2003) also reject the hypothesis of complete insurance within households in Côte d'Ivoire. Conditional on overall levels of expenditure, the composition of household expenditure is sensitive to the gender of the recipient of a rainfall shock. Rainfall shocks that increase the yields of women's crops shift expenditure toward food. However, strong social norms constrain the use of profits from yam cultivation, which is carried out almost exclusively by men. In line with these norms, rainfall-induced fluctuations in income from yams are transmitted to expenditures on education and food, not to expenditures on private goods. In Ghana, spouses do not co-insure; women pool their risk with other women in the village, while men have a wider and less defined risk pool (Goldstein 1999). Indeed, transfers from the spouse and the extended family are not responsive to shocks, while those from nonfamily friends are. A study of pastoralist societies in Ethiopia and Kenya suggests not only that shocks matter, but also that *perceptions* of shocks matter (Doss, McPeak, and Barrett 2008). Men and women may differ in their perception of the nature of a shock, the severity of the shock, and the appropriate coping mechanisms to be used. Price fluctuations may also affect gendered asset accumulation. In Nigeria, Dillon and Quiñones (2011) find that the evolution of prices over a 20-year period reinforced gender asset inequality. Men primarily held larger livestock with larger unit values and benefited from price increases in high-value livestock, while women held lower-value livestock and thus did not experience the same degree of appreciation of their asset stocks.

There is also substantial evidence, particularly from the anthropological literature, that men and women have different asset accumulation strategies, and that men's and women's assets are used in different ways to cope with shocks. In Thailand, Antonopoulos and Floro (2005) find that women tend to keep more of their individual assets in real (tangible) forms rather than in a financial form, because

keeping assets in real form, such as jewelry, gives them more control over asset use. In Indonesia, Frankenberg, Smith, and Thomas (2003) show that jewelry traditionally serves as a buffer asset for consumption smoothing since it can be easily pawned or sold, even if women consider distress sales of jewelry shameful in the Bangladeshi context (White 1992, 133). Indeed, gold, mostly in the form of jewelry, was often sold to cope with the recent Indonesian economic crisis (Frankenberg, Smith, and Thomas 2003).

This paper uses the Carter and Barrett dynamic assets framework as a point of departure for investigating gender-differentiated asset dynamics and responses to shocks in rural Bangladesh. In particular, using a unique longitudinal survey covering around 750 households located in three case-control intervention study sites in rural Bangladesh, it investigates the following questions:

1. Are asset dynamics different for jointly and exclusively held assets?
2. Is the impact of negative events and processes different on male-, female-, and jointly held assets? To what extent are these mitigated by positive events?
3. Do different types of shocks contribute to gender asset inequality?
4. Are men and women with better access to social networks better able to accumulate assets?

This paper attempts to answer these questions using both nonparametric and parametric (regression-based) methods, which are outlined in the next section of the paper. Section 3 describes the unique longitudinal survey of rural Bangladesh used in this study, together with baseline household characteristics, baseline livelihood strategies, the incidence of shocks, and the trends in asset stocks observed over the 10-year interval spanned by the survey. Section 4 discusses the empirical specification. Section 5 presents nonparametric results using LOWESS (locally weighted scatterplot smoothing) plots, and Section 6 then examines the impact of individual and household characteristics, shocks, and initial asset ownership on land and asset growth, examining the impacts of different types of shocks, looking at different types of assets, and, finally, performing an indicative analysis of the role of social networks in asset accumulation. Section 7 concludes with a summary of the results and a discussion of the implications for the design of gender-sensitive social protection mechanisms.

2. METHODOLOGY

In a series of recent papers, Michael Carter, Christopher Barrett, and others have developed a theory of (dynamic) poverty traps and tested it empirically using data from Sub-Saharan Africa.[1] Observing that it is usually much easier to measure assets than either consumption expenditures or incomes, Barrett and Carter develop a theory of asset dynamics and dynamic poverty traps that can be applied to longitudinal data on asset stocks. Parametric and nonparametric methods are used to derive a dynamic asset path that shows the typical relationship between asset holdings in two periods, usually a number of years apart. Typically, as shown in Figure 2.1, the dynamic asset path has an elongated S-shape with three equilibria at the points where the dynamic asset path intersects the diagonal: a stable low-level equilibrium (A^L), an unstable mid-level equilibrium (A^*), and a stable high-level equilibrium (A^H). This leads to a prediction that households' asset trajectories will bifurcate, with those households that start off with asset levels above A^* accumulating assets over time and tending toward the stable high-level equilibrium. Meanwhile, households with assets below the unstable equilibrium decumulate their initial assets and tend toward the stable low-level equilibrium. This implies that some households will tend toward a persistently (or chronically) poor state, while other households will tend toward relative affluence.

Figure 2.1—Carter and Barrett's theory of asset dynamics and poverty traps
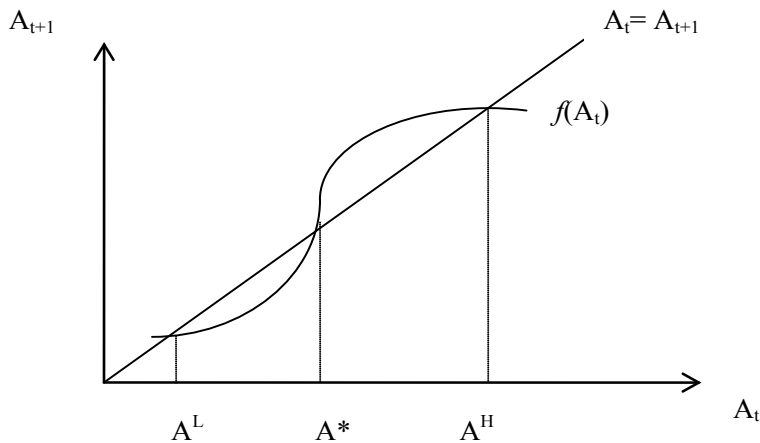
Source: Carter and Barrett (2006).

The dynamic asset path represents the central tendency of the asset recursion function (Naschold 2006). Dynamic asset paths can be estimated using a variety of nonparametric and parametric methods, although, given the inherent nonlinearity hypothesized by the theory, nonparametric methods usually provide the best fit. LOWESS, as proposed by Cleveland (1979), is used for nonparametric estimation. Despite its computational intensity, LOWESS is attractive compared to other nonparametric methods such as kernel regression, as it uses a variable bandwidth, which is robust against outliers, and uses a local line or polynomial estimator to minimize boundary problems (Cameron and Trivedi 2005). However, such methods do impose continuity on the dynamic asset path.[2]

Most, if not all, studies that have estimated dynamic asset frontiers have estimated these for households, owing to the paucity of longitudinal data on individually held assets. However, if resources—

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[1] See, inter alia, Carter and Barrett (2006), Barrett et al. (2006), and Lybbert et al. (2004). This exposition draws heavily from Quisumbing and Baulch (2009).

[2] This is not the innocuous assumption it may first appear, as it rules out the sort of discontinuities (jumps) in the asset frontier that might characterize poverty traps. However, testing for such discontinuities is a complex estimation problem (Hansen 1999), and previous work (Quisumbing and Baulch 2009) has shown no evidence of such discontinuities in the graphical analysis for Bangladesh.

including assets—are not pooled within the household, it is possible that males and females within the household may have gender-specific dynamic asset frontiers that differ from the household asset frontier. Focusing on the time path of individually accumulated assets is important if there is a nonzero risk of marital dissolution (whether through death or divorce) and if the surviving spouse is not adequately protected by legal guarantees or social norms.

The extent of asset pooling within households probably varies across cultures, with spouses pooling most assets in some cultures and having separate asset ownership in others. In Bangladesh, although spouses clearly have some concept of joint assets, there is reason to believe that resource pooling is incomplete; previous work on assets at marriage indicates that men's and women's assets have different effects on household resource allocation, with women's assets increasing expenditure shares on education (Quisumbing and Maluccio 2003) and improving girls' health relative to boys' (Hallman 2000).

Similar to previous work estimating dynamic asset frontiers, the following nonparametric equation is estimated:

$$A_{iT} = \beta\,(A_{iB}) + \varepsilon_{it} \qquad\qquad i = j,\,h,\,w, \tag{1}$$

where A_B and A_T are assets at the baseline (B) and the most recent survey period (T), and i indexes the owner of the asset, whether joint (j), husband (h), or wife (w). The analogous parametric regression is

$$A_{iT} = (1 + \alpha)A_{iB} + \theta_{it}, \tag{2}$$

which is estimated in differenced form as

$$A_{iT} - A_{iB} = \alpha A_{iB} + \theta_{it}. \tag{3}$$

A dynamic equilibrium implies that, at least in expectation, asset stocks do not change over time, that is,

$$E[A_{iT} - A_{iB}] = 0. \tag{4}$$

Suppose there is a level of assets $A_i{*}$ that represents a dynamic equilibrium. For $A_i{*}$ to be a stable equilibrium, the following condition must be met:

$$-2 < \frac{\partial E[A_T - A_t]}{\partial A_{B|A^*}} \leq 0. \tag{5}$$

The parametric specification uses a fourth-order polynomial regression as follows:

$$A_{iT} - A_{iB} = \beta_0 + \beta_1 A_{iB} + \beta_2 A_{iB}^2 + \beta_3 A_{iB}^3 + \beta_4 A_{iB}^4 + Z_i \Gamma_i + C_i \Lambda_i + \varepsilon_{it}, \tag{6}$$

where A_{iT} - A_{it} is asset growth for owner i in household j from the baseline survey period (B) to the most recent survey (T), A_{iB} is assets at the baseline, Z_i and C_j are time-invariant household and community characteristics, and ε_{it} is the error term. This specification, which resembles that used by Barrett et al. (2006) and Naschold (2006), allows for convergence to be tested in two ways. First, a strong test of convergence would be to reject $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ in favor of $-2 < \beta_1 \leq 0$ and $\beta_2 = \beta_3 = \beta_4 = 0$. That would imply a unique, stable dynamic equilibrium in which less-wealthy asset owners' asset stocks grow faster until they reach the equilibrium, while the asset growth of wealthier owners slows down. Second, a weaker test of convergence is if the expected value of change in log assets is nonnegative and the first derivative of the expected change in log assets with respect to lagged assets is negative at the point where $E[.] = 0$ and the first derivative is greater than -1; otherwise the equilibrium would not be stable.[3] This

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[3] Note that because of the higher-order polynomial terms, the derivative must be evaluated throughout the conditioning domain.

weaker test implies local convergence but not necessarily a stable or unique equilibrium, since the function could diverge before reaching the global maximum. However, this can be checked by repeating the test at different percentiles of the lagged asset distribution. Similar to the test performed by Quisumbing and Baulch (2009), this test is conducted at the 10th, 25th, 50th, 75th, and 90th percentiles of the lagged asset distribution for each category of asset owner.

Another issue is the extent to which different shocks affect men's and women's asset accumulation (or decumulation) behavior, and whether the impact of shocks differs across asset types. If men and women have different types of assets in their portfolios—men, for example, holding more land and agricultural equipment, and women holding more jewelry and small livestock—one would expect shocks to have different impacts on different asset types, depending on who owns the asset and the relative ease with which assets can be acquired and sold. If women's assets are smaller and more easily disposed of, shocks could increase, rather than decrease, gender asset inequality within the household.

Finally, there is much interest in the role of social networks and collective action in enabling the poor to reduce their vulnerability. Participation in collective action, particularly formal membership in groups, has increasingly been promoted by development practitioners as a way for the asset poor to invest in another type of asset—social capital. In Bangladesh, where women have traditionally owned fewer assets than men, development programs that build women's social capital by working through women's groups have been shown to help women build up their stocks of physical assets (Kumar and Quisumbing 2010).

Thus, this paper also attempts to investigate whether husbands' and wives' access to social networks helps them and their families accumulate land and assets. By identifying the different types of shocks to which men and women are vulnerable, and the factors that are protective against such shocks, this paper hopes to contribute to the development of gender-sensitive social protection mechanisms.

3. DATA AND DESCRIPTIVES

Survey Design

The longitudinal study on which this paper is based builds on three surveys conducted by IFPRI in Bangladesh to evaluate the impacts of microfinance, new vegetable and polyculture fish technologies, and the introduction of educational transfers. The original evaluations surveyed 1,787 households and 102 villages located in 14 of Bangladesh's 64 districts and were set up with intervention and comparison groups. These districts and villages were selected to span the range of agroecological conditions found in rural Bangladesh, and, although the sample cannot be described as representative in a statistical sense, it does broadly characterize the variability of livelihoods found in rural Bangladesh. These same households were resurveyed in 2006/07 as part of an integrated qualitative and quantitative study on the determinants and consequences of chronic poverty; further details on the study are found in Quisumbing (2010), Davis (2007), and Baulch and Davis (2008).[4]

The analysis in this paper uses the data collected in the second (quantitative) phase of the study. The household survey took place from November 2006 to March 2007, coinciding roughly with the same agricultural season as one of the original survey rounds, and covered 2,152 households, of which 1,787 were core households that took part in the original survey and 365 were *splits* from original households. The household survey questionnaire was designed to be comparable across sites and also to facilitate comparability with the original questionnaire from the evaluation studies. A community-level questionnaire was also administered to key informants at this stage to obtain basic information on each village and changes in the community and important institutions within the community since the last survey round.

Since this paper focuses on growth of husbands' and wives' assets between the baseline and the 2006/07 survey rounds, the analysis sample consists of a subsample of those households that were reinterviewed, consisting of core households (originally interviewed households) for whom data on *individually owned assets* in both the baseline and 2006/07 rounds and for husbands and wives within the same household exist.[5] Because gender-disaggregated asset data were collected only in the agricultural technology site at the baseline, analysis of individual and joint asset dynamics is possible only with data from the agricultural technology study site.

The agricultural technology study originally surveyed 47 villages in three sites in Bangladesh in 1996/97, with each site chosen as part of an impact evaluation of programs disseminating new agricultural technologies. Commercial vegetable technologies were being disseminated in Saturia *thana*, Manikganj district (referred to below as Saturia); polyculture fish production technologies were being provided in two sites, Jessore Sadar *thana*, Jessore district (referred to below as Jessore); and Gaffargaon *thana*, Mymensingh district, and Pakundia and Kishoreganj Sadar *thanas*, Kishoreganj district (collectively referred to as Mymensingh below), in combination with specific extension programs for disseminating these technologies. Saturia and Mymensingh are located in the central part of Bangladesh, whereas Jessore is in the west, close to Calcutta and the Indian border. In two sites (Saturia and Jessore), technologies were being introduced through nongovernmental organization (NGO) programs targeted exclusively to women, who were provided training and credit. At the third site (Mymensingh), the Mymensingh Aquaculture Extension Project (MAEP) and 15 Department of Fisheries extension agents provided training to relatively better-off households, and training with credit to relatively poorer households; this training was directed at both men and women, but men participated more often than women. The primary distinction between the two polyculture fish production sites is that in Jessore the NGO (Banchte Shekha) had arranged long-term leases of ponds that are managed by groups of women

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[4] The dataset is publicly available at http://www.ifpri.org/dataset/chronic-poverty-and-long-term-impact-study-bangladesh.
[5] Household asset dynamics are analyzed in Quisumbing and Baulch (2009), using the full sample from all three intervention sites.

(ranging in number from 5 to 20). In Mymensingh, ponds are owned and managed by single households or households that have shared ownership.

About 93.7 percent of original households were reinterviewed, implying an overall attrition rate of 6.3 percent between the baseline and the 2006/07 survey round. Attrition rates across survey sites differ, ranging from a low attrition rate of 4 percent in the improved vegetables site to 11.1 percent in the individual fishponds site, over the 10-year survey interval.[6] Attrition rates for *intact couples*—husbands and wives who remained married to each other and who were reinterviewed—were higher, at 17 percent over the 10-year interval between surveys. Because attrition bias may affect coefficient estimates, all regression estimates in this paper are corrected for attrition using inverse probability weights (Fitzgerald, Gottschalk, and Moffitt 1998).

Household Characteristics and Asset Trends

Bangladesh experienced impressive rates of poverty reduction from the mid-1990s up to the onset of the food price crisis in 2007. While these data are not nationally representative, comparisons of per capita consumption and poverty in the baseline survey and in 2006/07 show definite increases in per capita consumption and impressive reductions in poverty.[7] Table 3.1 presents per capita consumption expenditures, poverty transition categories, and baseline household characteristics of core households in the agricultural technology site. All monetary values are in 2007 taka, converted using the consumer price index.[8] In the agricultural technology sites, poverty incidence declined from 70 percent in 1996 to 18 percent in 2006/07 (an average yearly reduction of 5.2 percentage points). Consistent with the decline in poverty incidence, movements of previously poor households across the poverty threshold were substantial, with 54 percent of households in the agricultural technology sites moving out of poverty. Despite these substantially and statistically significant reductions in poverty, 16 percent of households in the agricultural technology sites had per capita consumption expenditures below the poverty line in both periods, or are chronically poor. Even if their conditions may have improved, they have not improved sufficiently to raise their per capita consumption above the poverty line.

Heads of the core households were around 45 years old during the baseline, with a very low percentage of female-headed households (4 percent). As of the baseline, households in the agricultural technology sites had an average of 5.69 co-resident individuals. Most household heads had very little schooling, with only about 38 percent of household heads having completed four or more years of schooling.[9] Average schooling attainment in the agricultural technology site was low, at 3.09 years; the average area of land owned was 148.49 decimals, which is skewed by Mymensingh, an area with relatively large landholding sizes.[10] Almost 40 percent of households are considered functionally landless, which in the Bangladeshi context is defined as owning less than 50 decimals of land (Hossain et al. 2007).

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[6] The attrition rates compare quite favorably to the longitudinal datasets reviewed in Alderman et al. (2001), where attrition rates range from 6 to 50 percent between two survey rounds and 1.5 to 23.2 percent per year between survey rounds. While resources to track all splits that had migrated to other districts were not available, names and addresses of migrants were obtained from their parents or neighbors. All in all, about 75 percent of household splits were traced and interviewed. Details on computing the attrition correction at the household level are in Quisumbing (2010).

[7] See Quisumbing (2010) for a definition of the consumption variable used in this paper.

[8] Note that since the number of valid observations on assets differs slightly from the number with valid observations on consumption expenditures, there may be slight differences between the numbers here and those reported in Quisumbing (2010).

[9] All household characteristics are evaluated as of the baseline, but monetary values are expressed in 2007 taka for comparability, since the baseline surveys for each study site took place in different years.

[10] 100 decimals = 1 acre (or 0.4047 hectare).

Table 3.1—Characteristics of households in agricultural technology sites

	Agricultural technology site	
	Mean	**Standard deviation**
Number of panel households in asset growth analysis[a]	**(879)**	
Per capita expenditures and poverty incidence		
Per capita expenditure in baseline survey	960.48	549.61
Per capita expenditures in 2006/07	1,485.69	754.75
Whether poor in baseline survey	0.70	0.46
Whether poor in 2006/07	0.18	0.39
Poverty transition category		
Chronic poor	0.16	0.37
Falling into poverty	0.02	0.15
Moving out of poverty	0.54	0.50
Nonpoor	0.28	0.45
Characteristics in baseline survey		
Age of household head	44.80	12.75
Whether female-headed household	0.04	0.20
Education of household head (years of schooling)	3.09	4.00
Household head has at least 4 years of schooling	0.38	0.49
Area of land owned at baseline (in decimals)	148.49	207.95
Whether functionally landless (< 50 decimals)	0.38	0.49
Household size	5.69	2.77
Percent males 0–4 years	4.86	9.73
Percent females 0–4 years	4.74	9.33
Percent males 5–14 years	13.53	14.50
Percent females 5–14 years	11.50	13.62
Percent males 55 years and over	4.81	8.97
Percent females 55 years and over	4.15	9.04

Source: CPRC-DATA-IFPRI Long-Term Impact Study.
Note: [a] These households had valid observations on land and assets in both survey rounds.

Households' self-reported livelihood strategies were centered around agriculture at baseline (Table 3.2), albeit with marked gender differences. Forty-five percent of male household members 15 years of age and older said that their primary occupation was in agriculture, whether they were self-employed or working as agricultural wage workers. Nonagricultural self-employment, wage work, or salary work accounted for the primary occupation of around 35 percent of adult male household members. Around 17 percent of adult males were in neither sector, since they were students, unemployed, retired, beggars, or invalids. In contrast, women's livelihoods revolved around the home: almost 80 percent of adult females said that they were engaged in domestic work within the home, even if they may have had their own small enterprises, reared livestock, or cultivated home gardens.[11]

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[11] Women may tend to underestimate their own involvement in agricultural activities. Women report themselves as being engaged in domestic work, even if, by sample design, at least two-thirds of the sample households participated in NGO-led agricultural production programs that were targeted at women.

Table 3.2—Primary occupations of household members 15 years of age and older, by site, percent distribution

	Males	Females
Agriculture		
Agriculture, self-employed	35.48	1.13
Agricultural wage labor	9.85	0.28
Nonagriculture		
Nonagriculture, self-employed	16.53	3.02
Nonagricultural wage labor	8.10	1.04
Salaried or skilled workers	10.85	2.83
Domestic work, including servants	0.50	79.72
Not employed		
Students	13.69	8.40
Unemployed	1.25	0.09
Retired	0.50	0.00
Beggars and invalids	1.84	2.83
Others	1.42	0.66

Source: CPRC-DATA-IFPRI Long-Term Impact Study.

Consistent with the large long-term reduction in poverty, sample households built up and diversified their asset stocks over time (Table 3.3). The nonland asset measure includes livestock, productive assets (agricultural equipment and nonagricultural business assets), consumer durables, vehicles, and jewelry, but excludes monetary savings, loans given to others, the value of food stocks, owner-occupied housing, and trees. Because land markets may be imperfect and land may be less easily bought and sold compared to nonland assets, land is not included in the asset aggregate; however, the amount of land owned is controlled for in the regression analysis. The nonparametric analysis of poverty traps in Section 5 is conducted using two separate categories of assets—land and total nonland assets—and three separate categories of asset ownership—joint, husband's, and wife's assets. In Section 6, a parametric analysis of the same asset categories is conducted, looking more closely at the responsiveness of assets to negative shocks and positive events, and at more disaggregated asset categories.

Although land is an important asset for agricultural households and is a strong predictor of movement out of poverty or of never being poor (Quisumbing 2010), the area of owned land in both jointly owned and husband-owned categories has decreased over time. This reflects both a movement out of agriculture, mostly by men, into nonagricultural income-earning opportunities, as well as life-cycle processes in which parents retire from active farming and subdivide their land among their children (usually sons). Such decreases in the size of landholdings, particularly of owned land, are typically due to institutional factors such as partible inheritance (in which, upon his death, a father's land is divided between the surviving sons) rather than market forces (Foster and Rosenzweig 2002). However, the area of women-owned land has increased by 39 percent, possibly as a result of NGO-led interventions that require land used for projects to be in women's names. Indeed, it is possible that the reduction in jointly held land and the increase in wife-owned land may simply be a reclassification across these categories. For example, husband-owned cultivated area declined by 21 percent and jointly owned cultivated area by 41.4 percent, but wife-owned cultivated area increased by 39.7 percent. Interestingly, however, the increase in women-owned homestead land, 44.5 percent, is higher than the decline in jointly held land (35.8 percent), suggesting that more than mere reclassification is taking place.

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Table 3.3—Joint, husbands', and wives' land and asset holdings, 1996 and 2006/07, mean values in 2007 taka

	1996			2006/07			Percentage change		
	Joint	Husbands	Wives	Joint	Husbands	Wives	Joint	Husbands	Wives
Landholdings (in decimals)									
Homestead	1.91	10.29	0.34	1.23	10.90	0.61	-35.8	5.8	44.5
Cultivated land	18.04	85.94	1.94	10.57	67.90	3.21	-41.4	-21.0	39.7
Other land	0.64	5.45	0.14	0.56	4.97	0.15	-11.7	-8.9	6.1
Size of owned land	20.59	101.68	2.42	12.36	83.76	3.98	-40.0	-17.6	39.2
Value of owned land (in 2007 taka)	50,118.71	254,806.20	6,129.03	63,802.00	508,112.00	22,846.08	27.3	99.4	73.2
Nonland assets (in 2007 taka)									
Consumer durables	3,737.28	2,181.80	291.05	7,712.93	5,812.29	409.66	106.4	166.4	40.8
Agricultural durables	1,060.78	1,633.82	7.43	449.75	610.05	7.89	-57.6	-62.7	6.2
Nonagricultural durables	372.07	547.86	15.73	466.07	3,256.07	83.22	25.3	494.3	428.9
Jewelry	451.34	28.64	1,528.04	6,265.59	1,535.77	2,116.43	1,288.2	5,262.2	38.5
Poultry	73.94	13.06	493.36	247.88	144.71	206.86	235.2	1,007.9	-58.1
Other livestock	2,765.98	5,755.99	1,168.96	5,709.85	8,943.86	924.97	106.4	55.4	-20.9
Total livestock	2,839.92	5,769.06	1,662.33	5,957.73	9,088.57	1,131.83	109.8	57.5	-31.9
Total value of nonland assets	5,621.46	4,392.12	1,842.26	14,894.35	11,214.18	2,617.20	165.0	155.3	42.1

Source: Author's computations based on survey data.
Notes: This table is based on 904 households with valid observations in both years. Joint assets are those identified as joint assets in the interview; each spouse's holdings consist of his or her exclusively owned holdings, excluding jointly held assets.

In contrast to the decline in landholding sizes (albeit not land values, which have increased over time), households in the agricultural technology sites nearly doubled their nonland asset holdings, growing from a baseline value of 27,040 taka (in 2007 prices) to 49,730 taka, an average asset growth rate of about 8 percentage points per year. Changes in the composition of the asset portfolio accompanied increases in asset holdings. For jointly held assets, the top three categories were consumer durables, livestock, and agricultural durables at baseline; by 2006/07, the most important assets were consumer durables, jewelry, and livestock. Livestock, consumer durables, and agricultural durables were the most important in husbands' asset portfolios at baseline; 10 years later, the portfolio composition had shifted somewhat, with livestock the most important, followed by consumer durables and nonagricultural durables. Wives' asset portfolios at baseline leaned toward livestock, jewelry, and consumer durables; in 2006/07, these remained the most important assets, although with differing degrees of importance, with jewelry ranked first, followed by livestock and consumer durables.

Growth rates of asset categories differed across ownership types. The fastest-growing asset in both jointly and husband-owned categories was jewelry, reflecting the desirability of gold as a household investment as well as fathers' desires to build up dowries for their daughters. Although jewelry is traditionally considered a woman's asset in Bangladesh, the value of jewelry exclusively owned by wives grew by less than 40 percent, while the value of jewelry exclusively owned by husbands or jointly owned grew much more dramatically. Although these disparities raise issues of reporting bias and attribution of ownership, jewelry clearly remains an important store of value in Bangladesh.

Investment in nonagricultural durables also increased, indicating diversification to nonfarm income-generating activities. Most of this growth is reported in husband- and wife-owned nonagricultural durables, not joint property, possibly indicating that men and women are pursuing their own separate nonagricultural enterprises. This is the fastest-growing category of women-owned assets. At all sites, households reduced their holdings of agricultural durable equipment (reflected in reductions in jointly owned and husband-owned agricultural durables), possibly because of diversification out of agriculture, although wives increased their holdings of agricultural durables.

Despite the rapid growth in wives' asset holdings, most assets within the household are either held jointly or controlled by the husband (Table 3.4). In both survey periods, more than 80 percent of owned land was controlled by the husband, and between 2 to 4 percent controlled by the wife. The ownership of nonland assets is more equally distributed, even if the wife's share remains small. In 1996, 47 percent of nonland assets were jointly owned; this proportion increased to 52 percent in 2006/07. The husband's nonland asset ownership remained steady between 37 and 39 percent in both periods, and the wife's share of the household's nonland asset portfolio even declined, from 15.5 percent in 1996/97 to 9 percent in 2006/07. Thus, growth in women's asset holdings did not necessarily imply that the distribution of household assets had become more equal. Indeed, across three out of four asset categories (consumer durables, jewelry, and livestock), the wife's share of the household's asset portfolio decreased over time; although women increased their share of nonagricultural durables owned, they still accounted for a small share of the household's total. At the same time, the share of jointly held jewelry and livestock increased significantly over the 10 years between the surveys: the share of jewelry held jointly increased from 22 percent to 63 percent, and the share of livestock held jointly increased from 27.6 percent to 36.8 percent. The implications of this large increase in the proportion of jointly owned assets still need to be further understood, particularly in the case of jewelry.

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Table 3.4—Distribution of major assets across ownership categories, 1996 and 2006/07 (percentage distribution across ownership categories)

	1996			2006/07		
	Joint	Husband	Wife	Joint	Husband	Wife
Land area	16.51	81.55	1.94	12.35	83.68	3.97
Value of nonland assets	47.42	37.05	15.54	51.85	39.04	9.12
Consumer durables	60.18	35.13	4.67	55.35	41.71	2.94
Nonagricultural durables	39.76	58.55	1.68	12.25	85.56	2.19
Jewelry	22.48	1.43	76.10	63.18	15.49	21.34
Livestock	27.65	56.17	16.18	36.82	56.18	7.00

Source: Author's computations based on survey data.
Notes: This table is based on 904 households with valid observations in both years. Joint assets are those identified as joint assets in the interview; each spouse's holdings consist of his or her exclusively owned holdings, excluding jointly held assets.

Negative Shocks and Positive Events

Households experienced a variety of negative shocks and positive events during the 10 years between the surveys. The data on shocks come from both the community questionnaire and the household questionnaire. Household-level shocks modules, similar to the module developed in Hoddinott and Quisumbing (2003) but modified for the Bangladeshi context, include a list of adverse events and indicate whether the household was negatively affected by them. Households were also asked to recall positive events that occurred in the same intervening period. Because there may be biases in the household reporting of covariate shocks (for example, wealthier households may report higher flood-related losses because they had more to lose to begin with), data on covariate shocks come from the community survey.

Floods are the most important covariate shock in Bangladesh. During the 10 years between the surveys, Bangladesh experienced two significant flood events, the 1998 floods, which were widespread in scale (del Ninno et al. 2001), and the 2004 floods, which were less severe for the country as a whole (even though some individual communities may have been severely affected). Figure 3.1 shows the proportions of households affected by floods based on both the community and household surveys. As previously discussed, there are striking differences between community and individual reports of flood severity. Based on the community survey, 31 percent of households in the agricultural survey sites were affected by the 1998 flood, compared to only 8.5 percent by the 2004 flood. In all sites, household self-reports of flood occurrences for the 1998 floods suggest a lower incidence of flood losses compared to the community reports. For the later flood, in contrast, household reports indicate a higher incidence of flood losses and are quite close to the community reports. This could indicate a recall problem (especially for the earlier floods, which households are less likely to remember compared to the more recent floods) but could also reflect measurement error in community surveys. While these differences are interesting and sizable, the magnitude of the bias between community and household self-reports cannot be ascertained.

Figure 3.1—Flood shocks, community and household reports, 1997–2001 and 2002–2006
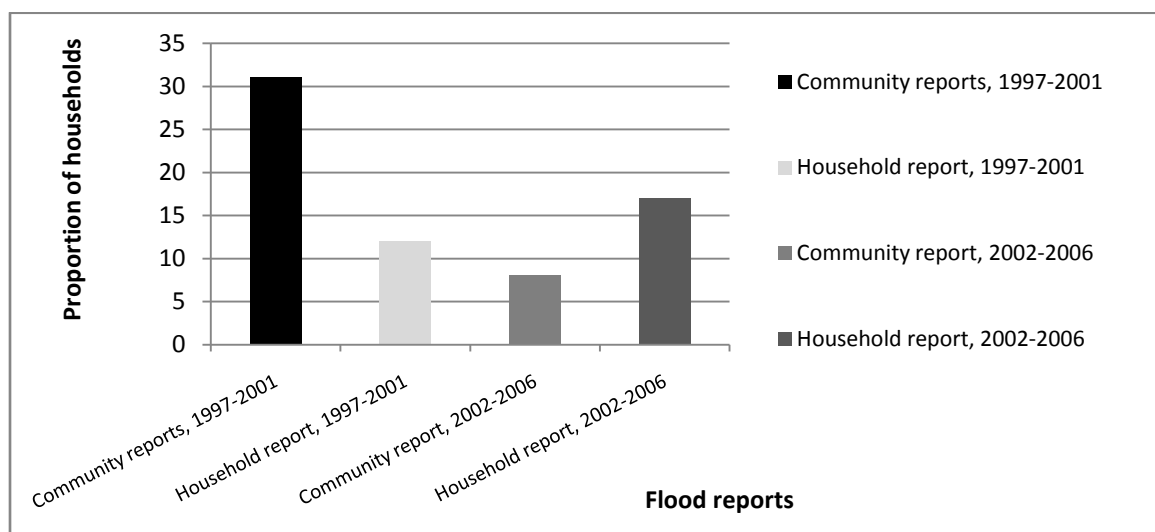
Source: CPRC-DATA-IFPRI Long-Term Impact Study.

Figure 3.2 presents the proportions of households affected by negative shocks, broken down into two five-year periods, 1997–2001 and 2002–2006. For parsimony, only the most important idiosyncratic shocks reported by households—dowry and wedding expenses, plus illness and/or death of a household member—are presented.[12]

Figure 3.2—Proportion of households reporting negative shocks, 1997–2001 and 2002–2006
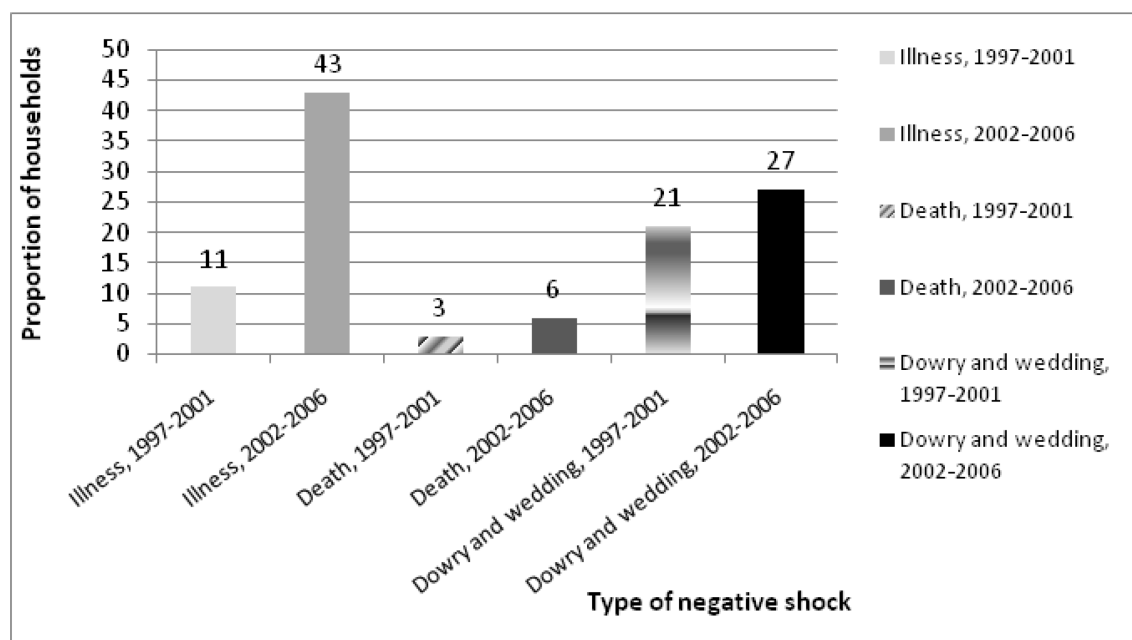
Source: CPRC-DATA-IFPRI Long-Term Impact Study.

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[12] The relative frequencies of shocks reported is consistent with the reporting of factors responsible for household decline or remaining in poverty obtained from the focus group discussions conducted in a subsample of these sites during Phase I of the current study (Davis 2007).

Illness (combining expenses related to illness and forgone income) is the most common idiosyncratic shock affecting households, followed by dowry and wedding expenses, and then by death. Although one could argue that dowry and wedding expenses can be anticipated, the limited availability of financial instruments as well as poverty prevent many families from saving adequate amounts to provide dowries, so families view these life-cycle events as shocks. Reflecting the aging of the sample, the prevalence of illness and death shocks varies across five-year periods, with much higher incidences reported in the last five years. Dowry and wedding expenses are also more frequently reported in the later period, as daughters reach marriageable ages.

Figure 3.3 shows the proportions of households reporting positive events, namely, receipt of remittances, inheritance, and dowries. The prevalence of positive events is much lower than that of negative events, although proportions increase over the two five-year periods. One would expect that as children grow up and start working, the proportion of households receiving remittances would increase. Similarly, as sons grow up and get married, their parents also start receiving dowries. However, because dowries tend to accrue to the newlywed groom rather than his parents, reports of dowry receipts by core households (parents) tend to be lower than reports of dowry and wedding expenses. Although inheritance reports are higher in the second five-year period, reflecting sample aging, the proportion of households reporting inheritance received is low, consistent with the low incidence of death in the sample as a whole.

Figure 3.3—Proportion of households reporting positive events, 1997–2001 and 2002–2006
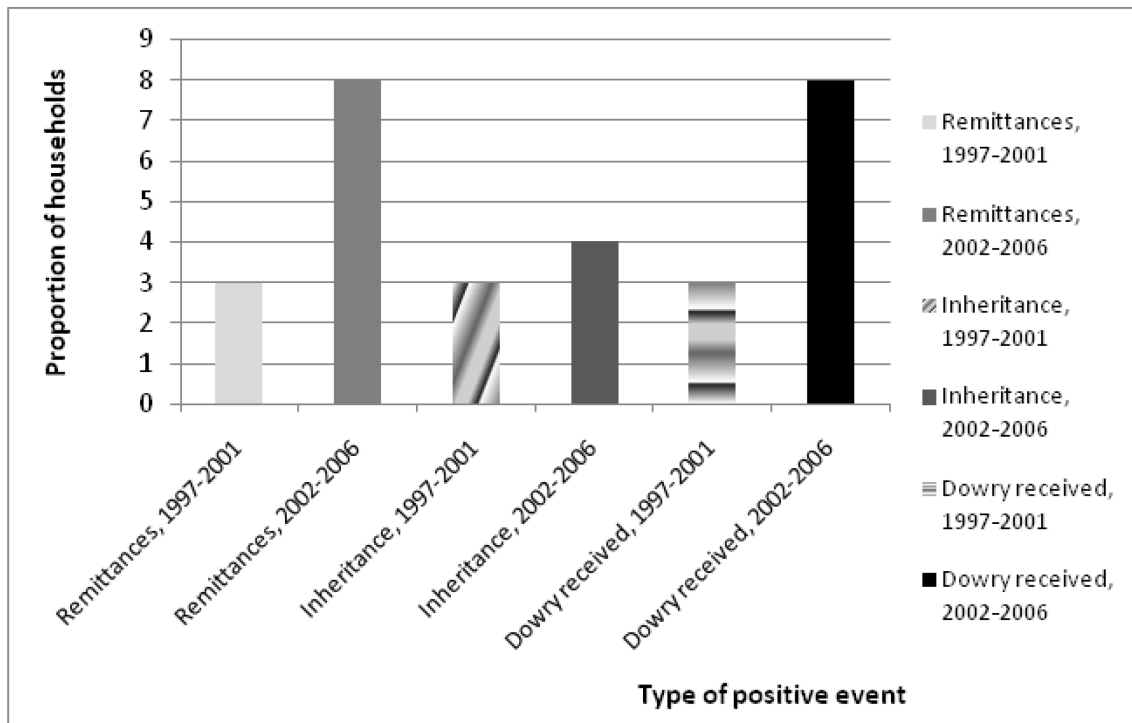
Source: CPRC-DATA-IFPRI Long-Term Impact Study.

4. EMPIRICAL SPECIFICATION AND DEFINITION OF VARIABLES

The subsequent analysis examines how initial asset positions (whether jointly owned, husband-owned, or wife-owned assets), shocks experienced by households, baseline individual and household characteristics, and characteristics of the community affect asset growth between the baseline and 2006/07 rounds. Baseline individual and household characteristics and unobserved community characteristics are controlled for because current household characteristics could be affected by the same processes that bring about current asset levels. Past values of individual and household characteristics are used to eliminate endogeneity bias, and *upazila*-level (subdistrict) dummies are included to control for unobserved community characteristics.

The empirical specification of this paper draws from the work of Carter et al. (2007), Barrett et al. (2006), and Naschold (2008), with adaptations for the specific characteristics of the Bangladeshi datasets. The data available include measures of baseline asset stocks (in 1996) and endline asset stocks (in 2006/07), measures of negative and positive shocks, individual and household characteristics, and measures of social networks. To compare the growth of assets of husbands and wives within the same household, the analysis is confined to *core* households that were interviewed in both the baseline and recent rounds, where the husband and wife have remained married in the 10-year interval between rounds.

The empirical specification, which includes polynomial terms in lagged assets up to the fourth degree, is similar to Barrett et al. (2006) in including higher-order (up to quartic) terms in lagged assets. The empirical specification modifies equation (6) and is similar to Carter et al. (2007) in the inclusion of shocks and positive events experienced by households.[13] The asset growth function with polynomial terms in lagged assets up to the fourth degree is given by (7):

$$
\ln A_{iT} - \ln A_{iB} = \beta_0 + \beta_1 A_{iB} + \beta_2 A_{iB}^2 + \beta_3 A_{iB}^3 + \beta_4 A_{iB}^4 \\
+ \Theta(A_{iB}, L_i, K_i) + \Omega_i(A_{iB}, L_i, K_i) + Z_i \Gamma_i + C_i \Lambda_i + \varepsilon_{it},
$$

(7)

where $\ln A_{iT}$ - $\ln A_{iB}$ is asset growth for asset owner i from the baseline survey period (B) to the most recent survey (T); A_{iB} is assets at the baseline; Θ_i and Ω_i are vectors of negative and positive shocks obtained from the retrospective shocks modules; Z_i and C_i are time-invariant individual, household, and community characteristics; and ε_{it} is the error term. These are estimated separately for land and nonland assets.

Because the impacts of shocks may differ depending on initial asset levels and labor and capital market conditions, the responses to these shocks, β_Θ and β_ε, are written as functions of initial asset stocks A_{bi}, labor market conditions L_i, and capital market conditions K_i. Labor market and capital market conditions are proxied by *upazila* dummies. Unlike in Carter et al. (2007), asset and income shocks are not distinguished from each other, but the most important negative and positive shocks reported by the respondents are included: floods, illness, and death, and remittance, inheritance, and dowry receipts. Partly to control for reporting bias in the case of covariate shocks, the village-level proportion of households reporting the flood shock in a given year from the community questionnaire is used, rather than respondent self-reports. To examine whether shocks have persistent impacts, the shocks are divided into two recall periods, 1997–2001 and 2002–2006. The first recall period includes the 1998 floods, and the second the 2004 floods. Regression analyses are conducted separately for husband-, wife-, and jointly owned assets, and separately for different types of assets.

This paper also investigates whether households that have access to social networks are better able to withstand negative shocks. Although the data contain rich information about membership in groups and relationships with influential people (Quisumbing 2009), the sample was designed to evaluate the impact of agricultural technologies disseminated through women's groups, and thus one cannot treat

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[13] It would have been ideal to have individually reported shocks, but the shocks module was administered at the household level owing to budgetary constraints.

the number-of-groups or the strength-of-networks variables as exogenous. Instead, this paper uses information on husbands' and wives' family background—the number of brothers and sisters and the distance from the parental village—as indicators that capture social connectedness. Analysts of Bangladeshi society have pointed out the importance of the *gusti*, or the local lineage group composed of several related families within a village, which has traditionally formed the basis for the organization of agricultural labor and systems of reciprocity in Bangladesh (Lewis and Hossain 2008, 59). In earlier analysis using this dataset (Quisumbing 2009), these variables were found to be significant determinants of men's and women's group membership and strength of relationships with influential people in the village.

Husbands generally have easier access to their familial support networks because they do not typically leave their parents' village to marry. Because of these exogamous marriage patterns, husbands live much closer to their parental villages, living 2.97 kilometers away on average, compared to wives, who live 9.98 kilometers away (Table 4.1). Siblings also play different, often conflicting, roles for husbands and wives. Although Islamic law mandates that sisters inherit half the share of brothers, in Bangladesh the former tend to renounce their share of their land inheritance in return for their brothers' support, a practice called *naior* (Subramanian 1998). Consequently, a sister may act as a drain on a man's resources if he is expected to assist her in times of distress. While brothers may help each other farm while their parents are living, owing to the practice of partible inheritance, they are implicitly competitors for their parents' land. Finally, because wives tend to be younger than their husbands, wives in our sample have a larger number of living brothers and sisters than do their husbands.

Table 4.1—Indicators of familial networks, husbands and wives

Number of siblings and distance to parental village	Mean	Standard deviation
Husbands		
Number of living brothers	1.77	1.46
Number of living sisters	1.84	1.53
Distance to parental village (km)	2.97	29.15
Wives		
Number of living brothers	2.26	1.53
Number of living sisters	2.20	1.69
Distance to parental village (km)	9.98	37.23

Source: Author's calculations based on survey data.
Note: Husbands and wives in intact marriages who were interviewed in both 1996/97 and 2006/07.

5. NONPARAMETRIC RESULTS

In Figures 5.1 and 5.2, the dynamic asset paths are presented separately for household assets (figures taken from Quisumbing and Baulch 2009), jointly owned assets, husband-owned assets, and wife-owned assets, for land (in decimals) and nonland assets (in constant 2007 Bangladeshi taka), respectively.[14] The land graphs include the sum of cultivated homestead and other owned land measured in decimals. For nonland assets, which include agricultural and nonagricultural durables, consumer durables, jewelry, and livestock, values have been restricted to the first 95 percentiles of the total nonland asset distribution in all the figures that follow. This trimming of the top 5 percentiles of the data was adopted because of the presence of a number of implausibly high outliers at the extreme upper end of the distribution (especially in the initial years). Inclusion of these observations makes the overall shapes of the dynamic asset paths difficult to see.

Two features of the asset plots are apparent. First, while all the dynamic asset paths for household land and nonland asset holdings are nonlinear, none have the elongated S-shape hypothesized by Carter and Barrett (2006). Indeed, all have just one point at which they cross the diagonal (from above), implying that the equilibrium is stable. This suggests that multiple equilibria and asset-based poverty traps do not exist in rural Bangladesh. Second, although the observations (represented by crosses) in these diagrams are widely distributed, they do not appear to divide into two groups (toward the bottom left-hand corners and top right-hand corners of the asset plots), as Carter and Barrett's theory of bifurcation would lead one to expect. Instead, there is a clustering of observations close to the origin, which suggests the persistence of minimal asset holdings among a large number of households. However, the existence of a unique low-level equilibrium can be viewed as the harshest form of a socially exclusionary process in which capital endowments do not permit individuals and households to sustainably overcome obstacles to accumulation. The clustering of observations close to the origin is especially marked for women-owned land and assets, for which processes of gender-based social exclusion come into play.

The shapes of the land and nonland assets plots are, however, quite different, and the shapes of the plots across ownership categories for a given asset are also quite different. The LOWESS curves for land cross the diagonal line close to the origin and lie almost entirely below the diagonal from there on (Figure 5.1). This is consistent with the declining annual growth rates for total and cultivated land observed in Table 3.3, and the type of partible land inheritance practiced in rural Bangladesh.[15] It also seems that the shape of the household land frontier is very similar to the husband's land frontier, possibly because the husband's land accounts for the major portion of owned land. The wife's landholdings, however, remain fairly flat over time, and even if wives have increased their areas of owned land, in both absolute and relative terms, they control very little of families' landholdings.

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[14] These figures were produced using a LOWESS estimator with optimal bandwidth in Stata 10.

[15] Note that in recent years, the practice of partible inheritance has been modified so that the division of land among surviving sons takes place both informally, when sons marry and set up their own households, and formally, upon the father's death (Davis 2007). As Foster and Rosenzweig (2002) have pointed out in the Indian context, whether or not households divide is not strictly exogenous.

Figure 5.1—LOWESS plots for land

Household land
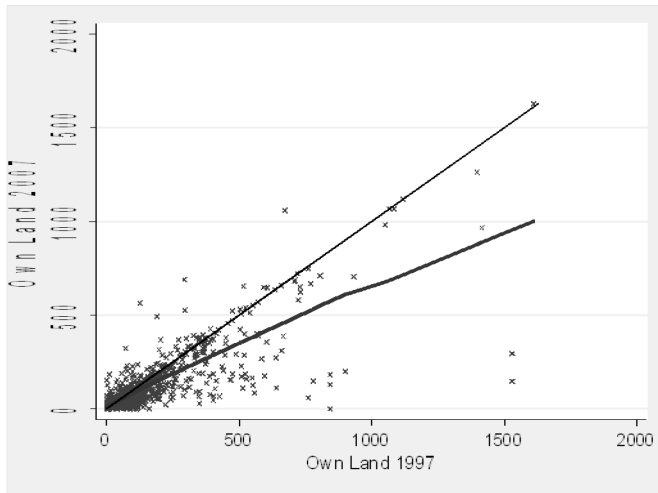
Jointly held land
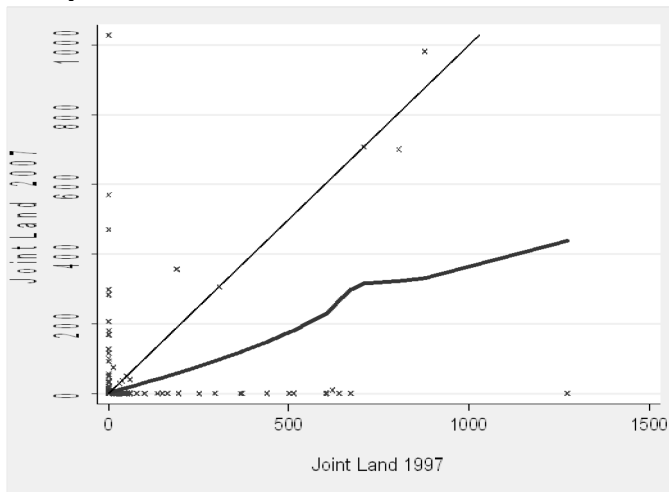
Husband's land
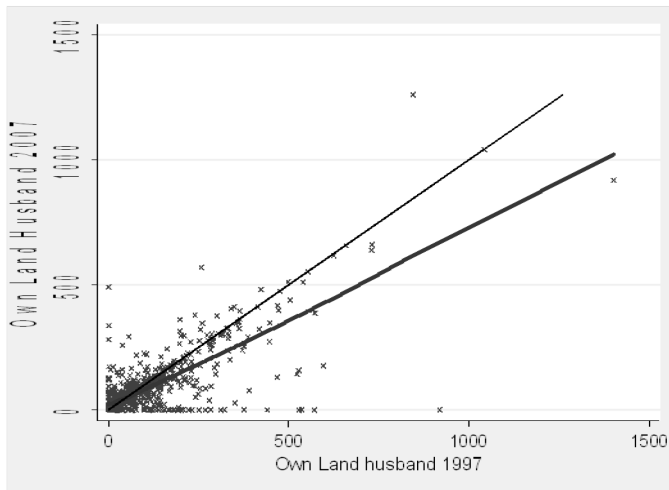
Figure 5.1—Continued

Wife's land
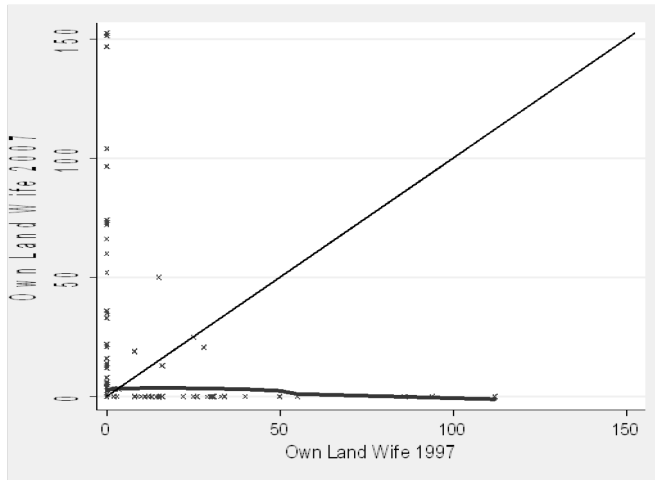
Source: Author's estimations.
Note: Scale of axes not uniform across graphs.

In contrast, the shapes of the nonland asset plots in Figure 5.2 have clear curvature and cross the diagonal at somewhat higher values, but remain under the diagonal thereafter, indicating slower asset growth for households (and individuals) with higher initial assets. While the shapes of the nonland asset frontiers are similar for household, husband-owned, and wife-owned assets, the curve for joint assets is quite different, and curves upward, although this may be driven by outliers.

Figure 5.2—LOWESS plots for nonland assets

Household assets

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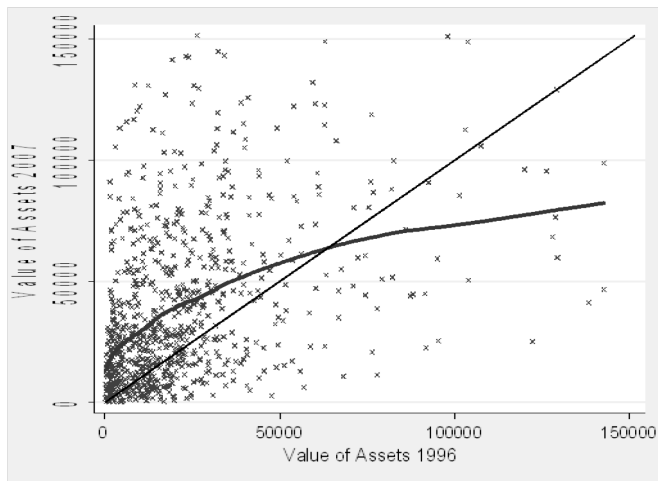
Figure 5.2—Continued

Jointly held assets
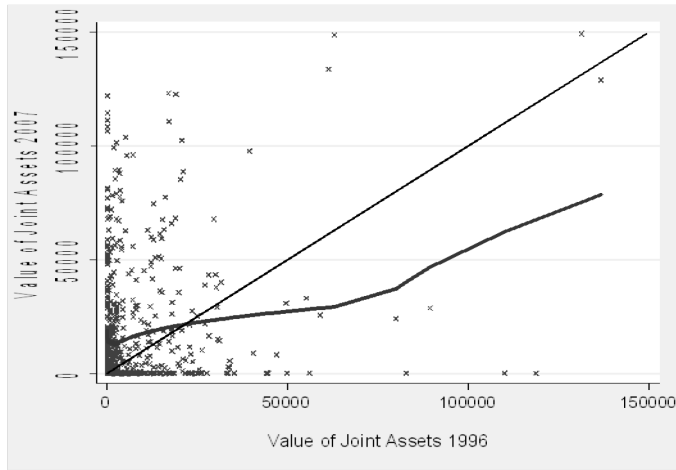
Husband's assets
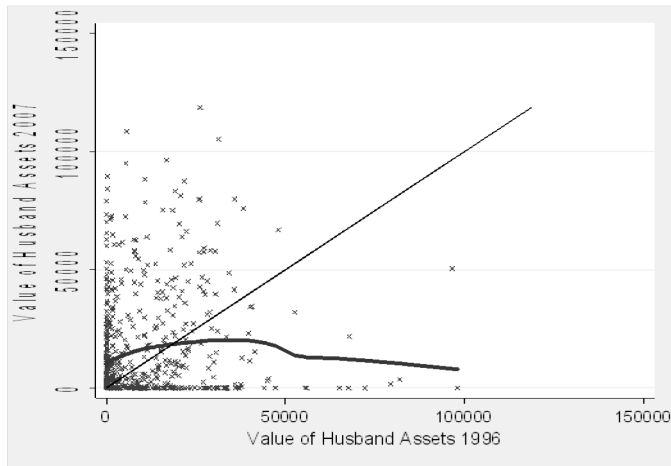
Wife's assets
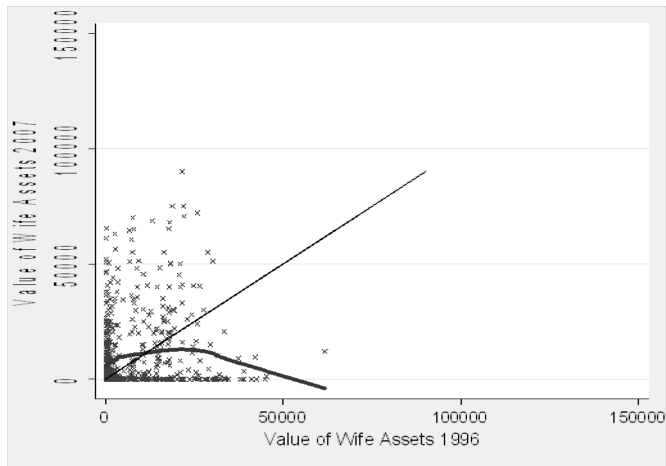
Source: Author's estimations.
Note: Scale of axes not uniform across graphs.

6. RESULTS FROM PARAMETRIC METHODS

Land Accumulation Regressions

Impact of Baseline Characteristics

Land accumulation regressions, estimated separately for jointly owned, husband-owned, and wife-owned land, are presented in Table 6.1. The dependent variable is the difference between the areas of current and baseline owned land.[16] The specification with higher-order terms is presented because the null hypothesis that they are jointly equal to zero for jointly owned and wife-owned assets is rejected. (The null hypothesis that the higher-order terms are equal to zero for husband-owned land cannot be rejected.)

Table 6.1—Land accumulation regressions: Joint, husband's, and wife's land

		Exclusively held	
	Joint	Husband's	Wife's
Lagged landholdings			
Land in 1996	0.886**	-0.283	-0.714**
	(2.20)	(-1.47)	(-2.40)
Land in 1996, squared	-0.013***	-0.001	-0.009
	(-6.58)	(-0.67)	(-0.90)
Land in 1996, cubed	0.000***	0.000	0.000
	(7.88)	(0.74)	(0.79)
Land in 1996, quartic	-0.000***	-0.000	-0.000
	(-8.52)	(-0.74)	(-0.59)
Covariate shocks (floods)			
Proportion of households affected, 1997–2001	-0.083	0.028	0.001
	(-0.82)	(0.25)	(0.05)
Proportion of households affected, 2002–2006	0.222	-0.190	0.016
	(1.29)	(-1.20)	(0.79)
Idiosyncratic shocks, 1997–2001			
Any illness in household	-2.209	5.831	1.944
	(-0.35)	(0.97)	(1.10)
Any death in household	23.915	-17.082	8.204
	(1.58)	(-0.69)	(1.03)
Dowry or wedding expenses	20.277*	-9.569	-1.625
	(1.69)	(-0.81)	(-0.65)
Idiosyncratic shocks, 2002–2006			
Any illness in household	-0.622	-9.134	1.708
	(-0.14)	(-1.22)	(1.67)
Any death in household	-2.929	-59.779***	11.343*
	(-0.28)	(-4.18)	(2.00)
Dowry or wedding expenses	-14.243	2.570	2.019
	(-1.33)	(0.21)	(0.84)
Positive events, 1997–2001			
Whether received remittances	13.670	-5.574	5.727
	(0.88)	(-0.29)	(1.16)
Whether received inheritance	-5.103	-11.815	5.622
	(-0.59)	(-0.37)	(1.12)
Whether received dowries	27.529	-18.023	-1.437
	(1.08)	(-1.06)	(-1.22)

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[16] *Area of owned land*, *area*, and *landholding size* are used interchangeably in the discussion of the regression results.

Table 6.1—Continued

	Joint	Exclusively held	
		Husband's	Wife's
RRPositive events, 2002–2006			
Whether received remittances	33.085*	-6.212	2.411
	(1.72)	(-0.43)	(0.81)
Whether received inheritance	-4.684	-15.736	-2.004
	(-0.62)	(-0.51)	(-0.52)
Whether received dowries	5.473	-9.194	-2.681**
	(0.58)	(-1.53)	(-2.01)
Husband's characteristics			
Age	2.310	0.196	0.102
	(1.34)	(0.10)	(0.51)
Age squared	-0.020	-0.014	-0.002
	(-1.48)	(-0.77)	(-0.85)
Years of schooling	-0.273	1.296	0.152
	(-0.33)	(1.19)	(0.86)
Wife's characteristics			
Age	-2.335	5.551**	-0.059
	(-0.91)	(2.31)	(-0.18)
Age squared	0.028	-0.074**	0.001
	(1.01)	(-2.48)	(0.31)
Years of schooling	-0.429	2.853*	-0.465**
	(-0.29)	(1.90)	(-2.57)
Household characteristics			
Household size	0.113	-0.434	0.089
	(0.10)	(-0.21)	(0.33)
Proportion aged 0–4 years	-0.076	0.064	-0.024
	(-0.45)	(0.26)	(-0.52)
Proportion aged 5-14 years	0.017	0.094	0.001
	(0.12)	(0.54)	(0.04)
Proportion aged 15–19 years	0.058	0.077	0.026
	(0.47)	(0.37)	(0.49)
Proportion aged 35–54 years	-0.033	0.001	-0.030
	(-0.23)	(0.01)	(-0.81)
Proportion aged 55 years and over	-0.315*	0.892**	-0.013
	(-1.87)	(2.38)	(-0.23)
Value of nonland assets at baseline	0.001	0.000*	0.000
	(1.51)	(1.80)	(0.95)
Upazila dummies (Saturia excluded)			
Mymensingh	4.297	-3.002	0.627
	(0.46)	(-0.25)	(0.56)
Kishoreganj	-12.316	2.877	0.310
	(-1.37)	(0.31)	(0.23)
Jessore	-7.074	-5.004	2.559*
	(-0.92)	(-0.60)	(1.89)
Constant	-11.119	-62.781	-2.309
	(-0.66)	(-1.35)	(-0.38)
Test of coefficients			
-2<B<0 (t-statistic)	-7.18	-8.94	-4.33
p-value	0	0	0.00
B2=B3=B4=0 (F-statistic)	39.95	0.3	2,158.59
p-value	0	0.7426	0.00
Number of observations	729	729	729
R-squared	0.74	0.40	0.32

Source: Author's estimations.

Notes: Regressions include inverse probability weights to account for attrition; t-statistics are based on robust standard errors.
*** indicates p < 0.01, ** indicates p < 0.05, and * indicates p < 0.10.

Initial landholding sizes are important determinants of asset growth for all categories of land, with the exception of husband's land. Individual and household characteristics have different impacts on land accumulation, depending on the identity of the owner. Men whose wives have completed more years of schooling are better able to accumulate land, suggesting some complementarity between human and natural capital. Men in households with a higher proportion of older individuals also experience faster land accumulation, possibly because older males would have died in the survey interval and bequeathed their land to husbands. Finally, higher values of nonland assets at baseline are complementary to husbands' land accumulation. In contrast, very few individual and household characteristics significantly affect the growth of jointly owned and wife-owned land. Wives who are better educated accumulate land more slowly, possibly because they are less likely to be engaged in agriculture. Finally, women are better able to accumulate land in Jessore, where women's NGOs have been particularly active in increasing women's economic and political participation.

Impact of Shocks

Flood shocks do not appear to affect land accumulation (Table 6.1). Possibly owing to the effectiveness of emergency relief efforts (del Ninno et al. 2001; Quisumbing 2005), households seem to have recovered from both recent and more distant flood shocks. Households also seem to have recovered from earlier episodes of idiosyncratic shocks, or households experiencing shocks in the earlier period (which may temporarily have reduced asset stocks) have engaged in catch-up accumulation behavior. For example, it is possible that households that paid out dowry expenses in the earlier period were able to catch up, as evidenced by the positive sign of the coefficient on this variable. In contrast, having experienced shocks in later periods seem to have reduced asset growth—a more recent death made a major dent in husbands' land accumulation. Possibly because death is a signal for property division and inheritance, having experienced a recent death weakly increases the growth of a wife's land. Recent remittances appear to be weakly associated with increased land acquisition, but having received a dowry recently—signaling the marriage of a son—decreased a wife's landholdings.

Asset Accumulation Regressions

Impact of Baseline Characteristics

An analogous specification for asset growth is found in Table 6.2. The dependent variable is the difference between the values of baseline and current nonland assets (defined as consumer durables, agricultural and nonagricultural durables, jewelry, and livestock). The coefficients on initial assets in Table 6.2 are significantly different from zero in the jointly held and husbands' assets regressions; however, one cannot reject the null hypothesis that the higher-order terms are jointly equal to zero for jointly held and wives' assets.

Table 6.2 also shows that some household baseline characteristics are important determinants of asset growth. Higher levels of schooling of the husband are associated with faster growth of joint assets, but not husband- or wife-owned assets. Household size reduces the growth of husbands' assets, and the proportion of household members ages 35–54 and age 55 and over reduces household asset growth. Finally, the significance of *upazila* dummies indicates the importance of unobserved *upazila*-level effects, with the growth of joint assets lower in all *upazilas* relative to Saturia (the excluded category), which is closest to Dhaka, and the growth of individually owned assets lower in Mymensingh.

Impact of Shocks

Table 6.2 confirms that the impact of shocks on nonland asset accumulation differs depending on who owns the asset and on the timing of the shock. Flood shocks in 1997–2001 had a weak negative impact on jointly owned assets. Husbands' and wives' assets seem to have recovered well from illness shocks occurring in the earlier five-year period, with wives' assets showing some catch-up growth (albeit at a

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weak level of significance), but illness in the more recent five-year period had a negative impact on both husbands' and wives' assets. (The impact on husbands' assets is weakly significant at a 10 percent level; the impact on wives' assets is significant at 5 percent.) A more recent death in the household also had a negative impact on jointly held assets. Inheritances received in the more distant past built up husbands' and wives' assets, but not a more recent inheritance, which is associated with a recent death and eventual division of property. Dowry or wedding expenses had a weak positive impact on husbands' assets (possibly indicating reporting bias), while recent dowry receipts increased growth in joint asset holdings.

Table 6.2—Asset accumulation regressions: Joint, husband's, and wife's nonland assets (including livestock)

| | | Exclusively held | |
	Joint	Husband's	Wife's
Lagged assets			
Initial assets in 1996	-1.282*	0.297	-0.461
	(-1.80)	(0.85)	(-0.71)
Initial assets, squared	0.000	-0.000**	0.000
	(0.46)	(-2.50)	(0.20)
Initial assets, cubed	-0.000	0.000*	-0.000
	(-0.39)	(1.97)	(-0.52)
Initial assets, quartic	0.000	-0.000*	0.000
	(0.53)	(-1.71)	(0.73)
Covariate shocks (floods)			
Proportion of households affected, 1997–2001	-112.389*	92.637	54.192
	(-1.70)	(1.31)	(1.55)
Proportion of households affected, 2002–2006	31.539	-11.600	44.120
	(0.38)	(-0.18)	(0.81)
Idiosyncratic shocks, 1997–2001			
Any illness in household	-6,309.632	4,973.462	5,303.696*
	(-1.39)	(1.57)	(1.84)
Any death in household	-1,163.294	-5,870.762	-2,142.886
	(-0.18)	(-1.04)	(-0.49)
Dowry or wedding expenses	-2,958.423	-10,924.139**	-3,833.915
	(-0.45)	(-2.14)	(-1.01)
Idiosyncratic shocks, 2002–2006			
Any illness in household	-1,447.611	-4,755.185*	-3,849.202**
	(-0.38)	(-1.72)	(-2.16)
Any death in household	-13,400.676**	-6,959.191	-4,361.174
	(-2.33)	(-1.28)	(-1.64)
Dowry or wedding expenses	-1,423.589	10,164.464*	4,515.450
	(-0.20)	(1.80)	(1.26)
Positive events, 1997–2001			
Whether received remittances	-459.821	-5,368.244	506.202
	(-0.08)	(-1.02)	(0.12)
Whether received inheritance	1,783.691	42,832.933**	15,400.884***
	(0.18)	(2.61)	(3.18)
Whether received dowries	7,385.711	5,325.161	7,887.819
	(0.52)	(0.73)	(1.06)
Positive events, 2002–2006			
Whether received remittances	6,388.694	3,961.602	4,185.985
	(1.11)	(0.64)	(0.94)
Whether received inheritance	-10,641.439	-36,502.561***	-8,895.578***
	(-1.25)	(-2.81)	(-2.93)
Whether received dowries	9,766.419*	1,006.232	-1,451.262
	(1.72)	(0.27)	(-0.47)

Table 6.2—Continued

	Joint	Exclusively held	
		Husband's	Wife's
Husband's characteristics			
Age	1,182.343	-244.162	174.297
	(1.12)	(-0.37)	(0.39)
Age squared	-11.009	1.714	-1.831
	(-1.44)	(0.32)	(-0.54)
Years of schooling	2,122.289***	839.949	89.404
	(3.98)	(1.21)	(0.30)
Wife's characteristics			
Age	1,377.477	-1,382.472	-1,145.497**
	(1.46)	(-1.15)	(-2.15)
Age squared	-15.389	23.243	15.686**
	(-1.40)	(1.39)	(2.34)
Years of schooling	1,049.051	893.126*	139.114
	(1.33)	(1.80)	(0.36)
Household characteristics			
Household size	1,702.966	-1,334.298**	-427.470
	(1.60)	(-2.08)	(-0.90)
Proportion aged 0–4 years	-296.448*	-26.977	-84.277
	(-1.99)	(-0.18)	(-0.83)
Proportion aged 5-14 years	-286.593**	90.011	-24.552
	(-2.15)	(0.92)	(-0.39)
Proportion aged 15–19 years	-293.637*	-58.708	-94.480
	(-1.90)	(-0.45)	(-1.32)
Proportion aged 35–54 years	-325.487**	20.560	100.464
	(-2.46)	(0.22)	(1.56)
Proportion aged 55 years and over	-241.742*	-129.155	-102.280
	(-1.92)	(-1.09)	(-1.21)
Landholdings at baseline	-2.781	7.631	11.846
	(-0.08)	(0.54)	(0.12)
Upazila dummies (Saturia excluded)			
Mymensingh	-15,009.847***	-12,095.606***	-5,673.639**
	(-3.58)	(-2.76)	(-2.10)
Kishoreganj	-27,586.349***	2,493.002	1,626.646
	(-5.22)	(0.47)	(0.57)
Jessore	-17,382.530***	-1,095.914	839.856
	(-3.25)	(-0.23)	(0.33)
Constant	-13,879.156	38,494.112***	24,319.258**
	(-0.63)	(2.87)	(2.35)
Test of coefficients			
-2<B<0 (t-statistic)	-1.01	-6.53	-2.38
p-value	0.32	0.00	0.02
B2=B3=B4=0 (F-statistic)	0.21	6.24	0.04
p-value	0.65	0.02	0.84
Number of observations	728	728	728
R-squared	0.17	0.26	0.14

Source: Author's estimations.

Notes: Regressions include inverse probability weights to account for attrition; t-statistics are based on robust standard errors.
*** indicates p < 0.01, ** indicates p < 0.05, and * indicates p < 0.10.

Impact of Shocks by Type of Asset

The above results do not reveal how households and individuals adjust their asset portfolios in response to shocks. Tables 6.3 and 6.4 present the coefficients of the shock variables on the growth of different categories of durable goods (Table 6.3), livestock, and jewelry (both in Table 6.4). Floods experienced in 1997–2001 reduced growth in joint holdings of consumer durables. Earlier illness shocks reduced wives' holdings of agricultural durables as well as joint holdings of nonagricultural durables, although these coefficients are only weakly significant at 10 percent. Deaths experienced in the household, however, had negative impacts on jointly held durable goods, with larger impacts for more recent deaths. Earlier deaths

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reduced jointly held agricultural durables, while more recent deaths reduced all types of jointly held durables but increased wives' holdings of consumer durables. Dowry and wedding expenses in the earlier period had a weak negative impact on husbands' consumer durables but a strong negative impact on husbands' agricultural durables. In Bangladeshi society, providing a good dowry for a daughter is viewed as the father's responsibility—even if it requires the sale of productive equipment.

Remittances in 1997–2001 did not significantly affect holdings of durables, but later remittances are significantly associated with growth in jointly held consumer durables. Husbands' consumer durables clearly benefited from earlier inheritance receipts, but later inheritance receipts were associated with lower growth in the husband's consumer durables and nonagricultural durables. This might be because inheritance receipts also signal the death of the parent and property division, and possible loss of access to familial assets. Finally, dowry receipts were a mixed blessing for parents: although later receipts increased jointly held consumer durables, dowry receipts in both periods were also associated with lower holdings of jointly held agricultural durables, possibly because they were given to the newly married son to start a new household.

Jewelry and livestock are often mentioned as risk-coping instruments because they are relatively easy to dispose of in an emergency. Yet, Table 6.3 shows that different types of shocks affect holdings of these assets in different ways. Earlier flood shocks increase growth of women's livestock holdings, possibly owing to a replacement or catch-up effect. Earlier illness shocks are also associated with higher growth in husbands' livestock holdings, while later illness shocks reduce husbands' livestock holdings (there are negative impacts on wives' holdings, but these are not statistically significant). A death in the household, however, reduces jointly held jewelry and the husband's livestock holdings, but unexpectedly increases the wife's livestock holdings. Remittances do not appear to be channeled toward either livestock or jewelry, tending instead to be invested in durable goods purchases (see Table 6.2). Earlier inheritance receipts have a positive impact on husbands' livestock holdings, but later receipts decrease those holdings, again because they are linked to parental death. Similar to the results for consumer durables, later dowry receipts end up reducing wives' livestock holdings (possibly because the marriage of a son may have resulted in gifts of livestock to start him off) as well as wives' jewelry, but also result in increases in household jewelry holdings. It is possible that the entrance of a bride to the household increases household jewelry holdings, but at the expense of the wife's assets, which could have been used to finance wedding expenses.

Impact of Shocks on Gender Asset Inequality

Table 6.5 presents the impact of shocks on the difference between the husband's and wife's asset growth within the same household—a positive coefficient indicates that the husband's assets grew (increasing gender asset inequality, given the initial distribution that favors husbands), while a negative coefficient implies a reduction in gender asset inequality. Similar to previous results, the impact of shocks is quite nuanced. Flood shocks do not appear to have any net impact on gender asset inequality. Idiosyncratic shocks and life-cycle events appear to have offsetting impacts on the gender asset gap within the household. While the death of a household member and dowry and wedding expenses end up reducing the growth of the husband's relative to the wife's assets—implying that husbands' assets bear the brunt of these shocks—earlier inheritance tends to benefit the husband's asset accumulation relative to that of the wife, while later inheritance increases the wife's asset accumulation relative to that of the husband. Because wives tend to be younger, on average, than husbands, earlier inheritance receipts may signal the husband receiving an inheritance, and later receipts, the wife. While illness takes a toll on both husbands' and wives' assets, it does not necessarily increase gender asset inequality, because both spouses' asset stocks are negatively affected.

Table 6.3—Impact of shocks on change in value of durable goods, by type of asset ownership

	Consumer durables			Agricultural durables			Nonagricultural durables		
	Joint	Husband	Wife	Joint	Husband	Wife	Joint	Husband	Wife
Covariate shocks (floods)									
Proportion of households affected, 1997–2001	-58.161**	0.324	-6.979	-9.300	0.956	-0.003	-11.346	63.389	-0.276
	(-2.44)	(0.01)	(-1.11)	(-1.39)	(0.25)	(-0.06)	(-1.61)	(1.60)	(-0.43)
Proportion of households affected, 2002–2006	-21.049	-9.528	-5.581*	-0.911	-5.042	0.003	9.144	27.292	0.516
	(-0.83)	(-0.36)	(-1.71)	(-0.14)	(-0.89)	(0.05)	(0.93)	(1.15)	(0.67)
Idiosyncratic shocks, 1997–2001									
Any illness in household	-954.844	502.546	-96.748	-304.786	236.288	-3.400*	-360.595*	41.068	105.472
	(-0.79)	(0.60)	(-0.83)	(-1.22)	(0.96)	(-1.68)	(-1.70)	(0.03)	(0.83)
Any death in household	234.960	-1,956.274	61.833	-263.605*	-206.758	-7.267	220.705	-728.400	144.594
	(0.08)	(-1.01)	(0.15)	(-1.70)	(-1.22)	(-0.62)	(0.48)	(-0.95)	(0.97)
Dowry or wedding expenses	-1,414.743	-2,971.027*	-607.115	586.827	-833.280**	-12.964	245.467	-2,762.130	35.527
	(-0.68)	(-1.79)	(-1.02)	(0.73)	(-2.51)	(-0.80)	(0.54)	(-1.33)	(0.98)
Idiosyncratic shocks, 2002–2006									
Any illness in household	-1,285.271	63.841	133.054	-39.244	-126.500	2.048	704.910	-1,880.356	9.199
	(-1.12)	(0.08)	(0.90)	(-0.16)	(-0.72)	(0.54)	(1.63)	(-1.10)	(0.28)
Any death in household	-4,103.672***	-1,316.157	1,107.579***	-407.894*	-342.255***	53.536*	-719.770**	-1,385.398	-99.266*
	(-2.70)	(-0.63)	(3.05)	(-1.80)	(-2.96)	(1.85)	(-2.62)	(-0.93)	(-1.76)
Dowry or wedding expenses	-815.105	1,527.927	587.328	-863.518	488.125	12.068	273.770	3,088.742	-63.222
	(-0.53)	(0.89)	(1.04)	(-1.23)	(1.17)	(0.74)	(0.87)	(1.40)	(-1.60)
Positive events, 1997–2001									
Whether received remittances	-180.963	-1,347.915	1,789.400	-386.349	-117.275	13.186	-481.267	-1,479.602	-15.094
	(-0.06)	(-0.97)	(1.17)	(-0.93)	(-0.58)	(0.93)	(-1.33)	(-0.69)	(-0.35)
Whether received inheritance	921.010	6,983.064**	158.045	-660.881	450.814	8.455	-35.736	25,056.364	-168.376
	(0.23)	(2.19)	(0.37)	(-1.48)	(1.02)	(0.60)	(-0.10)	(1.66)	(-0.95)
Whether received dowries	983.001	228.207	-174.176	-1,148.776**	232.419	1.984	-781.242**	-1,651.210	117.977
	(0.26)	(0.10)	(-1.06)	(-2.64)	(0.67)	(0.60)	(-2.09)	(-1.21)	(1.16)
Positive events, 2002-2006									
Whether received remittances	7,385.616**	2,626.797	102.021	302.361	915.984	1.525	499.234	-323.270	129.229
	(2.48)	(0.76)	(0.41)	(0.36)	(1.41)	(0.60)	(0.52)	(-0.43)	(1.38)
Whether received inheritance	-5,617.243	-5,382.978**	-264.106	196.430	-686.649	-14.752	-525.551	-23,810.927*	210.639
	(-1.46)	(-2.13)	(-0.62)	(0.60)	(-1.54)	(-1.01)	(-1.33	(-1.92)	(1.35)
Whether receive dowries	3,393.055*	-61.150	-131.178	-529.409***	-336.705	-7.354	1,316.802	-757.710	12.171
	(1.79)	(-0.06)	(-0.77)	(-3.16)	(-1.15)	(-1.67)	(1.07)	(-0.87)	(0.31)
Number of observations	728	728	728	728	728	728	728	728	728
R-squared	0.27	0.29	0.31	0.89	0.95	0.61	0.61	0.15	0.37

Source: Author's estimations.
Notes: Regressions included linear, squared, cubed, and quartic terms in the specific type of asset, age and schooling of the household head and spouse, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (1996) values. Robust t-statistics based on standard errors clustered on village are in parentheses. Regressions are weighted using inverse probability weights to account for attrition. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6.4—Impact of shocks on change in value of jewelry and livestock, by type of asset ownership

	Jewelry			Livestock		
	Joint	Husband	Wife	Joint	Husband	Wife
Covariate shocks (floods)						
Proportion of households affected, 1997–2001	20.835	5.477	38.054	-45.787	15.340	20.538**
	(0.69)	(0.55)	(1.57)	(-1.06)	(0.61)	(2.33)
Proportion of households affected, 2002–2006	-6.664	-20.953	16.060	39.133	23.031	8.709
	(-0.16)	(-1.50)	(0.62)	(0.90)	(0.63)	(1.29)
Idiosyncratic shocks, 1997–2001						
Any illness in household	-2,494.918	830.777	1,534.369	-2,031.447	3,795.051*	-176.530
	(-1.38)	(1.06)	(0.88)	(-0.98)	(1.84)	(-0.34)
Any death in household	-918.276	-1,474.131*	-112.146	-1,716.856	-2,674.093	294.023
	(-0.29)	(-1.85)	(-0.09)	(-0.58)	(-0.73)	(0.22)
Dowry or wedding expenses	-1,877.299	-561.246	-1,124.886	-181.976	-2,323.418	-1,270.186
	(-0.64)	(-1.02)	(-1.09)	(-0.08)	(-0.73)	(-1.20)
Idiosyncratic shocks, 2002–2006						
Any illness in household	-1,331.785	-330.129	-1,303.159	-575.408	-2,289.717*	-90.125
	(-0.97)	(-0.80)	(-1.42)	(-0.31)	(-1.74)	(-0.24)
Any death in household	-4,805.734*	940.841	-116.942	-2,429.156	-4,540.669**	3,156.618**
	(-1.89)	(0.45)	(-0.13)	(-1.20)	(-2.03)	(2.35)
Dowry or wedding expenses	2,573.971	-674.127	98.786	-1,719.660	3,643.544	1,668.503*
	(0.82)	(-1.26)	(0.15)	(-0.76)	(1.10)	(1.74)
Positive events, 1997–2001						
Whether received remittances	2,045.278	-42.635	631.752	912.548	-1,046.735	395.973
	(0.62)	(-0.09)	(0.46)	(0.42)	(-0.36)	(0.43)
Whether received inheritance	1,554.339	-589.595	2,430.541	1,903.784	12,964.682***	-699.783
	(0.37)	(-0.67)	(1.15)	(0.54)	(3.45)	(-0.37)
Whether received dowries	11,504.236	-487.976	1,142.203	-4,019.076	7,519.664	-350.420
	(1.13)	(-1.42)	(0.55)	(-1.36)	(1.29)	(-1.23)
Positive events, 2002–2006						
Whether received remittances	-918.148	987.045	3,300.460	-1,225.832	-0.266	872.502
	(-0.43)	(0.54)	(0.97)	(-0.48)	(-0.00)	(1.00)
Whether received inheritance	-3,200.287	-871.334	-1,913.604	-2,717.360	-6,911.920***	20.214
	(-0.89)	(-0.95)	(-1.08)	(-0.90)	(-3.34)	(0.01)
Whether received dowries	8,213.257**	2,017.967	-1,452.965***	-2,294.526	35.640	-959.553**
	(2.32)	(1.12)	(-2.85)	(-0.90)	(0.01)	(-2.66)
Number of observations	728	728	728	728	728	728
R-squared	0.14	0.08	0.16	0.13	0.14	0.45

Source: Author's estimations.

Notes: Regressions included linear, squared, cubed, and quartic terms in the specific type of asset, age and schooling of the household head and spouse, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (1996) values. Robust t-statistics based on standard errors clustered on village are in parentheses. Regressions are weighted using inverse probability weights to account for attrition. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6.5—Impact of shocks on gender asset inequality

	Land	Total assets	Consumer durables	Agricultural durables	Nonagricultural durables	Jewelry	Livestock
Covariate shocks (floods)							
Proportion of households affected,1997-2001	0.083	46.880	11.539	1.382	63.140	-36.951	-10.315
	(0.64)	(0.91)	(0.32)	(0.37)	(1.61)	(-1.16)	(-0.37)
Proportion of households affected, 2002–2006	-0.201	-36.845	-6.088	-5.022	26.717	-35.400	22.519
	(-1.36)	(-1.00)	(-0.20)	(-0.94)	(1.11)	(-1.08)	(0.60)
Idiosyncratic shocks, 1997–2001							
Any illness in household	5.809	-286.634	-16.770	164.263	-27.793	-780.103	4,078.859
	(0.95)	(-0.09)	(-0.02)	(0.68)	(-0.02)	(-0.38)	(1.61)
Any death in household	-25.324	-4,148.011*	-2,358.590	-160.575	-917.706	-1,259.436	-2,575.204
	(-0.97)	(-1.96)	(-1.11)	(-0.91)	(-1.20)	(-0.79)	(-0.64)
Dowry or wedding expenses	-5.667	-7,281.293*	-2,038.305	-781.556**	-2,817.564	969.839	-1,266.779
	(-0.45)	(-1.97)	(-1.09)	(-2.21)	(-1.36)	(0.78)	(-0.46)
Idiosyncratic shocks, 2002–2006							
Any illness in household	-11.488	-1,163.359	-31.061	-47.880	-1,916.637	956.194	-2,391.962
	(-1.58)	(-0.70)	(-0.04)	(-0.30)	(-1.10)	(0.89)	(-1.60)
Any death in household	-69.632***	-3,016.305	-2,186.917	-391.490***	-1,329.082	874.776	-7,270.088**
	(-4.08)	(-0.66)	(-0.99)	(-3.18)	(-0.86)	(0.35)	(-2.43)
Dowry or wedding expenses	0.594	6,227.074	901.234	361.380	3,142.028	-1,013.031	2,531.240
	(0.05)	(1.49)	(0.47)	(0.80)	(1.43)	(-1.17)	(0.91)
Positive events, 1997–2001							
Whether received remittances	-7.961	-6,470.281**	-3,263.675	-172.795	-1,503.950	-1,309.679	-1,422.016
	(-0.34)	(-2.26)	(-1.45)	(-0.88)	(-0.68)	(-0.87)	(-0.47)
Whether received inheritance	-10.860	27,993.952*	6,826.062**	466.877	25,169.707	-3,076.896	12,748.712***
	(-0.31)	(1.96)	(2.39)	(1.10)	(1.64)	(-1.63)	(2.96)
Whether received dowries	-17.796	-2,313.492	301.627	155.188	-1,238.908	-1,509.826	7,964.018
	(-1.05)	(-0.51)	(0.13)	(0.55)	(-0.83)	(-0.74)	(1.29)
Positive events, 2002–2006							
Whether received remittances	-8.402	411.225	1,936.516	936.876	-449.353	-2,489.639	-627.064
	(-0.53)	(0.09)	(0.56)	(1.44)	(-0.58)	(-0.71)	(-0.21)
Whether received inheritance	-24.930	-27,752.257**	-5,055.785**	-677.155	-23,925.491*	1,162.753	-6,336.618**
	(-0.72)	(-2.29)	(-2.49)	(-1.56)	(-1.90)	(0.83)	(-2.52)
Whether received dowries	-5.681	2,178.710	4.993	-286.055	-808.736	3,417.190*	839.472
	(-0.86)	(1.01)	(0.00)	(-1.09)	(-0.93)	(1.69)	(0.33)
Number of observations	729	728	728	728	728	728	728
R-squared	0.42	0.35	0.32	0.95	0.15	0.15	0.22

Source: Author's estimations.

Notes: Regressions included linear, squared, cubed, and quartic terms in the specific type of asset, age and schooling of the household head and spouse, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (1996) values. Robust t-statistics based on standard errors clustered on village are in parentheses. Regressions are weighted using inverse probability weights to account for attrition. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Social Networks and Differential Asset Growth

Table 6.6 presents selected coefficients of the effect of social network determinants on land and asset growth, separately for jointly and exclusively held assets, as well as for the difference between the husband's and wife's asset growth within the same household. Brothers and sisters play different roles in familial networks. Because husbands' brothers compete for parental land, a greater number of brothers decreases the husband's land accumulation and reduces the husband–wife land accumulation gap. Because husbands are expected to provide for their sisters, the latter may act as a drain on their brothers' resources yet not compete for parental land. Indeed, the impact of husbands' sisters is ambiguous— having more sisters reduces jointly held land (which may typically have been acquired after marriage) but increases the land that the husband claims as his own, coming primarily through inheritance. Husbands' having more sisters also increases the gap between husband and wife in land accumulation. The wife's number of sisters does not affect land or asset accumulation by either husband or wife. Finally, a greater distance from the wife's parental village reduces her husband's land accumulation. Familial networks— mostly the wife's—also have an impact on the accumulation of nonland assets. The wife's brothers, however, are clearly an important part of her social network. A husband's nonland asset accumulation is lower the more brothers his wife has, and the nonland gender asset gap is smaller. In contrast, possibly because other sisters compete with the wife for their brothers' support, or wives may also have to come to their sisters' aid, nonland asset growth of husbands relative to wives is faster if wives have more sisters. Finally, indicating the importance of support from the wife's kinship network, a greater distance from the wife's village is associated with lower growth of jointly held assets.

Table 6.6—Impact of network determinants on land and asset accumulation, by type of ownership

	Land				Nonland assets			
	Joint	Husband	Wife	Husband-Wife	Joint	Husband	Wife	Husband-Wife
Husband's network determinants								
Husband's brothers	0.541	-5.251**	0.373	-5.231***	-437.255	615.786	529.477	-93.699
	(0.34)	(-2.67)	(1.04)	(-2.73)	(-0.49)	(0.65)	(0.93)	(-0.14)
Husband's sisters	-2.630**	3.757*	-0.066	4.268*	-759.804	-1,151.145	-584.468	-525.222
	(-2.02)	(1.69)	(-0.17)	(1.79)	(-0.81)	(-1.42)	(-1.16)	(-1.07)
Distance to parental village of husband	0.015	0.058	0.029**	-0.033	-4.857	79.406	67.535	12.298
	(0.53)	(0.58)	(2.41)	(-0.35)	(-0.12)	(1.28)	(1.03)	(0.51)
Wife's network determinants								
Wife's brothers	-0.822	-1.425	-0.087	-1.444	1,116.351	-1,394.890*	-773.998	-779.583*
	(-0.77)	(-0.92)	(-0.31)	(-0.91)	(1.18)	(-2.01)	(-1.14)	(-1.73)
Wife's sisters	-0.913	2.338	-0.342	2.732	-1,529.337	911.761	442.841	672.101*
	(-1.02)	(1.27)	(-1.62)	(1.46)	(-1.07)	(1.26)	(0.80)	(1.82)
Distance to parental village of wife	-0.028	-0.131**	-0.015	-0.092	-59.749***	-13.142	-14.605	-1.727
	(-1.21)	(-2.50)	(-1.66)	(-1.45)	(-4.06)	(-0.75)	(-1.11)	(-0.16)
Number of observations	722	722	722	722	722	722	722	
R-squared	0.68	0.40	0.32	0.42	0.18	0.27	0.15	

Source: Author's estimations.

Notes: Regressions included linear, squared, cubed, and quartic terms in the specific type of asset, negative shocks and positive events, age and schooling of the household head and spouse, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (1996) values. Robust t-statistics based on standard errors clustered on village are in parentheses. Regressions are weighted using inverse probability weights to account for attrition. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

7. CONCLUSIONS AND POLICY IMPLICATIONS

This exploration into the dynamics of jointly and individually owned assets suggests that the asset accumulation paths of individuals may be quite different from those of households. While analysis of the gender-disaggregated asset data does not support the existence of multiple equilibria, the clustering of a large number of observations near the origin is indicative of many households—and individuals, particularly women—being trapped in asset poverty. The analysis of the impact of shocks on jointly owned and individually owned assets also suggests that men's and women's assets respond differently to some types of shocks, with a husband's land being reduced by a death in the household and his assets drawn down to cope with dowry and wedding expenses. Both men's and women's assets are reduced by illness shocks. Life-cycle events also affect land and asset accumulation of men and women, with more recent events having different impacts than events in the more distant past. Factors that affect husbands' and wives' ability to form social and familial networks also affect asset accumulation: the gender asset-accumulation gap is smaller in households where wives have more brothers (who provide her with support) and fewer sisters. Households that live closer to the wife's parental village are also better able to acquire jointly held assets. Put differently, factors that encourage the formation or maintenance of social networks for women also reduce gender asset inequality.

The negative impact of dowry and wedding expenses and illness shocks on a variety of outcomes related to individual and household well-being has been documented using both qualitative and quantitative analyses of the longitudinal data (Quisumbing 2010; Baulch and Davis 2008). Baulch and Davis (2008), using both life history and quantitative survey data from this study, find that improvements in poor people's lives tend to happen gradually, whereas sudden declines are common. They find that a crisis is likely to produce a serious and sudden decline when the crisis either directly damages something constitutive of a person's well-being, such as his or her health, or when a person has very few buffers and low resilience (due to previous crises, limited or no ability to insure, few assets or savings, and poor network resources). The downward pressure exerted on people's life trajectories are particularly severe when two or three shocks occur within the space of a few years (for example, if high medical expenses for treating an elderly parent coincide with dowry and wedding expenses for a daughter).

These results suggest three areas of potential policy significance: providing health insurance, providing mechanisms to save for anticipated life-cycle events, and addressing the elimination of dowries. Providing some form of health insurance to protect against illness shocks is a recommendation that emerges clearly from this work; some large NGOs, such as BRAC, are exploring the provision of micro–health insurance schemes. Yet the recognition that illness shocks can be detrimental to poor people's well-being appears to receive less attention in Bangladesh than covariate shocks such as floods, precisely because illness is an idiosyncratic event. This should not lead policymakers to underestimate the detrimental impact of illness on people's livelihoods and ability to move out of poverty; Krishna's (2010) study of household poverty dynamics in societies as diverse as India, Kenya, Uganda, Peru, and the United States identifies illness and accidents as the most common and preventable cause of poverty.

Providing households with the ability to save and invest, particularly when positive shocks occur, might help build up their stock of assets and enable them to prepare for anticipated life-cycle events, such as endowing the next generation with assets, which is one interpretation of dowries. But this begs the question of whether dowries are, in themselves, desirable. While providing the poor with savings instruments could be one solution to mitigate the impact of dowry shocks, it does not address the other social implications of dowries. Although South Asian governments, including the government of Bangladesh, have attempted to curb dowries, the practice has continued to be widespread and may even be on the rise (Davis and Bach 2010). Some authors (notably Botticini and Siow 2003) have argued that dowries will disappear as labor markets develop and children become less dependent on their families' assets for their livelihoods. The pernicious effects of dowries on the poor, however, imply that one cannot wait for this evolutionary process to reach its conclusion. As Davis and Bach (2010) argue, anti-dowry policy must be seen as an antipoverty initiative that also serves to reduce the oppression of women. As

there is widespread reluctance to address this deeply rooted cultural practice in government and policy circles, innovative approaches to eliminate dowries are needed that go beyond national economic policies and involve NGOs and civil society.[17] At the same time, government needs to continue providing incentives to invest in women's human capital—through schooling, conditional cash transfers, and other programs—and to increase returns on women's human capital by removing barriers to labor market participation. Legal reform to strengthen women's inheritance and property rights will also provide a stronger foundation for women's asset accumulation and the eventual reduction of gender asset inequality.

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[17] For example, the Grameen Bank does not allow its members to provide or receive dowries (though it has also been observed that some families have used loans to pay for dowries).

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