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IFPRI Discussion Paper 01113

August 2011

**Do Shocks Affect Men's and Women's
Assets Differently?**

A Review of Literature and New Evidence from
Bangladesh and Uganda

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PARTNERS AND CONTRIBUTORS

IFPRI gratefully acknowledges the generous unrestricted funding from Australia, Canada, China, Denmark, Finland, France, Germany, India, Ireland, Italy, Japan, the Netherlands, Norway, the Philippines, South Africa, Sweden, Switzerland, the United Kingdom, the United States, and the World Bank.

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ABSTRACT

This paper attempts to expand our understanding of the gender-differentiated impact of shocks on assets through a literature review on shocks and gendered asset dynamics and an analysis of new panel data (2007 and 2009) from Uganda and Bangladesh looking at the impact of negative shocks and positive events on men's and women's assets. We take advantage of detailed assets and shocks modules to disaggregate the type of shock between covariate and idiosyncratic shocks and types of assets according to ownership (joint, husband's, and wife's assets). We also consider the impact of life-cycle events such as dowry payments and receipts, and inheritance. Estimation of an asset accumulation regression as a function of covariate and idiosyncratic shocks, with controls for baseline characteristics and asset stocks, finds that although many shocks are similar in both countries, commonly experienced shocks do not necessarily have the same effects across countries and on men's, women's, and jointly owned assets within countries. Land and assets in general were relatively well insured against food price increases in Bangladesh, but jointly held assets and wives' assets in Uganda were negatively affected. Weather shocks negatively impact husbands' assets and wives' assets in Bangladesh and Uganda, respectively. Reflecting differences in country and context, dowry and wedding expenses took their toll on wives' land in Bangladesh, and illness shocks also had a large detrimental impact on wives' assets in Bangladesh, while death negatively affected wives' assets in Uganda. Within households, however, it appears that in Bangladesh, husbands' land and assets were more negatively affected by covariate shocks relative to wives' assets, whereas in Uganda, husbands' assets were relatively protected against covariate shocks relative to wives' assets.

Keywords: shocks, gender, assets, Bangladesh, Uganda

ACKNOWLEDGMENTS

This paper was commissioned as a background paper for the World Bank's *World Development Report* on "Gender Equality and Development." We thank the World Bank for funding the analysis reported in this paper, and the Swiss Development Corporation for funding the most recent round of data collection in Bangladesh and Uganda. We thank Wahid Quabili for excellent research assistance, Markus Goldstein for helpful discussions in conceptualizing this paper, and Amber Peterman for insightful comments. Ginette Mignot and Jay Willis helped with the production of the document. All errors and omissions are ours.

1. INTRODUCTION

Households in developing countries use a variety of mechanisms to cope with shocks. Households typically 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). Among these responses, drawing down assets 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 asset accumulation and decumulation have implications for the evolution of household poverty and well-being over time. There is now a sizable literature on the impact of shocks on household assets, and a growing literature on assets and poverty traps in developing countries (Carter and May 2001; Lybbert et al. 2004; Carter and Barrett 2006; Adato, Carter, and May 2006; Barrett et al. 2006; Carter et al. 2007; Jalan and Ravallion 2004; Naschold 2006, 2008).

Despite the recent growth of this literature, made possible by the increasing availability of panel datasets, there is still relatively little evidence on the impact of shocks on men's and women's assets. This is partly due to the paucity of gender-disaggregated data on ownership of physical assets. The comparatively larger literature on the impacts of shocks on nutritional status, health, and schooling arises in no small part from the fact that human capital outcomes are necessarily measured as individual outcomes. Other than human capital outcomes, most of the existing literature has examined the differential impacts of shocks to male and female incomes on household-level outcomes, such as consumption.

Different asset dynamics for men and women are 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 men's and women's body mass index, controlling for a variety of confounding factors. They find that, while risk is shared efficiently in most of the Ethiopian highlands, poor women in the southern part of the country, where customary laws on settlement at divorce are biased against women, fare worst. Duflo and Udry (2003) also rejected 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*—that is, rainfall variations that affect crops that men and women produce.¹ Rainfall shocks that increase the output of yams, which are culturally valued and whose distribution is subject to social norms, are associated with expenditure reallocations toward education, staples, and overall food consumption and away from adult goods and *prestige* goods such as jewelry. In contrast, rainfall shocks that increase the output of crops cultivated individually by either men or women are associated with increases in expenditure shares of adult and prestige goods. Rainfall shocks that increase the yields of women's crops shift expenditure toward food (except staples), while similar shocks affecting cash crops cultivated by men have no effect on the purchases of food (Duflo and Udry 2003, 5). 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. Interestingly, a study from 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. There is also substantial evidence, particularly from the anthropological literature (for example, White 1992), that men and women have different asset accumulation strategies, and that men's and women's assets are used in

¹ Note in the Duflo and Udry (2003) paper that men's crops and women's crops refer to crops cultivated largely by one sex or the other. Men's crops are considered to be cocoa, coffee, wood, pineapple, and kola nuts. Women's crops are considered to be coconut, plantain, oil palm, taro, sweet potato, vegetables, banana, fruit trees, and some minor crops. Duflo and Udry (2003) recognize that many traditional assumptions about which crops are male and which crops are female are misleading or erroneous, as shown by Doss (2001) in Ghana.

different ways to cope with shocks (see Antonopolous and Floro [2005] for Thailand and Frankenberg, Smith, and Thomas [2003] for Indonesia).

This paper attempts to expand our understanding of the gender-differentiated impact of shocks on assets by (1) conducting a comprehensive review of the literature on shocks and gendered asset dynamics, and (2) analyzing new panel data (2007 and 2009) from Uganda and Bangladesh looking at the impact of negative shocks and positive events on men's and women's assets. This will take advantage of detailed assets and shocks modules to disaggregate the type of shock between covariate and types of idiosyncratic shocks and types of assets according to ownership (joint, husband's, and wife's assets). These two countries were chosen because of the existence of data prior to the global increase in food prices in mid-2007–2008, and the opportunity to field a follow-up survey shortly afterward, in 2009 and 2010, which enables us to examine the gendered impact of the food price shock, and because they represent societies with very different social and cultural institutions, household structures, and gender norms.

The paper is organized as follows. Section 2 presents a review of the micro-empirical work on gendered asset dynamics undertaken since 2000. Section 3 briefly describes the conceptual framework for the study, while Section 4 discusses data and settings in Bangladesh and Uganda. Section 5 presents regression results and Section 6 concludes.

2. LITERATURE REVIEW

We divide the review of the existing literature into three parts: (1) a brief exposition of the types of shocks faced by rural households, (2) the impact of shocks on men's and women's asset accumulation, and (3) the impact of gender-differentiated shocks on household- and individual-level outcomes.

Characterizing Risks and Shocks Faced by Rural Households

Rural households face different sources of risk. Dercon defines risk as the “presence of a potentially large number of different possible circumstances that may materialize at a particular moment in time in the future” (2010, 15); a shock is the realization of one of these possible circumstances. For a household or an individual, shocks are exogenous, although certain characteristics of households or individuals may predispose them to certain shocks. For example, a household with a large number of elderly individuals will be more likely to experience illness episodes. Shocks also often have a negative connotation, although there are certainly some positive shocks, such as winning the lottery or unexpectedly receiving a large inheritance. The key element of risks and shocks is their exogeneity: households and individuals cannot influence them, and therefore cannot anticipate them. The inability to anticipate negative (or positive) events is what distinguishes shocks from other events that, even if likely to have a negative impact, can be almost perfectly anticipated. We return to this important distinction below.

The large literature on consumption-smoothing and risk-sharing (surveyed in Townsend [1995] and Deaton [1997], among others) distinguishes between covariate and idiosyncratic risks and shocks. Covariate risks, such as floods, droughts, and high prices, affect most people in a community at the same time, while idiosyncratic risks will affect only a few people within a community at the same time—such as illness, crop or livestock losses, and theft (Dercon 2010, 17). Some negative events are certain, although their timing is uncertain (death, unlike taxes, cannot be evaded). Because unanticipated death of a prime-age adult, particularly the household's main income earner, is a major shock to the household, it is justifiably classified as an idiosyncratic shock.

Life-cycle events are other factors that may affect household well-being. Although most life-cycle events can be predicted with near certainty, their timing is often uncertain, and related events may have ambiguous impacts. For example, death of a relative, while an occasion of mourning (and often entailing large funeral expenditures), may also signal the devolution of assets to the next generation. The demographic composition of the household is linked to the likelihood that a household will receive remittances, as children finish (or leave) school, start working, and contribute to parental expenses.

Transfers at the time of marriage are yet another life-cycle phenomenon that have received much attention (see Botticini and Siow 2003; Fafchamps and Quisumbing 2008). Whether or not parents have to pay a dowry, for example, is known at the birth of a child. One could argue that because parents know that they have to pay dowries for daughters in some societies (or bride-prices when sons marry, in others), the problem is not paying the dowry per se, but the lack of appropriate savings instruments. For example, in rural India, Deolalikar and Rose (1998) find that the birth of a boy (relative to a girl) reduces savings for medium and large farm households, although there is no evidence that the shock affects savings for the landless and the small farm households. In a society where consumption levels are already low, dowries represent forced savings as households with daughters significantly reduce consumption to save for dowries. Final dowry amounts are also determined by negotiation, and they carry the risk that the marriage will not proceed or that domestic violence will occur if dowries are deemed insufficient (Bloch and Rao 2002). In rural China, the actual size of the dowry paid responds to shocks to grain yield, because dowries are typically paid the year after the harvest (Brown 2009). In India, dowries paid by households who marry off a daughter in a year with a positive rainfall shock are lower in rice-growing areas, which are intensive in women's labor, compared to wheat-growing areas, which use men's labor more intensively (Mbiti 2007). Finally, qualitative work based on life histories in Bangladesh (Baulch and Davis 2008) has revealed that the particular combination of dowry and illness shocks may lead to sudden declines in people's well-being.

In the remainder of this paper, we examine how the combination of covariate shocks, idiosyncratic shocks (both positive and negative), and life-cycle events affect the asset accumulation of men and women.

Gender Differences in Asset Accumulation

The existence of significant gender differences in asset accumulation is documented by several recent empirical studies. Quisumbing and Maluccio (2003) analyze data on assets brought to marriage in Bangladesh, Indonesia, Ethiopia, and South Africa and find that in all four cases, husbands bring significantly more assets to a marriage. There is also evidence that gender gaps in assets at marriage have increased through time: Quisumbing and Hallman (2005) examine trends in human capital (schooling) and assets brought to marriage in six countries (Bangladesh, Ethiopia, urban Guatemala, Mexico, the Philippines, and South Africa). They find that in three out of six countries, husband-wife gaps in schooling attainment have narrowed over time, but that the distribution of assets at marriage continues to favor husbands, and that gender asset inequality favoring husbands has even increased through time.

In addition to accumulating assets at different rates, men and women may also collect different types of assets. For example, in a sample of 134 Thai couples in low-income urban households in Bangkok, Antonopolous and Floro (2005) find women typically store individual assets in tangible forms (that is, jewelry) rather than financial ones, such as cash or savings accounts, whereas men are more likely to hold financial or transport assets. Antonopolous and Floro suggest that specialization in different types of assets occurs because women are better able to retain control over tangible than intangible assets, although it is also possible that such specialization occurs not because of preferences but because of occupational choice.

In spite of the robust literature on shocks and assets and the recognition that men and women hold assets differing in quantity, quality, and type, there are very few studies that explore the differential impact of exogenous changes, such as price fluctuations, and unexpected events (or *shocks*) on men's and women's assets. In northern Nigeria, Dillon and Quiñones (2011) find the effects of price changes over a 20-year period reinforced initial inequality in asset holdings between men and women. Men, who had larger initial holdings of higher-value livestock, benefited from price increases in these livestock species. However, women, who held lower-valued livestock, did not experience a similar appreciation in their asset stocks. Frankenberg, Smith, and Thomas (2003) study the household-level effects of the Asian financial crisis in Indonesia and find that in the post-crisis period, the value of certain types of assets—housing and financial wealth—declined sharply while the value of other assets—some types of businesses and jewelry—increased. Gold, mostly in the form of jewelry, was often sold to cope with the economic crisis, a fact that has interesting gender dimensions, given that jewelry is usually owned by women. However, the authors do not fully explore explanations for these gender dynamics.

Using a longitudinal dataset of 957 households in rural Bangladesh constructed with a 10-year survey interval between 1996–97 and 2006–07, Quisumbing (2009) finds that within a household, men's and women's nonland assets are drawn down for different types of shocks.² Experiencing a recent death in the household and consequently receiving an inheritance is associated with reductions in the wife's asset holdings and increases in the husband's asset holdings. This finding indicates that women are responsible for paying for illness-related shocks. On the other hand, the assets of husbands, rather than wives, are drawn down to pay for the dowries and weddings of daughters. Quisumbing also looks at the impact of shocks on men's, women's, and jointly held land. Consistent with findings on nonland assets, husbands' landholdings are drawn down with wedding and dowry expenses. On the other hand, wives' landholdings increase with deaths in the household (possibly due to inheritance). Jointly held household land—as opposed to individual land—appears to be better insulated from shocks. Gender-based

² In this case, nonland assets include 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. The data used by Quisumbing (2009) come from a subset of the households studied in the present paper.

differences in responsibilities for coping with shocks have a number of implications for long-term asset accumulation. For example, husbands have a long time to accumulate the assets needed to pay for a dowry or wedding, which are anticipated events, whereas illness—the responsibility of women—comes on quickly and unexpectedly.

Impact of Male- and Female-Specific Shocks on Household Assets

The literature cited in the introduction has highlighted the differential impact of shocks experienced by men and women on intrahousehold allocation (for example, the study by Duflo and Udry [2003]). This section reviews several empirical studies—often, though not exclusively, focused on HIV/AIDS—that explore the impact of becoming a widow or widower on household assets. Mather and Donovan (2008) look at a panel of 4,058 Mozambican households and find significant reductions in total landholding upon the deaths of adult females (19 percent) and males (20 percent).³ On the other hand, upon the death of a male household member, there is a 34 percent reduction in livestock holding while no such reductions were found for households experiencing female deaths. Yamano and Jayne (2004) use panel data on 1,400 rural Kenyan households and find the death of a prime-age adult male results in the reduction of farm assets and small livestock, while the death of a prime-age adult female results in the reduction of only small livestock.

Several authors also focus on the loss of assets associated specifically with widowhood. Much of this literature focuses on the practice of *property grabbing*, whereby land is taken from widowed women, often by extended family of the deceased. In contexts where rural livelihoods are largely dependent on land, property grabbing is particularly detrimental to rural women who likely are already asset poor. In a Ugandan study on child support services and HIV/AIDS, Gilborn et al. (2001) find that 29 percent of 204 widows had property taken away from them following the death of a husband. An International Justice Mission (2008) survey of 115 widows in Uganda (Mukono District) finds that 41 percent experienced property grabbing upon the death of a husband and 51 percent had been threatened with property grabbing. Within a Zambian panel sample of 5,000 households, Chapoto, Jayne, and Mason (2010) find that following a husband's death, households control, on average, 35 percent less land. Peterman (2010) uses Demographic and Health Survey (DHS) data from 15 countries in Sub-Saharan Africa to explore the relationship between widowhood and asset inheritance. Results indicate that less than half of widows report inheriting any assets, although there is variance across countries.⁴ In the same paper, Peterman looks at data over a 13-year period from the Kagera region in Tanzania and finds that the value of inheritances, especially for widows (and specifically land inheritance), is significant in determining changes in household consumption and asset stocks.

A number of factors do appear to help widowed women insulate themselves against involuntary asset decumulation. In Zambia, Chapoto and colleagues (2010) find older women and women with larger kinship networks are better able to protect against property loss. Peterman (2010) finds that across 15 countries in Sub-Saharan Africa, asset inheritance by widows is generally correlated with higher education and wealth. Education may be a factor affecting asset inheritance in other dimensions as well. Fafchamps and Quisumbing (2002) find that in Ethiopia, educated women anticipate receiving fewer assets through inheritance, which the authors attribute to the fact that more educated women may have access to additional income-generating opportunities.

The literature on the impact of gender-specific shocks on household asset accumulation is not limited to the developing world. Ward-Batts (2001) finds that male- and female-specific health shocks affect the growth of household wealth differently in the United States. Specifically, the impact of a health shock to the wife had a larger negative impact on household wealth than a health shock to the husband.⁵

³ There is some variance by region, perhaps indicating differences in matrilineal versus patrilineal patterns of inheritance.

⁴ Average inheritance of any asset is 47 percent, ranging from 22 percent in Sierra Leone to 66 percent in Rwanda.

⁵ Note that these findings refer to the second wave of data collection. Health shocks to wives include diabetes, hypertension, stroke, psychological problems, and lung disease; health shocks to husbands include hypertension, diabetes, and psychological problems.

Another study from the United States that uses the first two waves of the Health and Retirement Study (HRS) finds that health shocks lead to significant declines in household wealth by lowering the earnings of both men and women (Wu 2003). However, after controlling for earnings decreases due to changes in labor supply, Wu finds that health shocks to husbands do not have additional effects on household wealth accumulation, while health shocks to wives have residual effects not entirely explained.

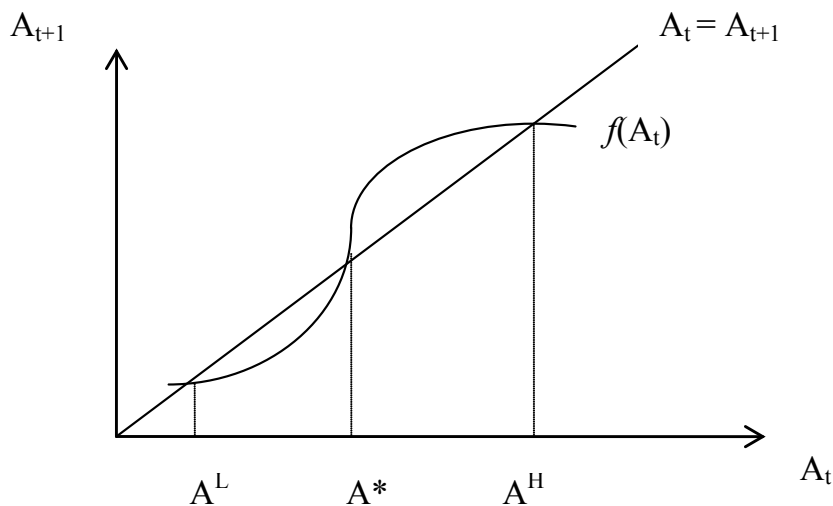
Related Areas of Interest

There is some interesting related literature regarding gendered perceptions and expectations of shocks and asset accumulation. A study from pastoralist societies in Ethiopia and Kenya finds that perceptions of shocks matter, and males and females often differ with respect to their perceptions of the nature of a shock, the severity of the shock, and the appropriate coping mechanisms to be used (Doss, McPeak, and Barrett 2008). Further investigation into gendered perceptions of shocks would be particularly useful, given the evidence that expectations of future asset security play an important role in investment decisions (Deininger and Jin 2006; USAID 2009). Thus, perceptions or expectations regarding future loss of assets by women may negatively have an impact on their economic decisions and investments, even prior to experiencing a negative shock.

3. CONCEPTUAL FRAMEWORK

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.⁶ Their conceptualization of poverty traps starts with the observation that it is usually much easier to measure assets than either consumption expenditures or incomes, and goes on to develop a theory of asset dynamics and dynamic poverty traps that can be applied to longitudinal data on assets stocks. Parametric and nonparametric methods are used to derive a dynamic asset path, which shows the typical relationship between asset holdings in two periods, usually a number of years apart. Typically, as shown in Figure 3.1, 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 3.1—Carter and Barrett's Theory of Asset Dynamics and Poverty Traps



Source: Carter and Barrett (2006).

Most, if not all, studies that have projected dynamic asset frontiers have estimated these for household assets, owing to the paucity of longitudinal data on individually held assets. However, if resources—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, and that these may differ from the household asset frontier. In an extreme case where there is no risk-pooling or resource-pooling within the household, the *household* asset frontier may simply be masking separate asset accumulation decisions by husband and wife. 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.

⁶ See Carter and Barrett (2006), Barrett et al. (2006), Lybbert et al. (2004), and Barrett and Carter (2001). This exposition draws heavily from Quisumbing and Baulch (2009).

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 both Bangladesh and Uganda, where spouses clearly have some concept of *joint* assets, and joint assets make up the largest portion of the household asset portfolio, we have reason to believe that 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).

In our analysis, we estimate a fourth-order polynomial regression as follows:

$$A_{iT} - A_{iB} = \beta_0 + \beta_1 A_{iB} + \beta_2 A_{iB}^2 + \beta_3 A_{iB}^3 + \beta_4 A_{iB}^4 + Z_j \Gamma_i + C_j \Lambda_i + \varepsilon_{it}, \quad (1)$$

where $A_{iT} - A_{iB}$ 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_j and C_j are time-invariant household and community characteristics, and ε_{it} is the error term.⁷ Equation (1) is estimated separately for joint, husband’s, and wife’s land and assets, and for selected disaggregated asset categories. We discuss the specification of key variables after describing the data and settings.

⁷ In future work, we will also conduct nonparametric estimation of the asset accumulation paths. However, since this paper is concerned with the measurement of the impacts of shocks on men’s and women’s assets, it will focus on parametric results.

4. CONTEXT AND DATA

Country Context

Bangladesh and Uganda were chosen for this analysis for two reasons. First, the International Food Policy Research Institute conducted detailed household surveys in primarily rural areas of both countries in 2006–07, prior to the onset of the food price crisis in 2007–08, and a resurvey in 2009 or 2010 allowed us to examine the impact of the food price crisis with a pre-crisis baseline. Second, both countries have very different sociocultural traditions, reflected in differences in family structure, production organization, and gender norms. Because of such differences, one could hypothesize that the gendered impacts of shocks might differ across these country contexts.

Bangladesh

Women tend to be *invisible* in the agricultural sector in Bangladesh, owing to the assumption that women are not involved in agricultural production, and because of cultural norms that value female seclusion and undervalue female labor. Yet, this assumption is challenged by data from various studies (for example, Ahmed et al. 2010).⁸ Participation of women in agriculture has also increased over time. Between 1999–2000 and 2005–06, the number of employed persons in agriculture has increased from 19.99 to 22.93 million persons, or by just about 15 percent (BBS various years; see Birner, Quisumbing, and Ahmed 2010). For male labor, there has been an absolute decrease of about 6 percent, while for females the number has increased from 3.76 to 7.71 million persons, that is, by more than 100 percent. As a result of such changes, the proportion of women in the agricultural labor force has increased from less than 20 percent to 33.6 percent of the total. This is indeed a phenomenal change, although the extent to which this change may have resulted from a true secular increase versus better measurement of women’s participation needs to be ascertained.

Because of this perception, and because Islamic inheritance laws provide that daughters inherit half the share of sons, women have less land and fewer assets than men do, and have traditionally not been the targets of agricultural extension services. Rural households headed by women are more likely to be among the poorest; women also lag behind in terms of education—more than one in three rural women have no schooling, compared to one in four rural men (NIPORT 2009). Lack of education in adult women in Bangladesh is a strong correlate of being *ultra-poor*: 80 percent of adult women with no education live below half a dollar a day (Ahmed et al. 2007). Marital regimes are also mostly exogamous, with daughters leaving their natal villages for their husbands’ villages, and dowries are typically given to the groom’s family upon marriage. While dowries are often considered a daughter’s share of the family’s wealth, in the Bangladeshi context, the groom’s family typically controls dowries and demands these dowries as part of negotiations over marriage. The one-time costs of dowries and wedding expenses are a large drain on families’ resources and are highly correlated with downward mobility into poverty (Davis and Baulch 2011).⁹ The composition of women’s and men’s land and asset holdings is correlated with the gender division in agriculture: men bring more assets to marriage (Quisumbing and Maluccio 2003) and typically own most of the household’s land, livestock, and productive equipment, while jewelry is owned largely by women and is considered a woman’s asset.

⁸ A profile of poor households eligible for a variety of food and cash transfers shows that while only about 2 percent of women participants in public works programs are self-employed in agriculture, almost 29 percent of women in the Food Security Vulnerable Group Development Program are self-employed in agriculture. Across different types of program participants and eligible households that did not participate in the program, between 3 and 11 percent of women work as agricultural wage laborers (Ahmed et al. 2010).

⁹ Interestingly, the prevalence of dowry is a recent phenomenon. Historically, bride-prices were paid, but have shifted toward dowry since the 1950s (Ambrus, Field, and Torero 2007).

Uganda

In Uganda, a considerable portion of the population is engaged in agriculture (65 percent of the population in 2003 and 73 percent of the population in 2006).¹⁰ According to statistics published by the Uganda Bureau of Statistics, a large fraction of women (roughly 60 percent) actively participate in agriculture and constituted a large share of economically active women in the country (almost 80 percent) in 2006. In fact, these percentages are slightly higher than those for men. This, along with the fact that women are also responsible for taking care of the young and old as well as household chores, puts great pressure on women's time constraints (Evers and Walters 2001). In Uganda, most agricultural production takes place on small family farms. Evers and Walters (2001) maintain that gendered norms in Uganda imply that men decide the pattern of work and allocation of resources, with women having some say about *women's* crops. There may also be a gendered division of agricultural activities, with men in charge of land clearing and marketing and women in charge of weeding, postharvest processing, and food preparation (Kasente et al. 2001). Recent HarvestPlus qualitative work in central and eastern Uganda largely confirms the picture presented by Evers and Walters and Kasente (Behrman 2011). In focus group discussions, participants maintain that men and women frequently use the same plots for agricultural purposes—particularly because land is in short supply—although in some instances men and women do farm separate plots. Respondents differentiate between *male crops*, *female crops*, and *jointly cultivated crops*. While the male household head allocates land to different members of the family, women are reported to have freedom to make agricultural decisions related to planning and selling female crops. In cases of joint crops, both spouses are often involved in agricultural decisionmaking, although men typically have the final say over what will happen with respect to usage of land and sale of produce.

In much of Uganda customary land tenure is the norm, with land owned collectively by the clan and inherited and distributed via consultation of clan elders. However, the continued influence of the clan system varies by region and ethnic group, with clan structures being more important in the northern part of the country and less important in the central and eastern parts of the country where the data were collected. In most of Uganda, women, who in most cases lack formal ownership rights, are able to access and use land through husbands or male kin. Evidence indicates that the type of marital regime—customary, church marriage, or nonmarried cohabitation—strongly influences the rights Ugandan women have with respect to control over land and other key assets (Doss 2010). Prior to marriage, a bride-price—usually in the form of cattle or other livestock—is paid by the husband's family to the wife's family to compensate them for the resources needed to raise and educate the woman. Once the bride-price has been paid, the married woman moves to the clan of her husband and is no longer regarded as the responsibility of her natal clan. The bride-price can become a basis for control of women's labor by her husband, as Evers and Walters (2001) note: "This custom (bride-price) gives a husband rights to his wife's labor as well as to the fruits of her labor."

Bangladesh Chronic Poverty Dataset

The analysis in this paper is based on a recently (2010) collected round of the Bangladesh Chronic Poverty Panel together with the 2006–07 round, which resurveyed households in 102 villages in rural Bangladesh first surveyed in 1994, 1996, or 2000 for evaluations of microfinance, agricultural technologies, and educational transfers programs.¹¹ After initial community-level fieldwork, approximately 2,272 households, consisting of 1,907 original households and 365 households that had split from their original households, were interviewed in late 2006 to ascertain how their living standards, endowment, and other characteristics have changed over time and what role selected unanticipated positive and negative events, as well as antipoverty interventions, have had on their welfare trajectories.

¹⁰ From a link on the Uganda Bureau of Statistics website, www.countrystat.org/uga/cont/pxwebquery/ma/226cla010/en. The source for the data is stated to be the 2002–03 and 2005–06 Uganda National Household Surveys.

¹¹ The 2006–07 round is available at www.ifpri.org/dataset/chronic-poverty-and-long-term-impact-study-bangladesh, and the initial evaluation data are also available on the IFPRI website; for links to the data, see the documentation of the 2006–07 round. The data analyzed by Quisumbing (2009) are from the agricultural technology sites.

Key variables collected were food and nonfood expenditures, transfers and social assistance received, assets, educational attainment of children, shocks, and perceptions of poverty and well-being. In addition to these modules, data were also collected on migration, schooling costs and attendance, employment, social assistance, net income from agriculture, access to facilities, assets owned by husband and wife, landownership and sales of land in the past 10 years, housing and sanitation, health status and morbidity (for all household members), anthropometry (collected for all household members), group membership, social networks, and family background (collected separately for household head and spouse). In 2007, gender-disaggregated land data were collected in the agricultural technology sites only.

The timing of the 2006–07 round, prior to the onset of the food price increases in mid-2007, provided a convenient baseline for estimating the impact of covariate shocks such as the food price shock. Thus, with funding from the Swiss Development Corporation (SDC), households from two out of the three evaluation sites—the agricultural technology and educational transfers sites—were reinterviewed in early 2010, to collect essentially the same information collected in the 2006–07 round (including gender-disaggregated assets and a detailed module on covariate and idiosyncratic shocks, both positive and negative), but with additional information on impacts of, and responses to, the food price increases.¹² Information on community infrastructure and covariate shocks was obtained through key informant interviews in the survey communities in both 2007 and 2010. The 2010 resurvey covered 2,185 households out of the 2,272 households surveyed in 2007. This implies an attrition rate of 3.8 percent over the three-year period, or 1.27 percent per year, which compares quite favorably with the longitudinal datasets reviewed in Alderman et al. (2001), where attrition rates range from 6 percent to 50 percent between two survey rounds and from 1.5 percent to 23.2 percent per year between survey rounds. The distribution of surveyed villages is presented in Figure 4.1.

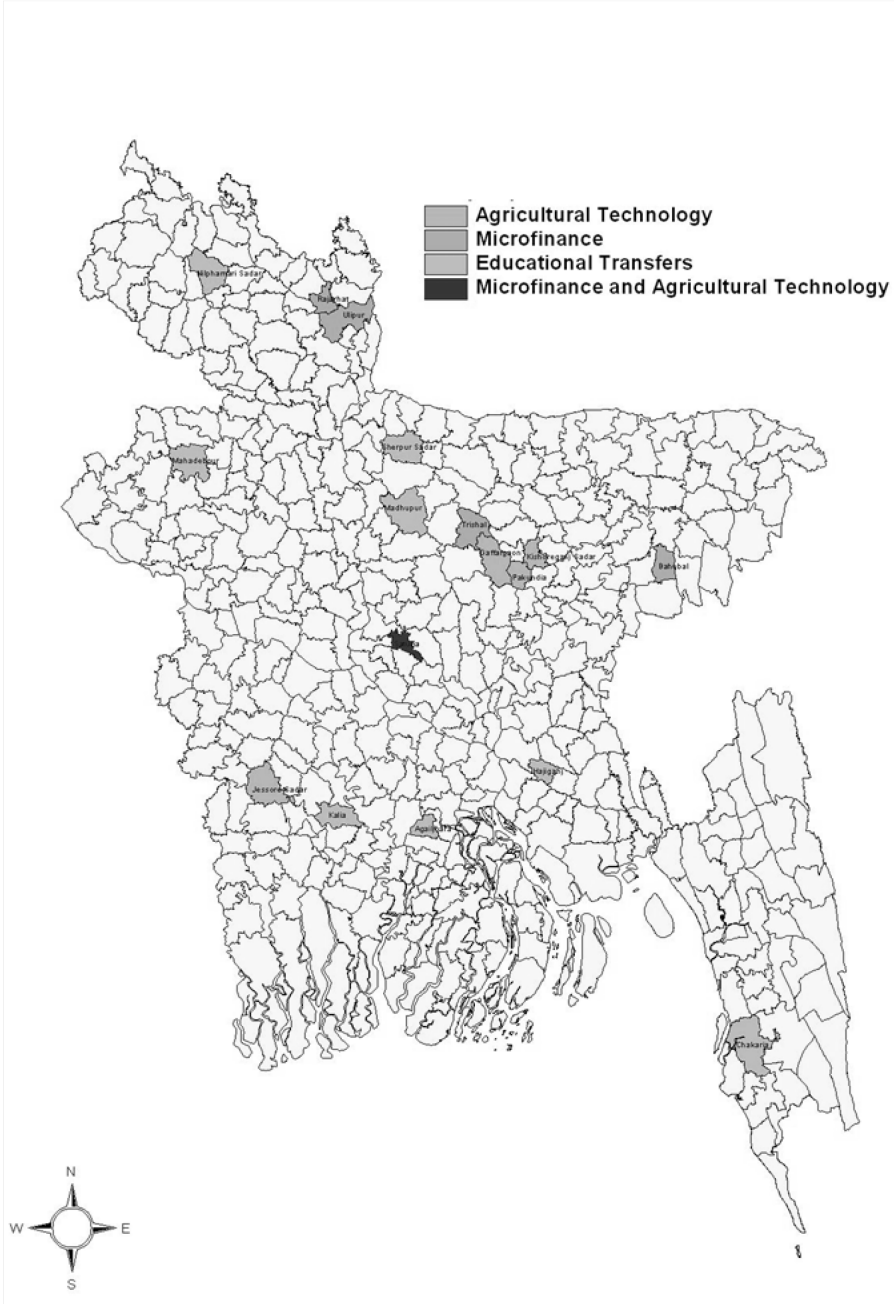
Table 4.1 presents selected household characteristics as of 2007, which we treat as the baseline round in this analysis. Husbands are considerably older and better educated than their wives. Husbands were 46 years old, on average, and had completed 3.7 years of schooling, compared to wives, who were 37 years old and had completed 2.75 years of schooling. Households owned, on average, 74 decimals of land—less than an acre (100 decimals = 1 acre)—and held almost 40,000 taka worth of nonland assets in 2007, of which half consisted of jointly owned assets, 43 percent was exclusively owned by the husband, and the balance (about 7 percent) was exclusively owned by the wife.¹³

Households in our sample also reported being affected by a number of covariate and idiosyncratic shocks as well as life-cycle events that affected their well-being (Table 4.2 and Figure 4.2). Because of the possibility of respondent bias, we use community reports for weather-related covariate shocks: about 5.6 percent of households in the survey communities were affected by floods or cyclones, while 7.5 percent were affected by drought, albeit with substantial variation across villages. The global increase in food prices in 2007–08 is another example of a covariate shock; in our study we use household self-reports of whether they were affected by the food price shock. Reflecting the timing of the survey after the 2007–08 global food price increases, 45 percent of households reported having been affected by the food price increase. Similar to other work in Bangladesh using earlier rounds of the dataset (Quisumbing 2010), the most prevalent idiosyncratic shock is illness, affecting 10 percent of households, which includes both illness of any household member and illness-related expenses. Death, while arguably an extreme shock, affects only a small percentage of households (2 percent in the three-year survey interval). Dowry and wedding expenses, which we classify as a life-cycle event, affect only 4 percent of households. Among the other life-cycle events reported, only 2 percent report receiving remittances and less than 1 percent have benefited from inheritance or dowry receipts.

¹² The microfinance sites, consisting of seven villages, were not included in the 2010 survey because of insufficient variation across a limited number of villages. The agricultural technology and educational transfers sites cover 47 and 57 villages, respectively.

¹³ US\$1 = 66.6 Bangladeshi taka in January/February 2007.

Figure 4.1—Map of study sites in Bangladesh



Source: Hassan et al. (2011).

Table 4.1—Baseline household characteristics in 2007, Bangladesh

| Household characteristic in 2007 | Mean | Standard Deviation |
|---|-------------|---------------------------|
| Husband's age | 45.99 | 12.92 |
| Husband's years of schooling | 3.74 | 4.14 |
| Wife's age | 37.48 | 11.85 |
| Wife's years of schooling | 2.75 | 3.36 |
| Household size | 4.47 | 1.68 |
| Proportion in demographic categories | | |
| Ages 0–4 | 10.31 | 14.05 |
| Ages 5–14 | 19.52 | 18.69 |
| Ages 15–19 | 10.91 | 14.85 |
| Ages 35–54 | 25.89 | 21.52 |
| Ages 55 plus | 11.20 | 20.48 |
| Household land owned, in decimals | 73.67 | 124.46 |
| Value of household nonland assets, including livestock, in 2007 taka (US\$1 = 66.6 Bangladeshi taka) | 39,737.13 | 39,465.29 |
| Value of jointly held nonland assets, in 2007 taka | | |
| Value of husband's exclusively held nonland assets, in 2007 taka | 17,061.64 | 27,210.75 |
| Value of wife's exclusively held nonland assets in 2007 taka | 2,582.48 | 8,170.76 |

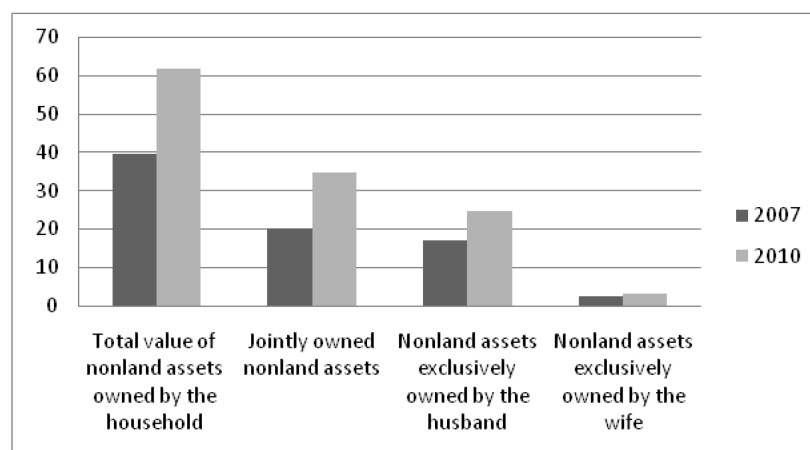
Source: Bangladesh Chronic Poverty Dataset.

Table 4.2—Major shocks and positive events experienced by households between 2007 and 2010, Bangladesh

| Type of shock or positive event | Mean | Standard Deviation |
|--|-------------|---------------------------|
| Covariate shock (from community questionnaire) | | |
| Proportion of households in village affected by flood or cyclone | 5.59 | 16.31 |
| Proportion of households in village affected by drought | 7.48 | 22.74 |
| Covariate shock (self-reported) | | |
| Ever affected by price increase | 0.45 | 0.50 |
| Idiosyncratic shock | | |
| Illness or illness expenses of household members | 0.10 | 0.30 |
| Death of any person in household | 0.02 | 0.13 |
| Life-cycle events | | |
| Dowry and wedding expenses | 0.04 | 0.20 |
| Remittance receipts | 0.02 | 0.13 |
| Inheritance | 0.00 | 0.07 |
| Dowry receipts | 0.00 | 0.06 |

Source: Bangladesh Food and Financial Crisis Impact dataset, 2009–2010.

Figure 4.2—Total value of assets, by ownership status, in 1,000 taka (2007 values), Bangladesh



Source: Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Despite these shocks, households, on average, were able to accumulate assets over the three-year survey interval (Table 4.3). Total asset holdings increased from 39,737 taka in 2007 to 71,736 taka in 2010 (in 2007 values). The most important nonland assets held by households are consumer durables, livestock, and jewelry (Figure 4.3), with most of these assets being jointly held by husband and wife, although husbands owned the bulk of exclusively held assets (Figure 4.4). There are clear gender differences in the type of assets held within the household (Figures 4.4 and 4.5).

Table 4.3—Land and asset holdings, by identity of owner, 2007 and 2010, Bangladesh

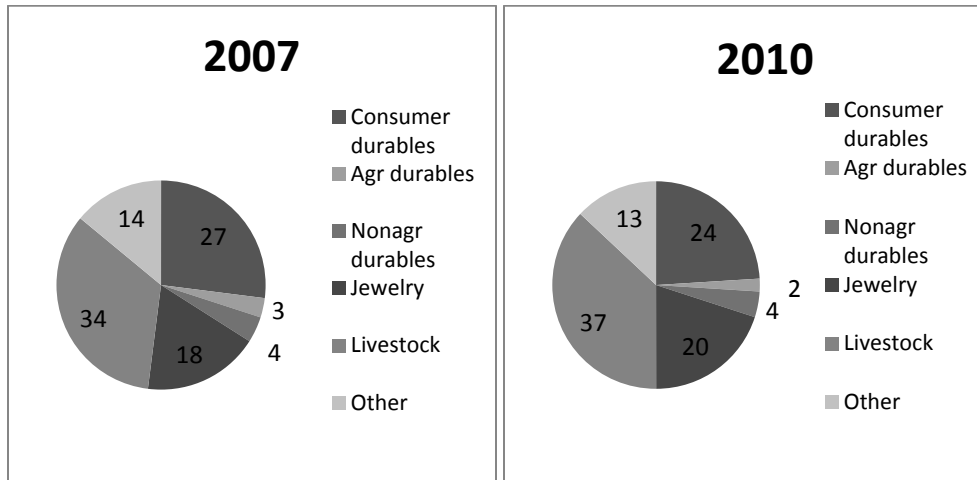
| Area of owned land and value of assets | 2007 | | 2010 | |
|--|-----------|--------------------|-----------|--------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Owned land (in decimals)^a | | | | |
| Total land owned by the household | 74.06 | 108.64 | 87.73 | 140.41 |
| Jointly owned land | 2.51 | 16.54 | 14.08 | 61.27 |
| Land exclusively owned by the husband | 70.20 | 107.10 | 72.37 | 121.43 |
| Land exclusively owned by the wife | 1.34 | 11.63 | 1.28 | 10.71 |
| Share of household land owned by wife | 0.03 | 0.14 | 0.03 | 0.16 |
| Asset holdings (in 2007 taka)^b | | | | |
| Total value of nonland assets owned by the household | 39,737.13 | 39,465.29 | 61,736.22 | 87,227.35 |
| Jointly owned nonland assets | 20,093.01 | 30,193.48 | 34,636.31 | 79,990.67 |
| Nonland assets exclusively owned by the husband | 17,061.64 | 27,210.75 | 24,519.36 | 40,481.38 |
| Nonland assets exclusively owned by the wife | 2,582.48 | 8,170.76 | 3,007.67 | 10,419.50 |
| Share of household nonland assets owned by wife | 0.09 | 0.18 | 0.07 | 0.16 |

Source: Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

^a Land data disaggregated by owner in 2007 are available only for the agricultural technology sites. Data for 2010 include both agricultural technology and educational transfers sites.

^b Asset data are disaggregated by owner for both agricultural technology and educational transfers sites in both 2007 and 2010.

Figure 4.3—Distribution of total assets, by type, 2007 and 2010, Bangladesh



Source: Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

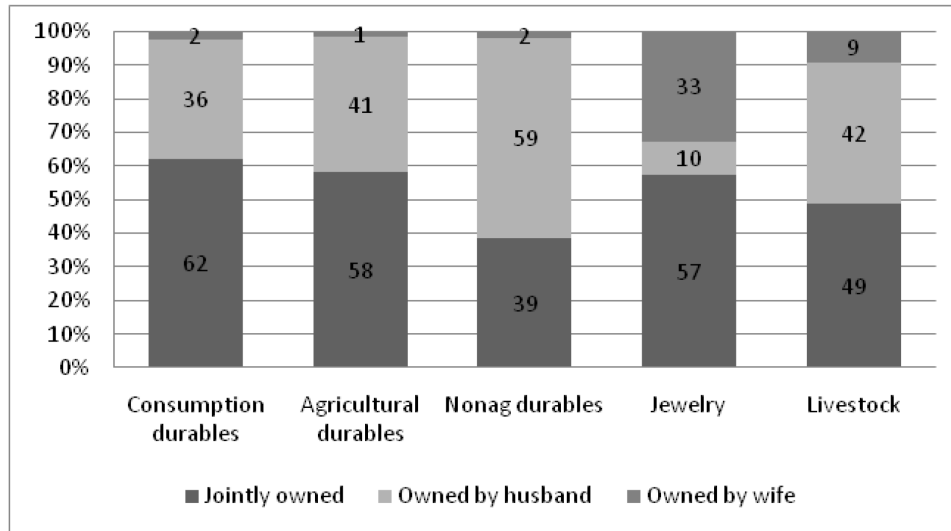
Figure 4.4—Ownership shares, by type of asset, 2007, Bangladesh



Source: Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Although women hold the minority share of most assets, jewelry is clearly identified as a woman’s asset, with women holding 40 percent of the household’s share in 2007 and 33 percent in 2010. Women also tend to invest in livestock, although their share of total livestock declined from 16 percent in 2007 to 9 percent in 2010. The decline in the share of women’s assets overall, and in livestock and jewelry in particular, even as overall levels increase, is worth noting.

Figure 4.5—Ownership shares, by type of asset, 2010, Bangladesh



Source: Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Uganda HarvestPlus Orange-Fleshed Sweet Potato Study

The analysis takes advantage of two survey rounds collected for the impact assessment of the orange-fleshed sweet potato (OFSP) reaching the end-user project of HarvestPlus (see de Brauw et al. 2010 for details). The baseline sample consisted of 1,594 households clustered around 84 farmer groups across three districts in Uganda: Kamuli, Bukedea, and Mukono, in central and eastern Uganda. Since this was a panel survey, 1,473 of the 1,594 households that were included in the baseline survey were resurveyed in 2009. This represents an attrition rate of 7.6 percent over the two-year period, which is also low in comparison to other longitudinal data sets (Alderman et al. 2001). The baseline survey was conducted in July 2007, also fortuitously occurring prior to the onset of the food price crisis. SDC funds were used to add supplementary modules to collect gender-disaggregated asset data (and to collect baseline gender-disaggregated data retrospectively) and to explore impacts of the food price crisis in the follow-up survey, conducted in 2009. The location of the survey sites is shown in Figure 4.6.

In each survey round, data collection included a household socioeconomic survey (SES), an individual 24-hour dietary recall and nutrition survey, collection of anthropometry, and collection of serum retinol through serum blood samples for a subsample of individuals. The 2007 and 2009 survey rounds included a great deal of gender-disaggregated information relevant to OFSP adoption, control over land, asset ownership, and nutrition knowledge. In the 2009 survey, a retrospective gender-disaggregated asset module was implemented. Using data from the 2007 survey on number and value of assets owned across several categories, the 2009 interview asked respondents whether each asset in 2007 was primarily controlled by the most responsible male or female household member at that time. Comparable questions were asked for the assets owned in 2009. Questions on negative shocks in the intervening period, impacts of the food price crisis and coping mechanisms, and mother's asset sales were also administered in 2009. For the analysis in this study, we remove polygamous and female-headed households. We remove the former to study the dynamics of asset growth between husbands and wives, which is easier to track in our data for monogamous couples. Female-headed households are excluded because most of these households are headed by either separated or widowed women, and it would not be possible to compare changes in their assets with those of their husbands.

Figure 4.6—Map of study sites in Uganda



Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Table 4.4 gives the summary statistics of the baseline characteristics for our sample households. On average, the head (husband) is 41 years old and his spouse is 32 years old. The heads have, on average, completed 7 years of schooling, whereas their spouse, only 4.6 years. The average household size is seven and the majority of household members are between 5 and 49 years of age.

Table 4.4—Baseline household characteristics, 2007, Uganda

| Household characteristic in 2007 | Mean | Standard Deviation |
|--|-------|--------------------|
| Head's age | 41.03 | 12.31 |
| Head's education | 6.91 | 3.63 |
| Wife's age | 32.30 | 9.42 |
| Wife's education | 4.61 | 3.50 |
| Household size | 7.49 | 2.87 |
| Number of household members, age 0–5 years | 1.85 | 0.97 |
| Number of household members, age 5–14 years | 2.68 | 1.72 |
| Number of household members, age 15–49 years | 2.53 | 1.36 |
| Number of household members, age > 50 years | 0.35 | 0.62 |

Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007.

Table 4.5 gives the proportion of households that were affected by various shocks in the period between 2007 and 2009. A quick look at the numbers reveals that prevalence of shocks is quite high among the households. On average, households have experienced at least five shocks in the three-year

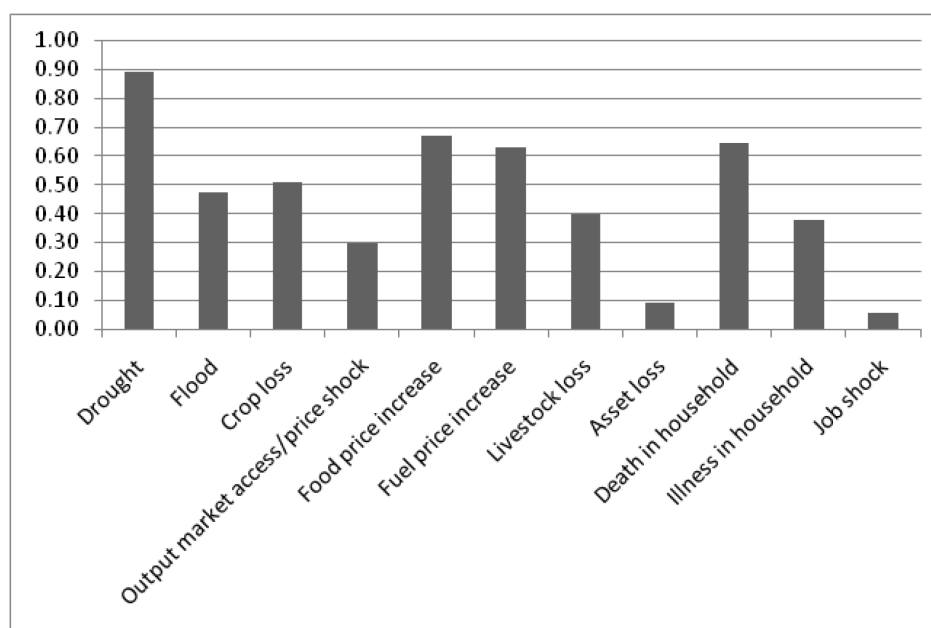
period between 2007 and 2009 and at least two shocks in 2009 alone. Drought is the most prevalent shock, with almost 90 percent of households being affected. Incidence of floods (47 percent) and crop loss (51 percent) due to causes other than climate are quite high as well. As expected, a large fraction (about two-thirds) of the households was adversely affected by large increases in food and fuel prices in this period. Illness shocks are also important, affecting 38 percent of households. While 65 percent of households report experiencing a death in the extended family, a much lower percentage of households—13 percent—experience death of a household member. Figure 4.7 shows the distribution of shocks across various categories. In Uganda, the shocks module did not collect information on positive shocks.

Table 4.5—Major shocks experienced by households between 2007 and 2009, Uganda

| Fraction of households affected by . . . | Mean | Standard Deviation |
|--|------|--------------------|
| Covariate shocks | | |
| Drought | 0.89 | 0.31 |
| Flood | 0.47 | 0.50 |
| Output market access/price shock | 0.30 | 0.46 |
| Food price increase | 0.67 | 0.47 |
| Fuel price increase | 0.63 | 0.48 |
| Idiosyncratic shocks | | |
| Crop loss | 0.51 | 0.50 |
| Livestock loss | 0.40 | 0.49 |
| Asset loss | 0.09 | 0.29 |
| Death in extended family | 0.65 | 0.48 |
| Death in household | 0.13 | 0.33 |
| Illness in household | 0.38 | 0.49 |
| Job shock | 0.05 | 0.23 |
| Overall negative shocks | | |
| Number of shocks experienced 2007–09 | 5.42 | 2.20 |
| Number of shocks experienced 2009 | 2.42 | 1.54 |

Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Figure 4.7—Percentage of households affected by shocks, 2007–09, Uganda



Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Before we analyze the relationship between shocks and assets held by men and women, we present the asset levels in 2007 and 2009 owned jointly, by the heads and by their spouses, in Table 4.6. The value of (land and nonland) assets held by the household in 2007 was 5,329,000 Ugandan shillings (UGS), which is about US\$3,100. This increased to 6,400,000 UGS in 2009. Unlike in Bangladesh, where most of the households' assets are considered jointly held, the largest proportion of Ugandan household assets is held by the husband (head), followed by jointly owned assets. A striking feature of this table is the very low fraction of household assets that are owned by the wife. While wives have access to a larger share of assets through joint ownership with the head, the fraction of assets exclusively held by the wife is a meager 10 percent and does not change much over the period. Nevertheless, this share is slightly larger than the share of the wife's exclusively held assets in Bangladesh. The increase in value of total household assets over the period seems to have come entirely from the increase in value of jointly held assets (Figure 4.8). Figure 4.9 gives the distribution of nonland asset across different asset types. We find that a large portion of nonland assets is comprised of consumer durables in 2007 (74.3 percent), which increases marginally by 2009 (to 77.5 percent). Asset shares of jewelry and productive equipment went down by half over the period 2007–09 (from 2 percent to 1 percent and from 9.2 percent to 4.1 percent, respectively). The share of livestock increased from 16.4 percent in 2007 to 18.3 percent in 2009.

Table 4.6—Land and asset holdings, by identity of owner, 2007 and 2009, Uganda

| Area of owned land and value of assets | 2007 | | 2009 | |
|--|----------|--------------------|----------|--------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Owned land (in acres) | | | | |
| Total land owned by the household | 2.09 | 2.13 | 2.49 | 3.86 |
| Jointly owned land | 0.47 | 1.31 | 0.54 | 1.36 |
| Land exclusively owned by the husband | 1.52 | 2.08 | 1.81 | 3.82 |
| Land exclusively owned by the wife | 0.09 | 0.32 | 0.15 | 0.65 |
| Share of household land owned by the wife | 0.06 | 0.18 | 0.06 | 0.18 |
| Asset holdings (in 2007 UGS) | | | | |
| Total value of household assets, (in thousand UGS) | 2,917.05 | 2,891.13 | 4,005.01 | 3,441.36 |
| Total value of assets jointly owned (in thousand UGS) | 800.03 | 1,829.25 | 1,114.86 | 2,406.99 |
| Total value of assets exclusively owned by the husband (in thousand UGS) | 1,870.89 | 2,473.91 | 2,549.05 | 3,005.71 |
| Total value of assets exclusively owned by the wife (in thousand UGS) | 246.13 | 703.72 | 341.17 | 829.88 |
| Share of assets held by the wife in total household assets (in thousand UGS) | 0.09 | 0.17 | 0.09 | 0.17 |

Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

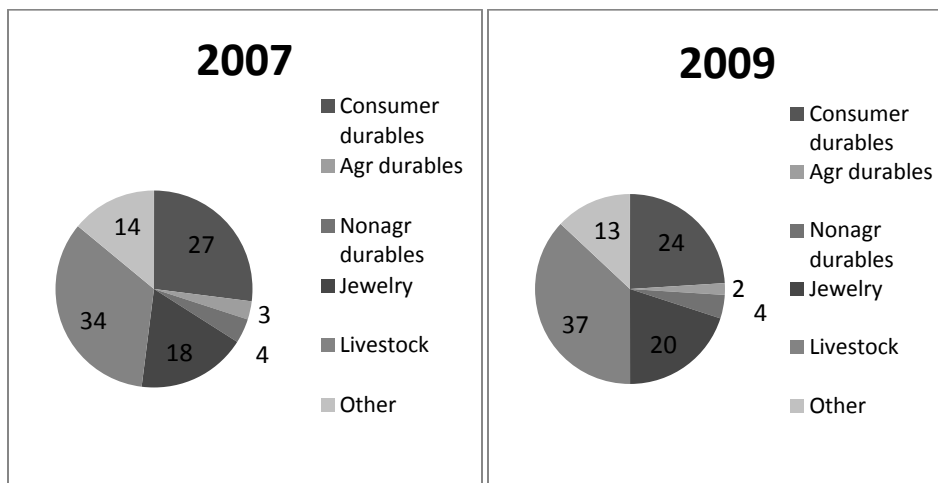
Notes: UGS = Uganda shilling. The asset values in 2009 have been deflated to reflect value in 2007 UGS. The deflator used is the CPI published by Uganda Bureau of Statistics.

US\$1 = 1,700 UGS in 2007.

Figure 4.8—Total value of assets, by ownership status in UGS (in 1,000s), 2007–09, Uganda

Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

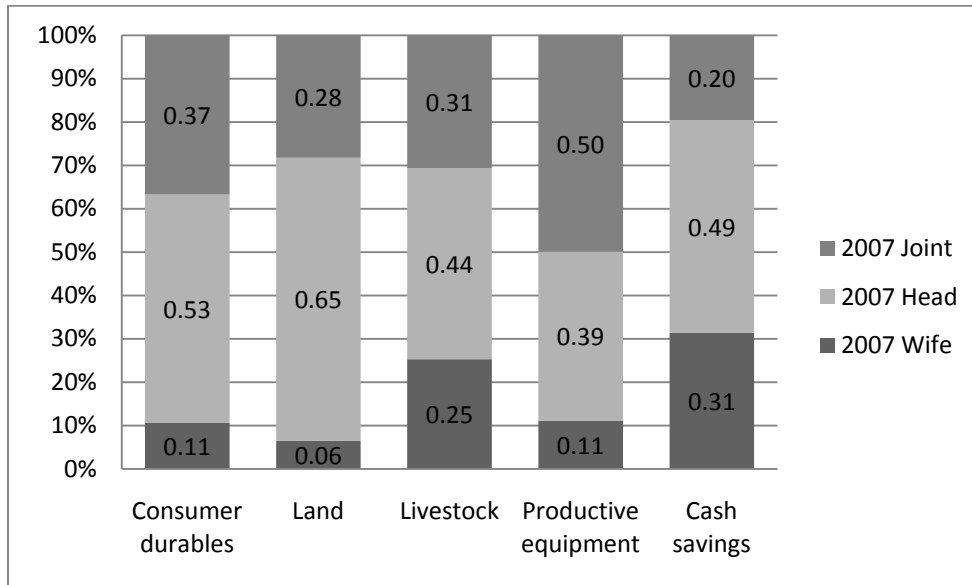
Figure 4.9—Distribution of total nonland assets, by type in 2007 and 2009, Uganda



Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

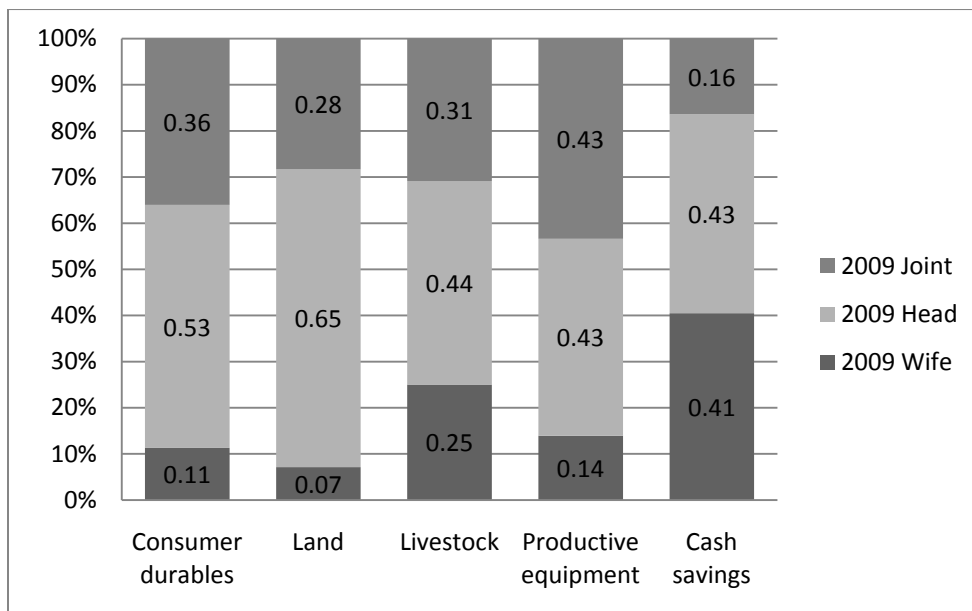
Figures 4.10 and 4.11 show the ownership shares across asset types in the years 2007 and 2009. The largest share held by wives is of cash savings, which is 31 percent. The next highest share of household assets held by women is livestock, of which they own 25 percent. The ownership shares remain more or less constant over the period, except for share of cash savings held by women, which increases by 10 percent.

Figure 4.10—Ownership shares, by type of asset, 2007, Uganda



Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Figure 4.11—Ownership shares, by type of asset, 2009, Uganda



Source: HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

5. RESULTS

Bangladesh

Our regression specification involves estimating equation (1) separately for jointly held, husband-owned, and wife-owned assets for the following categories: owned land (for 2007 only), total nonland assets, and separately for consumer durables, agricultural durables, nonagricultural durables, jewelry, and livestock. The dependent variable, A_{it} , is asset growth (separately for each type of asset) 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_j and C_j are time-invariant household and community characteristics, and ε_{it} is the error term.¹⁴

$$A_{iT} - A_{iB} = \beta_0 + \beta_1 A_{iB} + \beta_2 A_{iB}^2 + \beta_3 A_{iB}^3 + \beta_4 A_{iB}^4 + Z_j \Gamma_i + C_j \Lambda_i + \varepsilon_{it}, \quad (2)$$

For flexibility, baseline assets enter in linear, squared, cubed, and quartic form. Household characteristics are evaluated at baseline and include age and age squared of the household head (or the individual, in the case of exclusively owned assets), years of schooling of the head (or the individual), household size, proportions in household demographic categories, covariate and idiosyncratic shocks experienced by the household, baseline assets in the land regression (and baseline land in the assets regression), and *upazila* (subdistrict) dummies. Standard errors account for clustering across villages.

Table 5.1 presents selected regression coefficients from the land accumulation regression, separately for joint, husband, and wife assets, and for the difference between the growth of husband- and wife-owned land in the last column. This is estimated using data from the agricultural technology sites alone, because gender-disaggregated data on landownership is available in both survey rounds. A positive coefficient on the husband-wife differential indicates that husband's land is growing faster than the wife's, and a negative coefficient indicates the opposite. Among the covariate shocks, only flood shocks have a significant impact, reducing the size of the husband's owned land, and reducing the growth of the husband's landholdings relative to the wife's. In contrast, illness reduces the wife's landholdings. Life-cycle events are important determinants of land accumulation. Dowry and wedding expenses reduce the wife's landholdings, while inheritance increases the growth of the wife's land. Dowry receipts, which occur when a son marries, result in the reduction of both joint and husband's land, and a reduction in the growth of the husband's relative to the wife's land. The negative impact of dowry receipts on both joint and husband's exclusively owned land may signal the devolution of parental land to the next generation upon a son's marriage, thereby reducing the parents' landholdings. The relatively small impact of covariate and idiosyncratic shocks on joint landholdings may indicate that the household collectively tries to protect its main source of livelihoods, disposing of exclusively held assets when shocks occur.

To examine the impact of different types of shocks on assets, it is instructive to look at different types of assets separately, to see whether shocks induce portfolio substitutions, and then ascertain the impacts on differential asset growth of husband and wife. We first examine the three types of durable goods for which husband's ownership is significant (Table 5.2). Flood shocks do not significantly affect holdings of durable goods, but drought shocks reduce husbands' holdings of both consumer durables and agricultural durables. The food price increases also negatively affect only husbands' agricultural durables. Idiosyncratic shocks do not appear to affect durable goods holdings, with the exception of death, which reduces husbands' holdings of both consumer and nonagricultural durables. Among the life-cycle events, dowry and wedding expenses reduce joint holdings of consumer durables, possibly because these may be given as dowry. Interestingly, remittance receipts decrease holdings of joint agricultural durables, while inheritance reduces the husband's holdings of agricultural durables. Given the positive impact of inheritances, in general, on total assets (see Table 5.5), the negative impact of remittances and inheritance on agricultural durables may indicate that these forms of transfers may induce diversification of the

¹⁴ In future work, we will also conduct nonparametric estimation of the asset accumulation paths. However, since this paper is concerned with the measurement of the impacts of shocks on men's and women's assets, it will focus on parametric results.

household's portfolio away from agricultural assets into other forms, possibly because the household is diversifying into nonagricultural income sources. Dowry receipts also reduce the husband's holdings of consumer durables, which could be explained by the need to set up a new household upon a son's marriage.

Table 5.1—Impact of shocks on change in areas of owned land, by type of asset ownership, Bangladesh

| Type of shock | Joint | Husband | Wife | Husband-wife difference |
|--|----------------------|----------------------|----------------------|-------------------------|
| Covariate shocks | | | | |
| Proportion of households in village affected by flood or cyclone | 0.352 (0.72) | -0.534** (-2.12) | -0.013 (-0.77) | -0.514** (-2.04) |
| Proportion of households in village affected by drought | 0.304 (0.86) | 0.248 (1.07) | -0.001 (-0.09) | 0.234 (1.01) |
| Ever affected by price increase | -4.044 (-1.03) | -6.006 (-1.40) | 0.306 (0.70) | -6.937 (-1.54) |
| Idiosyncratic shocks | | | | |
| Illness or illness expenses of household members | 0.836 (0.09) | 0.325 (0.05) | -1.028*** (-2.72) | 1.150 (0.17) |
| Death of any person in household | -1.699 (-0.14) | -13.607 (-1.48) | -0.295 (-0.41) | -6.252 (-0.83) |
| Life-cycle event | | | | |
| Dowry and wedding expenses | -5.281 (-0.67) | -25.177 (-1.66) | -0.847** (-2.10) | -20.336 (-1.34) |
| Remittance receipts | -8.438 (-0.85) | -3.121 (-0.26) | -0.517 (-0.94) | -3.960 (-0.33) |
| Inheritance | 4.754 (0.74) | 3.042 (0.63) | 1.587** (2.21) | 2.304 (0.46) |
| Dowry receipts | -38.300** (-2.28) | -19.800** (-2.04) | 2.644 (0.78) | -27.314* (-1.99) |
| Number of observations | 907 | 907 | 907 | 901 |
| R-squared | 0.13 | 0.11 | 0.21 | 0.11 |

Source: Authors' computations from Bangladesh Chronic Poverty dataset 2006–2007 and Food and Financial Crisis Impact dataset 2009–2010.

Notes: Land regressions are estimated only for the agricultural technology households, where we have gender-disaggregated data on landownership in both rounds. Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total value of assets, and *upazila* dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on village are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In contrast to the results for land, overall assets, and durables, livestock and jewelry appear to respond significantly to many types of shocks—indicating that these assets are used for consumption-smoothing purposes (Table 5.3). Covariate shocks have a negative impact on holdings of jewelry and livestock. A higher proportion of households experiencing drought in the village is associated with reductions in the wife's livestock holdings, while having price increases have a negative impact on jointly held jewelry and husband's livestock. Illness shocks—the most prevalent idiosyncratic shock experienced by households—have a negative impact on wife's jewelry holdings and husband's livestock holdings, while death reduces jewelry held by both husband and wife. Dowry and wedding expenses reduce wives' livestock holdings, possibly because livestock may be sold to raise money for dowries. Remittance receipts reduce joint jewelry accumulation, possibly because cash remittances provide an easier source of liquidity than jewelry does; however, this coefficient is only weakly significant (at 10 percent). Inheritance has a negative effect on livestock holdings that may indicate diversification toward other assets, but we are unable to discern the specific assets that are substituted for livestock, even if there is a positive impact on overall assets for the household, and on land owned by the wife.

Table 5.2—Impact of shocks on change in value of durable goods, by type of asset ownership, Bangladesh

| Type of shock | Consumer durables | | | Agricultural durables | | | Nonagricultural durables | | |
|--|-----------------------|------------------------|----------------------|------------------------|-----------------------|--------------------|--------------------------|-------------------------|--------------------|
| | Joint | Husband | Wife | Joint | Husband | Wife | Joint | Husband | Wife |
| Covariate shocks (floods) | | | | | | | | | |
| Proportion of households in village affected by flood or cyclone | -111.738 (-1.18) | 25.828 (0.91) | -3.600 (-0.78) | 9.892 (0.35) | 1.499 (0.19) | 0.033 (0.24) | -6.393 (-0.62) | -3.557 (-0.40) | -0.009 (-0.16) |
| Proportion of households in village affected by drought | 28.673 (1.11) | -25.100** (-2.53) | 0.867 (0.66) | -1.450 (-0.16) | -5.089*** (-2.88) | -0.073 (-0.75) | -2.533 (-0.59) | -1.485 (-0.43) | -0.098 (-0.76) |
| Ever affected by price increase | -1,261.519 (-1.07) | 39.545 (0.07) | 90.821 (1.01) | -177.157 (-0.18) | -609.433** (-2.22) | 11.444 (1.16) | -80.118 (-0.21) | 243.223 (1.00) | 11.417 (1.26) |
| Idiosyncratic shocks | | | | | | | | | |
| Illness or illness expenses of household members | -555.646 (-0.47) | 299.972 (0.47) | 144.950 (0.83) | -511.376 (-1.26) | 290.765 (0.61) | -6.318 (-0.99) | -340.301 (-1.14) | 11.915 (0.03) | 8.122 (0.50) |
| Death of any person in household | -1,961.825 (-0.83) | -1,528.232* (-1.97) | 153.244 (0.67) | -465.572 (-0.58) | 550.610 (1.02) | -18.411 (-1.00) | -413.601 (-0.63) | -1,429.439** (-2.11) | -17.144 (-0.68) |
| Life-cycle events | | | | | | | | | |
| Dowry and wedding expenses | 3,388.599* (-1.99) | -502.571 (-0.69) | 699.976 (1.13) | 413.423 (0.61) | 475.064 (0.93) | -4.125 (-0.68) | 787.517 (0.95) | 85.589 (0.10) | -12.095 (-1.34) |
| Remittance receipts | 601.682 (0.19) | 981.490 (0.41) | -3.349 (-0.02) | -1,994.092* (-1.90) | 1,571.023 (1.05) | -5.296 (-0.50) | -1,048.882 (-1.66) | -522.626 (-1.29) | -5.050 (-0.76) |
| Inheritance | 1,081.069 (0.71) | 2,512.774 (0.84) | 150.862 (1.19) | -139.046 (-0.23) | -675.077** (-2.19) | 15.772 (0.83) | -355.480 (-0.52) | 6,151.767 (1.26) | -28.740 (-1.23) |
| Dowry receipts | 11,707.842 (0.98) | -4,098.335* (-1.69) | 11,407.357 (1.12) | 34.879 (0.04) | 1,945.957 (0.81) | 29.634 (0.50) | 881.657 (0.48) | -712.093 (-1.14) | -13.204 (-0.89) |
| Number of observations | 1,249 | 1,264 | 1,269 | 1,249 | 1,264 | 1,269 | 1,249 | 1,264 | 1,269 |
| R-squared | 0.12 | 0.22 | 0.30 | 0.06 | 0.14 | 0.10 | 0.14 | 0.16 | 0.88 |

Source: Authors' computations from Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on village are in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5.3—Impact of shocks on change in value of jewelry and livestock, by type of asset ownership, Bangladesh

| Type of shock | Jewelry | | | Livestock | | |
|--|-------------------------|-------------------------|--------------------------|-----------------------|--------------------------|------------------------|
| | Joint | Husband | Wife | Joint | Husband | Wife |
| Covariate shocks | | | | | | |
| Proportion of households in village affected by flood or cyclone | -479.470 (-1.00) | -7.551 (-0.68) | 12.673 (0.65) | 32.385 (0.67) | -28.340 (-0.69) | -0.136 (-0.04) |
| Proportion of households in village affected by drought | 29.482 (0.72) | 0.771 (0.21) | 2.795 (0.32) | 83.683 (1.65) | -27.030 (-0.73) | -5.526*** (-2.79) |
| Ever affected by price increase | -5,136.011** (-2.18) | -323.292 (-1.23) | 505.837 (0.96) | -1,831.282 (-0.39) | -2,751.974* (-1.81) | 121.963 (0.59) |
| Idiosyncratic shocks | | | | | | |
| Illness or illness expenses of household members | -3,068.165 (-1.31) | 299.768 (0.60) | -1,339.268*** (-2.89) | -2,501.553 (-1.28) | -2,953.332* (-1.70) | -144.769 (-0.56) |
| Death of any person in household | 3,141.375 (0.95) | -1,080.568** (-2.19) | -1,268.895* (-1.97) | -2,855.668 (-0.65) | -1,987.780 (-0.86) | 37.596 (0.06) |
| Life-cycle events | | | | | | |
| Dowry and wedding expenses | 37.382 (0.01) | 640.800 (0.95) | 1,260.596 (0.71) | -294.612 (-0.13) | -3,523.697 (-1.52) | -510.442*** (-2.98) |
| Remittance receipts | -11,565.356* (-1.96) | -949.858 (-1.65) | 2,532.721 (0.77) | -5,281.591 (-0.66) | 9,469.573 (1.40) | -37.970 (-0.05) |
| Inheritance | 388.139 (0.18) | -714.180 (-0.63) | 4,418.142 (1.08) | 6,885.879 (1.33) | -9,737.466*** (-2.73) | -538.188* (-1.84) |
| Dowry receipts | 74,775.271 (1.26) | -657.631 (-1.64) | 5,068.473 (0.75) | -4,208.328 (-0.34) | 8,808.333 (0.86) | -407.325 (-1.09) |
| Number of observations | 1,249 | 1,264 | 1,269 | 1,249 | 1,264 | 1,269 |
| R-squared | 0.07 | 0.08 | 0.22 | 0.03 | 0.17 | 0.42 |

Source: Authors' computations from Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on village are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Do shocks have a different impact on the differential growth of assets within the household? Table 5.4 presents regressions on the difference between husbands' and wives' growth in assets. Drought shocks reduce husbands' holdings of both consumer durables and agricultural durables relative to wives', while price increases reduce the growth of husbands' agricultural durables and livestock relative to wives'. Within the same household, illness affects asset portfolios differently, reducing wives' jewelry holdings relative to husbands', and increasing their holdings of livestock relative to husbands'. This indicates that wives' jewelry—and husband's livestock—is disposed of when someone in the household falls ill. Death, however, has a negative impact on husbands' holdings of consumer durables and nonagricultural durables more than it affects wives'. On balance, inheritance receipts and dowry receipts tend to decrease husbands' holdings of livestock and agricultural durables, respectively, compared to those of their wives.

Table 5.4—Impact of shocks on husband-wife difference in asset growth, Bangladesh

| Type of shock | Consumer durables | Agricultural durables | Non-agricultural durables | Jewelry | Livestock |
|--|--------------------------|-----------------------|---------------------------|-----------------------|------------------------|
| Covariate shocks | | | | | |
| Proportion of households in village affected by flood or cyclone | 30.725 (1.17) | 1.650 (0.21) | -3.409 (-0.38) | -25.542 (-1.09) | -20.507 (-0.51) |
| Proportion of households in village affected by drought | -24.642** (-2.55) | -5.098*** (-2.78) | -1.578 (-0.45) | -0.447 (-0.04) | -24.022 (-0.75) |
| Ever affected by price increase | -66.980 (-0.12) | -634.303** (-2.30) | 228.031 (0.93) | -913.424 (-1.47) | -3,017.714* (-1.94) |
| Idiosyncratic shocks | | | | | |
| Illness or illness expenses of household members | 145.927 (0.25) | 361.581 (0.69) | -5.057 (-0.01) | 1,725.246** (2.14) | -3,285.888* (-1.83) |
| Death of any person in household | -2,569.419*** (-3.01) | -47.726 (-0.33) | -1,547.759* (-1.93) | 153.225 (0.18) | -1,086.778 (-0.43) |
| Life-cycle events | | | | | |
| Dowry and wedding expenses | -1,265.392 (-1.27) | 479.849 (0.91) | 83.309 (0.09) | -593.093 (-0.31) | -2,650.597 (-1.16) |
| Remittance receipts | 654.700 (0.31) | 1,552.172 (1.04) | -535.584 (-1.29) | -3,537.256 (-1.01) | 9,259.867 (1.50) |
| Inheritance | 2,262.610 (0.73) | -704.286** (-2.28) | 6,186.854 (1.26) | -5,673.416 (-1.00) | 9,061.415** (-2.26) |
| Dowry receipts | -17,022.126 (-1.57) | -964.567* (-1.92) | -517.501 (-0.84) | -5,755.865 (-0.85) | 8,334.202 (0.62) |
| Number of observations | 1,253 | 1,253 | 1,253 | 1,253 | 1,253 |
| R-squared | 0.25 | 0.14 | 0.16 | 0.17 | 0.20 |

Source: Authors' computations from Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and *upazila* dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on village are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Overall, the previous regressions represent reallocations among different types of assets within a household's and an individual's portfolio. What might be more relevant for policy purposes is to examine the impact of shocks on the total value of nonland assets. Table 5.5 therefore presents regressions for total assets, with results presented separately for joint, husbands', and wives' assets, and for the difference in growth of husbands' and wives' assets. Different types of covariate shocks have differential impacts on the total value of assets. While flood shocks do not appear to affect asset growth in general, drought shocks decrease husbands' assets as well as the growth of husbands' relative to wives' assets. The insignificant impact of floods on asset holdings may be partially attributable to the emergency assistance

system, which is targeted to the most flood-damaged areas, and preferentially to the poor within those areas (Quisumbing and Hallman 2005); an evaluation of the impact of food assistance on asset holdings found that flood relief (after the 1998 floods) enabled asset-poor recipients to rebuild their asset stocks. However, households appear to be less well insured against drought shocks, which differentially affect husbands' nonland assets. Although having experienced a food price shock reduces the growth of husbands' relative to wives' assets, the coefficient is only marginally significant (at 10 percent). Among idiosyncratic shocks, only illness is significant, and reduces wives' assets. Finally, among life-cycle events, inheritance receipts have a positive impact on joint asset growth, with an insignificant impact on exclusively held assets, and the difference between husbands' and wives' assets.

Table 5.5—Impact of shocks on change in value of nonland assets, by type of asset ownership, Bangladesh

| Type of shock | Joint | Husband | Wife | Husband-wife difference |
|--|-------------------------|-----------------------|-------------------------|-------------------------|
| Covariate shocks | | | | |
| Proportion of households in village affected by flood or cyclone | -570.862 (-1.00) | -26.879 (-0.34) | 7.356 (0.33) | -33.506 (-0.40) |
| Proportion of households in village affected by drought | 175.122 (1.65) | -83.193* (-1.96) | -2.308 (-0.27) | -83.890** (-2.04) |
| Ever affected by price increase | -10,594.236 (-1.64) | -2,835.319 (-1.45) | 656.048 (1.05) | -3,623.690* (-1.82) |
| Idiosyncratic shocks | | | | |
| Illness or illness expenses of household members | -5,212.094 (-1.35) | -2,164.220 (-0.87) | -1,042.269** (-2.00) | -1,858.553 (-0.72) |
| Death of any person in household | -2,203.086 (-0.28) | -4,565.608 (-1.29) | -746.579 (-0.74) | -4,934.403 (-1.24) |
| Life-cycle events | | | | |
| Dowry and wedding expenses | -4,216.413 (-0.82) | -2,315.902 (-0.64) | 1,429.744 (0.81) | -3,192.585 (-0.78) |
| Remittance receipts | -11,960.332 (-0.99) | 11,189.671 (1.14) | 3,408.878 (1.06) | 7,300.322 (0.75) |
| Inheritance | 10,898.660*** (3.53) | 249.678 (0.02) | 4,211.848 (1.03) | -5,823.538 (-0.71) |
| Dowry receipts | 77,461.066 (1.07) | -2,148.589 (-0.19) | 22,113.175 (0.99) | -30,404.095 (-1.10) |
| Number of observations | 1,249 | 1,264 | 1,269 | 1,253 |
| R-squared | 0.07 | 0.16 | 0.26 | 0.18 |

Source: Authors' computations from Bangladesh Chronic Poverty dataset 2006-2007 and Food and Financial Crisis Impact dataset, 2009-2010.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and upazila dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on village are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Uganda

Following analysis done for Bangladesh, the regression specification involves estimating equation (1) separately for jointly held, husband-owned, and wife-owned assets for the following categories: owned land, total nonland assets, and cash savings and separately for consumer durables, productive equipment, jewelry, and livestock.¹⁵

¹⁵ We use husband/head and wife/spouse interchangeably in the discussion.

Table 5.6 presents the coefficients on the shock variables from the land accumulation regression, separately for joint, husband's, and wife's land, and for the difference between growth of husband- and wife-owned land in the last column. As mentioned earlier, a positive coefficient on the husband-wife differential indicates that husband's land is growing faster than the wife's, while a negative coefficient indicates the opposite. Land owned by husbands in households that report having experienced a flood shock in the past 24 months increased between 2007 and 2009. This is a surprising result because one would expect floods to have a detrimental effect on land area. In the survey we also asked households about the year in which they experienced the shock and found that about 30 percent of the households experienced losses due to flood in 2007 and the rest in 2008 and 2009. What we do not know is the relative extent of the flood shock in the three years. If the flood in 2007 was particularly bad that it significantly affected land owned in 2007, then the change in area owned over the period 2007–09 can be positive for those who experienced this shock in 2007. Since the majority of the land is owned by men, we do not see any effect on the jointly owned land or that owned exclusively by the wife. None of the other covariate shocks have any significant effect on the total land owned. Among idiosyncratic shocks, death of a household member has a significant negative effect on husband's land. The negative effect of a death on the head's land may occur because the head of the household may be responsible for funeral expenses.

Table 5.6—Impact of shocks on change in areas of owned land, by type of asset ownership, Uganda

| Type of shock | Joint | Husband | Wife | Husband-wife difference |
|-------------------------|-------------------|---------------------|-------------------|-------------------------|
| Covariate shocks | | | | |
| Drought | -0.031 (0.044) | 0.146 (0.141) | 0.003 (0.005) | 0.101 (0.160) |
| Flood | -0.049 (0.031) | 0.254*** (0.092) | -0.004 (0.004) | 0.276** (0.106) |
| Increase in food prices | 0.006 (0.036) | -0.142 (0.124) | 0.000 (0.003) | -0.168 (0.150) |
| Increase in fuel prices | -0.026 (0.047) | -0.006 (0.161) | -0.009 (0.007) | -0.084 (0.164) |
| Idiosyncratic shocks | | | | |
| Death | 0.087 (0.074) | -0.300** (0.140) | 0.013 (0.010) | -0.207 (0.203) |
| Illness | -0.022 (0.028) | -0.100 (0.094) | -0.000 (0.004) | -0.053 (0.120) |
| Positive shock | | | | |
| Treated in OFSP study | 0.016 (0.035) | 0.041 (0.087) | 0.005 (0.004) | -0.025 (0.113) |
| Number of observations | 706 | 730 | 718 | 592 |
| R-squared | 0.348 | 0.350 | 0.692 | 0.333 |

Source: Authors' computations from HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and district dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on farmer group level are in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

To understand better how different shocks affect assets owned by husbands and wives, we now examine the impact of these shocks on a number of asset categories. This analysis will also highlight any changes in the distribution of assets held. We start by examining consumer durables and productive equipment, reported in Table 5.7, which are primarily owned by the husband or jointly owned in the household. Although wives' exclusive ownership of both these category of assets in the household is 11 percent on average, consumer durables account for 47 percent of their total asset holdings, whereas productive equipment constitutes a meager 3 percent. Among husbands, consumer durables and

productive equipment account for 45 percent and less than 2 percent of their asset holdings, respectively. This implies that consumer durables constitute a significant asset category for both husbands and wives. Among covariate shocks, an increase in food prices negatively affects jointly held and wives' consumer durables. This indicates that disposal of consumer durables is being used as a coping mechanism against increased food prices. The effect on wives' exclusively held consumer durables is much larger than that for jointly held consumer durables, and we do not observe any significant effect on consumer durables exclusively owned by husbands. This, and the results in Table 5.8, which show the difference in asset growth between husband and wife, reinforces the belief that women's consumer durable assets are more likely to be depleted as the household faces food insecurity. A flood shock has a positive effect on the wife's consumer durables. This is also very surprising and needs further investigation. Among idiosyncratic shocks, death of a household member has a negative effect on the wife's consumer durables, whereas illness of a household member has a negative effect on jointly held consumer durables. Again, we find no negative effect of death or illness in the household for consumer durables held by the husband.

Table 5.7—Impact of shocks on change in value of durable goods, by type of asset ownership, Uganda

| Type of shock | Consumer durables | | | Productive equipment | | |
|-------------------------|---------------------|-------------------|----------------------|----------------------|-------------------|-------------------|
| | Joint | Husband | Wife | Joint | Husband | Wife |
| Covariate shocks | | | | | | |
| Drought | 0.673 (0.463) | -0.339 (0.299) | -0.302 (0.475) | 0.094 (0.359) | -0.290 (0.441) | -0.508 (0.421) |
| Flood | -0.370 (0.380) | -0.071 (0.248) | 0.624** (0.304) | 0.278 (0.302) | -0.280 (0.298) | -0.221 (0.176) |
| Increase in food prices | -0.746** (0.331) | 0.384 (0.294) | -1.348*** (0.321) | -0.042 (0.278) | -0.309 (0.326) | -0.028 (0.166) |
| Increase in fuel prices | -0.265 (0.515) | 0.259 (0.388) | 0.369 (0.449) | -0.296 (0.358) | 0.691* (0.405) | -0.029 (0.290) |
| Idiosyncratic shocks | | | | | | |
| Death | -0.586 (0.521) | 0.597 (0.402) | -1.007* (0.530) | 0.065 (0.353) | 0.201 (0.432) | -0.286 (0.323) |
| Illness | -0.681* (0.370) | 0.089 (0.264) | 0.436 (0.320) | -0.315 (0.216) | 0.306 (0.266) | 0.148 (0.188) |
| Number of observations | 699 | 724 | 714 | 708 | 718 | 715 |
| R-squared | 0.095 | 0.146 | 0.180 | 0.232 | 0.194 | 0.158 |

Source: Author computations from HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Notes: Regressions include linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and district dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on farmer group level are in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5.8—Impact of shocks on husband-wife difference in asset growth, Uganda

| Type of shock | Consumer durables | Productive equipment | Jewelry | Livestock |
|-------------------------|---------------------|----------------------|-------------------|-------------------|
| Covariate shocks | | | | |
| Drought | -0.076 (0.636) | -0.274 (0.625) | 0.158 (0.284) | -0.439 (0.819) |
| Flood | -0.675* (0.389) | -0.084 (0.393) | 0.140 (0.226) | -0.205 (0.619) |
| Increase in food prices | 1.400*** (0.437) | -0.289 (0.341) | 0.310 (0.225) | 0.055 (0.744) |
| Increase in fuel prices | -0.012 (0.679) | 0.344 (0.449) | 0.364 (0.325) | 0.685 (0.802) |
| Idiosyncratic shocks | | | | |
| Death | 1.433** (0.665) | 0.205 (0.532) | -0.020 (0.289) | 0.795 (0.747) |
| Illness | -0.377 (0.397) | 0.181 (0.321) | 0.079 (0.212) | -0.499 (0.546) |
| Number of observations | 576 | 585 | 559 | 588 |
| R-squared | 0.199 | 0.212 | 0.468 | 0.282 |

Source: Author computations from HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Notes: Regressions include linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and district dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on the farmer group level are in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

For productive equipment, the only covariate shock that has a significant effect is an increase in fuel prices, and the effect is positive. Although this result is unexpected, and because productive equipment constitutes a very small fraction of total assets held by the farm households that comprise our sample, it is unlikely that these households would draw down their productive assets unless they are confronted by a very severe shock. The fuel price shock was driven by an increase in prices in 2007–08, which could have encouraged farmers to build up their productive assets in 2009 as a buffer against future surges in prices.

Table 5.9 gives regression results for jewelry and livestock. Wives own a larger fraction of jewelry and livestock than men do, but the absolute amount of jewelry held is quite small (less than 1 percent of total household assets) and livestock constitutes about 9 percent of total household assets. Among the covariate shocks, flood and increase in food prices have a positive significant effect on jewelry held by the husband and the wife in the former case and jewelry held by the husband in the latter. This result may be due to precautionary savings behavior. As noted earlier, the shocks variable reflects experiencing a shock any time between 2007 and 2009. Households that experienced a shock in 2007 or 2008 may decide to accumulate jewelry to cope with future shocks rather than hold cash. Jewelry has been used as a store of wealth and is considered fairly liquid, which makes it a good candidate for such precautionary savings. Death and illness, both of which are idiosyncratic shocks, have opposing effects on wife's jewelry. Death of a household member has a strong negative effect and illness in the household has a smaller but positive effect on wife's jewelry. However, this result should be taken with caution, because it is based on a very small fraction of households that report holding any jewelry. We find no significant effects of covariate or idiosyncratic shocks on livestock holdings.

Table 5.9—Impact of shocks on change in value of jewelry and livestock, by type of asset ownership, Uganda

| Type of shock | Jewelry | | | Livestock | | |
|-------------------------|-------------------|--------------------|----------------------|-------------------|-------------------|-------------------|
| | Joint | Husband | Wife | Joint | Husband | Wife |
| Covariate shocks | | | | | | |
| Drought | -0.093 (0.155) | 0.184 (0.287) | 0.013 (0.160) | 0.059 (0.407) | -0.854 (0.559) | -0.654 (0.524) |
| Flood | 0.007 (0.116) | 0.392** (0.192) | 0.221** (0.096) | 0.356 (0.359) | 0.070 (0.403) | -0.149 (0.403) |
| Increase in food prices | -0.016 (0.092) | 0.397** (0.192) | 0.052 (0.106) | -0.575 (0.423) | 0.010 (0.428) | 0.149 (0.495) |
| Increase in fuel prices | -0.019 (0.122) | -0.010 (0.252) | -0.176 (0.160) | -0.275 (0.447) | 0.429 (0.606) | -0.353 (0.496) |
| Idiosyncratic shocks | | | | | | |
| Death | 0.131 (0.159) | -0.304 (0.254) | -0.258*** (0.097) | -0.689 (0.546) | -0.169 (0.614) | -0.838 (0.631) |
| Illness | -0.015 (0.103) | 0.225 (0.220) | 0.172** (0.086) | 0.111 (0.380) | -0.495 (0.416) | -0.444 (0.332) |
| Number of observations | 688 | 715 | 688 | 702 | 725 | 722 |
| R-squared | 0.653 | 0.400 | 0.577 | 0.214 | 0.230 | 0.224 |

Source: Author computations from HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Notes: Regressions include linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and district dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on farmer group level are in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The above regressions suggest that certain types of assets are more likely to be used to cope with particular types of shocks. However, these may simply indicate substitution within a given portfolio of assets; we are concerned with the impact of shocks on the total value of the portfolio. Table 5.10 shows that drought has a negative effect on wife's nonland asset holdings, whereas no significant effect on jointly held or nonland assets of the husband can be observed. The difference in the asset growth between husband and wife, as indicated by the last column, also shows that a drought leads to faster growth of husband's nonland assets as compared to his wife's. The increase in food prices has a significant negative effect on jointly held and wife's nonland assets but no significant effect on husband's nonland assets. The last column shows that a food price shock leads to faster depletion of wife's nonland assets as compared to her husband's nonland assets.

Table 5.10—Impact of shocks on change in value of nonland assets, by type of asset ownership, Uganda

| Type of shock | Joint | Husband | Wife | Husband-wife difference |
|-----------------------------|----------------------|-------------------|----------------------|-------------------------|
| Covariate shocks | | | | |
| Drought | 0.134 (0.483) | -0.425 (0.259) | -1.281*** (0.430) | 1.085* (0.565) |
| Flood | -0.056 (0.401) | -0.035 (0.255) | 0.201 (0.300) | -0.137 (0.420) |
| Increase in food prices | -1.161*** (0.392) | 0.122 (0.252) | -0.899** (0.406) | 1.038** (0.483) |
| Increase in fuel prices | -0.222 (0.526) | 0.558 (0.391) | 0.027 (0.500) | 0.594 (0.639) |
| Idiosyncratic shocks | | | | |
| Death | -0.744 (0.581) | 0.178 (0.373) | -1.324** (0.558) | 1.186** (0.584) |
| Illness | -0.459 (0.409) | 0.075 (0.251) | -0.086 (0.295) | 0.173 (0.418) |
| Number of observations | 697 | 719 | 707 | 562 |
| R-squared | 0.116 | 0.117 | 0.220 | 0.200 |

Source: Authors' computations from HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Household Survey, Uganda 2007 and 2009.

Notes: Regressions included linear, squared, cubed, and quartic terms in land, age, and schooling of the husband and wife, household size and proportions in age categories, total area of owned land, and district dummies. All regressors use baseline (2007) values. Robust t-statistics based on standard errors clustered on farmer group level are in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Among idiosyncratic shocks, death of a household member has a negative effect on the wife's nonland assets and no significant effect on either jointly held or husband's nonland assets. The positive coefficient on the death shock in the last column can therefore be interpreted as faster growth of the husband's assets compared to his wife's as a result of a death in the family. All in all, it appears that husbands' assets are better protected against both covariate and idiosyncratic shocks than wives' assets are.

6. SUMMARY AND CONCLUSIONS

Table 6.1 summarizes the impact of negative shocks and positive events on land accumulation in Bangladesh and Uganda, while Table 6.2 presents similar evidence for nonland asset growth in both countries, based on coefficients for land and nonland assets regressions for both countries. Although many shocks are similar in both countries, it is noteworthy that commonly experienced shocks do not necessarily have the same effects across countries and on men's, women's, and jointly owned assets. The impact of weather shock on men's and women's assets appears to depend on involvement in agricultural production and exposure to weather risk. As indicated in Section 4, women are less involved in agricultural production in Bangladesh, whereas they manage land and grow their own crops in Uganda. While weather-related shocks (both flood and drought) affect a large proportion of our sample households in both Bangladesh and Uganda, flood shocks negatively affect only husband's land accumulation in Bangladesh, and have a positive effect on husband's land in Uganda. In contrast, drought shocks have a negative impact on husband's nonland assets (mostly agricultural and consumer durables) in Bangladesh and wife's nonland assets in Uganda. The lack of impact of these covariate, agriculture-related shocks on wife's assets in Bangladesh may reflect lack of direct exposure to agricultural risk because women rarely cultivate land independently, as well as the low level of women's ownership and control of agricultural assets. However, while it appears that weather shocks do not affect women's assets on aggregate in Bangladesh, these results mask impacts on more disaggregated asset categories. In Bangladesh, droughts are associated with lower growth of livestock owned by wives, possibly because livestock are more vulnerable to drought because of scarcity of water or fodder; because wives' livestock, being smaller, may be sold off first; and because priority may be given to the preservation of the household's joint or husband-owned livestock, particularly if these are working animals.

The food price shock was experienced by 45 percent of households in our Bangladesh sample and 67 percent of households in the Uganda sample. Land and assets, in aggregate, were relatively well insured against food price increases in Bangladesh, but jointly held and wives' assets in Uganda were negatively affected. However, there is evidence that some portfolio reallocation took place, because Bangladeshi husbands decreased holdings of agricultural durables and livestock, and households disposed of jointly held jewelry. In Uganda, food price increases reduced holdings of jointly owned and wife-owned durable goods. Reflecting differences in country and context, dowry and wedding expenses took their toll on wives' land in Bangladesh, and illness shocks also had a large detrimental impact on wives' assets in Bangladesh. The differences in the relative impact of the shocks, and their impacts on different types of assets depending on whether these were owned by men or women, show that responses to shocks are context-specific, and that *gendered* responses to shocks are even more so.

Knowing the type of shock that affects men's and women's assets the most may help in designing social protection schemes. For example, in Bangladesh, weather-related shocks, whether floods or droughts, have a larger impact on men's assets, while illness shocks take their toll on women's assets. In Uganda, drought shocks affect wives' assets, but not husbands' assets. One could surmise that weather-based insurance could be marketed to husbands in Bangladesh and wives in Uganda, but that health insurance might be more readily taken up by wives in Bangladesh. Designing social protection schemes should also take into account the prevalence of shocks, the severity of their impact, and whose assets are used to cope with them. While the food price shock emerged as the most important shock (quantitatively) for the 2006–10 period, in Bangladesh, illness shocks were the most prevalent shock between 1996 and 2006 (Quisumbing 2010), and also most severely affected women's assets.

Differences in the institution of marriage and cultural concepts of joint and individual ownership may affect the extent to which joint or individually owned assets are used to cope with shocks. In Bangladesh, the results showing generally insignificant impacts on aggregate land and asset holdings—while individual assets are sacrificed at the margins—indicates that husbands and wives try to preserve the economic base of the household unit. In contrast, in Uganda, husbands' assets appear better insured than wives' or even joint assets. Policy interventions to enable households to manage risk need to take into account both the jointness and the non-jointness of asset ownership, and ensure that social protection schemes do not—intentionally or unintentionally—widen the gender asset gap.

Table 6.1—Summary table: Impacts of shocks and life-cycle events on joint, husbands’, and wives’ land accumulation, Bangladesh and Uganda

| Type of shock or positive event | Bangladesh | | | | Uganda | | | |
|---------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Joint | Husband | Wife | Husband-wife | Joint | Husband | Wife | Husband-wife |
| Covariate shocks | | | | | | | | |
| Flood | n.s. | -0.534** | n.s. | -0.514** | n.s. | 0.254*** | n.s. | 0.276** |
| Drought | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Price increases | n.s. | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |
| Food prices | Not included | Not included | Not included | Not included | n.s. | n.s. | n.s. | n.s. |
| Fuel prices | Not included | Not included | Not included | Not included | n.s. | n.s. | n.s. | n.s. |
| Idiosyncratic shocks | | | | | | | | |
| Death | n.s. | n.s. | n.s. | n.s. | n.s. | -0.300** | n.s. | n.s. |
| Illness | n.s. | n.s. | -1.028*** | n.s. | n.s. | n.s. | n.s. | n.s. |
| Life-cycle events | | | | | | | | |
| Dowry and wedding expenses | n.s. | n.s. | -0.847** | n.s. | Not included | Not included | Not included | Not included |
| Remittances | n.s. | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |
| Inheritance | n.s. | n.s. | 1.587** | n.s. | Not included | Not included | Not included | Not included |
| Dowry and wedding receipts | -38.300** | -19.800** | n.s. | -27.314* | Not included | Not included | Not included | Not included |

Source: Tables 5.1 and 5.6.

Notes: Shaded cells indicate that the variable was not included in the regressions; “n.s.” means not significant. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 6.2—Summary table: Impacts of shocks and life-cycle events on joint, husbands’, and wives’ nonland asset accumulation, Bangladesh and Uganda

| Type of shock or positive event | Bangladesh | | | | Uganda | | | |
|---------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Joint | Husband | Wife | Husband-wife | Joint | Husband | Wife | Husband-wife |
| Covariate shocks | | | | | | | | |
| Flood | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Drought | n.s. | -83.193* | n.s. | -83.89** | n.s. | n.s. | -1.281*** | 1.085* |
| Price increases | n.s. | n.s. | n.s. | -3.623.69* | Not included | Not included | Not included | Not included |
| Food prices | Not included | Not included | Not included | Not included | -1.161*** | n.s. | -0.899** | 1.038** |
| Fuel prices | Not included | Not included | Not included | Not included | n.s. | n.s. | n.s. | n.s. |
| Idiosyncratic shocks | | | | | | | | |
| Death | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | -1.324** | 1.186** |
| Illness | n.s. | n.s. | -1,042.269** | n.s. | n.s. | n.s. | n.s. | n.s. |
| Life-cycle events | | | | | | | | |
| Dowry and wedding expenses | n.s. | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |
| Remittances | n.s. | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |
| Inheritance | 10,898.660*** | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |
| Dowry and wedding receipts | n.s. | n.s. | n.s. | n.s. | Not included | Not included | Not included | Not included |

Source: Tables 5.5 and 5.10.

Notes: Shaded cells indicate that the variable was not included in the regressions; “n.s.” means not significant. *** p < 0.01, ** p < 0.05, * p < 0.1.

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