



Community-based Risk Management Arrangements: An Overview and Implications for Social Fund Programs

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Abstract

Risk and its consequences pose a formidable threat to poverty reduction efforts. This study reviews a plethora of community-based risk management arrangements across the developing world. These types of arrangements are garnering greater interest in light of the growing recognition of the relative prominence of household- or individual-specific idiosyncratic risk as well as the increasing shift towards community-based development funding. The study discusses potential advantages (such as targeting, cost and informational) and disadvantages (such as exclusion and inability to manage correlated risk) of these arrangements, and their implications for the design of innovative social fund programs.

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Executive Summary

This study provides an overview of community-based risk management arrangements commonly observed in low-income countries. It also offers lessons and recommendations to social fund programs on how community-based risk management can be supported in a more proactive manner.

There is growing recognition that vulnerability to risk is one of the defining characteristics of poverty and, moreover, can trap households in chronic poverty. Therefore, policies for poverty reduction are increasingly linked to understanding risk, household responses to risk and shocks (especially among the poorest), and coverage by and gaps in existing safety nets. While some households are able to manage asset and income shocks by tapping into financial or other markets, shocks can render others destitute due to their lack of financial or social insurance. Still others choose livelihoods that are less risky but offer lower returns, thereby trapping them and their future generations in chronic poverty.

Such differentiated dynamics of household wellbeing accentuate the importance of effective risk management to reduce and respond to risks. However, no one-size-fits-all risk management tool exists. The appropriateness of interventions depends on the nature of the risk involved. Shocks are either idiosyncratic - meaning one household's experience is typically unrelated to neighboring households' - or covariate - meaning that many households in the same locality suffer similar shocks. Idiosyncratic shocks commonly arise due to illness (especially chronic rather than infectious disease), crop yield shocks associated with microclimatic variation or localized wildlife damage or pest infestation, and one-off events (e.g., property loss due to fire or theft). Covariate shocks occur, among other things, because of adverse weather events, natural disasters, war, price instability and financial crises, to which (virtually) everyone in a community is vulnerable.

Given the prevalence of shocks, rural communities have commonly developed norms and institutions that attempt to reduce risk. Community-based strategies can be adopted *ex ante* (before the realization of a risk) and include risk reduction or mitigation. They can also be adopted *ex post* (after the realization of a risk) and include risk coping measures. In this context, the distinction between covariate and idiosyncratic shocks is important as community-based arrangements and strategies can, in principle, help households cope with idiosyncratic shocks but less so with covariate shocks, unless communities find a way to transfer risk outside the community or to others within the community who are willing and able to assume more risk. Notwithstanding the type of risk, a number of studies have shown that significant gaps exist in these risk-sharing arrangements, implying that there is a need for outside intervention.

This study contributes to the existing literature on risk and risk management by low-income households by taking into account recent advances in the understanding of poverty traps and their relation to risk. The mounting evidence of the prevalence of shocks and the persistence in their effects, especially among the poor, emphasizes the relationship between risk and poverty. In addition, it underscores the fact that if income is endogenous, asset risk can have a more permanent impact than one-off income risk.

The second major contribution of this study is the synthesis of evidence of a range of community-based risk management arrangements observed across the developing world. The latter include traditional, indigenous, informal credit, savings and insurance arrangements as well as newer, semi-formal community-based microfinance, storage and insurance arrangements typically introduced by the government or an NGO. These share a common feature absent from market-based arrangements, namely, the use of interpersonal relations in order to reduce informational and transaction costs. Examples of indigenous, informal arrangements include (but are not limited to) rotating savings and credit associations, funeral insurance societies, transfers and reciprocal gift-giving, traditional state-contingent credit arrangements as well as state-contingent systems of rights to common property resources.

Some examples of newer, semi-formal arrangements are microfinance associations, health insurance associations, cereal banks and grain banks.

Relative to market-based arrangements, community-based arrangements have important informational advantages. Since rural communities typically have intimate knowledge regarding the circumstances and needs of member households, they are often better able to identify the most needy and vulnerable among them, thereby improving targeting outcomes if they so desire. In addition, due to their close physical proximity and frequent, repeated interactions between them, they can use relatively low-cost methods of contract enforcement, such as peer monitoring and the threat of social sanctions. These advantages potentially enable the delivery of savings, credit and insurance products and services at prices that are accessible to poor households, which is usually not the case for a typical commercial provider. Of course, these advantages are not always realized, as sometimes the intimacy of communities also generates power and social relations that inhibit efficient or progressive distribution of resources. It is important to recognize the potential of community-based arrangements without being naïve as to the dynamics that underpin collective action arrangements such as risk sharing norms and institutions.

Implications for Social Funds

Social funds focus primarily on improving the institutional capacity of poor communities. This feature, as well as the close involvement of social funds with a range of community, public and market agents and the rapidity and flexibility of their response, place social funds in a potentially advantageous position to enable community-based institutions to manage risk. Currently, social funds support a number of community-based risk management arrangements with a public good nature (e.g., the construction of community-based infrastructure such as health centers and schools or the financing of community-based public works programs such as roads, dykes and irrigation schemes). These may reduce income risk through the provision of short-term earnings opportunities. They can also reduce asset risk though, for example, the provision of infrastructure which reduce asset losses due to poor health, lack of schooling, floods and drought.

However, social funds can not only expand their role to help communities to reduce and cope with risk but do so in new ways. For example, social funds can expand the menu of permissible projects to include innovative programs such as burial insurance societies and health insurance associations. Social funds can also be used to subsidize the start-up costs associated with creating viable microfinance institutions, which help with both risk mitigation and coping, thereby reinforcing and harnessing the informational advantage enjoyed by community-based arrangements. Other examples in which social funds can reduce both income and asset risk, include the support of public health programs for disease, pest and pathogen control. For example, social funds can support community-based deworming, immunization or insect and vector control programs. They can also reduce the risk of water-borne disease by supporting community-based sanitation programs that promote changes in individual hygiene practices. Such interventions not only address health risks—which are by far the most commonly reported idiosyncratic risk faced by poor households—but also reduce covariate risk (by reducing the onset of epidemics, for example). In another example, in addition to simply providing funding for school infrastructure, social funds can also promote the development of parent-teacher associations. In so doing, social funds can go beyond a one-off, “brick and mortar” development strategy to implementing more sustainable, behavioral change which can reduce asset risk. However, expanding the menu to include ongoing projects implies that social fund program managers hitherto accustomed to overseeing one-off projects require new and different administrative expertise.

In supporting community-based risk management arrangements, social fund program managers need to be aware that, like any group that is formed endogenously, they are also vulnerable to social exclusion of certain groups or individuals (based, for example, on income or gender). These excluded groups are often the most vulnerable and thereby of particular interest to policy makers. These gaps in informal risk-sharing arrangements therefore provide an opportunity for beneficial external interventions. If social fund program designs can identify and address existing cleavages, they can benefit the previously excluded groups. In addition, in communities divided by ethnic or religious affiliations, social funds

can mobilize different groups for the provision of a public good valuable to all members, thereby reducing the costs of social interaction and enabling people to come together more easily.

Second, community-based risk management arrangements are often beset by gaps in coverage of the poorest households because these households are unable to make the initial contributions needed in order to become members of an insurance pool (such as a community-based health insurance association). In this context, social funds can subsidize the cost of participation of these households.

Third, given the vulnerability of community-based arrangements to covariate shocks, social funds can help communities reduce exposure to covariate risk and also access insurance against covariate risks. For example, social funds can build the capacity of communities to tap into reinsurance markets, thereby enabling them to transfer risk outside the community. Social funds can also underwrite the start-up costs needed to create relevant insurance products such as index-based insurance products. In so doing, social funds can develop a system of two-tier allocation of disaster assistance which harnesses the informational advantage enjoyed by communities while providing the external assistance necessary to cope with covariate risk. Social funds can potentially also address both sudden-onset events, such as floods or cyclones, as well as slow-onset events, such as droughts.

Fourth, the interpersonal relations that are at the heart of community-based interactions also make these arrangements vulnerable to manipulation by local leaders or more educated individuals acting as “development project brokers”, especially in poor, isolated rural communities where there are few checks and balances. In order to reduce the potential for manipulation, social fund program managers can invest in services that have a public good character. In particular, services that reduce asset risk have the potential of reducing not only short-term poverty but also alleviating the more persistent effects of shocks.

Finally, given the broad range of existing community-based arrangements (which are marked by differences in membership and leadership structure, history, longevity, nature of activities, etc), future studies that provide evidence on which features of such arrangements make them more conducive for receiving external assistance and being scaled up can inform successful involvement by social funds. In addition, studies which estimate the rate of return to community-based risk management arrangements versus those that are not community-based through either non-experimental econometric work or randomized controlled trials can promote the understanding of their costs and benefits vis-à-vis other arrangements. Social fund programs which involve active community decision-making, management and participation can provide a valuable crucible for such analyses.

I. Introduction

There is growing recognition that vulnerability to risk is one of the defining characteristics of poverty (World Bank 2000). Therefore, policies for poverty reduction are increasingly linked to understanding risk, household responses to risk and shocks¹ (especially among the poorest), and coverage by and holes in existing safety nets. Over the past decade or so, this greater recognition has resulted in an outpouring of research on the impact of risk and vulnerability on poor households. Some households weather asset and income shocks well, buoyed by access to financial and other markets, informal social networks and other mechanisms that provide effective insurance against risk. The (formal or informal) insurance available to them enables them to avoid or escape poverty. For many households, however, cumulative efforts at improving one's position through steady asset accumulation and productivity improvements are suddenly set back by one major crisis or a lethal sequence of smaller shocks. Others face a Sisyphean challenge, laboring steadily in an effort to escape poverty but regularly knocked backwards and forced to begin again. Still others evade such risks by choosing livelihoods that offer reliable but meager returns that trap them—and often their children—in chronic poverty.

Such differentiated dynamics of household well-being accentuate the importance of effective risk management to reduce and respond to risks. However, no one-size-fits-all risk management tool exists. The appropriateness of the intervention depends on the nature of the risk involved. Shocks are either idiosyncratic – meaning one household's experience is typically weakly, if at all, related to neighboring households' –or covariate—meaning that many households in the same locality suffer similar shocks. Idiosyncratic shocks commonly arise due to crop yield shocks associated with microclimatic variation or localized wildlife damage or pest infestation, illness (especially chronic rather than infectious disease), and one-off events (e.g., property loss due to fire or theft). Covariate shocks occur because of natural disasters, war, price instability and financial crises to which (virtually) everyone in a community is vulnerable. Covariate shocks are difficult to insure locally and thus require some sort of coordinated external response, whether

¹ We use the term “risk” to denote an uncertain outcome and the term “shock” to mean an adverse realization of a stochastic variable. Risk is thus an ex ante concept and shock an ex post one.

through financial markets or governmental or non-governmental agencies. Idiosyncratic shocks, however, can in principle be effectively managed within a locale.

Toward that end, rural communities have regularly developed norms and institutions that attempt to reduce risk and individuals adopt livelihood strategies that reduce the probability of experiencing adverse shocks. These strategies can be adopted *ex ante* (before the realization of a risk) and include risk reduction or mitigation. They can also be adopted *ex post* (after the realization of a risk) and include risk coping measures. In this context, the distinction between covariate and idiosyncratic shocks is important to understand as community-based arrangements and strategies can, in principle, be successful in helping households cope with idiosyncratic shocks but less so with covariate shocks, unless communities find a way to transfer risk outside the community or to others within the community who are willing and able to take on more risk.

These strategies, however, typically reduce only a portion of overall risk exposure. When shocks do occur, communities often have some mechanisms for providing social insurance and individuals often enjoy some capacity to self-insure. But these mechanisms often fail to prevent people falling into destitution. Moreover, uninsured risk exposure sometimes impedes the poor from climbing out of chronic poverty if chosen strategies offer low expected returns in exchange for lower risk.

Recognizing the limited range of traditional risk management arrangements, states have instituted various insurance, price stabilization and safety net programs, often at great cost and with modest success. Indeed, there have been considerable recent efforts to improve risk management by developing countries using index-based risk transfer products related to rainfall and other climate variables, options and futures in international commodity markets, improved early warning systems for prospective natural disasters, and other innovations. Such innovations focus overwhelmingly on covariate risks (e.g., prices, drought, floods), however.

Meanwhile, a growing body of empirical evidence suggests that idiosyncratic risk may be as important, indeed may even dominate covariate risk in rural Africa and Asia (Udry 1990,

Townsend 1995, Deaton 1997, Lybbert et al. 2004, Morduch 2004, Dercon 2005, Kazianga and Udry 2006). Research on and innovations to address idiosyncratic risk remain in short supply, however, especially when connected back to the dynamics of household welfare. The relative importance of idiosyncratic risk and the relative dearth of attention given to it by researchers and policymakers alike raise the possibility of untapped potential for improved local risk management in developing countries.

In this paper, we build on the large existing literature on risk and risk management by low-income households by taking into account recent advances in the understanding of poverty traps and their relation to risk and by cataloguing the range of community-based risk management arrangements commonly observed across the developing world. We include traditional and informal credit, savings and insurance arrangements as well as newer, semi-formal community-based microfinance, storage and insurance arrangements.² We discuss the strengths and shortcomings of these arrangements, especially in settings where poverty traps might exist, and review the potential for using social fund programs and related instruments to design and finance new community-based risk management arrangements in order to help poor households manage risk.

For present purposes, we adopt a broad definition of community-based risk management arrangements to include all coordinated strategies used and managed by social groupings of individuals for the purpose of protection against the adverse effects of various types of risk. We use the word “community” loosely in order to include agents whose relations have an informal and non-market character. This can include persons linked by lineage, ethnicity, religion, occupation, historical ties, proximate residence, etc. The key criteria are that they share a common motivation for risk-pooling and that their strategies are explicitly, if often informally,

² We include both traditional informal arrangements as well as newer semi-formal schemes because they share a crucial characteristic—namely, the use of interpersonal relations in order to reduce informational and transaction costs—absent from market-based arrangements. However, there are also important differences between these two types of institutions, as discussed in Section 3.

coordinated.³ In addition, we use the phrase “community-based arrangements” to mean systems adopted by social groupings of individuals, whether indigenously developed or otherwise, whose management is executed by members of the groups themselves.

The remainder of this paper is organized as follows. In Section 2, we provide the motivation for examining risk and risk management strategies for poor households, in particular the motivation for examining community-based risk management arrangements to address idiosyncratic asset and income risk. A solid, thorough understanding of the different kinds of risks faced by poor households (e.g., asset vs. income risk; idiosyncratic vs. covariate risk) as well as of the efficacy of existing and new risk management strategies (income smoothing vs. consumption smoothing vs. asset smoothing; self-insurance vs. mutual insurance) is essential to the design, implementation and evaluation of effective poverty reduction policies. In the absence of well-functioning insurance and credit markets, the poor turn to informal institutions for ex ante risk mitigation and ex post shock coping mechanisms.⁴ Social networks have been identified as loci of risk sharing. These networks fostered by kinship ties, ethnicity, geographical proximity, religion, and gender groups, may exclude some individuals (Goldstein 1999; de Weerd 2005; Udry and Conley 2005; de Weerd and Dercon 2006; Santos and Barrett 2006; Fafchamps and Gubert 2007). Empirical tests, however, routinely reject the provision of full insurance by these networks (Townsend 1994; Townsend 1995; Deaton 1997; Gertler and Gruber 1997).⁵ Residual risk exposure may result not only in efficiency losses, but in retarded asset accumulation and households’ collapse into or failure to escape from poverty traps. And there is little reason to believe that all households are equally exposed (Vanderpuye-Orgle and Barrett forthcoming). Patterns of social exclusion lead to systematic patterns that might be remedied via well-targeted interventions to close the holes in extant social safety nets (Santos and Barrett 2007).

³ We do not use the word “community” to refer to a culturally and politically cohesive social system comprised of homogenous agents. For a discussion of the (often incorrect) use of the word “community” in the development literature, see Mansuri and Rao (2004). We emphasize coordination so as to rule out uncoordinated insurance mechanisms that exist within communities, e.g., the de facto income insurance local markets provide against yield shocks through uncoordinated price adjustment mechanisms.

⁴ See Alderman and Paxson (1994), Besley (1995), Townsend (1995), Morduch (1995, 1999a), Bardhan and Udry (1999) and Dercon (2005) for excellent reviews.

⁵ Under the full insurance model, household consumption co-moves with village consumption and idiosyncratic shocks have no impact on household consumption.

In Section 3, we catalog the most-commonly observed community-based risk-management arrangements. Often, these are informal, indigenous, traditional mutual insurance groups that pool risk within extended families, ethnic groups, neighborhood groups and professional networks (e.g., traditional funeral insurance associations). They also include more formal, externally-driven (NGO or local government-driven), community-based local groups (e.g., cereal banks, health insurance associations). We also discuss both informal and semi-formal credit and savings facilities used by the poor in developing countries that have a community or group character and offer insurance-like products. Second, given the prevalence of both traditional and semi-formal community-based risk-sharing arrangements across developing countries, we examine their strengths and limitations in enabling households to manage risk.

In Section 4, we draw out lessons that existing community-based risk-management arrangements offer for social protection policy, and how existing institutions might be improved in order to help households manage risk better. In this context, we look at whether and how social funds, which support community-driven and community-based development projects, might fulfill a critical social protection objective by helping poor households manage risk better.

In Section 5, the last section, we provide a brief summary and some concluding remarks.

II. Overview of Risk and Risk Management by Poor Households

The development literature is rich with empirical and theoretical descriptions of risk exposure and its consequences. Our objective in this section is not to offer a comprehensive review of that literature (see footnote 4 for such reviews) but, rather, to motivate this paper's focus on community-based risk management arrangements and to properly contextualize our ensuing discussion of possibilities and limitations of such arrangements. We begin by noting that the existing literature on risk and risk management by poor households may understate the importance of the issue by largely ignoring the possibility of poverty traps. Risk and shocks are of first-order importance in systems characterized by multiple equilibria, particularly where one of the equilibria is a poverty trap. We then discuss the types of risk faced by poor households,

emphasizing the relative importance of idiosyncratic risk. We close the section with an extended discussion of risk management strategies followed by households. These latter two sub-sections, on the nature of poor households' risk exposure and risk management strategies, motivate section 3's focus on community-based risk management arrangements.

2.1 Risk, Vulnerability, and Poverty Traps

The poverty traps hypothesis that is increasingly drawing attention as an explanation for persistent underdevelopment carries important implications for the study and management of risk and shocks. Under textbook neoclassical assumptions (which include competitive markets, profit-seeking behavior and free entry), growth rates are fastest among those households (or countries) that begin poorest, given convex production technologies and diminishing returns. The assumption of (strictly) convex production technologies results in a single, profit-maximizing choice of production plan. This yields the familiar prediction of growth convergence towards a common steady state, regardless of initial conditions. Thus, in the neoclassical world, recovery from shocks should be most rapid among the poorest, for whom expected growth rates are greatest. However, under the multiple equilibrium-based poverty traps hypothesis (characterized by a system of multiple equilibria arising from non-convex production technologies and some exclusionary mechanisms that prevent poor households from choosing the higher welfare equilibrium), long-run performance is determined by initial conditions. In this world, agents below a certain income or wealth threshold may remain trapped in a low-level equilibrium.⁶ Thus, if this sort of poverty trap exists, the poorest may not recover quickly, or at all, from shocks. Given the heavy data demands for examining the presence of poverty traps and multiple equilibria, there is limited (and contested) empirical support for the multiple equilibrium-based poverty traps hypothesis.⁷ However, regardless of whether or not multiple equilibria can be formally established, the negative long-term welfare consequences of shocks, as discussed in this

⁶ See Azariadis and Stachurski (2004) for a comprehensive review of the literature on poverty traps.

⁷ See, for example, Lokshin and Ravallion (2004), who examine household income dynamics in two transition countries. They find that adjustment to income shocks is nonlinear; however, they do not find evidence of non-convexities that would cause temporary adverse shocks to permanently lower household income. By contrast, Lybbert et al. (2004), Adato et al. (2006) and Barrett et al. (2006) all find evidence of multiple equilibria associated with a poverty trap.

section, are widely documented and accepted in the development research and policy communities.

Shocks and Poverty Persistence

A growing body of microeconomic empirical research finds considerable persistence in the effects of shocks, especially among the poor in China, Ethiopia, Honduras and Zimbabwe (Alderman et al. 2006; Carter et al. 2007; Dercon 2005; Dercon and Hoddinott 2005; Hoddinott 2006; Hoddinott and Kinsey 2001; Jalan and Ravallion 2005). Recovery from major shocks associated with drought, hurricanes and other exogenous disasters is commonly slow or non-existent. Health shocks appear to have especially important effects (Gertler and Gruber 2002). Krishna (2007), synthesizing findings from methodologically similar studies of household-level welfare dynamics undertaken over four years among more than 25,000 households in 223 villages in Kenya, Uganda, Peru and India, reports that health shocks are overwhelmingly the most frequent cause of descents into long-term poverty. The mounting evidence on shocks and their long-term effects thus reinforce questions about whether poverty traps might be a widespread and important phenomenon.

The literature on poverty traps associated with non-convex asset dynamics emphasizes several distinct relationships between risk and poverty (Bardhan et al. 2000; Carter and Barrett 2006). The most common observation is that if agents' preferences exhibit decreasing absolute risk aversion (that is, if aversion to risk decreases as wealth increases), then poorer people will pay a relatively greater premium to avoid risk than will wealthier people. In equilibrium, this leads to divergence in expected incomes as the poor choose lower risk, lower expected return portfolios than do those who begin with greater wealth (Bardhan et al. 2000; Carter and Barrett 2006). In this view, initial endowments combine with risk to generate multiple dynamic equilibria. Some empirical studies seem to support this prediction (e.g., Bliss and Stern 1992; Carter 1997; Rosenzweig and Binswanger 1993).

Second, due to the non-convex asset dynamics that characterize systems with multiple equilibria, agents may prefer to smooth assets rather than consumption in response to shocks (as would be

predicted by the permanent income hypothesis), if they are at or just above the threshold at which wealth dynamics bifurcate (Barrett et al. 2006; Carter et al. 2007; Hoddinott 2006; McPeak 2004; Zimmerman and Carter 2003). In other words, agents who are near the asset threshold may be unwilling to liquidate productive assets in order to smooth consumption, if doing so would push them below the threshold, resulting in further asset loss and a descent into a low-level asset (and income) trap. Multiple equilibria associated with non-convex asset dynamics could also lead to seemingly excessive risk-taking behavior among a subpopulation of the poor who might find it attractive to take chances when a safer strategy is unlikely to break them out of a poverty trap, as shown by Lybbert and Barrett (forthcoming). This hypothesis bears similarity to the distinction Banerjee (2005) draws between poverty as vulnerability (above dynamic asset thresholds) and poverty as desperation (below those same thresholds).

Asset Risk versus Income Risk: Implications for Risk and Risk Management

The poverty traps literature also highlights the crucial distinction between asset risk and income risk. Models of poverty traps emphasize the role of asset accumulation in shaping welfare dynamics, as asset ownership determines income generation processes. When income is endogenous, asset risk can have a more permanent impact than income risk. In particular, uninsured asset risk has the potential to drive a household onto a path of sustained asset loss, as a result of which the household falls below a critical asset threshold from which it is unable to recover, suffering persistent income poverty thereafter. As a result, households that face asset risk may be more vulnerable to falling into persistent poverty. The classic models of such phenomena are nutritional poverty traps, wherein those with insufficient income to sustain their energy levels become unemployable, leading to a low-level equilibrium trap (Dasgupta and Ray 1986, 1987; Dasgupta 1997). Furthermore, households must consciously trade off asset smoothing and consumption smoothing objectives when faced with correlated asset and income risk, as McPeak (2004) demonstrates in the case of rainfall shocks that affect both herd mortality (i.e., asset risk) and productivity (i.e., income risk) among livestock producers in northern Kenya. Shocks that deplete a household's asset stock can lead to long-term poverty, as found in studies in Ethiopia, Indonesia, Kenya, South Africa (Adato et al. 2006; Barrett et al. 2006; Gertler and Gruber 2002; Lybbert et al. 2004).

Beyond the intra-generational effects of asset shocks, another important consequence of uninsured risk is its effect on inter-generational poverty transmission as mediated by disruption of children's accumulation of human capital. For example, in a study in south India, Behrman (1988) finds that the health of children, especially girls, suffers during seasons before the major harvest since households are not able to smooth consumption effectively. Similarly, using data from Bangladesh, Foster (1995) finds that the body size of children suffers in households that are not able to smooth consumption in the aftermath of a flood. Using panel data from Zimbabwe, Hoddinott and Kinsey (2001) show that children aged 12-24 months, especially those from poorer households, experience a slowdown in growth which has a permanent effect on their height. In light of the evidence that adult height is strongly correlated with height achieved by age 3 years, and is also correlated with adult earnings and productivity, the inability to smooth consumption in the face of a shock can have persistent effects on poverty levels. In addition, given the fact that taller women have, on average, healthier children, the impact of the drought can lead to the persistence of poverty across generations. Using data from south India, Jacoby and Skoufias (1997) find that children are withdrawn from school in the aftermath of an adverse income shock, leading to low human capital accumulation. Using socio-economic and rainfall data from a number of Indian states, Rose (1999) finds evidence that rural households are unable to smooth consumption in the face of rainfall shocks and that adverse shocks result in excess female mortality. These results are especially strong for landless households since they have less ability to smooth consumption relative to landed households. Dercon and Hoddinott (2005) estimate that recent droughts in Zimbabwe result in reduced growth for children of pre-school age. Since this cohort is unable to catch up from the effects of the drought shock, the lower rate of growth translates into lower lifetime earnings estimated at about 7 percent.

If there exist poverty traps—and such phenomena could arise simply due to decreasing absolute risk aversion and uninsured risk—then (asset and income) risk exposure and management becomes especially important. As we discuss next, the empirical evidence suggests widespread prevalence of uninsured risk among households in the developing world and limited access to effective risk management strategies.

2.2 Risk Exposure among the Poor

If risk acquires particular salience in the presence of poverty traps, then understanding patterns of risk exposure among the poor and the means they employ to cope with shocks becomes especially important. We illustrate common patterns in the literature with reference to a few specific rural areas we know well.

Table 1 lists the main shocks experienced over five years by tribal households in rural Orissa, a state in eastern India.⁸ The tribal population in this region is one of the most destitute and vulnerable populations in the entire country. Data from a small household sample survey reveals that almost two-thirds of the sample report suffering one or more major shocks in the 5 years preceding the survey. Serious illnesses faced by family members are the most commonly reported shocks, followed closely by loss of livestock and death of family members.

Table 1 Risk-Related Hardships Faced by Tribal Households in Orissa, India

Event causing hardship	Share of households (in percent)
Serious illness of family member	26.7
Livestock loss	18.6
Death of family member	18.2
Crop failure	6.0
Other	5.4

Notes: Shares reflect reports of all shocks faced by sample households in five years preceding a household survey in rural Rayagada, Orissa. Out of 499 households, 301 reported facing at least one shock, while 65 reported facing two or more shocks.

Source: Authors' calculations.

These findings mirror reports from other parts of the developing world where the experience of shocks is commonplace and often serious, especially among poor rural populations. For example,

⁸ The state of Orissa, having a population of about 36.8 million (Census of India 2001), is characterized by low levels of social and economic development. More significantly, the (sizable) tribal population in Orissa (approximately 7.6 million, or approximately a quarter of the state population) fares considerably poorly on a range of development indicators, even compared to the state average (for a brief overview of Orissa's tribal population, see Bhattamishra 2008).

in a survey of a rural community in Tanzania, de Weerd and Dercon (2006) also find illness to be the main shock faced by sample households, as almost one-third of sample households suffered an illness, of which 92 percent reported cutting back daily consumption in response. Vanderpuye-Orgle and Barrett (forthcoming) similarly find that a majority of rural Ghanaian households experience health, mortality or farm production shocks within the course of a single year and that roughly one in five households suffers theft (see table 2). As much as 57 percent of respondent households reported facing health problems and 51 percent reported suffering a sudden death in the family over all three rounds of the survey. Health shocks are also found to be very costly and to have the largest contribution to losses (as a share of total expenditure calculated using the imputed value of losses due to shocks) in the first two rounds. This suggests that morbidity and mortality affect households in this area with a high degree of frequency and also impose a huge financial burden on them.

Table 2 Risk-Related Hardships Faced by Households in Rural Ghana

Event causing hardship	Share of households (in percent)
Farm problems	31.7
Total health expenses	56.7
Theft of personal item	14.7
Sudden death	50.7
Any/All shocks	84.6

Source: Vanderpuye-Orgle and Barrett (forthcoming).

Thus, while the specific patterns of risk experience vary across space and time, the basic pattern of widespread experience of shocks, most of them idiosyncratic and related to health, crime, etc., seems an empirical regularity.

Using panel data from rural Ethiopia, Dercon (2005) similarly finds that a large proportion (40 percent) of households report having been seriously affected by mortality and morbidity shocks in the 20 years preceding the survey. While he finds harvest problems and policy shocks to be the most frequent shocks affecting households, these shocks can also have a large idiosyncratic

component since even neighboring households can have very different strategies and resources which affect their exposure to covariate risk.

Table 3 Risk-Related Hardships Faced by Households in Rural Ethiopia

Event causing hardship	Share of households (in percent)
Harvest failure (drought, flooding, frost, etc.)	78
Policy shock (taxation, forced labor, ban on migration, etc.)	42
Labor problems (illness or deaths)	40
Oxen problems (diseases, death)	39
Other livestock (diseases, death)	35
Land problems (villagization, land reform)	17
Asset losses (fire, loss)	16
War	7
Crime/banditry (theft, violence)	3

Source: Dercon (2005).

This is also found from a study of educational outcomes in Senegal using data from a panel household survey (World Bank 2005). While these data are not nationally representative (being biased against communities without schools), the sample of 32 village communities and 938 rural households is country-wide. The study finds that even within the same village, common shocks hit households differently. For example, as seen in table 4, 70 percent of households reported being affected by famine, and only 20 percent of households reported being affected by epidemics.

Table 4 Shocks Faced by Households in Senegal

Type of shock	Share of households (in percent)
Drought	84
Insects/Crop Disaster	76
Famine	70
Herd decimation	58
Flooding	50
Catastrophe /Accident	48
Closing of health center	30
Enterprise closing	30
Epidemic	20
Fire	16

Source: World Bank (2005).

Another finding by World Bank (2005) is that repeated shocks in Senegal (whether idiosyncratic or covariate) lead to more adverse outcomes than single shocks. As seen in table 5, the larger the number of shocks faced by a community, the greater the likelihood that the community perceives of its situation as having worsened. This finding underscores the need for effective risk management strategies and social protection policy which not only address one-off large catastrophic risks but also repeated, often small idiosyncratic, shocks.

Table 5 Impact of Frequency of Shocks in Senegal on Reported Household Outcomes

Number of community-level shocks	Number of villages affected	Likelihood of deterioration perceived by share of villagers (in percent)
None	4	50
1 shock	5	64
2 shocks	12	70
3 shocks	6	73
At least 4 shocks	5	80

Note: 32 communities surveyed country-wide. Shocks include drought, livestock loss, insect infestation, fire, epidemic, famine, accidents, enterprise closing, flooding and other.

Source: World Bank (2005).

Idiosyncratic versus Covariate Risk

The distinction between idiosyncratic risk (i.e., household- or individual-specific risk) and covariate risk is important because community-based risk-management arrangements can handle idiosyncratic risk but are likely to break down in the face of covariate risk. As Alderman and Paxson (1994) demonstrate with a full insurance model, covariate shocks cannot be insured by risk-sharing, as all members of the insurance pool would require payouts at the same time.⁹ Thus, the relative magnitude of idiosyncratic and covariate shocks is important to the design of appropriate risk management policy interventions.

⁹ Alderman and Paxson (1994) also however show that the full-insurance model can accommodate consumption smoothing in the aftermath of a covariate shock. For example, stocking behavior can be used for inter-temporal consumption smoothing within a village.

The Importance of Idiosyncratic Risk

There is increasing evidence regarding the importance of idiosyncratic risk. For example, using survey data from Ethiopia, Dercon and Krishnan (2000) show that many risks have both idiosyncratic and covariate components. Even rainfall shocks which can be expected to produce substantial co-movements in incomes for farming households within the same village are shown to have a significant idiosyncratic component. Townsend (1994) similarly, using ICRISAT data from India, finds that weather can produce idiosyncratic changes in income realization even for farmers on neighboring plots. This may indicate that there is significant scope for risk-sharing within a village community, even in the presence of common shocks.

In addition, a number of empirical studies have found that the idiosyncratic part of income risk is relatively large. Using data from rural Nigeria, Udry (1993) finds that 42 percent of the variation in farm yields across households can be attributed to idiosyncratic shocks (defined as an unexpected adverse event on any of the fields farmed by the respondent, if the respondent was a borrower, or an unexpected, serious event that occurred in the borrower's household, if the respondent was the lender. These events typically included agricultural losses, medical problems, rain damage to houses and other "household emergencies"). Using data from rural Thailand, Townsend (1995) finds that changes in income cannot be explained by changes in common regional factors alone. Similarly, Deaton (1997) finds that the variation in household income changes in rural Cote d'Ivoire cannot be explained by the common village components. These findings imply that covariate shocks do not explain much of the variation in household incomes, emphasizing the adverse impact of idiosyncratic shocks for poor, rural households. In another example, Morduch (2005) shows that 75 to 96 percent of the total variance of the logarithm of household income in ICRISAT villages in southern India is idiosyncratic. Lybbert et al. (2004) show that idiosyncratic asset risk dominates covariate asset risk among pastoralists in southern Ethiopia, a population that is extremely vulnerable to climatic, epidemiological and other covariate risks.

Using household panel data from South Africa, Carter and Maluccio (2003) find that child nutrition is affected due to idiosyncratic shocks (as measured by household economic losses and

gains) but not so due to community-shocks (as measured by neighbors net gains). Thus, they find that while households are not able to insure fully against idiosyncratic risks, they are relatively unaffected by community-level shocks. The evidence on the importance of idiosyncratic risk for poor households therefore underscores the need for a continuing discussion on the efficacy of the strategies available for mitigating the impact of random shocks.

In drawing attention to idiosyncratic shocks, we do not wish to discount the severe, adverse impact that large covariate shocks can have on these households. In fact, the increase in the frequency and severity of large financial and natural disasters in the recent past implies that addressing covariate shocks is also an extremely pressing policy issue (Skoufias 2003). We emphasize idiosyncratic shocks for two reasons. First, community-based risk management arrangements, the main topic of discussion in this paper, cannot address covariate shocks without transferring risk outside the community or to those within the community that are able and willing to take on the risk. Second, we wish to inform debates on the importance of public intervention focusing on large covariate shocks versus idiosyncratic shocks by emphasizing the extent and frequency of idiosyncratic shocks that adversely impact poor households.

2.3 Risk Management Strategies

Given the frequency of shocks, poor households have devised a number of ways to mitigate their impact and cope with risk. In this section, we first present examples of risk management from specific regions that we are familiar with, followed by a discussion of general patterns of risk management that have been documented. Using data from a village in Tanzania, De Weerd and Dercon (2006) document risk-coping strategies employed by households there. As shown in table 6, they find that risk-sharing (in the form of private gifts, loans or labor transfers, as well as loans and help through local community-based organizations) is employed by over two-fifths of households as the main coping strategy. However, households also report drawing on cash reserves, sale of assets, earning extra income and other strategies in the wake of a shock, indicating significant gaps in social safety nets.

Table 6 Coping Mechanisms Used to Manage Shocks Experienced by Households in Rural Tanzania

Coping mechanism	Share of households reported having used mechanism (in percent)
Risk sharing (private transfers, transfers from community organizations)	76
Savings (drawing on cash reserves)	67
Sale of assets	56
Earning extra income	32
Other (withdrawing children from school, borrowing from moneylender, transfers from government and NGO)	2

Notes: Shares reflect reports of coping mechanisms ever used for facing the two worst shocks in 10 years, conditional on experiencing a shock, from a household survey in Nyaaktoke village.

Source: De Weerd and Dercon (2006).

Such findings are observed commonly across low-income countries. For example, in a completely different part of the world, tribal households in Orissa report a range of coping mechanisms in the aftermath of shocks (Bhattamishra 2008). Table 7 presents the coping mechanisms reported by sample households in Orissa. Approximately two out of every five households report a combination of strategies that include borrowing from local moneylenders, receiving monetary or in-kind transfers from friends and family and selling productive assets. The dependence on informal arrangements to tide through periods of hardship brought on by frequent (and often severe) shocks indicates the absence of formal credit and insurance arrangements. Some of these informal arrangements may be bilateral (such as borrowing from an informal, private local moneylender) while others are multilateral arrangements that involve community participation and management.

Table 7 Coping Mechanisms Used to Manage Shocks Experienced by Tribal Households in Orissa, India

Coping mechanism	Share of households reported having used mechanism (percent)
Reduce consumption	56.9
Borrow from local moneylender	22.6
Transfers from friends and family	10.0
Sale of assets (agricultural tools, livestock, land, other)	7.0
Other (increase labor supply, transfers from government and NGO, etc.)	3.5

Notes: Shares reflect reports of coping mechanisms ever used for up to 3 most recent shocks, conditional on experiencing a shock.

Source: Bhattamishra (2008).

What we also find from table 7 is that the majority of households report a reduction in consumption in the wake of a shock. Assuming that households prefer to smooth consumption, such autarkic destabilization of consumption exposes the limits of self- and mutual-insurance arrangements forged by rural households and suggests holes exist in available safety nets, creating a potential role for appropriate policy intervention. A number of recent studies have shown similar gaps in social safety nets (Dercon and Krishnan 2000; Dercon 2002; De Weerd 2005; Santos and Barrett 2006; Vanderpuye-Orgle and Barrett forthcoming). For example, Dercon and Krishnan (2000) find that the poor in Ethiopia enjoy far less protection against shocks than do wealthier households and that men enjoy far more protection than women do, even within the same household. Santos and Barrett (2006), studying a different population in Ethiopia, find that the poor are significantly less likely to be known by other households and social visibility is a necessary condition to participate in social insurance arrangement. Like Dercon and Krishnan (2000), they also find that conditional on being known by others, the poorest households are least likely to receive transfers in response to shocks they suffer. Vanderpuye-Orgle and Barrett (forthcoming) find that younger individuals, recent in-migrants and those not engaged in non-farm activities were most likely to be socially invisible and that the socially invisible enjoy significantly less risk sharing through social networks than do those who are better connected to others within the community. We return to this point later.

The risk management strategies employed by households can be broadly classified into self-insurance and mutual insurance activities. Self-insurance activities comprise both ex ante risk mitigation strategies, whereby households smooth income, or ex post shock coping strategies, whereby households smooth consumption, assets or both. Households can also manage risk by participating in mutual insurance groups of various sorts. In the sub-sections that follow, we provide a brief overview of risk management strategies via self-insurance as well as mutual insurance activities. Given the focus of this paper on community-based arrangements, which fall into the latter category, we also provide suggestive evidence on the extent of observed risk-sharing.

2.3.1 *Income Smoothing as Self-Insurance*

As mentioned earlier, households may smooth stochastic or non-deterministic income streams¹⁰ by choosing activities, inputs, technologies and asset portfolios that reduce risk exposure, thereby providing one form of self-insurance through risk reduction. In his classic review of income and consumption smoothing strategies employed to mitigate and cope with risk, Morduch (1995) discusses how missing and imperfect markets and the absence of spatial integration results in complex choice sets, often involving nonseparability of choices across different spheres. He illustrates this most starkly using Bardhan's (1983) study of permanent labor contracts. Under these contracts, workers choose to enter into long-term relationships with landlords at low but steady wages and thereby forego higher daily or seasonal wage contracts. However, where there is no risk of being unemployed during the agricultural slack season, permanent labor contracts may be more efficient for the worker who anticipates being unable to borrow or insure. Thus, missing or imperfect markets can result in households making variability-reducing choices that result in lower expected income.

A number of empirical studies also provide evidence that households are willing to forego income streams with higher expected income in return for lower income variability.¹¹ For

¹⁰ In a stochastic income stream, today's income does not determine tomorrow's income.

¹¹ Using an experimental gambling approach in ICRISAT villages in semi-arid, tropical rural India to elicit farmers' attitudes towards risk, Binswanger (1980) finds that at high-payoff levels (commensurate to local monthly wage

example, Bliss and Stern (1982) show that farmers in Palanpur, India use lower amounts of fertilizer than the profit-maximizing input amount so as to reduce investment losses in the case of harvest failure, thereby lowering total output. Rosenzweig and Binswanger (1993) show that farmers in ICRISAT villages in India belonging to the lowest wealth quartile who have least access to credit and insurance markets forego expected profits of as much as 35 percent in return for lower income variability, indicating that the preference for less risky production techniques may be driven by wealth levels (and not the level of risk-aversion). Barrett et al. (2004) find that rice farmers in Madagascar routinely forego higher expected returns offered by a new rice production method, seemingly in part because of the substantially higher yield risk associated with the method. Feder et al.'s (1985) seminal survey of technology adoption patterns in developing country agriculture emphasizes the importance of risk in guiding technology choice.

Households may also diversify occupational, plot and crop choices in order to reduce income variability, even if this implies foregone income. Popkin (1979) argues that Vietnamese peasants diversified landholdings by farming plots in different regions in order to reduce risk, although this was at the cost of a substantial loss in productivity and income. It is important, however, to keep in mind that income smoothing via diversification does not necessarily imply foregone income, as diversification strategies may also be undertaken to increase incomes (Alderman and Paxson 1994; Barrett et al. 2001).

2.3.2 Consumption Smoothing via Self-Insurance

Households may also undertake self-insured consumption smoothing strategies ex post of a shock occurring. These include depleting savings and assets and adjusting labor supply. For example, in a study of Thai farmers, Paxson (1992) finds little impact of transitory rainfall shocks on household consumption as farmers draw down their savings after shocks. Households may also sell off assets in order to cope with the impact of a shock. In rural agrarian economies, livestock are an important asset, and are often used as a buffer against income shocks. For example, Rosenzweig and Wolpin (1993) show that bullock sales contribute to consumption

rates or small agricultural investments), most individuals are moderately risk-averse, indicating that they would indeed be willing to give up higher expected income for lower income variability.

smoothing in the ICRISAT villages in south India. However, as discussed by Dercon (2005) and McPeak (2004), if movements in the value of assets and income covary in the event of a covariate shock, as is commonly observed, then asset depletion is not always an effective strategy for consumption smoothing. For example, Fafchamps et al. (1998) and Kazianga and Udry (2006) find that livestock sales in Burkina Faso protected households against only a small portion of the income shock suffered as a result of widespread drought. In addition, the poorest (and therefore, the most vulnerable) households are likely to be asset poor and unable to use asset-based strategies for smoothing consumption. For example, Dercon (1998) finds that in spite of the importance of cattle in the local farming system, only half the households in a sample from western Tanzania own cattle as the rest cannot afford to do so. Using panel data from China, Jalan and Ravallion (2001) find that rural households hold wealth in liquid, unproductive forms to protect against idiosyncratic income risk. However, they find that this precautionary wealth effect is small and restricted to middle income households.

Moreover, as alluded to in the discussion on asset risk, households may hold on to their assets at the cost of reduced consumption, as depleting current assets will lower future expected income levels. For example, McPeak (2004) finds limited support for the use of livestock assets as a buffer against income shocks for pastoral nomads in northern Kenya, for whom depleting current livestock assets will most likely reduce future expected income. De Weerd and Dercon (2006) find that sale of land as a coping strategy is rarely practiced, due to imperfections in the land market that make it extremely difficult to buy back a fertile piece of land once it has been sold.

Households may also make labor supply adjustments in order to smooth consumption in response to income shocks. For example, Kochar (1995) and Rose (2001) provide evidence from India of increased labor force participation in response to economic shocks. Moser (1998) finds an increase in female labor market participation and child labor in Ecuador and Zambia. Malapit et al. (2006) find similar labor supply responses to shocks in the Philippines, while noting that gender barriers to labor market participation, heterogeneity in household composition and credit constraints create marked differences between households in their ability to rely on labor markets as shock absorbers. Barrett and Clay (2003) find that poorer and female-headed households in

Ethiopia are far less likely to participate in food-for-work programs intended to provide insurance against shocks because their capacity to supply additional labor to market is sharply limited relative to wealthier or male-headed households.

2.3.3 Consumption Smoothing via Mutual Insurance

Probably the most extensively studied consumption smoothing mechanism in developing countries are mutual insurance arrangements. This reflects the limitations of self-insurance mechanisms as well as the plethora of informal and semi-formal risk-sharing arrangements that exist across the developing world and social scientists' longstanding fascination with such institutions. Evidence on participation in informal risk-sharing arrangements as a coping strategy has been documented in a number of studies by anthropologists, economists and other social scientists (e.g., Evan-Pritchard 1940; Colson 1962; Scott 1976; Posner 1980; Platteau and Abraham 1987; Eswaran and Kotwal 1989; Ellsworth and Shapiro 1989; Udry 1990, 1993; Fafchamps 1992; Alderman and Paxson 1994; Besley 1995; Platteau 1997; Morduch 1999a, Quisumbing et al. 2008).¹² In a recent survey of households in rural Tanzania, De Weerd and Dercon (2006) find risk-sharing among households – including gift-giving and credit without interest from social networks – to be the most important strategy for coping with shocks.

Risk sharing in rural communities: What is the empirical evidence?

Given that one of the main objectives of this paper is to discuss community-based arrangements that support risk management, we first examine the empirical evidence on the extent of risk-sharing in village economies. Under the full risk-sharing hypothesis, idiosyncratic risks have no impact on household consumption; as a result, household income has no impact on contemporaneous consumption after controlling for aggregate network (e.g., village) income. In a seminal study, Townsend (1994) finds evidence of close to full risk-sharing within the ICRISAT villages in south India. He finds that household consumption co-move with average village consumption, and that after controlling for community resources, household consumption is not much influenced by contemporaneous income, sickness or other idiosyncratic shocks.

¹² Lim and Townsend (1998), however, find that savings and drawing down grain reserves (or self-insurance) are more important for risk-coping than risk-sharing. At the very least, this indicates that households engage in a variety of risk management strategies and that self-insurance is not unimportant, especially if risk-sharing is not complete.

However, a number of subsequent studies using the same data but different methodologies have found weaker evidence of risk-sharing (Morduch 1991 as cited in Morduch 1995, Morduch 2004; Ravallion and Chaudhuri 1997). Other studies have also found weak or no evidence of complete risk-sharing through informal insurance. In a sample of households from rural Cote d'Ivoire, Deaton (1992) finds more co-movement between income and consumption within than across villages. After including village fixed effects to control for village-invariant characteristics, however, he finds that fluctuations in household income do affect household consumption levels. Jalan and Ravallion (1999) find close to full risk-sharing amongst the highest income decile in rural China, but not so for the lowest income decile. Morduch (1993 as cited in Morduch 1999a) also finds consumption smoothing among wealthier households in the ICRISAT sample, but no such evidence among landless households and smallholders. Fafchamps and Lund (2003) find evidence of risk-sharing via informal insurance, but show that it is effective only in the case of young adults who are acutely ill. Vanderpuye-Orgle and Barrett (forthcoming) find strong evidence of near-full risk pooling among socially well-connected individuals in rural Ghana, but easily reject the risk pooling hypothesis for the sizeable minority of the sample without extensive social networks. In summary, we can conclude that there is some evidence of risk-sharing, but it is not complete, especially for poorer households or those with fewer social networks.

The rejection of the full risk-sharing hypothesis across a range of studies should not be interpreted as conclusive evidence against the prevalence or importance of risk-sharing. Rather, this has to be understood in the context of the need for a finer parsing of the level at which risk-sharing takes place. Until recently, most empirical tests of risk-sharing were conducted at the village level. This practice was driven by both data and conceptual problems. Firstly, given the sampling strategies and questionnaires used to collect household survey data, the most natural unit of analysis of informal insurance networks is the village (De Weerd and Dercon 2006). Household surveys typically do not collect data on the incomes of extended family members who do not reside with the household, making it difficult, for example, to test whether extended families provide informal insurance. Rosenzweig and Stark (1989) are able to address this question using unique longitudinal data from rural India. Examining the high frequency of

migration of women to geographically-distant yet kinship-related households due to marriage, they find that migration due to marriage contributed significantly to the reduction of variability of household food consumption. They conclude that marriage-related migration is aimed at mitigating income risk and enabling consumption smoothing. Such analyses, however, are rare due to the data limitations mentioned above.

Second, researchers disagree about whether geographic sampling enumeration areas—typically a village—provide a conceptually suitable unit for the analysis of mutual insurance networks. Although the number of households in a village and the scope of idiosyncratic risk are both commonly sufficiently large to provide scope for mutual insurance, while the information and enforcement costs of such arrangements are likely relatively small within a village, most studies that have tested risk-sharing within a village have rejected it (e.g., Townsend 1994; Udry 1994; Jalan and Ravallion 1999; Gertler and Gruber 2002; Park 2006; Vanderpuye-Orgle and Barrett forthcoming). Other networks that have been examined as units of risk-sharing include ethnic groups (Grimard 1997), friends and relatives (Fafchamps and Lund 2003), extended family (Foster 1993 and Witoelar 2005) and social networks (De Weerdt and Dercon 2006; Santos and Barrett 2006; Vanderpuye-Orgle and Barrett forthcoming). However, Grimard (1997) rejects complete risk-pooling among households within an ethnic group in Cote d’Ivoire, while Foster (1993) and Witoelar (2005) do so between extended families in Bangladesh and Indonesia, respectively. Fafchamps and Lund (2003) find evidence of risk-sharing between friends and relatives only in the case of young adults who have a serious illness (but not so for older adults). They also find risk-sharing in the case of funerals but not for crop failures or mild illnesses. This raises a question on the extent of risk-sharing for consumption smoothing purposes, an issue on which there is limited evidence at present.

Using data from Bangladesh that allows the investigation of risk-sharing among groups of households living at close proximity within a village, Park (2006) finds that risks to food consumption are pooled between neighboring (related and unrelated) households residing in a cluster referred to as *bari* and also between related households in different villages, but not among all households residing within a village. Similarly, De Weerdt and Dercon (2006) find no

evidence of risk-sharing for non-food consumption in the village but find evidence at the level of networks. These findings suggest that the rejection of risk-sharing at the village level does not indicate the lack of risk-sharing; rather, a better understanding of what constitutes the risk-sharing network is needed. In addition, data enabling the examination of the extent to which risk-sharing helps households cope with risk within these networks can also provide evidence on their efficiency. Also, more evidence on the extent of risk-sharing for disaggregated types of consumption can be instructive, as food and non-food consumption may respond differently to shocks and also suffer from different types of measurement error. While the evidence on the extent of risk-sharing is inconclusive, what is clear is that there are substantial gaps in social safety nets, indicating the relevance of social protection policy.

III. Community-based Risk Management Arrangements

In this section, we summarize the main features of community-based risk management arrangements commonly found across the developing world. Often, these are informal, indigenous community-based groups that provide credit or insurance within extended families, ethnic groups, neighborhood groups or professional networks. Community-based risk management arrangements also include more formal, externally-driven, non-market community-based local groups. Typically, these are recent innovations that are often based on informal traditional arrangements.

The concept of formality used in this paper is different than other common uses of the term. Here, we wish to distinguish home-grown, completely decentralized, community-based arrangements which are typically sustained by a system of unwritten rules, from other community-based arrangements that are initiated by an external agent (but like the home-grown initiatives, typically managed by members of the community themselves) and often governed by a system of codified rules. We refer to the former as “informal” community-based arrangements and to the latter as “semi-formal” community-based arrangements.

We discuss both types of arrangements together for two main reasons. First, the interpersonal relations that typify community-based arrangements are common features of both informal, indigenous arrangements as well as semi-formal, externally driven arrangements. Second, due to the evolving nature of these groups in response to increases in market penetration and monetization of the economy, many semi-formal institutions are actually based on traditional, informal arrangements. For example, African cereal banks and Indian grain banks (discussed later) are offshoots of traditional hunger-insurance arrangements found in many villages.

3.1 Stylized Features of Community-Based Risk Management Arrangements

Low transaction and information costs arising from close interpersonal relations

Perhaps the defining feature of both informal and semi-formal community-based arrangements is the interpersonal relations between members. Both of these arrangements are often characterized by low information and transaction costs, since participants typically live in close geographical proximity and their economic circumstances (wealth, income, realizations of shocks) are, for the most part, easily observable. Contracts, almost always unwritten, are found to be self-enforcing even in the absence of state policing and judicial courts arising from a combination of effective peer monitoring, fear of social sanctions as well as repeated interactions over time between the same individuals.

Self-enforcing contracts arising from repeated interactions

Another factor that reinforces unwritten contracts is the longstanding association among members, often extending over several generations. Indeed, the indefinite, dynastic nature of village social relations has often motivated the modeling of informal mutual insurance systems as infinitely-repeated games (Coate and Ravallion 1993; Fafchamps 1992). Therefore, both informal and semi-formal community-based arrangements are similar in that they involve repeated transactions between the same (or almost the same) set of individuals (or households).

In discussing informal (indigenous) and semi-formal (externally-driven) arrangements together, we do not imply the absence of differences between them (especially those that may affect their

capacity for scalability and to absorb external intervention). First, unlike semi-formal arrangements, informal arrangements are characterized by very simple transactions and have no requirement for accounting and financial management skills. Clearly, the administrative, management and technical requirements of semi-formal arrangements are more onerous. The scalability of these arrangements (especially of informal ones) is inherently limited by the capacity of individuals to track transactions informally. Second, as discussed by Platteau (1997), in informal arrangements, transfers to beneficiary households typically take place *ex post*, i.e., after the realization of a shock. In semi-formal arrangements, however, transfers often take place *ex ante* (akin to ‘premiums’ paid under formal insurance contracts) as well as *ex post* (akin to ‘claims’ in formal insurance). Third, unlike semi-formal arrangements, premiums and coverage are not well-defined in informal arrangements and are often state-contingent. Premiums in informal arrangements are typically hidden or implicit, embedded in the cost of establishing and maintaining social ties.

In spite of these differences, we choose not to distinguish community-based arrangements on the basis of their level of formality since, as previously mentioned, the importance of community relations in both formal and semi-formal arrangements is the key defining (and similar) feature. We present instead a typology of some of the common arrangements for risk management based on the primary function that they are designed to serve. The list is by no means exhaustive. Rather, it is merely suggestive of the different types of informal and semi-formal risk sharing arrangements one finds in low-income communities. In fact, the diversity of community-based risk-management arrangements across the developing world is immense, and any attempt to categorize them into a systematic list necessarily involves a loss of descriptive richness. Nevertheless, the contribution of this exercise is to present a brief overview of the various types of arrangements that commonly exist, and how they help households to manage risk. In practice, many of these risk-sharing arrangements provide insurance for more than one event. For example, some burial societies in Ethiopia and Tanzania also provide insurance in the case of illness (Dercon et al. 2006). In such cases, we categorize these arrangements based on the main function that they serve.

3.2 Community-Based Risk Management Arrangements

Here, we describe the main features of a number of commonly-observed community-based risk management arrangements, based on whether they provide public goods and services, facilities for savings and credit, credit as insurance, transfers, insurance for major life events or common property resource rights.

3.2.1 *Community-Based Provision of Public Goods and Services*

There are a large number of community-based programs that deliver public goods and services, bolstering the ability of households to manage risk, whether through risk transfer (i.e., insurance) mechanisms or, more commonly, through reduced risk exposure. Examples include disease, pest and pathogen control through community-based preventive medical and veterinary care and community-based sanitation programs, community management of irrigation, community-based information systems as well as community-run auctions that can help to reduce price variability in market transactions. These are typically provided through community-based arrangements established by NGOs or local governments to deliver goods and services that have a public good character.¹³ Good examples include pest and disease control, for example through spraying insecticides in swampy areas, or emergency warning systems based on sirens or public callers. In other cases, they can be made excludable by charging a fee for the service (e.g., fee for animal health services). However, since the provision of public goods and services is often susceptible to the problem of free ridership and may have high start-up fixed costs (e.g., roads and informational systems infrastructure), they tend to be underprovided by the market in the first place. We describe below some commonly observed community-based arrangements for the provision of public goods that reduce risk.

Community-based disease, pest and pathogen control programs can reduce risk by preventing disease. Makemba et al. (1995) describe a community-based malaria control program in Tanzania, one of many such programs established in African countries south of the Sahara where

¹³Public goods do not have rivalry in consumption and are non-excludable.

malaria is a major problem.¹⁴ In this program, insecticide-treated mosquito nets are introduced in rural areas using a community-based model, which involves community participation for the distribution, sales and impregnation of nets as well as education on proper usage. Using a combination of focus-group discussions and household surveys in villages in Nigeria where malaria is hyperendemic, Onwujekwe et al. (2005) find that the community-based model for the distribution and sale of insecticide-treated mosquito nets is preferred by respondents to those by the commercial sector (e.g., patent medicine dealers), public health system and by health teams that visit villages occasionally. The major reasons cited for their preference are the ease of access and flexibility for payment provided by community-based distribution, relative to other models.¹⁵

Community-based immunization, deworming, and sanitation programs can also reduce the risk of disease and disease transmission. Miguel and Kremer (2004) provide evidence from a randomized evaluation of a school-based project in Kenya that mass treatment with deworming drugs increases school attendance for treated children. They also find that deworming treatment has positive externality effects, reducing disease transmission and thereby increasing attendance among untreated children in treatment schools as well as in neighboring schools, where the treatment was not provided. Given the externalities present in mass immunization or deworming treatments, individual households may not adopt these interventions unless they are taken up by a critical proportion of the community.

Community-based sanitation programs can also play a critical role in reducing the risk of water-borne disease such as diarrhea, one of the leading causes of childhood mortality. In a recent review of interventions for reducing diarrhea in developing countries, Zwane and Kremer (2007) summarize evidence on the effectiveness of handwashing and point-of-use water treatment campaigns which involved frequent (weekly or daily) reminders from fieldworkers. Given the

¹⁴ WHO/UNICEF (2003) reports that 90 percent of all malaria deaths occur in African countries south of the Sahara where it is endemic. Across these countries, 25-40 percent of all outpatient clinic visits are for malaria and between 20-50 percent of all hospital admissions are a consequence of malaria, placing an enormous burden on the health systems.

¹⁵ Wacira (2007) et al., however, find evidence from Kenya that community-based provision of insecticide-treated nets is not as effective in terms of coverage and beneficiary satisfaction relative to an employer-based approach, because the latter provided credit for purchase of nets and treatment kits as well as informational outreach.

high frequency of visits from fieldworkers needed for the success of such campaigns, community-based programs are likely to be more cost-effective and have greater sustainability. Low-cost community-based sanitation programs such as community sanitation centers (e.g., public toilets and public water points) can also reduce the risk of disease, given the absence of individualized on-site systems or centralized sewerage systems. Examples of well-functioning community-based toilets include publicly-financed community toilets in Pune and other Indian cities (Burra et al. 2003).¹⁶ In the Pune model, a partnership between the local municipal government, NGOs and the beneficiaries have enabled the successful operation of more than 400 community-designed, managed and maintained toilet blocks.

Community-based animal health programs provide an important service in reducing the risk of livestock disease and death in remote rural areas in developing countries, where access to veterinarians may be limited. In these programs, local farmers are provided training in both modern as well as indigenous knowledge to provide treatment for common livestock diseases (IIRR 1998). To ensure financial viability and sustained functioning of these programs, a critical mass of involvement by local farmers is required. Typically, in these programs, technical support as well as a supply of drugs are provided externally through NGO-based veterinary professionals or government veterinary services. Community-run animal health programs can reduce idiosyncratic risk for herders and farmers whose livestock may be affected by disease, by providing veterinary services in a timely manner. They can also reduce covariate risk by stemming the spread of infectious disease, thereby heading off epidemics.

Other examples of community-based arrangements for the provision of public goods include community-based small-scale irrigation schemes and community-based construction of physical infrastructure such as roads, health centers, and schools. Community-based irrigation-schemes reduce risk of crop loss or lower yield by providing water in a timely and more regulated manner. They can also help with addressing covariate risk such as drought. They typically involve provision of labor by the community and provision of technical knowledge and financial

¹⁶ Zwane and Kremer (2007) find, however, that community-based rural water infrastructure that are low-cost alternatives to piped water (such as wells) are not effective in reducing diarrheal disease.

resources externally, through NGOs or the government. Public works programs such as Food-for-Work (FFW) programs which use community labor to provide public goods can also reduce risk (Barrett et al. 2005), both in the short run and the long run. Von Braun et al. (1999) provide evidence on the impact of a FFW project in Ethiopia, which has the largest FFW program in Africa. They show how a FFW road increased market access, dampening price volatility and leading to multiplier effects which included the establishment of water mills and fruit plantations in the three years after the road was constructed. Another focus of Ethiopia's FFW programs, namely, the promotion of natural resource conservation, can also reduce risk. For example, terracing hillsides in FFW programs helps in soil and water conservation, which reduces yield risk (Holden et al. 2006). It can also reduce disaster risk, such as the risk of landslides and mudslides.

Community-based information systems can also help to reduce both idiosyncratic and covariate risk. A recent example is the internet site created, managed and used by members of the Zimbabwean diaspora (www.mukuru.com) which enables individuals living outside the country to transfer remittances to family members during times of need, thereby helping them to smooth consumption. An example of a community-based information system that reduces covariate risk is a cyclone warning system in Bangladesh, which is affected by seasonal flooding during the annual monsoon season. It is based on a network of 33,000 village-based volunteers who receive alerts via radio stations linked to the national capital, Dhaka, which they then relay via megaphones to at-risk villagers in coastal areas, thereby reducing risk of losses due to flooding (Niskala 2005, as cited in Barrett 2006).

3.2.2 Savings and Credit Arrangements to Insure against Income Risk

Savings, credit and insurance arrangements help risk management in a variety of ways. First, households can use precautionary savings or consumption credit to smooth consumption in the face of either income shocks or anticipated variation in income (e.g., due to seasonality) or in expenditures (e.g., due to dowries or costs associated with weddings or other predictable ceremonies). Second, households can use production or investment credit to build up assets and

thereby increase future capacity to self-insure. As a vast literature on microfinance indicates, there exist a wide range of community-based arrangements for managing risk through finance.¹⁷

Rotating Savings and Credit Associations (ROSCAs)

ROSCAs are traditional savings and credit arrangements, found across the world under a wide variety of names, for example, *chit* funds in India, *bisi* in Pakistan, *hui* in Taiwan, *kye* in Korea, *tontine* or *pari* in West Africa.¹⁸ As described by Besley et al. (1993), a ROSCA typically comprises of a group of individuals who make regular contributions to a common pot. This pot is then allotted to each of the individuals in turn, either in a predetermined order, or on the basis of lottery or auction. The process continues, with past winners excluded, until each member of the group obtains the pot at least once. ROSCAs in which winners are decided on the basis of auction, have an implicit risk-sharing character as they depend on the relative intensity of participant needs (Platteau 1997). In this case, a participant who is willing to take the largest deduction (thereby paying the highest, albeit implicit, premium) wins the pot (see, e.g., Ghate 1992 for illustrations).

While the main function of the other types of ROSCAs is to enable capital accumulation of indivisible items, they can also serve as risk-pooling arrangements if individuals receive negative shocks during the rotation cycle (Calomiris and Rajaraman 1993 as cited in Besley 1995). While there is little data on the extent of participation in ROSCAs, Levenson and Besley (1995 as cited in Besley 1995) find, for example, that about 80 percent of the adult population in Taiwan participates in ROSCAs, reflecting the wide popularity of these arrangements.

Variations in design emerge across time and space. For example, the *ubbu-tungngul* is a traditional savings and credit arrangement found in northern Philippines. It functions somewhat

¹⁷ For excellent reviews of the microfinance movement as well as the stylized features of microfinance institutions, see, for example, Morduch's (1999b) article and a recent book by Armendariz and Morduch (2005) on the economics of microfinance. See also Robinson (2001) for an overview of the microfinance movement in developing countries and Zeller and Meyer (2002) for limitations of the microfinance movement and how to make it sustainable and more effective. For a general overview of formal and informal financial services used by the poor in developing countries, see Rutherford (2000).

¹⁸ For a detailed discussion of the stylized features of ROSCAs including how the institution is sustained, see Besley et al. (1993).

like a ROSCA, but contributions vary across members and across time (Rutherford 2000). In this arrangement, all participants contribute varying amounts which are put in a common pot, which is then obtained by one member of the pool. This member then returns the contributions in turn to each participant, at regular intervals, in the same amount received from them. However, in the process, each member receives one large lump-sum amount once (the sum of the different varying amounts contributed by the n participants) and repays them, in varying small amounts, over the next $(n-1)$ meetings. Although this arrangement seems to involve a number of unique private exchanges, they are done in public at regular group meetings. The advantage of the *ubbutungul* is that the flexibility in the contribution amount over every round can increase the amount of the total pot that is collected, as individuals are not limited to contributing what they are sure to be able to afford in each and every round.

Microfinance

Microfinance offers a well-known category of a semi-formal, community-based credit, savings and insurance services. Microfinance institutions of various sorts serve over 70 million low-income individuals worldwide, most of them women (Daley-Harriss 2003). Typically, they offer loans in small amounts (“microcredit”), although some of these institutions have also started to offer facilities for making savings in small amounts (“microsavings”) and others have set up insurance facilities that involve contributions in small amounts and payouts under prespecified conditions (“microinsurance”).

As summarized by Armendariz de Aghion and Morduch (2004), microcredit institutions are typically characterized by joint liability: although loans are made to individuals, they can obtain a loan only if they form a group with other individuals seeking loans. If any member of the group fails to repay their loan, then all members of the group become ineligible for future loans from the bank. This creates added incentive for group members to provide each other with insurance against shocks, as part of the cost of shock-induced illiquidity that disrupts loan servicing is shouldered by other group members. As a result, microcredit arrangements can lower informational costs for lenders by taking advantage of peer selection effects (which can lower problems of adverse selection) as well as peer monitoring (which can lower problems of moral

hazard). The risk-sharing inducements of microcredit arrangements are further deepened by dynamic incentives, whereby loan sizes are increased over time. As a result, default rates are lowered, provided progressive lending takes place over infinitely many periods. In addition, default rates are also lowered by screening out ‘bad types’. Finally, microcredit institutions are less likely to require traditional collateral (e.g., housing, land) that have resale value, as they rely more heavily on reputational mechanisms to reduce default. By lessening the need to place borrowers’ assets at risk of seizure in the event of default, microlending arrangements can reduce borrowing risk and associated risk rationing of credit.¹⁹ Perhaps more importantly, lower or no collateral requirements tend to improve the access of the poor to credit to tide them over in the wake of serious shocks. Khandker (2007), for example, finds that microfinance institutions enhanced flood-affected households’ access to finance and thereby played a central role in enhancing coping ability in Bangladesh after the devastating floods of 1998.

Microfinance institutions often also offer ‘microsavings’ facilities to members. The various fees associated with savings in formal financial institutions are commonly too great to make bank accounts attractive investments, inducing poor households to hold their assets in less liquid form, such as livestock, grain or jewelry (McPeak 2005). Microsavings arrangements commonly reduce or completely do away with such expenses because they enjoy far lower overhead costs. This can induce increased financial savings, with improved liquidity facilitating better risk management by depositors (Rutherford 2000). Microsavings arrangements can be voluntary or compulsory and typically involve small, frequent deposits (Armendariz de Aghion and Morduch 2004). In the former case, savings can be withdrawn at the depositor’s discretion and thereby help households meet anticipated but lumpy expenses or to cope with unanticipated shocks. In the latter case, they act as a form of collateral that can be accessed in the event a borrower runs into repayment problems. Under such arrangements, compulsory savings can typically be withdrawn only with the consent of the group. This provides a form of credit insurance otherwise unavailable to many poor borrowers.

¹⁹ See Boucher et al. (2005) or Boucher and Guirkingner (2007) for theoretical discussion and empirical evidence, respectively, on risk rationing in credit contracts in rural Latin America.

This brings us to the third facet of microfinance, namely microinsurance. Microinsurance is typically group-based and involves payment of premiums in small amounts (often designed to accommodate clients' irregular cash flows), in return for prespecified payouts when a specific condition occurs. Because of the pro-poor nature of microfinance interventions, their clients are low-income individuals or households that would typically be excluded from standard insurance schemes. Although the microinsurance movement is relatively recent, it is becoming an increasingly popular way of addressing health, mortality and weather shocks (Morduch 2004).²⁰ Due to its group-based, community character, it can exploit informational advantages that are not available to private or public insurers that deal with individuals, thereby overcoming moral hazard and adverse selection problems.²¹ In addition, it can overcome the problem of limited scale economies that affect larger insurance companies, since it typically has much lower overhead costs. It can also resolve enforcement problems common in rural low-income economies using peer monitoring, a mechanism unavailable to non-community based private insurers. It can more easily address the problem of low awareness among clients regarding insurance products via outreach efforts, thereby increasing the risk pool. However, the small size of the risk pool in community-based microinsurance schemes is one of its major shortcomings, though many of these schemes overcome this through the use of reinsurance with a larger partner (Tabor 2005). This is particularly important for community-based disaster microinsurance schemes.²² These can cover sudden-onset events, such as earthquakes, floods and cyclones, as well as slow-onset events, such as droughts. Recently, index-based schemes for the latter have been developed.²³ The often use microfinance institutions for promoting and distributing the

²⁰ For examples of specific microinsurance programs, see, e.g., Jutting 2003 on a healthcare scheme in Senegal, McCord et al. (2002) for an integrated scheme in India, McCord (2001) for healthcare schemes from Uganda, Tanzania, India and Cambodia.

²¹ While life insurance is unlikely to be affected by major moral hazard or adverse selection problems, health insurance is likely to be affected by both, as those with insurance may engage in more risky health behavior and those with poorer health prospects will find insurance a more attractive investment, leading to only "bad types" joining. While moral hazard problems can be mitigated by peer monitoring, adverse selection problems are often addressed in a variety of ways, such as requiring a minimum pool size before insurance coverage comes into effect (Tabor 2005).

²² In addition to being community-based, weather microinsurance schemes can also include public and private insurers (Cohen and McCord 2003).

²³ These have been found to be more viable than traditional crop insurance schemes, which are beset by problems of moral hazard, adverse selection and high transaction costs. In the case of index-based schemes, since payouts are not dependent on individual losses but rather on a physical trigger (such as rainfall below a threshold level), there are no informational asymmetries. See Barnett et al. (2008) or Alderman and Haque (2007) for useful summaries.

product to target communities (typically, farmers in low-income economies) (Cohen and McCord 2003).

Accumulating Savings and Credit Associations (ASCAs)

In this semi-formal arrangement, a group of individuals make regular (equal or unequal) contributions to a common fund. However, unlike a ROSCA, an ASCA is more flexible in that the entire fund is not obtained by one person at any given time. One possibility, discussed by Rutherford (2000), is of an ASCA that provides fire insurance to slum dwellers in Dhaka, Bangladesh. In the case of a fire (a highly likely event in a crowded slum), each contributor gets the total of all the contributions that he or she made before the risk is realized. The ASCA fund can also be used in a variety of other ways, including lending (with or without interest) to members or non-members) and can end at a predetermined time (similar to a ROSCA) or not. In the latter case, they allow participants to accumulate savings over the long term on which they can draw loans. Relative to ROSCAs, ASCAs are less transparent as they require greater accounting and fund management skills and also have storage costs.

Cereal Banks

The primary function of cereal banks, a semi-formal institution established in recent years in different parts of Africa (especially in the Sahel), is to provide an in-kind savings facility. These cereal banks function as village cooperatives that buy, store and sell food grains. In the quintessential model, villagers receive a start-up grant or loan from an external agency (usually an NGO) to purchase grains after the harvest, when prices are low (CRS 1998). During the lean season when prices are high, the cereal bank sells its stock locally, at a price above the original purchase price and sometimes below the prevailing market price, using the revenues generated as a revolving fund to refinance its operation in the following year. Apart from providing the start-up grant or loan, the external agency typically also finances the construction of a storage facility. The cereal bank sometimes also assists producers to market their grains in urban markets where consumer prices are higher.

The main objective of cereal banks appears to be commodity price stabilization via storage and the provision of marketing services. Barrett (1997) finds some evidence that cereals banks in Madagascar did indeed reduce intra-annual price volatility, an uncommon form of community-based insurance against covariate risk, and one that benefits non-participants (e.g., food buyers who do not sell grain to the cereals bank) as well as participants. Cereals banks largely redress geographic variation in price risk that tends to disfavor infrastructure-poor rural areas (Barrett 1996). But when they are well-managed, cereals banks can also increase real incomes and reduce the risk of food insecurity by smoothing income seasonally, providing lower prices for net buyers in the hungry season and higher prices for net sellers in the post-harvest period, and by reducing post-harvest losses and creating local emergency buffer stocks.

Grain Banks

The main function of grain banks, a semi-formal arrangement established in recent years in various parts of tribal India, is to enable households to save grains in order to smooth consumption over the agricultural cycle.²⁴ Interviews with grain bank participants in tribal Orissa reveal that members experience difficulty in saving grains by themselves (Bhattamishra 2008). This can perhaps be attributed to self-control problems (which have been shown to impact savings abilities, in empirical studies from both Africa and Asia).²⁵

Grain banks are a descendent of the traditional system of grain *golas* in tribal villages, where surplus grains were collected post-harvest into a common pool which was controlled by the

²⁴ To some extent, grain banks also provide credit as insurance, in that households that are not able to return loans after facing negative shocks find their repayment periods extended. Although, at first glance, they may appear similar to the cereal banks more commonly found in the Sahel, they can be distinguished as follows: grain bank help member households to smooth consumption by providing a savings mechanism, while cereal banks help members with commodity price stabilization and marketing by providing a storage facility.

²⁵ Using data from Kenya, Gugerty (2007) shows that participants explicitly design their rotating savings and credit associations (ROSCAs) to enable exercise of self-control. Similarly, Rutherford (1999) discusses numerous commitment devices used by individuals in rural East Africa to stick to savings plans, including buying a lock box and throwing away the key and the use of “money guards” in which individuals entrust their savings to someone else so that they cannot spend it. Ashraf et al. (2006) provide evidence from an experiment in rural Philippines that individuals with time-inconsistent preferences (that is, individuals whose preferences change over time, such that what they prefer in one period may be inconsistent with what they prefer in another period) have a higher demand for a commitment savings product, and that by use of this commitment savings product, they are able to increase both short-term and longer-term savings.

village head and from which disbursements were largely discretionary, similar to the Zimbabwean institution of the *zunde ramambo* (described later). The current grain bank is initiated by a one-time grant from an external agency – an NGO or the government – with or without the requirement of contributions by participating (member) households. Once established, the grain bank is managed by member households themselves. The grain bank provides loans in the form of grain to member households at times of food scarcity, typically during the lean season. These loans are returned with interest (also in the form of grain) after the following harvest season. Thus, grain banks help member households to cope with anticipated seasonal food shortages and price fluctuations as well as with risk proper.

Credit as Insurance

Informal credit arrangements commonly incorporate some insurance element, enhancing the risk management function of the (informal) contract. There are two broad types of credit-based quasi-insurance. The first adjusts the terms of existing loans according to shocks that happen to either borrower or lender. The best known example of this has been studied by Udry (1990, 1993), who finds evidence of informal, state-contingent loans in rural northern Nigeria that provide insurance against a wide variety of idiosyncratic production and consumption shocks (such as flooding, wind damage, insect infestation as well as illness, rain damage to houses, etc.). In this arrangement, loans are state-contingent. If the borrower faces a negative shock after the loan was agreed, he pays a lower interest rate. If, on the other hand, the lender faces a negative shock after the loan was agreed, then he receives a higher interest rate. Repayment dates are also flexible and state-contingent. Due to the high incidence of idiosyncratic shocks faced by households in this setting, the quasi-insurance component of informal credit arrangements effectively pools risks over time as both parties are likely to find themselves affected by negative shocks (albeit from different sources) over successive periods.

A second way in which credit can build in insurance is through quasi-options. Informal arrangements can create de facto call options on lending, rather like a line of credit that one can tap when needed following some shock. Platteau and Abraham (1987) find evidence of a traditional arrangement of reciprocal subsistence credit as hunger insurance in small fishing

communities in south Kerala, India. In this arrangement, on any given day, fishermen with income in excess of subsistence income provide short-term, interest-free, unsecured consumption loans to a fellow fisherman whose income is below subsistence. By accepting a loan, the debtor makes an implicit commitment that when the creditor falls into distress, the debtor will provide him with a subsistence loan (regardless of whether he has paid back the loan or not). The repayment date is flexible and state-contingent, i.e., it allows for shocks to both the debtor and creditor. Due to the frequent realization of risky events, risks are pooled over time.

3.2.3 *Transfers*

A well-developed anthropological literature documents the existence of reciprocal gift-giving, which can help in risk management if ‘gifts’ are sensitive to shocks or to the observed income or expenditure level of individuals. These observations have been extensively corroborated by the empirical economics literature. For example, Rosenzweig (1988) finds that the net transfers received by a household increase when income falls relative to its average value (although this helps households smooth consumption by only a small amount). Lucas and Stark (1985) provide evidence from rural Botswana that the amount of remittances is responsive to the severity of droughts and ownership of drought-sensitive assets, such as cattle. Deininger et al. (2003) document the dramatic increase in receiving foster children by Ugandan households in the wake of deaths of biological parents due to the HIV/AIDS epidemic. In general, private transfers of cash, food and clothing are seen frequently across the developing world.²⁶ Empirical studies from different developing countries have shown that a large proportion of households give or receive transfers.²⁷ A recent analysis by Cox et al. (2006), using comparable data from eleven low- and lower-middle income developing countries in Eastern Europe, Asia and Latin and Central America, finds that in eight of these countries, 30 to 50 percent of households are

²⁶ Note that transfers may not necessarily be for risk-management purposes. There are models explaining inter-household transfers as based on altruism (for a review, see Linter 1997 as cited in Cox et al. 2004), ex ante precautionary savings (McPeak 2006) or side payments to manipulate recipients’ behavior (Huysentruyt et al. forthcoming). It is also possible that different motives posited in competing alternatives, such as altruism versus exchange, may co-exist, as theorized in Cox et al. (2004), although it may be difficult to disentangle the motives empirically.

²⁷ See, for example, Cox and Jimenez (1995) and Cox et al. (2004) for evidence from the Philippines, Cox and Jimenez (1998) for evidence from Colombia, and Ravallion and Dearden (1988) for evidence from Java.

involved in private transfers, either as donors or recipients. The study also finds that transfers form a significant portion of household incomes.

Transfers as a mechanism specifically for hunger insurance include many examples of traditional institutions in the developing world. Two such examples, which have been adapted by the state to address current needs, include the *indlunkhulu* in Swaziland and the *zunde ramambo* in Zimbabwe (Musi 2007; Ismail et al. 2003). In both these cases, output from common property resources produced using community labor is redistributed to vulnerable and needy individuals in the community. These two institutions have recently been adapted for the provision of state-assisted social protection in the context of the HIV/AIDS epidemic in Africa. The ongoing Indlunkhulu Programme builds on the traditional practice of the *indlunkhulu* in order to provide food to the large population of orphaned and vulnerable children in Swaziland. In this program, conducted under the aegis of the Ministry of Agriculture and the National Emergency Response Council on HIV and AIDS, chiefs and their communities are provided with seeds, fertilizers, pesticides, tractors and technical assistance in order to produce local crop varieties on the chief's lands. In some communities, storage facilities have also been provided. Labor is provided by the community in order to demonstrate their allegiance to the chief, as per the tradition of the *indlunkhulu*. The output is then distributed to orphaned and vulnerable children, identified as program beneficiaries by a committee of local stakeholders.

The *zunde ramambo* (literally, "the chief's granary") was a traditional arrangement whereby the leader designated common land for growing food crops to protect against food insecurity within the community (Kaseke 2006). Labor was provided on a voluntary basis by members of the community, and the output from the common land was distributed to dependent and needy individuals (as well as to the chief's soldiers who protected the community). Under a new program based on the tradition of the *zunde ramambo*, the government provides technical and financial assistance to communities. Traditional leaders are entrusted with identifying common land for the program, and the community provides voluntary labor assistance for cultivating the land. Produce from the land is then distributed to orphans and vulnerable children.

3.2.4 *Insurance for Major Life Events*

Because events such as death/funeral expenses are, in most cases, uncorrelated across participating households, community-based institutions that provide insurance for major life-events are commonly observed. These institutions insure against events that occur with certainty or near-certainty, but with uncertainty regarding the timing of the event. If timing were certain, straight savings products would suffice for managing the lumpy expenses associated with expensive ceremonies. But because the timing of some events – death, marriage, illness, birth – is difficult to foresee and because events may occur before adequate savings have been arranged (and credit constraints may bind), an insurance element commonly becomes necessary to help poor households manage the event.

Funeral/Burial Societies

Traditional funeral/burial societies are found in different parts of Africa and Asia (Platteau 1997) and provide mutual aid when there is a death in the community.²⁸ They have arisen largely in response to the substantial expenditures associated with funerals in developing countries. For example, in a study in the poorest province of South Africa, Roth (2001) finds that funerals cost about fifteen times the monthly income of households. A study in western Kenya, using an innovative methodology based on communities' own perceptions and definitions of poverty, finds evidence consistent across communities and ethnic groups in this region, that the majority of households find funeral expenses to be the cause of falling into poverty or remaining poor (Kristjanson et al. 2004).

Semi-formal burial societies in Africa and Asia, described, for example, in Dercon et al. (2006) and Rutherford (2000) have evolved based on their traditional precursors. They are typically characterized by a well-defined membership base and membership rules. Membership is restricted to individuals living in the same geographical area or belonging to the same religion. As a result, individuals are able to observe fellow members closely and monitor their behavior, mitigating problems of moral hazard (e.g., spending payouts on non-funeral expenses). Moral

²⁸ Burial societies commonly also provide insurance in the case of illness (Dercon et al. 2006 and Dercon et al. 2008).

hazard is not as much of a problem in the case of funeral insurance as in the case of other forms of insurance as, at least in most cases, it is extremely unlikely that individuals precipitate death because they have funeral insurance. In these semi-formal burial societies, contributions are typically made on a regular basis or when a death occurs. Contributions can be monetary or in-kind (in the form of food, labor assistance, etc.). Payments are made for funeral-related expenses incurred when a member or a well-defined set of relatives of the member die, and the amount is typically conditional on the relationship of the deceased to the member.

Health Insurance Associations

As mentioned in section 2, health shocks and related expenses appear to be a major, and perhaps the dominant, shock faced by poor households. In this context, the lack of access to credit and insurance markets is particularly burdensome for the poor, since they are also most likely to lack precautionary savings to fall back on. Health shocks can result in income loss in the short run and, perhaps more critically, lower assets in the long run (if health shocks lead to households selling off productive assets such as land or livestock, or reducing educational and health investments in children), leading to long-term poverty. In this context, access to affordable health insurance is probably one of the most pressing needs for poor households. While traditional arrangements of private transfers between extended families and neighbors have been found to be responsive to health shocks (Fafchamps and Lund 2003; Gertler and Gruber 1997), they are clearly inadequate. Preker et al. (2002) discuss how the difficulties of pooling risks in developing countries limit the possibility of effective (formal or informal) insurance within groups of poor households. In this context, a number of semi-formal community-based health financing schemes have been initiated in recent years in Africa, Asia and Latin America (Tabor 2005; Preker and Carrin 2004; Jutting 2003; Preker et al. 2002; Dror and Jacquier 1999). These are variously known as microinsurance programs, community health funds, mutual health organizations, rural health insurance, revolving drugs funds, and community involvement in user-fee management. Typically, these community-based health insurance initiatives are established in conjunction with health care providers. They are usually characterized by voluntary membership (which can potentially increase adverse selection problems) and have strong community involvement in pooling, revenue collection, resource allocation, and often, service provision. The latter can

ameliorate moral hazard and adverse selection problems. Members make regular ex ante contributions and receive a payout in the event that illness occurs. Among other things, community-based health insurance associations vary on the basis of the extent of coverage (high frequency, low cost events; or low frequency, high cost events), whether coverage involves deductibles or is on a “first-dollar” basis (that is, there are no deductibles or copayments and the insurance association covers the whole loss, typically subject to some prespecified limit), and the degree of risk-pooling.

In a review of community-financed health initiatives, Preker et al. (2002) find micro-level evidence that community financing improves access by rural and informal sector workers to much-needed health care and provides them with some financial protection against the cost of illness. In addition they also find macro-level evidence that risk-sharing in health financing improves all five World Health Organization (WHO) indicators of the performance of a country’s health system (including the level and distribution of health, financial fairness and responsiveness indicators).²⁹ The authors find that community-financed health initiatives frequently suffer from low resource mobilization, small size of the risk pool, poor management capacity in rural and low-income areas. Perhaps most critically from the viewpoint of risk management by the poor, they also find evidence that the poorest are often excluded from these schemes in the absence of some kind of subsidy.

3.2.5 *Common Property Resource Rights*

As described by Platteau (1991), common property natural resources (such as lands, forests, wildlife, fisheries, water) may incorporate elements of quasi-insurance by allowing for state-contingent access. For example, in the arid and semi-arid regions of sub-Saharan Africa, pastoralists regard transhumance (or the seasonal migration of livestock and herder communities), involving common property access to large tracts of rangeland, as a valuable strategy for dealing with rainfall variability (van den Brink et al. 1995). Goodhue and McCarthy

²⁹ The World Health Organization’s assessment system are based on five indicators: overall level of population health; health inequalities (or disparities) within the population; overall level of health system responsiveness (a combination of patient satisfaction and how well the system acts); distribution of responsiveness within the population (how well people of varying economic status find that they are served by the health system); and the distribution of the health system’s financial burden within the population (who pays the costs) (WHO 2000).

(1999) describe how the flexibility in access to these common resources provides pastoralists with an insurance mechanism. Under a system of flexible “fuzzy” property rights, clans can access different pastures at different times, through alliances they make with other clans. These alliances play the role of a mutual insurance system, whereby clans mutually adjust their use of the available rangelands on the basis of relative rainfall shocks to their own pastures and those of affiliated clans.³⁰

Common property resources that involve access on a rotating basis also have a quasi-insurance character. In these cases, as described in Platteau (1991), community members have equal likelihood (in expectation) of receiving fertile and infertile tracts of cultivable land (in the case of agricultural societies) or equal amounts in expected catches (in the case of fishing communities). For example, under the rules of a traditional land tenure system (called *mirasi*) in Tamil Nadu in south India, rights to different parts of cultivable land (differing in fertility levels) comprising the village commons were re-assigned periodically on the basis of a lottery (Haggis et al. 1986, cited in Platteau 1991). Similarly, in a fishing community in Sri Lanka, access to the biggest catches, which depends on both the time of the day and the location in which nets are cast, is allotted on a strict schedule, such that over time, the expected incomes of all fisherman is equalized (Alexander 1977). In another example, in the *warabandi* system of water distribution in rural Pakistan, canal water is distributed to farmers on a rotational basis and provides turns at prespecified times during the course of the week (Murgai et al. 2002).³¹ These traditional rules can help households to smooth consumption over time, thereby reducing risk.

³⁰ While traditional common property arrangements have been observed to provide insurance against adverse shocks, the relevance of these institutions for social protection interventions is increasing limited, given evidence of changes in property rights. As discussed by Baland and Platteau (1998), an evolution of land rights from open access to private property rights is being observed in many cases, probably due to increasing population pressures and the increase in value of common resources due to greater market integration and commercialization.

³¹ The length of the water turn is proportional to the landholding, and access to the water is limited to farmers with land in the watercourse command area. However, despite the rotation system, the *warabandi* system is not able to sustain fair and adequate distribution of water due to severe water fluctuations arising from overuse, illegal diversion of irrigation channels and growing problems with operation and maintenance (Murgai et al. 2002). As a result, households exchange in voluntary water transfers between neighbors, relatives and tightly knit clusters as part of an informal mutual insurance arrangement (ibid).

3.3 Advantages of Community-Based Arrangements

Community-based arrangements have a number of advantages relative to public or private risk-management schemes that do not involve communities in program identification and implementation. We discuss below some of the main advantages.

Targeting efficiency

First, there exists a substantial body of evidence that community participation often (albeit not always) results in improved targeting outcomes.³² Not surprisingly, relative to project managers from outside the community, communities can better identify the most needy and vulnerable among them. Alderman (2002) finds that the social assistance system in Albania, which allows for community discretion in determining distribution, is better targeted to the poor relative to safety net programs in other countries which do not allow for community involvement. He also finds that the poverty targeting in the social system in Albania achieves better outcomes that could be expected based on proxy indicators of targeting using household survey data. He concludes that community-level discretion in determining distribution permits the use of local information that is unlikely to be obtained from survey instruments. In a survey of safety net programs across many developing countries, Subbarao et al. (1997) find that those which involve beneficiary communities, local groups and local NGOs achieve better targeting outcomes. Thus, there is substantial evidence that communities enjoy major informational advantages in identifying who needs assistance and when, thus reducing the costs of verifying the need for indemnity payments and the risks of either false negative or false positives in the decision as to whether to provide transfers/claims payments.

Low information and enforcement costs

In addition to the substantial targeting advantages of community-based programs, they also have an advantage of low information and enforcement costs. Due to the frequent, repeated interactions among members linked through kinship, a village, ethnic group, profession, etc. and the general lack of privacy that characterizes peasant economies and densely-populated urban

³² See Coady et al. (2004) and Conning and Kevane (2002) for relevant references.

communities in developing countries, the effort and circumstances of a member of the community can typically be observed relatively easily. This reduces problems of asymmetric information (i.e., moral hazard and adverse selection) which beset formal credit and insurance markets. Moreover, due to the close proximity of members within a community, the cost of monitoring a fellow member is low and social sanctions are commonly available as relatively low-cost enforcement mechanisms. In addition, given that members of a community typically interact with the same individuals on a repeated basis over long periods of time, unwritten or informal contracts can be self-enforcing as the short-term benefits from renegeing are much smaller than the long-term costs (Posner 1980; Coate and Ravallion 1993).³³ Thus, even in the absence of formal legal courts, community-based arrangements can ameliorate problems of moral hazard and contract enforcement that plague impersonal credit and insurance contracts (Platteau 2000).

However, these cost and information advantages can easily be offset by objectives, such as an ethos of equal transfers to all that militates against targeting,³⁴ and intra-community power relations that may cut against outsiders' objectives to reduce or transfer risk faced by the poor. So one should guard against the naïve assumption that community-based arrangements are necessarily always superior. To date, there are no careful evaluations of the efficacy or rate of return from community-based arrangements, and the extent to which they address problems of informational asymmetries and lower enforcement costs. An empirical project for the future would be to fill this gap in knowledge either through non-experimental econometric work or randomized controlled trials related to community-based arrangements.

³³ This does not deny the possible role of a "moral economy" in tribal or peasant societies which define solidarity as a moral obligation and subsistence as a right. In fact, as discussed by Fafchamps (1992), social norms of mutual assistance can serve to increase the costs of renegeing on (unwritten) contracts, thereby lowering enforcement costs, making informal insurance and moral economy explanations mutually reinforcing, not necessarily strict substitute explanations. On a related note, Platteau (1997) argues that traditional mutual insurance systems are based on 'balanced reciprocity' rather than 'conditional reciprocity' which characterize modern insurance systems, implying that members of these societies are not necessarily always motivated by altruistic reasons.

³⁴ Lentz and Barrett (2005) find evidence suggesting that community-based targeting performs worse among east African pastoralists than does self-targeting food-for-work or traditional targeting by project managers, an effect they attribute to an egalitarian ethos as northern Kenyan communities routinely insisted on equal food aid rations for all residents. Similarly, Harragin (2004) presents a case study of shared targeted transfers in southern Sudan in the context of relief distribution following the famine of 1988. Due to the local perception of aid as a common resource, local authority's redistributed aid equally based on kinship lines after aid organizations distributed aid to vulnerable areas based on malnutrition status.

3.4 Limitations of Community-Based Risk Management Arrangements

Community-based risk management arrangements are not a panacea for uninsured risk, however. In this section, we discuss the main limitations of these arrangements for managing risk successfully.

Exclusion of poorest and other marginalized sub-populations

Modeling traditional mutual insurance as a repeated game, Fafchamps (1992) predicts social exclusion of the poorest due to large external shocks to the system. Several empirical papers have indeed found that certain subpopulations – commonly including the poorest households or individuals – are often excluded from informal insurance networks and enjoy limited, if any, risk pooling with others in their community. For example, using a model of non-linear wealth dynamics and multiple stable equilibria, Santos and Barrett (2006) find that asset transfers within a community of poor pastoralists in southern Ethiopia respond to recipients' losses, but only for those that are not below a certain asset threshold. They show that the poorest herders are both most likely to be “socially invisible” to their neighbors, and thus excluded from insurance networks, and that they are least likely to receive transfers conditional on belonging to insurance networks. Jutting (2003) finds similar evidence from semi-formal institutions from Senegal; the poorest members of the community cannot participate in mutual aid health institutions because they are not able to afford to make contributory payments. Hogset (2005) likewise finds that poorer households in the rural Kenyan highlands are systematically less likely to receive transfers from other households than are better-off neighbors. Using longitudinal household data from rural Ethiopia, Dercon et al. (2008) find that better-off households belong to more mutual insurance groups and have larger social networks. Similarly, using longitudinal data from the Philippines, Quisumbing et al. (2008) find that households belonging to lower asset quartiles belong to fewer mutual insurance groups. They also find that households with more human and physical capital have larger social networks, indicating that exclusion from social networks can be due to reasons other than only economic status. For example, Dercon and Krishnan (2000), using data from different areas of rural Ethiopia, likewise find that particular people – especially women and southerners – enjoy less informal insurance than do others in their sample. Morduch

(2005) provides empirical evidence from the ICRISAT villages in south India that a system of reciprocal transfers is more effective for higher-caste households.

The key point from these various studies is that group formation – for risk management or any other purpose – is voluntary and endogenous, and therefore potentially excludes subpopulations of particular interest to policymakers, such as women, religious minorities, the poorest, etc. Access to groups is not necessarily equal and is not readily imposed exogenously. As discussed by Santos and Barrett (2006), exclusion of the poorest from insurance groups may be a rational response for non-poor agents in the presence of poverty traps, as those trapped in a low-level equilibrium are far less likely to be able to reciprocate in the future and thus become undesirable insurance partners.³⁵ Using data from a village in Tanzania, De Weerd (2005) also finds that the poor have less dense social networks used for risk-management purposes. In addition to exclusion of the poorest, endogenous group formation can also lead to exclusion along the lines of ethnicity, occupation, gender, geographical proximity or other characteristics. For example, Goldstein et al. (2005) find that gender, lineage and social interactions, as well as wealth, matter at the individual level for inclusion in informal social networks among rural households in eastern Ghana. Vanderpuyé-Orgle and Barrett (forthcoming) similarly find patterns of social invisibility and exclusion in rural Ghana.

On the one hand, decisions to exclude insurance partners on the basis of variables such as lineage, occupation and geographical proximity can be rationalized on the basis of keeping information and enforcement costs low. However, on the other hand, more homogenous groups are also less likely to be able to withstand large covariate shocks, as their incomes are likely to co-vary. For example, Grimard (1997) discusses the tension in the selection of insurance partners made by households in Cote d'Ivoire. Households living in close proximity can be easily monitored but are vulnerable to correlated risk, while households living far away from each other

³⁵ A related limitation of community-based arrangements, as summarized in Morduch (1999a), is their inability to withstand different growth rates in incomes and savings for community members. In this case, households that become relatively wealthier over time will have an incentive to opt out, thereby reducing the risk pool, as found in Platteau and Abraham's (1987) study of fishing communities in south India.

are difficult to monitor but do not suffer from correlated risk. This is also discussed by Platteau (1991).

Inability to manage covariate risk

The above discussion brings us to other major limitation of local, community-based arrangements: their inability to manage covariate risk. For example, Reardon et al. (1988) find that after the 1984 drought in the Sahel, transfers accounted for only 3 percent of losses suffered by the poorest households. Pan (2007) finds that while local inter-household transfers offer some effective insurance against idiosyncratic shocks in rural Ethiopia, they offer no insurance against covariate shocks for the obvious reason that all community members find themselves in the same boat with respect to the covariate component of realized income. Community-based systems thus commonly fail in the wake of natural or manmade disasters, during which poor households have limited resources for self-insurance and often cannot avail themselves of local risk sharing arrangements; consequently they must reduce consumption drastically (Morduch 2004). For example, due to the widespread and severe financial crisis in Indonesia in the late 1990s, consumption poverty increased substantially and households reduced investments in health and education (Thomas et al. 2004). In addition, the severity of a shock also determines the efficacy of informal risk management arrangements, as risk sharing may break down in the face of more severe shocks. For example, Gertler and Gruber (1997) find that informal arrangements in Indonesia can provide greater levels of insurance for common health shocks than for serious health shocks. At its most extreme, the failure of community-based risk management arrangements in the face of major covariate shocks is the most common etiology of famine (Ó Gráda 2007).

The frequent exclusion of particular (often poor) households and the inability to handle covariate risk are two important limitations of community-based arrangements.³⁶ In the next section, we

³⁶ Wood (2003) also draws attention to the heavy price that may be paid by the poor for the security gained through participation in informal community-based insurance networks. For example, the immediate need for security can drive the poor to participate in hierarchical relation that potentially affect long-term ability for livelihood improvement.

discuss if and how social protection policy can reinforce community-based arrangements so as to help households manage risk better, while acknowledging and addressing their limitations.

IV. Implications for Social Funds

In this section, we first provide a brief overview of social funds, with a focus on the main features that make them natural instruments for supporting community-based social protection. We then discuss how social funds might be able to strengthen existing community-based risk management arrangements so that they are better equipped to help poor households to manage both idiosyncratic risk as well as covariate disaster risk. We emphasize that these are ideas that will require careful empirical validation through pilot projects using credible evaluation methods (e.g., randomized controlled trials or participant/non-participant matching with known selection and placement criteria).

4.1 Overview of Social Funds

As reported by Rawlings et al. (2003), social funds were first introduced in Bolivia in 1987 as a temporary safety net via the provision of temporary employment, in the context of the economic crisis there. Since then, due to their ability to adapt quickly to local needs and channel resources to communities, social funds have been used to promote a variety of community-led development investments in other countries across Latin America, Africa, the Middle East, Eastern Europe and Asia, and their mandate has expanded to include more longer-term development interventions. Between 1987 and 2000, a total of 98 social fund programs were established (Rawlings et al. 2003). Another 42 programs have been established between 2000-2006 (de Silva and Sum 2007). In a recent overview of social fund lending, de Silva and Sum (2007, pg. 5) define social funds as "...agencies or programs that channel grants to communities for small-scale development projects. They typically finance some mixture of socioeconomic infrastructure (e.g., building or rehabilitating schools, health centers, water supply systems, roads), productive investments (e.g., microfinance and income generating projects), social services (e.g., supporting nutrition campaigns, literacy programs, youth training programs,

support to the elderly and disabled), and capacity building programs (e.g., training for community-based organizations, NGOs and local governments).”

Thus, although social fund programs have different objectives based on where they are implemented, they all involve the identification and implementation of interventions with significant involvement by the local, beneficiary community as well as relevant government line ministries or local NGOs.

The *modus operandi* of a typical social fund is as follows. Community representatives submit funding proposals to a central public agency for the provision of one out of a menu of permissible projects. The central agency allocates funds based on certain prespecified criteria, such as the level of community participation and prevalence of poverty within the community. These criteria are important because funds are typically targeted to poor communities and often involve a co-financing clause (which can be in the form of labor, cash or materials). Communities have direct control over project fund management and decision-making, in keeping with the emphasis on the “community-driven development” (CDD) approach adopted by social funds.

Evaluation evidence of social fund effectiveness

Relative to the number of social fund projects that have been established (a total of 140 until 2006), there have been very few rigorous econometric evaluation studies. Most existing evaluation studies are anecdotal or qualitative in nature, and their findings are confounded by selection issues, especially given the fact that social fund investments are demand-driven. A cross-country analysis of social funds in six countries, namely, Armenia, Bolivia, Honduras, Nicaragua, Peru and Zambia, by Rawlings et al. (2003) is the first study where randomized control design and matching methodologies are used for a rigorous impact evaluation of health, education and water and sanitation outcomes. The authors also examine the targeting efficacy of social funds, the quality of infrastructure using social fund investments as well as their cost efficiency. Only the last criterion is examined relative to alternative, non-social fund, investments.

On the targeting criteria, the authors conclude that social fund projects are well-targeted to the poor in all countries studied. They assess this at two levels: (1) geographic targeting (by examining the distribution of social fund investments across districts ranked by poverty level) and (2) household targeting (by examining poverty levels of households receiving the social fund investment). Overall, they conclude that social funds are pro-poor, with poor districts receiving more per capita than wealthier districts. They also find that social funds are concentrated among poor households relative to nonpoor households. However, the targeting results vary significantly by the type of investment, with certain investments (such as latrines and clinics) better at reaching the poor than others (such as sewerage projects).

The authors use well-known experimental and quasi-experimental evaluation methodologies in order to examine the impact of social fund investments. They use propensity score matching estimators to create the counterfactual in social fund programs in Armenia, Nicaragua and Zambia; randomized control design in an educational project in Bolivia, and multivariate regression analysis and instrumental variable estimation in Honduras and Peru. Here, we summarize the main findings for investments in education and health infrastructure. In general, health centers constructed using social fund investments are found to have higher usage, especially by women and children, compared to non-social fund health centers. In Bolivia, where mortality data before and after the social fund project was implemented were available, infant mortality rates were found to be cut in half. Schools constructed using social fund investments were found to have higher enrollment than non-social fund schools in Armenia, Nicaragua and Zambia but not in Bolivia and Honduras. In Peru, two evaluation studies (examining different populations) were found to reach opposite conclusions. Social fund programs were found to increase educational attainment in all countries except Bolivia (where no difference was found in educational attainment outcomes between social fund and comparator schools). By increasing and protecting investments in health and education, households accumulate human capital which is known to significantly reduce vulnerability to shocks, even covariate shocks (Glewwe and Hall 1998; Barrett et al. 2006).

Overall, the authors find that social fund investments largely reflect community priorities. They indicate the high level of community participation in project identification as an important cause. They also find evidence that community management of resources and contracting reduces unit costs (for both social funds investments as well as those by other agencies). However, more conclusive analyses on the efficacy and rate of return from community-based development programs (relative to other approaches) are needed for quantifying the costs and benefits of community-based arrangements. In particular, in the context of risk management (ex ante, such as education and health investments or insurance, or ex post, such as credit), it is also important to design a careful evaluation study of how and whether community-led interventions (supported by social funds or comparator programs) achieve their objectives, relative to other interventions as well as those which do not involve community participation. Social fund programs can provide a valuable crucible for such an analysis, as they not only involve active community participation but also implement social infrastructure which plays a valuable role in risk management.

4.2 How can Social Funds Help in Community-Based Risk Management?

Social funds focus primarily on improving the institutional capacity of poor communities. This feature, as well as the close involvement of social funds with a range of community, public and market agents and the rapidity and flexibility of their response, place social funds in an advantageous position to enable community-based institutions to manage risk (de Silva and Sum 2007). Figure 1 provides a summary of the different arrangements that we discuss in the previous section using the Social Protection unit's risk management typology. This summarizes the broad range of existing community-based arrangements that could potentially be supported in order to help communities manage risk better.

Given potential differences between these arrangements in terms of their membership and leadership structure, the nature of activities, history, longevity, etc., clearly not all will be equally good candidates for being scaled up and receiving external assistance. The political economy and socio-economic environment of the community will also impact how successfully a social fund

project can be implemented in order to bolster existing risk management arrangements. In addition, informal arrangements may not require the same level of technical assistance or external resources as semi-formal arrangements.

Figure 1 Contextualizing Community-Based Risk Management Arrangements in the Social Risk Management (SRM) Matrix

	Risk Reduction	Risk Mitigation	Risk Coping
Informal/ Indigenous 		<ul style="list-style-type: none"> • Rotating access to common property resources. • Private remittances. 	<ul style="list-style-type: none"> • Rotating savings and credit associations (ROSCAs) • Funeral/burial societies. • Inter-household transfers. • Private remittances. • Redistribution of common property resources (“fuzzy” property rights).
Semi-formal/ External agency	<ul style="list-style-type: none"> • Public goods and services (e.g., veterinary and health care programs; sanitation programs; community-based information systems, small-scale irrigation and infrastructure projects). 	<ul style="list-style-type: none"> • Microfinance. 	<ul style="list-style-type: none"> • Microfinance. • Accumulating savings and credit associations. • Cereal banks. • Grain banks. • Credit-based quasi-insurance & quasi-options. • Health insurance associations • Public employment guarantee schemes.

Note: This figure is based on the risk-management typology developed by World Bank (2001) and adapted by de Silva and Sum (2007). The same community-based arrangement or strategy is found to exist in varying degrees of informality in different regions.

In the absence of evidence on which features of existing community-based arrangements and their environments make them better candidates for outside intervention or scalability, we do not attempt to provide a hierarchy of community-based arrangements that could be successfully supported by social funds. Instead, we provide some general guidance for social fund programs

that aim to support community-based risk management strategies.³⁷ Notwithstanding, future studies that provide evidence on which features of such arrangements make them most suitable for outside intervention would no doubt provide more compelling lessons. Below, we discuss the gaps present in most community-based risk management arrangements that social protection programs such as social funds can potentially bridge. These range from subsidizing the start-up costs for viable financial institutions, subsidizing the participation of poorest households, addressing social exclusion in existing community-based arrangements to expanding the menu of permissible projects and introducing insurance mechanisms to help communities cope with covariate shocks.

Subsidize startup costs for viable financial institutions

Social funds can be used to reinforce and harness the informational advantage enjoyed by community-based arrangements, for example by covering the start-up costs associated with creating viable microfinance institutions, thereby providing households with valuable (but usually absent) credit, savings and insurance products. Relative to strict commercial or central government mechanisms, community-based mechanisms typically enjoy an informational advantage, leading to reduced enforcement, monitoring and transactions costs. This advantage can likewise be harnessed to make financial services delivery commercially viable through group lending and insurance arrangements where they might not otherwise be remunerative for a commercial provider nor attractively priced for poor households.

Subsidize participation of poorest households

Social funds can address one of the most important limitations of community-based risk management arrangements: their frequent inability to insure the poorest households. In the case of many semi-formal risk management institutions (such as a cereal bank to which a household needs to make an initial contribution in order to become a member), poor households often cannot afford the ex ante contributions required to become members of an insurance pool. By providing funding to an appropriate community-based insurance arrangement, social funds can

³⁷Such general guidance is operationally useful only in so far that project design takes into account place-specific vulnerabilities, arising, for example, from socio-physical and climatic factors (e.g., vulnerabilities inherent to coastal regions due to climate change, or in conflict-prone regions characterized by ethnic fractionalization).

subsidize the cost of participation for poorer households, therefore potentially enabling them to become members.

Enable participation by socially-excluded groups

The endogeneity of social groupings also creates potential opportunities to reduce social exclusion, however, and thus perhaps to use social funds to close some of the holes in existing social safety nets. The key is whether cleavages can be identified and directly addressed through the design of social funds or transfer schemes. For example, in an applied theoretical model, Chantarat and Barrett (2008) show how transfers to poor households that are otherwise endogenously excluded from social networks can induce new social relations that not only benefit those who gain directly from transfers but also nonparticipants with whom participants then endogenously link. Where community-based risk management arrangements such as informal insurance networks systematically exclude the poor, for example, social funds that benefit the otherwise-excluded poor or that reduce the costs of social interaction so that people may come together more easily, may have crowding-in effects, rather than the crowding-out effects on which most attention has focused to date.

Expand menu of permissible projects

Social funds can expand their role in enabling communities to manage risk by expanding the menu of permissible projects to include innovative programs. Prominent examples include burial insurance societies and health insurance associations. In fact, community-based arrangements that are NGO-supported are prime examples of programs that, can, at least potentially, be supported successfully by social funds, because of the latter's close link with communities. Other examples include the public goods and services described in section 3.2.1, such as community-based efforts to increase mosquito net coverage in malaria-endemic areas. Social funds can support these efforts by providing credit or subsidies to households unable to purchase nets using their own resources. Social funds can reduce the risk of infectious disease by subsidizing community-based public health programs, such as de-worming or immunization or insect and vector control. They can also reduce the risk of water-borne disease by supporting community-

based sanitation programs that promote changes in individual hygiene practices (such as hand-washing before and after food-handling and after defecation).³⁸

Another way that social funds can reduce risk is by lowering household income variability. They can do this, for example, through community-based and community-managed information centers which enable farmers to obtain price information, thereby reducing price variability in market transactions.³⁹ Expanding the menu of permissible projects also enables social funds to be more inclusive of potentially vulnerable groups that may not be able to participate in more traditional social fund projects such as public works programs (for example, due to labor supply constraints in the case of female-headed households).

Reduce exposure to common shocks

As already discussed, community-based arrangements inherently struggle to internalize shocks experienced by all members. Social funds can, in principle, help communities reduce exposure to covariate risk, for example, through provision of risk-reducing public goods and services. Social funds can, for example, support community-based immunization and sanitation programs that reduce covariate risk by preventing disease and disease transmission. Supporting community-based animal health, pest and pathogen control programs can also reduce exposure to covariate risk by restricting the spread of infectious disease, thereby preventing epidemics of transmission. Social funds can also be used to help create local institutions such as auctions or grain banks or small-scale irrigation schemes that may help reduce risk exposure for many in a community. For example, northern Kenyan communities that established local auctions enjoyed greater price stability than did nearby communities that still relied on traditional, dyadic wet markets for livestock exchange (Green et al. 2006). And villages where cereal banks were constructed to facilitate inter-seasonal storage of rice, the local staple food, had significantly lower intra-annual price volatility than did villages without cereal banks (Barrett 1997). In fact, given the experience of social fund programs with implementing small-scale infrastructure projects, the

³⁸ Zwane and Kremer (2007) summarize evidence on the effectiveness of handwashing in reducing the risk of diarrheal disease in children in developing countries.

³⁹ A recent paper by Jensen (2007) provides evidence that information technology and cellular phones increase profits for fishermen in coastal villages in Kerala.

introduction of small, food storage infrastructure (such as for cereal banks) may be a natural intervention for social fund programs supporting community-based risk management.

Introduce insurance mechanisms for coping with covariate shocks

Social funds can support community-based mutual insurance groups for disaster risk management by building their capacity to tap into reinsurance markets necessary for sustaining large, correlated losses and by underwriting the start-up costs needed to create the relevant insurance products. For example, social funds can be used to support index-based risk transfer products such as the weather insurance contracts being used by Mexican states and municipalities to insure against drought (Alderman and Haque 2007) or the famine insurance posited for northern Kenya by Chantarat et al. (2008). Much of the cost of developing such products is sunk, associated with developing the data series necessary to price the instruments and the monitoring infrastructure to provide objectively verifiable, non-manipulable reporting on the trigger variable or event of interest (e.g., rainfall). As discussed by Skees et al. (2005) and Barnett et al. (2008), weather-based index products can be used to facilitate mutual insurance if a group buys the index and then determines how to distribute payments to members of the group.

On a related note, social funds can harness the power of community-based targeting for effective two-tier allocation of disaster assistance. Alderman (2001) describes a two-tier allocation of social assistance in Albania, whereby the central government provides grants to communes based on commune-level criteria. Local governments then allocate these grants to poor households within their communes based on household-level criteria. Social funds can similarly adopt a two-tier allocation process, whereby it provides in-kind or cash assistance to a community organization on the basis of a non-manipulable index measure (such as rainfall below a certain level over some duration). The community organization can then use its superior local information to allocate program participation (or assistance) to the poorest households.

4.3 Potential Problems

In this subsection, we discuss some of the potential problems that may arise due to the involvement of social funds in supporting community-based risk management arrangements.

These may range from crowding-out of existing arrangements and scalability to political economy and administrative issues.

Crowding-out and other implications of external involvement

The existence of significant risk pooling in the absence of social funds or external intervention should serve as a caution that donors and policymakers need to guard against disrupting existing social insurance arrangements. A literature on the possible crowding out effects of new, exogenous transfers emphasizes these prospective problems (Cox and Jimenez 1995, 1998; Cox et al. 2004). The extent to which these problems are general, however, remains an open question. For example, Lentz and Barrett (2006) find no evidence of crowding out of private transfers by food aid, whether allocated by communities or external agencies, in northern Kenya and southern Ethiopia.

As with any social grouping, the structure and membership of community-based arrangements are inherently endogenous. This is both a risk and an opportunity. As discussed by Dercon (2005), public assistance that improves a household's position outside group-based informal risk-sharing arrangements can change the nature of informal networks. In particular, it can reduce households' reliance on and need for each other, thereby adversely affecting the ability of informal networks to act as a safety net. This can not only crowd out pre-existing community-based risk management, as discussed above, it can also have broader disruptive effects on information flow, cooperative decision-making in production, marketing and community resource management processes, etc. In a randomized evaluation of external assistance to women's groups in western Kenya, Gugerty and Kremer (2008) find that assistance changed the characteristics of groups that had originally made them attractive to donors. Group membership shifted towards younger, more educated women, having a steady flow of income. Group leadership was systematically taken over by men and younger, more educated and better-off women, and the dropout rate from groups due to conflict doubled. Similarly, Munyao and Barrett (2007) document how efforts to devolve authority over land management to local communities in northern Kenya diminished the role of traditional tribal councils and led to the displacement of Gabra migratory herders who previously relied on lands for state-contingent grazing. Group and

authority structures can change quickly in response to outside interventions, whether at household or community levels.

A related concern is that an effectively functioning local mutual insurance arrangement may cease to have a successful record due to involvement by an external agent. In the case of local microcredit institutions that begin to receive support from an international donor agency, repayment records may start to break down since the cost of poor performance are no longer borne by beneficiaries (at least in the short run).

Scalability issues

The above concerns tie in with scalability issues that may arise when a previously existing community-based risk management arrangement is scaled up by a social fund program. The potential of a community-based arrangement is based on its existing structure, but the impact of scaling up is unknown. Murgai et al (2002) show that the transaction costs associated with engaging in a mutual insurance arrangement for water-sharing in rural Pakistan increase with the physical and social distance between members, thereby making mutual insurance in larger groups less effective. In another example, while small savings clubs work effectively due to low operational costs and efficient information flows, the cost and informational advantages can dissipate due to higher management and administrative costs and poorer informational flows as these clubs are expanded. Social fund program managers therefore need to be cognizant of potential scalability issues.

Vulnerability to manipulation by local elites

As discussed by Mansuri and Rao (2004) and Conning and Kevane (2002), community-based arrangements are often vulnerable to capture by local elites. This indicates that program managers need to be cognizant of community power dynamics in order to limit the misuse of project resources. Ensminger (2007) provides evidence that community-driven development (CDD) projects may also be vulnerable to manipulation by non-traditional leaders. Especially in isolated rural communities where effective checks and balances are absent, needy individuals (often younger and somewhat educated) familiar with the workings of district-level

administrative officials and operations may be able to manipulate the process by which projects are awarded, beneficiaries identified and benefits disbursed. If these individuals attain leadership positions in CDD projects, benefits can be channeled to non-poor households with relative impunity, leading to leakage of benefits to unintended recipients.

Therefore, only communities with egalitarian preferences and relatively transparent decision-making systems will generally be more effective than outside agencies in targeting resources so as to benefit poor households within communities. As Mude (2006) demonstrates in discussing cooperatives in central Kenya, simple flaws in the design of local elections can lead to rampant corruption. By investing in services that have a “public good” character, social fund program managers may reduce the potential for capture by local elites or non-traditional “development-project brokers”.

Administrative issues

There may be distinct differences in the administrative structure and community mobilization strategies involved in determining a periodic investment or preparing a proposal, compared to overseeing a regularly running program. Given that social fund programs thus far have experience mainly with one-off projects, expanding the menu of permissible projects to include ongoing programs implies that program managers may require new expertise in administrative techniques relevant to overseeing such programs.

Moral hazard and adverse selection problems

While the use of interpersonal relations in community-based arrangements mitigates informational problems considerably, the latter are not completely eliminated. For example, in the case of burial or life insurance, program managers need to be aware that even in close-knit communities, a potentially fatal condition (such as being HIV-positive) may likely not be common knowledge, thereby leading to adverse selection problems. Program managers must also remain aware of the potential pitfalls of using social funds to subsidize poorer households. Moral hazard issues may arise, as households may have an incentive to engage in risky behavior if they are not internalizing the costs of insurance.

Limitations of community management and decision-making

Although community-based arrangements may have superior local knowledge and achieve better targeting and contract enforcement outcomes, they may face limitations in technical decision-making and management. For example, Khwaja (2004) presents empirical evidence from Northern Pakistan that greater community participation in non-technical decisions results in better project outcomes, but not so in the case of technical decisions. Thus, greater external assistance in technical decision-making and management may be critical for successful project outcomes.

V. Conclusions

Poor populations face considerable uninsured risk. Especially when there is reason to believe that poverty traps may exist and compound the threat posed by adverse shocks, there is considerable return to reducing risk exposure through improved ex ante risk management and providing improved coping strategies through insurance and insurance-like arrangements. Communities throughout the globe commonly take these tasks upon themselves, banding together to reduce risk exposure and to provide informal mutual insurance within the group. This is important to recognize and such behaviors merit reinforcement.

Relative to market-based arrangements, community-based arrangements have important informational advantages. Since rural communities typically have intimate knowledge regarding the circumstances and needs of member households, they are better able to identify the most needy and vulnerable among them, thereby improving targeting outcomes. In addition, due to their close physical proximity and frequent, repeated interactions between them, they can use relatively low-cost methods of contract enforcement, such as peer monitoring and the threat of social sanctions. These advantages enable the viable delivery of financial services, such as microinsurance, microcredit and microsavings, at prices that are accessible to poor households, which is often not the case for a typical commercial provider.

However, gaps systematically appear in social safety nets as the endogenous nature of group formation commonly leads to the exclusion of some more marginalized subpopulations. Further, population increase, greater economic and geographic mobility, and increased exposure to covariate shocks associated with natural disasters, war and macroeconomic crisis place growing strains on community-based risk management arrangements. Opportunities seem to exist to deploy social funds in support of such arrangements.

Previous social fund projects have been demand-driven, i.e., they have been implemented depending on the need expressed by the community. However, social funds have the potential to bolster the risk-management ability of communities in a more proactive manner. They can do so by not only expanding the menu of permissible projects but by also using new tools and strategies (such as the provision of subsidies or promoting the involvement of previously excluded groups). For example, if social fund program designs can identify and address cleavages in existing social safety nets, they can benefit the previously excluded groups. In addition, in communities divided by ethnic or religious affiliations, social funds can mobilize the different groups for the provision of a common public good that is valuable to all members, thereby reducing the costs of social interaction and enabling people to come together more easily. Social funds can also benefit poorer households who are unable to make the initial contribution needed to join an insurance group by subsidizing the cost of participation for them. In addition, given the growing prevalence of covariate shocks and the limitations of community-based arrangements to withstand them, social funds can build their capacity to tap into reinsurance markets, thereby enabling them to transfer risk outside the community. Social funds can also underwrite the start-up costs needed to create relevant insurance products such as index-based insurance products, which can potentially address both sudden-onset as well as slow-onset events.

In supporting community-based arrangements, social fund programs need to be aware of the fact that the interpersonal relations at the heart of community-based interactions also make these arrangements vulnerable to manipulation by local leaders or more educated individuals acting as “development project brokers”, especially in poor, isolated rural communities where there are

few checks and balances. Thus, political economy features of the community need to be carefully considered, as well as the potential impact of outside intervention on the membership and leadership structure of existing community-based arrangements. In order to reduce the potential for manipulation, social fund program managers can invest in services that have a public good character, and in particular, services that reduce asset risk, thereby not only reducing short-term poverty but alleviating the more persistent effects of shocks. Social fund program managers should also be aware of the other limitations affecting community-based arrangements, such as low resource mobilization, small size of the risk pool and poor management capacity in rural and low-income areas, in order to offset them to the extent possible. Moreover, social fund program managers also need to be cognizant of the fact that although community-based arrangements may have superior local knowledge, they may face limitations in technical decision-making and management. Thus, greater external assistance in technical decision-making and management may be instrumental for successful project outcomes.

To conclude, given the broad range of existing community-based arrangements (which, among other things, can be marked by differences in membership and leadership structure, history, longevity, nature of activities, etc.), studies that provide evidence on which features of community-based risk management arrangements make them more conducive to being scaled up can inform successful involvement by social funds,. Finally, while previous studies have documented the targeting and informational advantages of community-based arrangements relative to arrangements that are not community-based, there are no careful evaluations of the efficacy or rate of return from community-based arrangements. Future studies which fill this gap in knowledge through either non-experimental econometric work or randomized controlled trials related to community-based arrangements can promote the understanding of their costs and benefits vis-à-vis other arrangements. Social fund projects can provide a valuable crucible for such analyses, given that they involve active community participation and also implement social infrastructure that plays an important role in risk management.

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Summary Findings

Risk and its consequences pose a formidable threat to poverty reduction efforts. This study reviews a plethora of community-based risk management arrangements across the developing world. These types of arrangements are garnering greater interest in light of the growing recognition of the relative prominence of household- or individual-specific idiosyncratic risk as well as the increasing shift towards community-based development funding. The study discusses potential advantages (such as targeting, cost and informational) and disadvantages (such as exclusion and inability to manage correlated risk) of these arrangements, and their implications for the design of innovative social fund programs.

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