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Microinsurance: The Next Revolution?

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Managua is a city of gaps. City blocks are scattered across the terrain as if they had been dropped from an airplane and had then broken into pieces upon hitting the ground. A block of buildings is followed by an open field, and then more buildings, and then a stretch of grass and dirt, more buildings, another field . . . and on it goes. The topography is a product of the earthquake of 1972, which killed six thousand people and toppled 80% of Managua's buildings. Neither the right-wing president Anastasio Somoza Debayle, nor the leftist Sandinistas, nor subsequent governments have patched the city together again. The scattered blocks are an ongoing reminder to residents of both the power of nature and the limited means they have to respond.

The most recent reminder of nature's vast power came in 1998 when Hurricane Mitch sat over Nicaragua for ten days. Three thousand people are reported to have died, and 20% of the population suffered directly. Even today, the hurricane is cited to explain disrepair and dislocation. While Mitch was particularly devastating, hurricanes course through the Caribbean with regularity. Nevertheless, most citizens and businesses cannot buy insurance against weather-related risks; as in much of the developing world, insurance markets are thin and public responses are limited. Health insurance, life insurance, property insurance—all are unobtainable for average citizens in most of the world, and this is doubly so for the poorest.

Below, I describe why this is so and how new ideas can change things. Others have so far focused mainly on how to build strong institutions that can provide insurance. In this essay my focus is instead on designing prod-

ucts that can most help poor customers deal with the risks that life throws before them.

THE INSURANCE CHALLENGE

My calculations from a 1998 survey of areas affected by Hurricane Mitch show the implications of missing insurance markets. For 21% of households, the main response to the hurricane was not to draw on insurance, nor to use savings, nor to borrow funds; it was a drastic reduction in consumption. As a "second most important response" another 18% report drastically reduced consumption. Most households in the survey (89%) reported receiving no assistance at all after Mitch, and for those who did report getting assistance, NGOs—not the government nor private insurers—were the largest single provider.[1]

Development experts are recognizing how intimately the lack of insurance and the persistence of poverty are related. When World Bank staff set out to define a new agenda on reducing poverty for the Bank's 2000/2001 *World Development Report*, addressing risk and vulnerability was pushed to top billing alongside traditional concerns such as spurring economic growth and creating jobs. Indeed, Ravi Kanbur, a Cornell economist on leave as the report's director, resigned his World Bank post rather than demote concern with risk (as well as concern with political "voice" and "empowerment") as bank higher-ups had requested he do.[2] In the end, the report still forcefully makes the case for addressing risk. The International Labour Organisation followed suit by taking the reduction of risk as a unifying theme in its work on social safety nets (as does the Bank's own Social Protection Strategy Paper), and the UNDP has also jumped on board.

The challenges in reducing risk are great. The lack of insurance markets has not happened through inattention, and hundreds of doctoral dissertations and other scholarly studies explain in careful detail why insurance markets remain so problematic. Despite the generally strong markets of the United States, for example, 44 million poorer households had no health insurance in late 2004. And insurance for U.S. farmers exists largely because taxpayers have subsidized it at a rate of about $5 of subsidy for every $1 of insurance provided (Yaron et al. 1997).

Around the world, most poor people are farmers, and crop insurance faces the same fundamental difficulties as in the United States. In the early 1990s, I spent parts of several summers in villages in Shandong province in northern China, investigating how poor households were coping with risk after the dramatic rural reforms that had started in 1978. The short answer to the question was "not too well." While on average incomes were growing at 8% per year, a quarter of the population in any given year was suffering losses of about 20% (Morduch and Sicular 2001). This was mainly due to fluctuations in agriculture as households battled a range of plagues with biblical echoes: drought, floods, hail, pest infestation, and livestock disease. The state-

owned People's Insurance Company had been revived in the 1980s, but it provided agricultural insurance purely to appease policy makers, and the company's lack of enthusiasm translated into miserly insurance coverage. Farmers could not buy coverage against infestation of cotton by boll worms, for instance, despite their frequent appearance and destructiveness, and the maximum coverage for losses was 70 yuan per mu, although the cost of production was roughly 200 yuan per mu from planting to harvest.[3] All the same, the company still suffered losses on its agricultural lines.

The Chinese experience has parallels globally; experts whom I have canvassed have difficulty naming even one truly successful small-scale crop insurance program anywhere (i.e., one that serves the poor, makes profits, and meaningfully reduces the largest risks). To make profits, insurers must pay out less than they take in as revenues, but Hazell (1992) finds the ratios of costs to revenue all well above break-even levels (i.e., 1 or below) in his studies of Brazil (4.6), Costa Rica (2.8), Japan (4.6), Mexico (3.7), and the United States (2.4). Most crop insurance, such as the People's Insurance Company's agricultural lines, is both subsidized and relatively ineffective.

Why do farmers have difficulty finding effective insurance? The problems are several, and a handful of Nobel Prizes in economics have been given to those who generated the key insights. First, "moral hazard" is omnipresent; once insured, farmers are less likely to apply the extra fertilizer, labor, and other inputs needed to maximize chances of success: the very fact of being insured raises the probability of losses. Second, "adverse selection" arises since farmers in the riskiest situations are naturally the most eager to purchase insurance. When insurers cannot tell beforehand who is most risky, they have to charge everyone the same price for insurance, but often that only ends up pushing "safer" farmers farther away. If insurers lowered prices, they might be able to attract a better pool of clients, but profit margins will fall if the improvement in clients is less than proportional to the price drop. This problem could be solved by charging different prices to different types of farmers, but the insurance company (at least at the outset) has little to go by when distinguishing the best prospects from the worst. The third issue is analytically less interesting (and thus receives less attention from academics), but it is often critical in practice: it's hard for insurers to provide crop insurance in a cheap way, since contracts are generally for small amounts and damages have to be assessed by insurers on an individual basis; scale economies are thus limited.

This all sounds grim: transactions costs are high and information problems are ubiquitous—not to mention that clients have limited cash flows and may not be literate or numerate, and that enforcement mechanisms are limited. Private-sector insurers naturally look elsewhere for profits, leaving state-subsidized companies as the main players—and even they are having a rough time of it.

But is it really as hopeless as it sounds? Despite the woeful litany, the

characterization sounds a lot like the situation facing the "microfinance" industry in the 1980s—the early pioneers such as Muhammad Yunus of Bangladesh's Grameen Bank also faced great skepticism when arguing that it is possible to lend profitably to the poor. Credit markets in poor regions, like insurance markets, are also characterized by similar problems of high transactions costs, moral hazard, adverse selection, limited cash flows, low education levels of clients, and weak enforcement mechanisms. And in the case of credit, too, the main "formal" lenders also had too often been bloated, subsidized, ineffective state-owned companies.

But today, thanks to a series of clever innovations, microfinance is booming, and the Grameen Bank served 3.4 million clients in early 2004 (which is perhaps one quarter of all microfinance clients in Bangladesh); a 2003 tally puts the global total at over 80 million served—with rapid growth predicted by some advocates (Daley-Harris 2004). Marguerite Robinson (2001) has described an international "microfinance revolution." Can the "microinsurance revolution" be far behind? Is it possible to find ways to sell small-scale insurance to low-income clients—profitably and on a wide scale?

Several promising innovations are described below: credit life insurance, health insurance partnerships, and weather insurance. Each was created to serve populations that were previously unserved, and workable institutional solutions are emerging. I argue that the next step must be to shift from the question of what creates workable institutions to the question of how to refine designs to best serve low-income populations. In doing so, current approaches must be reassessed in order to most improve clients' lives—and to avoid doing unintended harm.

WHAT WE DON'T KNOW (AND WHY IT SHOULDN'T STAND IN THE WAY)

The prospects are exciting, but much remains unknown. The expanding gaggle of microinsurance advocates is ahead of the available evidence on insurance impacts. Microinsurance advocates argue that selling insurance to the poor will give households new freedoms to pursue profit without fear. They argue that incomes will rise as a result and that poverty will fall substantially. (They thus argue that their projects should be generously funded by donors.) The advocates may be right, at least in the long term, but it is impossible to point to a broad range of great evidence on which to base that prejudice.

The problem is not that empirically inclined academic economists are not interested in risk. Quite the opposite. But they have not had much usable data from low-income countries with which to work, and academic economists have (understandably) stuck close by the questions that they can answer most precisely. The precise answers that they yield are not yet the stuff on which revolutions can be built. Taken together, though, the scattered studies make it clear that the poor have some protections but, in general, remain

highly vulnerable to risk. The evidence is still far from perfect, but it's adding up.

The problem for researchers is that to gauge the role of fluctuations, they need economic data on the same households over many years. Typical surveys, though, are done only once; some are done twice on the same households; and only a very few offer a longer time dimension. The longest suitable series that exists covers eight years for roughly 120 households in three villages in south India (see Walker and Ryan 1990). The questionnaire is rich, and over fifteen years, a series of excellent studies have been based on the data. But, at the end of the day, the survey still covers just three villages in the semiarid tropics. Researchers ideally want more than ten years of data on a much broader range of people and regions.

A second issue for researchers is that households are enormously resourceful. This means that not only do households take pains to protect consumption in the face of a period of unusually low income, but they will also have taken steps long beforehand to make sure that future income declines are limited in the first place—for instance, through crop and labor diversification, choice of technology, and risk-reducing input use. Because the ways that this is done are so varied (and often partial and overlapping), researchers have had limited success in calculating how costly these protective measures are (and thus we do not have good estimates of gains from replacing the measures with market-based insurance). A few estimates exist (again, mainly from rural south India), but we don't have anything very solid yet that, by itself, can justify major investments.[4]

A third issue is that the results we have, particularly those from rural south India, have been too frequently misinterpreted by readers eager for confirmation of their particular hunches. Some readers have been quick to conclude that (1) in the absence of formal insurance, villages brim with informal substitutes (such as the reciprocity-based gift-giving to those in need described by Besley 1995a); (2) informal insurance is principally cooperative as communities come together to help each other out; and (3) given all this activity within villages, policy makers should concentrate on regionwide risks. While there is variation, of course, my reading is that the three propositions are most often more wrong than right.[5]

Part of the confusion can be traced to interpretations of an important and clever paper by the University of Chicago economist Robert Townsend. He asks whether community-based informal insurance arrangements in the three south Indian villages might in fact be so effective that the poor can do a very good job of protecting their consumption levels against unusual swings in income—that is, he asks whether points 1, 2, and 3 in the preceding paragraph hold in the data. To do this, he shows that if "perfect insurance" occurs, then villagers will effectively pool their resources so that unusual losses are compensated for and unusual gains are contributed to the communal pot. I will help you today, the logic goes, if you promise to help me when I need it. This is not socialism: the pot is not necessarily split evenly

for all; the goal is only to smooth away idiosyncratic ups and downs. To everyone's surprise, Townsend finds that in these poor, isolated villages, this kind of "perfect insurance" is a "near miss."

If the result is right, community-based informal sharing must be strong, the village can be seen as a "natural insurance unit," and policy makers can stop worrying about the vagaries of risk facing individual villagers. Instead, policy makers can turn attention fully to "aggregate," covariant risks that villages as entities cannot deal well with on their own: droughts, floods, price swings, disease epidemics, and the like.

But the work after Townsend's initial research shows the picture to be more complicated (Townsend 1995). In my doctoral dissertation I returned to the ICRISAT data and found weaker evidence of insurance, using a somewhat different statistical formulation (Morduch 1991, 2004). Nor could I find much evidence of risk-sharing within caste groups, arguably an even more "natural" insurance unit.[6]

Youngjae Lim and Robert Townsend (1998) have written an especially illuminating follow-up study. Townsend's 1994 study had shifted attention from individual coping mechanisms (as studied fruitfully by, for example, Mark Rosenzweig 1988) to how the mechanisms add up when taken together. Thus immediate concern was only with whether consumption was protected from income swings, but not how this was achieved. Lim and Townsend (1998) instead sift through the data to find the specific ways that households are actually coping. The biggest part of the answer is that the action is not via informal community-based sharing after all. It is through individuals building up grain reserves and drawing them down as needed (a sort of in-kind saving). It is self-insurance. And this, coupled with the new evidence on imperfect informal insurance, radically changes the policy picture. It suggests the need to pay attention to idiosyncratic risk along with regionwide risk, and it points to the strengthening of opportunities to save as an important policy area.

Interpreting results on imperfect insurance is not easy. Townsend (1994) had asked a sharp question and gotten a sharp answer (even if it proved not to be entirely robust), but subsequent analyses are open to multiple interpretations. Take the interesting result of Jalan and Ravallion (1999) from China, for example; they show that on average 40% of idiosyncratic income shocks are translated into consumption shocks for the poorest households in a large longitudinal survey conducted between 1985 and 1990. This is an important result, confirming the vulnerability of the poor in a large non-Indian data set. But the average is hard to parse, and the result admits various possibilities. Is it that all poor households are vulnerable to 40% of shocks? Or can, say, half in fact fully insure while the other half suffers 80% of the loss? Or is it something in between? Are positive shocks handled very differently from negative shocks? Are protections achieved through borrowing and saving? Through community-based informal insurance?

Perhaps more important, the studies after Townsend, including those from

China, don't tell us about how well households deal with aggregate risk. Putting concern back onto the idiosyncratic risks of individual villagers was a step forward, but researchers are now at risk of losing track of aggregate, regionwide risks in the process (Townsend's method remains mute on the impact of shocks facing an entire region). We have bits of evidence on the impacts of droughts and floods and other major disasters, but studying periods of upheaval, with its attendant migration and dislocation, is hard in practice; it is also difficult to separate out the impact of an aggregate shock from other contemporaneous changes.

So, where should researchers go? From a policy perspective, ideally we would like to know probabilities that losses will occur (and how great they will be)—whether they are due to aggregate or idiosyncratic forces—within a given number of months or years. This is exactly what Gisele Kamanou, a Berkeley-trained statistician at the United Nations, and I set out to do in defining a framework to measure vulnerability in a way that might guide policy in Africa, but we quickly ran up against data issues (Kamanou and Morduch 2004). We used the data set with the greatest coverage of people (a World Bank survey from the Ivory Coast), but it tracked households for just two successive years. With two years of data, forecasting risk thus became impossible without heroic assumptions. But to see how far we could get, we pushed on. As we did so, however, the data proved to be noisy in ways that were particularly pernicious: measurement error was impossible to disentangle from actual fluctuations in income and consumption. The very poorest households as judged in the first year had huge increases in income by the second (+50%), and the very richest in the first year had what seemed like big losses (−30%). Perhaps we were seeing a spectacular case of what statisticians and geneticists call "reversion to the mean," but it seemed more likely that we were seeing a spectacular case of measurement error. The pattern we saw was consistent, for example, with the income of the "poorest" in the first year being severely undercounted (making for a big jump to a more accurate figure in year 2), while that of the "rich" was severely overcounted at first. To understand how vulnerable households really are, we need longer, cleaner data series. But policy makers should not hold their breath while waiting.

The experience with microfinance suggests that there is no need to despair. Muhammad Yunus, for example, did not wait until he had all the answers before he set up the Grameen Bank of Bangladesh. But once it was set up, the introduction of the bank provided a way to learn about credit markets by comparing outcomes in places served by Grameen versus outcomes in control villages (Morduch 1998). As a result, we are now learning about the nature of credit markets in ways impossible before microfinance was established. So too, I expect, with microinsurance. The best hope is that microinsurance implementers will forge ahead with pilot projects, and that, if they are carefully rolled out (with an eye to evaluations), a great deal about risk, vulnerability, and poverty can be learned in the process.

THINKING ABOUT LIFE INSURANCE

Let's return to the scene on the ground. Before getting to crop insurance and health insurance, take a moment to consider life insurance. If you support a family, one of the greatest fears is that one day you will no longer be alive to do so. From your family's perspective, your death will surely bring emotional and economic loss—and, more immediately, high funeral costs. Demand for life insurance among the poor is thus considerable. Neither moral hazard nor adverse selection is nearly as problematic here as it is for crop and health insurance (Would you be more likely to walk to the very edge of a precipice or to take up a pack-a-day smoking habit just because you have a life insurance policy in the drawer?), and verifying the loss is straightforward: either there was a death or there wasn't. (To further allay moral hazard, insurers typically exclude death from suicide, driving while intoxicated, and illegal activity.) So here, at least, we would expect to see private insurance companies jostling their way into the market. But we don't, at least not yet.[7]

Instead, to the extent that we see any action, it is informal, community-based arrangements without legal status, operating below the radar screen of the formal economy. Stuart Rutherford (2000), for example, describes burial societies in the fishing communities of Cochin, India. The societies are typically based around a church, temple, mosque, or social club, and each involves 300 people or more. In a typical fund, each member contributes at least 2 rupees per week (about 4 cents). For each rupee per week contributed, the society guarantees that if a member of the contributor's family dies within the year (with exclusions for infants and partial exclusions for young children), the family gets Rs. 500 (about $10) from the fund. Since the fund is taking in at least Rs. 600 per week (or about Rs. 300,000 over fifty weeks), the fund can cover deaths of at least thirty people. If each family has four adults (or their equivalent), there are at least 1,200 individual lives being insured, and the fund covers costs as long as no more than 5% of participants die in any given year; in typical years surpluses are generated and redistributed to members, but in other years extra collections are made.

This kind of burial society can be found worldwide, but the security comes at a high price for relatively healthy households. Each family puts in at least Rs. 100 rupees over the year (two rupees per week over fifty weeks), and the family gets Rs. 1,000 if an adult dies. To be a "fair" bet, the family would thus have to reckon that there is a 10% chance that an adult in their family will die in any given year (assuming that the fund exactly breaks even). If the probability is much lower, the family would be better off simply putting the money into the bank. To put the probability in perspective, the 10% figure implies that participants believe there is roughly a 30% chance that an adult in the family will die within three years—and roughly a 50% chance that an adult will die within six years. For a household with elderly members, these odds may not be far off, but for a young family (absent the threat of

killers such as AIDS), the odds are wildly unfavorable. Nevertheless, burial societies remain widely popular.

Partly their popularity comes from the fact that most people have a hard time thinking straight about probabilities. This was most famously demonstrated by the experimental psychologists Daniel Kahneman and Amos Tversky, who found that attitudes toward risk depend critically on how questions are framed (Kahneman et al. 1982). Hospital patients will show more interest in undergoing radical surgery when told that there is, say, an 80% survival rate versus when told that there is a 20% chance of dying—even though the two scenarios are, of course, just different ways of saying the exact same thing. And even if people think consistently, there is typically a lot of uncertainty about survival probabilities, not to mention the fact that calculations can get complicated quickly (to check the calculations for the simple example in the preceding paragraph, I used a computer spreadsheet program). On top of it all is uncertainty about one's general economic situation in the future, the ability to get public handouts and private charity, and so on. Add in emotional elements, and it becomes clear why even young, healthy families seem highly risk averse when they take "bets" on life insurance. The continuing mystery, again, is why private companies don't edge their way into this market. Compared with operations attached to the local church or mosque, private companies have far better opportunities to diversify risks and to offer a range of products, helping to cut effective costs and to increase quality for clients.

Here, the example from Cochin helps to make another point that gets us closer to the answer; burial societies handle a lot of small change: the equivalent of 4 cents a week, collected from each of three hundred families. Burial societies can operate this way because they are based out of local institutions where people already gather weekly; the societies can thus collect small payments as part of other activities. But an insurance company, coming from outside, lacks that advantage (not to mention lacking a reputation that insurees can trust). Insurance companies typically collect insurance premiums one-by-one, and given the costs of record-keeping and staff salaries, 4 cents a week per household looks like very small change indeed.[8]

In China, the People's Insurance Company cleverly addressed the small-change problem by setting up deposit accounts for purchasers of certain kinds of insurance—but instead of receiving interest, the depositors got insurance coverage. The PIC was able to do this because farmers were already used to having savings deposits and most were experiencing fast income growth. But consider the Cochin case again. If the insurance company earns, say, 5% per year on its deposits, depositors would need to put in Rs. 2,000 to generate Rs. 100 of annual premiums for the insurer. While Rs. 2,000 is just $40, it is a lot of money for a poor household to have up front and to tie up in a "nonproductive" investment (bearing in mind that the insurance payout in the event of death is just $10). The deposit-cum-insurance scheme

deserves wider application, but it will likely be a hard sell in the poor neighborhoods of Cochin.

Another option is to have insurees pay premiums less frequently (16 cents per month? 50 cents per quarter?), and this will work if the insurer's cost structure is low enough and insurees can save up reasonably well. Saving is not so easy, though, and if the solution was really as simple as collecting premiums less frequently, my guess is that we would currently see a lot more private life insurance. Stuart Rutherford, the founder and chairman of Dhaka's SafeSave cooperative, has written a helpful volume, *The Poor and Their Money*, which describes the ubiquity of savings difficulties through example after example of informal attempts to overcome them (Rutherford 2000); the theme of savings constraints is developed as a main theme of Armendariz de Aghion and Morduch (2005).

One hope is to pay local agents a small commission to collect funds and check claims. As microfinance institutions are starting to recognize, they are often already in this niche, and the emerging microinsurance movement is closely allied to the established microfinance movement. The most popular insurance product offered by microfinance institutions is credit life insurance. For a percentage of each loan, the bank will pay off any debt outstanding in case of death (plus, often, a bit extra for the family). This insurance mainly helps the lenders, and it turns out to be profitable, given the infrequency of death. As of several years ago, FINCA Uganda, for example, charged an additional interest rate of 0.5% per month for credit life insurance, with a $630 payout in the event of accidental death; FINCA's partner, the American Insurance Group, was enjoying a profit rate of 30% at these prices. Of course, access is permitted only if you're in a microfinance program. The ongoing challenge here is to provide wider access to life insurance, as well as to health, property, and crop insurance.

HEALTH INSURANCE: FOCUSING ON THE BIGGEST RISKS

There is a movement afoot to provide health insurance, and the model of the Self-Employed Women's Association (SEWA) of Ahmedabad, India, is one of the most discussed. SEWA has been ambitious in the health care that it provides its members, who are typically poor women working in the informal sector, but it has had difficulty covering costs. The problem with providing health insurance is that both moral hazard and adverse selection are rife. NGO practitioners pushing forward here are finding two problems. First, the risks can be sizable, so a large, established partner is invaluable to provide reinsurance. Second, historical data on health risks are inadequate to yield insurance premiums with much accuracy. Microinsurers thus see the value of their new endeavors at the same time they see how easily they could lose their shirts if they've guessed wrong about risk levels and costs.

As a result, putting caps on coverage is nearly universal, as is excluding coverage of particularly expensive health conditions. FINCA Uganda's health

plan, for example, covered a range of in-patient and out-patient services but chose to exclude ongoing coverage of AIDS-related illnesses. The impulse to cap payouts is understandable: it reduces the insurer's exposure to risk, and this will surely calm jittery accountants.

The other fairly common practice is to cover expenses starting with the first dollar spent.[9] It is popular with clients, but can lead to lots of costly, small claims that insurees could typically handle without insurance. Moreover, to reduce moral hazard, economic theory tells us that insurers should insist on sizable copayments and deductibles. Coverage from the first dollar spent too easily leads to wasteful overuse.

The use of caps also does not sit particularly well with the economic theory of the household. To make insurance most valuable, the theory suggests that an enlightened manager would want to do the opposite: to cover the expenses that are really big and exclude the small items. The priority ought to be on costs that would cripple a household—that is, priority should go to insurance against "catastrophic" events.

So why isn't economic theory more persuasive? The microinsurers that I have spoken to suggest that if they don't give "first dollar" coverage, people will wait until their problems become severe before going to the doctor. This hardly makes sense, unless clients are very ill-informed about the nature of their problems. If that's so (and Das and Das 2001 provide interesting evidence from India suggesting that it's not far-fetched), it is possible that first-dollar coverage actually saves money by encouraging preventive treatment. A better solution, though, would be to improve public information about health conditions and the importance of prevention.

Another often-heard defense of "first dollar" coverage is that clients want to get something back for the money they spend on insurance. At the end of the year, for example, new clients sometimes demand their money back if they haven't had to use a doctor within the year. This is a marketing problem, and should not be used to justify the dubious practice of "first-dollar" coverage. On the other hand, the idea of rebating some money to clients who have made no claims within a period isn't bad (in fact, that's the way some U.S. insurers create positive incentives for clients).

Another issue is reinsurance. Catastrophic events are costly but usually rare, and an unexpected cluster of large claims can wipe out an insurer (whereas it may be able to handle a steady stream of small claims capped at low levels on its own). Moving to insurance against catastrophic events requires that the insurer have a way to handle potentially large losses. The best way to do that is by reinsuring through arrangements with other insurers (paying another company to share some of the risk). This requires some sophistication, but it is not conceptually difficult and there are signs that reinsurers are becoming interested in relationships in low-income countries (partly to diversify their own portfolios of activities).

Another set of issues arises with the ability to pay for health insurance. If households suffered only from a clear set of readily identifiable and insurable

risks, designing appropriate coverage could follow textbook rules. But a major problem for the poor is that (1) many risks are not insurable (such as the risk that farmers will suffer falling crop prices) and (2) bad news tends to come in waves.

This has two implications. First, customers may be particularly price-sensitive when it comes to buying insurance. Not because they ignore health problems, but because they don't want to tie up scarce funds by paying insurance premiums. This makes the ability to save an important way to self-insure, and I come back to this at the end of the essay.

The second implication is that uninsurable risks may drag households down, pushing them to the point at which it's impossible to keep paying premiums for health insurance. Most programs cut off coverage for households not in good standing, which means that even after paying premiums regularly for years, the household is left to fend for itself once it gets behind in its payments. If a household then faces a health crisis, it is doubly hit since it must contend both with the original (uninsurable) loss and the fact that its health problems are no longer covered. One way to address this problem is to create an emergency loan and grant fund that is earmarked for households with a history of reliable insurance payments but a current demonstrated emergency.

The bottom line is that providing health insurance (particularly against catastrophic events) can reduce the vulnerability of low-income households in important ways, just as it does for higher-income households. But in this population especially, insurance may not be enough on its own. Coupling insurance with health education and an emergency fund to cover temporary nonhealth crises can make insurance more effective for clients and providers alike.

INSURING RAINFALL: A NEW SOLUTION TO AN OLD PROBLEM

Providing life and health insurance will help reduce vulnerability, but when it comes to rural risk, agriculture is where it's at. Existing microfinance institutions, though, focus mainly on urban or rural nonagricultural enterprises—conspicuously not on agricultural ones. Microfinance participation may reduce risk for farm households by allowing them to diversify their income sources (evidence showing this is presented in Morduch 1998), but microfinance institutions are far from being in a position to do much about crops and rural risks directly.

Falling crop prices can hit poor farmers hard, as can bad weather. We turn here to the latter problem. Insuring farmers against generic crop losses has turned out to be full of difficulties for reasons cited already (high transactions costs, moral hazard, and adverse selection). Recently, though, policy makers are rethinking their options. Why not abandon trying to insure against bad crop yields and instead insure against bad weather directly?

While Hurricane Mitch brought too much rain, a more common fear in Central America is in fact the opposite: drought. So why not create a product that pays out in the case of drought, irrespective of actual crop yields? The beauty of such drought insurance is that the insurance company pays clients when rainfall (as measured at a local weather station) fails to reach specified targets (see Hazell n.d.; Skees et al. 2004). Since rainfall is determined by higher powers than those commanded by the typical client, client behavior and client characteristics have no bearing on the probability of adverse events. Insurance executives can thus sleep at night without worrying about moral hazard and adverse selection. The insurer's problem is simplified to setting prices appropriate for the specified weather patterns. With short data series, this is an imprecise science, but at least it is mainly a technical exercise.

The other beauty of rainfall-linked insurance is that in principle the market is open to everyone. With crop insurance, only farmers are clients. But with rainfall insurance, the local cobbler or tailor can insure as well, and in that way gain a bit of protection from weather-related demand and supply fluctuations.

Another advantage of rainfall insurance is that it is simple to administer—and this may speed up the time between the experience of the drought and the disbursal of funds. After Hurricane Mitch hit Nicaragua in October 1998, for example, the Swedish aid agency SIDA set up a program in the hills of Matagalpa to rebuild infrastructure and assets. But money for the program was not allocated by SIDA until seven months after the hurricane, and the first disbursement to farmers was not for another two months; the final disbursement was in July 2000, one year and nine months after the hurricane.[10] In contrast, one of the most promising aspects of rainfall insurance is that it offers the possibility of very speedy initial disbursements, free of the usual politics and bureaucracy.

But rainfall insurance also faces practical hurdles, two of which are often noted. First, reinsurance, once more. On its own, an insurance company will likely have difficulties handling claims made for events (such as regional drought) that affect a great many people at the same time. A large company can diversify its portfolio by selling contracts in very different climatic zones, but possibilities are limited in a relatively small place like Nicaragua. Selling part of the portfolio to an international reinsurer provides local insurers with a way to limit their risk to acceptable levels. The downside is that the local insurer must do the administrative legwork involved in collecting premiums and disbursing payments, must conform to the wishes of the reinsurer in terms of types of coverage, and then must split a share of profits with the reinsurer. The bigger, practical tension is that the need for reinsurance necessitates scale and sophistication. Unlike microfinance, say, it's not practical to start very small and slowly scale up, village by village; here, the local insurer must start fairly big if it is to entice an international reinsurer to be interested.

The second well-recognized problem is "basis risk." Driving from Lake Managua up through the hills of Matagalpa, one can immediately sense how variations in elevation translate into continually changing microclimates. The frequency of microclimates adds to the idiosyncrasy of rainfall patterns even within small regions of Nicaragua, reducing the correlation between incomes and rainfall as measured at the local rain gauge or weather station. The greater the degree of idiosyncrasy, the less useful rainfall insurance is to potential clients (although, on the other hand, an insurer's portfolio gets more diversified).

There are two forces that combine to create basis risk. First, the local rainfall gauge may simply be too far away to provide data relevant to conditions throughout the region. This can be solved in principle by putting up more rainfall gauges, but that's the easy part. The harder part is to set premiums. To do that, the insurer needs to know gauge-specific probabilities of risk, and this requires having historical data on rainfall patterns for every gauge. Lack of disaggregated historical data on rainfall patterns turns out to be an important constraint in Nicaragua, and it is not exceptional; the constraints imposed by basis risk and missing data have helped push rainfall insurance to the back burner in much of the world. The sooner efforts to collect better data can begin, the better.

In Morocco, on the other hand, a World Bank study found more promising results. Moroccan agriculture is based on cereals, and the correlation between cereal revenues and rainfall was found to be 60%–80%. Since the incidence of drought and overall GDP growth move closely in Morocco, the World Bank hopes that addressing weather risk will ultimately affect economic growth rates. Based in large part on the Morocco study, the World Bank's International Financial Corporation invested $80 million in 2002 to establish a Global Weather Risk Facility in partnership with Aquila, a Kansas City-based trader in weather-based derivatives (World Bank 2002). Rainfall insurance will now get a trial run, and we will be able to track its impacts.

RAINFALL INSURANCE: FROM THE POPULATION'S PERSPECTIVE

The establishment of the Global Weather Risk Facility provides hope for many farmers. But it is not the end of the road. First, it is mainly a pilot project. Second, the analysis of microinsurance here has mainly concerned constraints and opportunities for insurers only. But it is happy, healthy customers who are of ultimate concern, not just happy, healthy insurers. We need to step back and think about society's welfare more broadly. We have taken it as a given that more insurance is necessarily a good thing. But we need to ask whether that's in fact true for everyone in all circumstances—and if it's not, what can policy makers do about it?

Some of the most important aspects of insurance will be indirect. The first important indirect impact of rainfall insurance involves possible changes

in the pattern and level of consumer prices. It's useful to turn to Amartya Sen's (1981) work on the Great Bengal Famine for an analogy. He describes how the famine resulted from price increases faced by poor households—in a situation where food availability was not low enough to create famine conditions by itself. Price increases typically particularly harm landless laborers and other net consumers.

As a result, landless laborers are often the ones worst off in droughts. Will introducing rainfall insurance improve their lots—or possibly worsen them? An advantage of rainfall insurance over crop insurance is that now landless laborers have the possibility of purchasing insurance against drought, something that's impossible when only crop insurance is being sold. If they buy rainfall insurance, landless laborers will have added purchasing power in times of crisis. This should be a great advantage.

The flip side is that landless laborers may not have access to rainfall insurance (or an equivalent); this may be because prices for premiums are too high for households with inadequate cash flows, marketing is ineffective, or, as I found in Nicaragua, insurers are reluctant to sell directly to individuals, preferring to reduce transactions costs by selling through established groups and associations. In this case, the landless poor could be made substantially worse off by the introduction of rainfall insurance. Now farmers (who are insured) will have added purchasing power to bid up prices for whatever food and services are available in the market during the drought. The price increases will further diminish the lot of the landless. The landless can thus be made worse off relative to a world without rainfall insurance.

In short, rainfall insurance has very positive elements, but if it is not accompanied by other measures for the poor, it can exacerbate losses for some of the most vulnerable populations. The magnitude of costs and benefits of rainfall insurance is an empirical question, and there is no a priori reason to assume the worst. But there is an a priori reason to be careful about distributional effects.

Let's also go back to the initial claim that rainfall insurance banishes concerns about moral hazard and adverse selection. This is certainly so from the perspective of the provider of rainfall insurance. But, if we look closer, it's not so from a global perspective; introducing rainfall insurance can improve or worsen moral hazard and adverse selection in other markets.

For example, provision of rainfall insurance could make other informal risk-sharing arrangements work less well. Consider, say, neighbors agreeing to help each other out in times of need. Informal insurance in this example is characterized by the inability to write binding, enforceable long-term contracts. Instead, the arrangements stay together only as long as the expected value of staying true to the arrangement exceeds the value of reneging and facing risk alone (i.e., self-insuring). The arrangements weaken when the self-insurance option improves.[11] Rainfall insurance can hurt by improving the fallback position for those who renege on their obligations and are thus left to their own devices (which, lucky for them, would now include buying

rainfall insurance). Of course, partially displacing informal arrangements by introducing rainfall insurance here could, on net, be a good thing, but there will inevitably be winners and losers (Morduch 1999a).

There is no empirical evidence yet that speaks to the magnitude of these kinds of spillovers, but they are there in principle, and we should be mindful. As rainfall insurance moves into view, it's important to see what it can do and what it can't. No one thinks it's a panacea, but it is promising. Still, failure to take into account the broader perspective of social welfare can lead to programs that can increase the vulnerability of some populations, despite the best of intentions.

CONCLUDING THOUGHTS

The poorest citizens of the poorest countries are typically exposed to the greatest risks. Earthquakes, floods, drought, disease, crime all tend to hit the poor hardest. Vulnerability and poverty go hand in hand, but microinsurance holds out the promise of breaking a part of the cycle that ties them together. The aim is to create sustainable, professionally run insurance programs that protect poor households from the most debilitating losses.

The task is tall, and reading the academic literature on insurance—strewn with well-documented accounts of why and how insurance markets fail—should be enough to force most observers to abandon hope. But knowing the main pitfalls is a first step toward finding workable innovations, and important new ideas are emerging. The past decade has seen renewed possibilities for life insurance, health insurance, and rainfall insurance that can substitute for crop insurance. The products and processes are mainly small-scale and imperfect, but they hold promise.

One early and critical lesson is that the constraints on building better insurance programs include more than the information asymmetries on which economists have focused most sharply. To be workable, solutions will have to address a set of very practical issues. The first is the need for reinsurance, the second is having data on which to base premiums, and the third is the ability to cut the costs of dealing with many small transactions. The parallel to the "microfinance revolution" offers cause for encouragement, but establishing widespread insurance will require more detailed regulatory architecture than the microfinance pioneers ever needed.

More than anything else, though, it will be important to keep the clients' views in mind. And doing that may mean taking a broad view of what providing "insurance" entails. Much vulnerability can be reduced through mechanisms that don't involve insurance per se. As with health insurance and rainfall insurance, both efficiency and equity may be enhanced by providing public education about the nature of risks, creating emergency funds to help households falling behind in their premium payments, and combining for-profit insurance provision with subsidized provision for poorer populations.

Being well-insured also often means having a cushion of savings on which

to fall back. Researchers have shown that villagers in south India were mainly easing risks through individual savings behavior (implemented by adjusting buffer stocks of grain). In Chinese studies, too, savings offered the main form of protection. In Bangladesh, Stuart Rutherford is piloting new savings products in Dhaka's slums, and is generating much interest. In Indonesia, savings facilities are in high demand by the poor (Robinson 2001). Having savings allows households to manage their affairs more flexibly, and it cushions against losses that are fundamentally uninsurable. Economists have long argued that the poorest households are simply too close to subsistence levels to save much. That idea is right in principle, but in practice even households substantially below the poverty line are eager to stash away something for later—if given an appealing way to do so.[12] The new microinsurance initiatives bank on the proposition that the same holds for insurance.

NOTES

1. These results parallel Morris et al.'s (2002) account of Hurricane Mitch's impact in Honduras.

2. See Wade (2001) for a lively account focusing on the U.S. Treasury's behind-the-scenes machinations with regard to World Bank policy, and Kanbur (2001) for his take on the disagreements.

3. One mu is 1/15 hectare or 1/6 acre; households commonly held three to four mu per family member. The 1990 official exchange rate was 4.77 yuan per $1, but purchasing power parity–adjusted exchange rates were roughly six times as high.

4. The issues and evidence are discussed in greater length in Morduch (1991, 1995).

5. For more on the issues here and below, see Morduch (1999a).

6. Ravallion and Chaudhuri (1997) similarly find additional evidence of imperfections, as do others; see Deaton (1997) and Morduch (2004).

7. There are of course exceptions, such as Delta Life's Gono Bima (People's Insurance) of Bangladesh, but closer inspection shows it to be effectively a lending institution in the guise of a life insurance company, and it has been doing poorly at that (Matin 2002).

8. Delta Life's Gono Bima of Bangladesh did, though, base its life insurance program on individual weekly collections of premiums, so it is not impossible.

9. Some programs have coinsurance rates and deductibles, but these tend to be kept low.

10. Information is from an interview with the head of the SIDA-funded program, Matagalpa, August 2000.

11. For useful discussion and references, see Ray (1998); a related example of "dysfunctional crowding out" in an insurance context is provided by Arnott and Stiglitz (1991).

12. Although they lack convenient access to banks, poor women in Bangladesh whom I interviewed in December 2002 confided that they routinely sew savings into their saris for safekeeping; others give savings to neighbors to guard or stash coins and small bills in hiding places around the home. Promising pilot projects are developing new mechanisms to make such accumulation easier, but their impacts have not yet been evaluated.

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