Micro-insurance: the next revolution?

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1. Introduction

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 6,000 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 twenty percent of the population suffered directly. Even today, four years later, 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 instead my focus is on designing products that can most help poor customers deal with the risks that life throws before them.

2. The insurance challenge

My calculations from a 1998 survey of areas affected by Hurricane Mitch shows 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; the main response was a drastic reduction in consumption. As a "second most important response" another 18% report drastically reduced consumption. Most households in the survey (89%) report receiving no assistance at all after Mitch, and, for those that did report getting assistance, NGOs—not the government nor private insurers--were the largest single provider.[1]

Development experts are recognizing how intimately related are the lack of insurance and the persistence of poverty. 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

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[1] These results parallel Morris and others' (2002) account of Hurricane Mitch's impact in Honduras.

and vulnerability was pushed to top billing alongside traditional concerns like 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 Labor Organization 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, 41 million poorer households remain without health insurance. And insurance for U. S. farmers exists largely because taxpayers subsidize it at a rate of about $5 of subsidy for every $1 of insurance provided (Yaron and others, 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 1990's, 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 they provided agricultural insurance purely to appease policymakers 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 their agricultural lines.

The Chinese experience has parallels globally; experts that 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 spend 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 U.S. (2.4).

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[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 3 to 4 *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.

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Most crop insurance, like the People's Insurance Company's agricultural lines, are 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 further 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 twenty years ago—and the early pioneers like Muhammad Yunus of Bangladesh's Grameen Bank also faced great skepticism when arguing that it is possible to profitably lend 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 had also 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 serves 2.4 million clients (which is not even one quarter of all microfinance clients in Bangladesh); a recent tally puts the global total at over 30 million served – with rapid growth predicted by some advocates (Druschel and others, 2001). 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 re-assessed in order to most improve clients' lives – and to avoid doing unintended harm.

3. 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 are 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 adademic economists are not interested in risk. Quite the opposite. But they have not had much useable 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 semi-arid 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—e.g., 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

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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 (like 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 region-wide 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—i.e., 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 together so that unusual losses are compensated for and unusual gains are contributed to the communal pot. 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 insurance must be strong, the village can be seen as a "natural insurance unit," and policymakers can stop worrying about the vagaries of risk facing individual villagers. Instead, policymakers can turn attention fully to "aggregate", covariant risks that villages as entities cannot deal well with on their own: droughts, floods, price swings, health 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 and 2001). Nor can 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, e.g., Mark Rosenzweig, 1988) to instead look at 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

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[4] The issues and evidence are discussed in greater length in Morduch (1991 and 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, 2001.

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 insurance 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 region-wide risk, and it point 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 got 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 collected 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, region-wide 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)--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 UN, 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, 2001). 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 (heroically we hoped). 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 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 under-counted (making for a big jump to a more accurate figure in year 2), while that of the "rich" was severely over-counted at first. To understand how vulnerable households really are, we need longer, cleaner data series. But policymakers should not hold their breath while waiting.

The experience with microfinance, however, has taught me not 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 micro-insurance. The best hope is that micro-insurance implementers will forge ahead with pilot projects, and that, if carefully rolled out (ideally with randomized location decisions, following the example of the Mexican PROGRESA education project) a great deal about risk, vulnerability, and poverty can be learned in the process.

4. Thinking about life insurance

So, let's get back to the scene on the ground. Before getting to crop insurance and health insurance, let's stop for 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 able 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 are nearly as problematic here as they are 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

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[7] There are exceptions of course, like 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).

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 rupees over 50 weeks), the fund can cover deaths of at least 30 people. If each family has four adults (or their equivalent), there are at least 1200 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 re-distributed to members, but in others extra collections are made.

This kind of burial society can be found world-wide, but the security comes at a high price for relatively healthy households. Each family puts in at least Rs. 100 rupees over the 50 weeks, and the family gets Rs. 1000 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 that there is roughly a 30% chance that an adult in the family would die within three years—and roughly a 50% chance that an adult would die within 6 years. For a household with elderly members, these odds may not be far off, but for a young family (absent the threat of killers like AIDS), the odds are unfavorable. Yet 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, for example, that hospital patients showed more interest in undergoing radical surgery when told that there was, say, an 80% survival rate versus when told that there was a 20% chance of dying; the two scenarios are, of course, just different ways of saying the exact same thing (Kahneman and others, 1982). And even if thinking 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 took advantage of 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 hand-outs and private charity, etc. 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 to 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. Four cents a week, collected from each of 300 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, four 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 their deposits, depositors would need to put in Rs. 2000 to generate Rs. 100 of annual premiums for the insurer. While Rs. 2000 is just $40, it is a lot of money for a poor household to have upfront and to tie up in a "non-productive" investment (bearing in mind that the insurance pay-out 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. Savings constraints matter, 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 *Safe*Save cooperative, has written a beautiful volume on "the poor and their money" which convincingly describes the ubiquity of savings constraints through example after example of informal attempts to overcome them (Rutherford, 2000).

One hope is to use local agents to collect funds and check claims, paying them a small commission. As microfinance institutions are starting to recognize, they are often already in this niche, and the emerging microinsurance movement is closely allied to the now-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 at the time 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 pay-out in the event of death by accidental cause; 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.

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

5. 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 healthcare 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, that the risks can be sizeable, 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. Micro-insurers thus both see the value of their new endeavors at the same time that 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 pay-outs 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 sizeable co-payments 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—i.e., 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 coming to the doctor. This hardly makes sense, unless clients are very ill-informed about the nature of their problems. If that's so (and Jishnu and Saumya 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

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[9] Some programs have co-insurance rates and deductibles, but these tend to be kept low.

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 US 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 they may be able to handle on their own a steady stream of small claims capped at low levels). 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 through 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 only suffered 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 (like 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 on its own once it gets behind in its payments. If a household then faces a health crisis, they are doubly hit since they must contend both with the original (uninsurable) loss plus the fact that their health problems are no longer covered. One way to address this problem is to create an emergency loan and grant fund that is ear-marked 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 non-health crises can make insurance more effective for clients and providers alike.

6. 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 non-agricultural enterprises—conspicuously *not* 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, policymakers 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., and Skees and others, 2001). 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 7 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 (like regional drought) that affect a great many people at the same time. A large company can diversify its portfolio by selling contracts in very

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

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 down-sides are that the local insurer must do the administrative leg-work involved in collecting premia 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 they are to entice an international reinsurer to be interested.

The second well-recognized problem is so-called "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 idiosyncracy 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 idiosyncracy, the less useful is rainfall insurance 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 time series 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 that 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 effect 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, Inc., 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.

7. 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 that 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 policymakers 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 can create particular difficulties for landless laborers and other net consumers.

Landless laborers are often the ones worst off in droughts. Will introducing rainfall insurance improve their lots – or possible 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.

8. Conclusion: saving as insurance

There has been much good economic work on risk and insurance, and it points the way to innovations that can provide better access for the poor. But constraints include more than the information asymmetries on which economists have focused most sharply. To be workable, solutions will have to address the very practical issues that have arisen repeatedly in discussions of microinsurance. 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.

There is a potential role for public action with regard to the first two at least, with the first being most pressing. The more people that create insurance schemes, the thicker (and thus cheaper and more effective) will be the reinsurance market. But coordination failure may keep the market from getting that far. Public action to encourage reinsurers to develop products and protocols to deal with micro-products could be an important step toward expanding insurance access broadly.[12] Collecting reliable data on health, demographic, and agricultural trends will also aid the development of a well-functioning market. The hope is that with those basic elements in place, innovations can be found to deal with both information asymmetries and transaction costs. The microfinance parallel offers cause for encouragement, but establishing widespread insurance will require more detailed regulatory architecture than the microfinance pioneers needed. Finding ways to cut costs will be best left to entrepreneurs, although there is scope for supporting pilot studies.

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[11] For useful discussion and references, see Debraj Ray (2000); a related example of "dysfunctional crowding out" in an insurance context is provided by Arnott and Stiglitz (1993).
[12] The World Bank, especially it's International Finance Corporation, and the ILO are taking a lead on re-insurance.

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 may also mean having a cushion of savings to fall back on. Researchers have showed that villagers in South India were mainly allaying 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 from 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 poorer 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.[13]

Practitioners have worked hard, sometimes against the odds, to get micro-insurance efforts started. A micro-insurance revolution could be a major step toward improving the well-being of the world's poor, but, it is important to design products with a full picture of how the products will fit into clients' lives (and possibly affect non-clients too). In that light, we should also bear in mind that micro-saving can be a key part of a household's best insurance strategy.

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[13] Although they lack convenient access to banks, poor women in Bangladesh that I interviewed in December 2002 confided that they routinely sew savings into their saris for safe-keeping; 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.

References

Arnott, Richard and Joseph Stiglitz (1991). "Moral Hazard and Nonmarket Institutions: Dysfunctional Crowding Out or Peer Monitoring?**"** *American Economic Review* 81 (1): 179-90.

Besley, Timothy (1995a), "Non-market Institutions for Credit and Risk-Sharing in Low-Income Countries," *Journal of Economic Perspectives* 9, 115 – 127.

Besley, Timothy (1995b), "Savings, Credit, and Insurance," in Jere Behrman and T.N. Srinivasan, eds., *Handbook of Development Economics*, vol. 3. Amsterdam: North-Holland.

Das, Jishnu and Saumya Das (2001). "Trust, Learning, and Vaccination: Case Study of a North-Indian Village," *Social Science and Medicine*.

Deaton, Angus (1997), *The Analysis of Household Surveys*. Baltimore: Johns Hopkins.

Druschel, Kate, Jennifer Quigley, and Christina Sanchez (2001). *State of the Microcredit Summit Campaign Report 2001*. Available at www.microcreditsummit.org/pdfs/SOCReport2001.pdf.

Hazell, Peter (1992). "The appropriate role of agricultural insurance in developing countries," *Journal of International Development* 4: 567-581.

Hazell, Peter (n.d.) "Potential role for insurance in managing catastrophic risk in developing countries," International Food Policy Research Institute, draft.

Jalan, Jyotsna and Martin Ravallion (1999), "Are the Poor Less Well Insured? Evidence on Vulnerability to Income Risk in Rural China," *Journal of Development Studies*.

Kahneman, Daniel, Amos Tversky, and Paul Slovic (1982), *Judgement under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press.

Kamanou, Gisele, and Jonathan Morduch (2001). "Measuring vulnerability to poverty," forthcoming in Stefan Dercon, ed., *Insurance Against Poverty*, Oxford University Press.

Kanbur, Ravi (2001). "Economic Policy, Distribution and Poverty: The Nature of Disagreements," *World Development.*

Lim, Youngjae and Robert Townsend (1998), "General Equilibrium Models of Financial Systems: Theory and Measurement in Village Economies," *Review of Economic Dynamics* 1 (1), January, 59 - 118.

Matin, Imran (2002) "New thinking and new forms of microfinancial services in Bangladesh: A comparative study of ASA, SafeSave, and Gono Bima," IDPM working paper, University of Manchester.

Morduch, Jonathan (1991). *Risk and Welfare in Developing Countries*. Unpublished Ph. D. dissertation, Department of Economics, Harvard University.

Morduch, Jonathan, (1994), "Poverty and Vulnerability," *American Economic Review* 84, May: 221 – 225.

Morduch, Jonathan (1995) "Income Smoothing and Consumption Smoothing," *Journal of Economic Perspectives* 9(3), Summer, 103 - 114.

Morduch, Jonathan (1998), "Does Microfinance Really Help the Poor? New Evidence on Flagship Programs in Bangladesh," Princeton University, draft.

Morduch, Jonathan (1999a), "Between the State and the Market: Can Informal Insurance Patch the Safety Net," *World Bank Research Observer* 14 (2), August, 187 – 207.

Morduch, Jonathan (1999b), "The Microfinance Promise," *Journal of Economic Literature* 37 (4), December, 1569 - 1614.

Morduch, Jonathan (2001). "Consumption Smoothing Across Space," forthcoming in Stephan Dercon, ed., *Insurance against Poverty*, Oxford University Press.

Morduch, Jonathan and Terry Sicular (2001). "Risk and Insurance in Transition: Perspectives from Zouping County, China," chapter 8 in Masahiko Aoki and Yujiro Hayami, eds., *Community and Market in Economic Development*, Oxford University Press.

Morris, Saul, Oscar Neidecker-Gonzales, Calogero Carletto, Marcial Munguia, and Juan Manuel Medina (2002). "Hurricane Mitch and the Livelihoods of the Rural Poor in Honduras," *World Development* 30 (1): 49 – 60.

Newbery, David and Joseph Stiglitz (1981), *The Theory of Commodity Price Stabilization*.

Ray, Debraj (2000), *Development Economics*. Princeton, NJ: Princeton University Press.

Ravallion, Martin and Shubham Chaudhuri (1997), "Risk and Insurance in Village India: Comment," *Econometrica* 65(1), January: 171-84.

Ray, Debraj (2000), *Development Economics*. Princeton: Princeton University Press.

Robinson, Marguerite S. (2001), *The Microfinance Revolution: Sustainable Finance for the Poor*. Washington, D.C.: World Bank.

Rosenzweig, Mark R. (1988). "Risk, Implicit Contracts, and the Family in Rural Areas of Low Income Countries." *Economic Journal* 98. December. 1148 - 1170.

Rutherford, Stuart (2000), *The Poor and their Money*. Delhi: Oxford University Press.

Sen, Amartya (1981), *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford: Clarendon Press, chapter 6.

Skees, Jerry, Panos Varangis, and Donald Larson (2001). "Can financial markets be tapped to help poor people cope with weather risks?" forthcoming in Stephan Dercon, ed., *Insurance against Poverty*, Oxford University Press.

Townsend, Robert (1994) "Risk and Insurance in Village India," *Econometrica* 62, May, 539-592.

Townsend, Robert (1995), "Consumption Insurance: An Evaluation of Risk-Bearing Systems in Low-Income Countries", *Journal of Economic Perspectives* 9, 83 – 102.

Wade, Robert (2001), "Showdown at the World Bank," *New Left Review* 7, January-February 2001: 124-37.

Walker, Thomas S. and James G. Ryan (1990). *Village and Household Economies in India's Semi-Arid Tropics*. Baltimore: Johns Hopkins.

World Bank (2000), *World Development Report 2000-1*: *Attacking Poverty*. Washington, DC: World Bank.

World Bank (2002), "IFC Invests in Weather Insurance in Emerging Markets", DevNews Media Center article (available at www.worldbank.org).

Yaron, Jacob, McDonald Benjamin, and Gerda Piprek (1997), *Rural Finance: Issues, Design, and Best Practices*. Washington, D.C., World Bank, draft.