

Overcoming Barriers to Microinsurance Adoption: Evidence from the Field[†]

Shawn Cole

Harvard Business School, Boston, MA 02163, U.S.A.

E-mail: scole@hbs.edu.

This paper provides an overview of the academic literature on microinsurance adoption in emerging markets, with a particular emphasis on randomised control trials. I discuss what we know, what we can reasonably hope to know using the extensive work on microcredit as a comparator, and what the available evidence implies for public policy. Particular attention is paid to the case for a greater role for the government in supporting the development of microinsurance.

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Introduction

In the next 20 years, more than a billion people will enter the formal financial system. Payment services will most likely be the initial draw, but savings, credit and insurance products will surely follow. While this transition to the formal economy appears inevitable, it is less clear how quickly these additional products will be adopted and the degree to which this expansion of financial services will improve consumers' welfare and firms' bottom lines.

This paper explores the role of microinsurance in the domain of household finance around the world, with a particular emphasis on the barriers to adoption and the potential for public–private partnerships (PPPs) to reduce or eliminate these barriers. Much, though by no means all, of the case for public involvement in microinsurance rests on two broad arguments.

The first is that insurance improves welfare: just as governments may support education, food aid, or other goods and services for the poor, so too might they provide insurance. The first part of this essay, therefore, reviews recent field work in developing countries that seeks to document the beneficial value of insurance to the insured. Though this discussion will be firmly grounded in (and cite) the most recent academic literature, this paper is not intended as an exhaustive literature review (for an excellent recent review of the literature on the demand

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for microinsurance, see Eling *et al.*¹ and the papers that follow in a special issue of this journal on microinsurance.² These field studies are expensive and time-consuming; in addition to reviewing the evidence base they create, I will discuss their strengths and limitations.

A second important argument supporting government intervention in insurance markets is the presence of classical market failures—adverse selection and moral hazard. Early economic models³ suggest that when the decision to purchase insurance is voluntary, and clients have private information about the risks they likely face, higher-risk clients are more likely to purchase insurance, resulting in a higher-cost risk pool. This, in turn, can drive up the premium insurance companies must charge and drive low-risk clients out of the market, and, in the extreme, could lead to a complete “market unravelling”. “Moral hazard” occurs when individuals take less care because they are insured; for example, driving less carefully after purchasing auto insurance.

The balance of this paper will examine, sequentially, the various barriers that may limit efficient and widespread microinsurance markets, with particular attention to how government interventions may improve the functioning and reach of these markets. I will consider perspectives of clients, governments and the firms offering insurance products.

Taken together, the discussion will generate several lessons on the scope for the public and private sectors to work together to promote microinsurance around the world. To preview the conclusions:

- The evidence base provides at best a weak case for direct government expenditure on life or health microinsurance to reduce poverty. There is, to date, almost no high-quality academic evidence that life or health microinsurance products can improve welfare (nor any evidence that they reduce it); but there are also good reasons why it may be very difficult to design a credible study that demonstrates insurance reduces poverty.
- In contrast, robust evidence suggests production-related microinsurance can increase economic output. Several studies show agricultural index insurance can improve farmers’ planting decisions, causing them to plant riskier, higher-yield crops.
- Reducing transaction costs is key, but the role of transaction costs in insurance adoption is rarely studied by academics. Robust mobile payment infrastructure, which in many cases may require government support, would greatly facilitate the provision of many types of insurance and hence lower transaction costs.
- Financial education, while promising in theory, often fails in practice. While it may be painful for academics who teach finance for a living to admit it, there is little evidence that traditional financial education programmes can improve financial decision-making in a cost-effective manner.
- The private sector has uniquely useful technical capacity. I discuss two case studies that suggest private insurance providers may be more creative in designing products to overcome frictions or distributional challenges that the government may face.

¹ Eling *et al.* (2014).

² The special issue examines a range of topics, such as the effect of personal experience of past disasters on demand for insurance (Turner *et al.*, 2014), the feasibility of agricultural insurance (Gehrke, 2014), community-based health insurance (Dror *et al.*, 2014), and the relationship between insurance and asset accumulation (Akotey and Adjasi, 2014).

³ For example Akerlof (1970).

The (uncertain) value of insurance

Simple theory

Insurance is arguably one of the greatest inventions of humankind. Idiosyncratic risks (death or sickness of a breadwinner, fire, etc.) can be devastating to human welfare. By pooling idiosyncratic risk, a well-functioning insurance product can effectively eliminate it. Moreover, because formal insurance contracts create strong incentives for some parties (e.g. insurers) to reduce and mitigate risks, the creation of insurance systems can, in some cases, reduce risk events. For instance, fire insurance companies may require homeowners to install and maintain smoke detectors.

This simple analysis—that individuals are averse to risk, and pooling risk can eliminate it—can quickly lead to the conclusion that insurance should be welfare enhancing. International aid organisations are increasingly focused on risk and the potential of insurance: the World Bank’s flagship publication, the *World Development Report*, focused on risk in 2014,⁴ and the International Labour Organization (ILO) has dedicated a facility to microinsurance development since 2008.⁵ Much of the case for public support turns on the possibility that the private sector alone cannot achieve widespread penetration, particularly among poor populations, on a purely commercial basis.⁶

But, of course, the presumed benefits must be weighed against the costs of providing insurance. These cost calculations should not include payouts (which are transfers) but rather transaction costs involved with issuing and servicing policies. In addition, we must consider any deadweight loss of taxation raised to fund government support of insurance, and the possibility that government intervention crowds out private insurance providers.

To explain why insurance markets sometimes fail to develop, the academic literature has long focused on information frictions, but many practitioners have worried more about the prosaic concern of transaction costs, which loom especially large for microinsurance products. Many insurance policies that are profitable when offered to wealthy or middle-class consumers cannot simply be scaled down (say, by reducing both premium and payout amounts by 90 per cent) to reach the “base of the pyramid” customers, as the transaction costs associated with acquiring these customers, writing policies, maintaining records, and processing claims might well exceed the entire premium the company could expect to collect, or even the value consumers place on reducing risk.

And the messy reality of building the evidence base

Much of the recent work on microinsurance has focused on consumer demand for such new products. Eling *et al.*¹ compare the post-2000 academic literature on microinsurance demand with existing research on traditional insurance markets. Adopting a framework from Outreville,⁷ the authors identify four key factors (economic factors,

⁴ World Bank (2014).

⁵ ILO (2009).

⁶ Olaosebikan (2013), which examines the profitability of life insurance in Nigeria, and Yao (2013), which examines the sustainability of health insurance in Pakistan.

⁷ Outreville (2013).

social and cultural factors, structural factors and personal/demographic factors) as determinants of demand, comparing the evidence to that for traditional insurance products. In particular, they propose further research on improving contract design, promoting trust, providing financial education and understanding the role of informal risk-sharing networks.

Over the past decade or so, the field of development economics has experienced a shift towards field-based research, often involving randomised control trials (RCTs). RCTs typically divide a study population (households, villages, districts, etc.) into treatment and control groups, administering an intervention to the treatment group to understand the causal impact of this intervention (or treatment).

RCTs came to prominence because they solved problems associated with causal inference. As an illustrative example, consider an attempt to determine the value of health insurance by comparing households that purchase health insurance to households that do not. If insurance has no effect, but sicker people expect more insurance payout and are therefore more likely to buy insurance policies, we would observe worse health outcomes among the population purchasing insurance. However, it would be clearly incorrect to conclude from this relationship that insurance degrades health.

While this shift towards RCTs is not without controversy,⁸ it has focused academic economists' efforts closely on policies and products that can be offered in a targeted manner, such as insurance schemes. Because much of the financial (and effort) cost of an evaluation comes from the study (i.e. hiring field research staff, surveying households, etc.) rather than the intervention (e.g. varying subsidies for insurance premiums), academics have often taken the lead in experimentally varying product offerings or programme features to test specific theories.

The past 10 years have seen a spate of field experiments designed to measure the value of microinsurance in the developing world. The Poverty Action Lab, a confederation of 100 academics around the world, currently lists more than 40 ongoing or completed studies related to a wide variety of insurance products: life and health insurance, to be sure, but also more exotic products such as weather index insurance⁹ and GDP insurance.¹⁰ The ILO, Microinsurance Network, International Cooperative and Mutual Insurance Federation and the Gesellschaft für Internationale Zusammenarbeit have been driving forces behind many of these (and other) studies.

I will discuss this emerging evidence base by product line.

Life insurance

Life insurance is by far the most commercially successful microinsurance product, with an estimated 48 million people receiving coverage around the world in 2012.¹¹ The majority of individuals covered receive a credit-life product, which reimburses a lending institution (typically a microfinance organisation) for the principal owed by a borrower who loses her life, and often pays to the borrower's family an additional amount roughly equal to the amount of the loan. Because life insurance is often a compulsory add-on to a microfinance

⁸ Deaton (2010).

⁹ Cole *et al.* (2012).

¹⁰ Groh and McKenzie (2014).

¹¹ Koven and McCord (2014).

loan, revealed preference arguments¹² in favour of insurance to benefit the consumer may be less compelling, though the fact that the lender requires them suggests that they do have value for the institutions.

Despite the commercial success, I am not aware of any academic studies that seek to measure the benefits of life insurance to poor households. This is perhaps not too surprising, for a number of reasons: academics like to study new things, and arrangements for payment on death (e.g. life insurance, burial societies) are perhaps as old as the written record. Moreover, most field projects last between one and five years, while many studies seeking to measure, for example, the effects of payouts on consumption smoothing, would require quite large sample sizes and long study periods (and hence costly data collection efforts).

Health insurance

There have been many attempts to offer micro health insurance, often through NGOs, and at least half a dozen ongoing or completed attempts study the impact of health insurance on the behaviour of the insured. An important challenge these studies face is the relatively immature nature of micro health insurance products, which may not have effective systems in place or face strong effective demand.

The title of one of the first published studies on micro health insurance is revealing: “Bundling health insurance and microfinance in India: There cannot be adverse selection if there is no demand”.¹³ Limited demand for the product, as well as administrative difficulties faced by clients attempting to make use of insurance, precluded meaningful impact evaluation.

In another RCT, Thornton *et al.*¹⁴ subsidised insurance premiums for the treatment group and found initially promising take-up rates (about 20 per cent). After one year, treated households had substituted towards health service providers covered by the insurance and reported slightly lower out-of-pocket health expenditures. However, total health costs plus premiums were higher in the treatment group, and health outcomes were no different. Most troubling, fewer than 10 per cent of those who subscribed in the first year continued to purchase the subsidised policies.

Finally, and most encouragingly, Dercon *et al.*¹⁵ find that a micro health insurance product in Kenya reduces households’ health expenditures without affecting access to care. Nevertheless, they find little systematic evidence of changes in actual or perceived well-being.

Weather index insurance

While weather derivatives (such as futures and options tied to heating and cooling degree days) have long traded on exchanges (e.g. the Chicago Mercantile Exchange’s weather markets), the sale of weather-linked derivatives directly to consumers originated relatively recently, for example, with the introduction of weather index insurance in India in 2003.¹⁶

¹² The “revealed preference” view argues that because individuals rationally maximise their own welfare, we can infer from purchase decisions that insurance products improve buyers’ lives.

¹³ Banerjee *et al.* (2014).

¹⁴ Thornton *et al.* (2010).

¹⁵ Dercon *et al.* (2012).

¹⁶ See Cole and Tufano (2007) for a history.

The early literature¹⁷ focused on take-up decisions. As a point of departure, Cole *et al.*¹⁷ note that even when an insurance policy was so highly subsidised as to yield an expected return of up to 181 per cent, only half of the households offered the policy purchased it. This work found substantial elasticity of demand for insurance and highlighted the relative importance of trust, liquidity and other factors. One surprising result from this line of inquiry is that financial education, as a means of promoting insurance adoption, is either ineffective¹⁷ or cost-prohibitive.¹⁸

These early studies that focused exclusively on adoption have been followed by work exploring the impact of insurance policies. At least three studies show substantial beneficial effects of insurance.

Cole *et al.*¹⁹ randomly assigned insurance policies as a gift to 750 farmers, with an additional 750 farmers serving as the control group. The study was conducted in two districts in Andhra Pradesh, India, the same region in which BASIX had originally introduced the rainfall insurance policy 10 years earlier. Thus, most farmers had at least a passing familiarity with the rainfall insurance product prior to receiving it, and many had witnessed fellow villagers receiving payouts in previous years. The study finds that the provision of insurance had a meaningful impact on farmers' planting decisions: farmers in the treatment group were 6 percentage points more likely to plant cash crops (castor or peanut), from a base rate of about 48 percentage points. Cash crops have higher expected profit than subsistence crops (such as millet), but also require more rain and are thus riskier.

In independent work, Mobarak and Rosenzweig²⁰ induce exogenous variation in the purchase of rainfall insurance in the Indian state of Tamil Nadu and study subsequent agricultural investment decisions. They find that farmers who were offered rainfall insurance chose to plant riskier varieties of rice that had greater expected yields but were less drought-tolerant.

Finally, a third study, Karlan *et al.*,²¹ divided farmers in Ghana into four treatment groups (cash grants, insurance for sale, cash grants and insurance for sale, and control group). An important goal of this study was to assess the relative importance of capital (e.g. credit constraints) vs risk management in farmers' investment decisions. Surprisingly, they found that cash grants alone did not increase agricultural investment, but insurance alone (even when sold at close to market rates) did increase agricultural investment by farmers.

These three different studies, conducted by three independent teams in very different geographies, produce a consistent set of messages: the provision of insurance encourages rural households, on average, to invest in riskier, more profitable crops. These results are quite important because they show that insurance can not only facilitate consumption smoothing, but also increase expected incomes.

In a large randomised control trial, Cai *et al.*²² study a sow insurance product provided by a government-owned insurance company in south-western China. The authors randomly assigned performance incentives to the village animal husbandry worker, who is responsible

¹⁷ Cole *et al.* (2013).

¹⁸ Gaurav *et al.* (2011).

¹⁹ Cole *et al.* (2015).

²⁰ Mobarak and Rosenzweig (2013).

²¹ Karlan *et al.* (2014).

²² Cai *et al.* (2015).

for signing farmers up for the sow insurance. They find that promoting greater adoption of sow insurance encourages farmers to raise sows, and this effect persists in the longer term.

These studies provide a micro-foundation for the strong correlation between economic growth and insurance markets specifically, and financial markets more generally. This relationship is described in detail in Outreville.²³

GDP insurance

Academics have been creative in thinking about insurance markets. One particularly intriguing example is a hybrid credit/microinsurance product, “invented” and studied by a research team working in Egypt.¹⁰ The product evaluated was an add-on insurance policy to accompany a loan from a microfinance institution. The policy would pay out if any of the following macroeconomic negative shocks obtained: suspension of the Cairo-Alexandria stock exchange for more than five days; curfews in Cairo; inflation of 4 per cent or more in a single month; and the price of subsidised gas rising above an official level. Policies were offered to about 1,500 micro-enterprises, randomly selected from a set of 3,000.

Unfortunately, the product was not very successful. Heavy subsidies (the authors estimated that borrowers paid about 20 cents in premium for each dollar of expected payout) facilitated high take-up in the first year (roughly 37 per cent of borrowers purchased the policy). However, examining borrowing and investment behaviour, the authors did not observe any change among the firms offered insurance, relative to the control group.

Efforts to continue the study, in the hope that firms would eventually change behaviour once familiar and comfortable with the product, were stymied by unusual events: Egypt experienced political instability, including the closing of the stock market for a day, and curfews were imposed in cities other than Cairo. However, neither of these events met the criteria for insurance payout. Understandably, this reduced client enthusiasm for the product, and in the second year, only 37 of the 1,138 micro-enterprises offered the insurance product elected to purchase it.

Towards an evidence base: the case of microcredit

Despite at least five years of effort by over a dozen researchers, we still do not yet have a comprehensive measure of the impact of microinsurance on household well-being. Policymakers, customers and corporate executives (i.e. the “real world”) do not have the luxury to wait the many years necessary to establish a compelling and incontrovertible evidence base before taking action—nor would academics encourage them to do so. However, to the extent that long-term growth plans of the insurance markets will likely rest on government subsidies or other costly government interventions, an evidence base will help inform governments about the value of allocating scarce resources.

To give the reader a sense of what such an evidence base may look like, I describe the evidence base for the leading financial service for the poor, microcredit, which has been the subject of a number of large, high-quality evaluations.

While the format of microcredit offerings varies around the world, it typically involves giving small, uncollateralised loans, often to women, and often with the express goal of funding productive activities, such as animal husbandry or micro-enterprises. Originally

²³ Outreville (2013).

created as a social service (at least three institutions in Indonesia, Colombia and Bangladesh have been credited with the “invention” of microcredit), these programmes overcame traditional barriers to lending to the poor through a number of innovations. These included (i) allocating transaction costs to the parties that could most efficiently bear them—for example, in India, where the poor lack affordable transportation options, micro-lenders send the loan officers out into the village on motorbikes to service loans; (ii) coming up with alternative contract structures to ensure high repayment rates (such as joint liability, whereby borrowers form small groups and are responsible for fellow group-members’ defaults).

While many development interventions are controversial, microcredit appealed to a wide range of groups, for a variety of reasons: it not only encouraged the poor to become entrepreneurs, but also focused on putting cash directly in the hands of very poor women. Expectations were high: in a speech to the Microcredit Summit opening plenary in 1997, Muhammad Yunus (who would go on to win the Nobel Peace Prize in 2006, along with the bank he founded) described the goal of “creating a process which will send poverty to the museum”.²⁴

The early economic literature evaluating microcredit relied on observational studies, which compare users of microcredit to non-users. A particularly compelling paper by Pitt and Khandker²⁵ found microfinance in Bangladesh to dramatically improve the incomes of the poor. To correct for the standard self-selection problems, they exploited an institutional rule that prohibited individuals who owned more than half an acre of land from participating in the programmes.²⁶ These results were, however, later called into question by Roodman and Morduch,²⁷ who are unable to replicate the results.

The heightened global attention to microfinance coincided with the growing appetite for randomised control trials and, in recent years, a number of researchers began ambitious, large-scale experimental studies with the goal of evaluating the impact of microcredit. One of the first of these was Banerjee *et al.*,²⁸ which began working with Spandana, a leading Indian microfinance institution, in 2005. The study randomly selected 52 of 104 poor neighbourhoods in Hyderabad that Spandana was not serving, for expansion. Five years later, the field work for the study concluded with an endline survey that reached approximately 6,000 households.

This was the first large-scale study to release results (initially, as a working paper in 2009), and received significant attention from both academics and practitioners. The main findings of this ambitious study left a clear story for neither vocal supporters nor opponents of microfinance. The authors found that, three to four years after the initial expansion of microcredit, the average business was no more profitable in treated slums, although profits of top-

²⁴ Yunus Centre (1997).

²⁵ Pitt and Khandker (1998).

²⁶ As noted above, standard comparisons of borrowers to non-borrowers suffer from selection bias problems: those electing to borrow may be different along many different dimensions. By comparing households who owned just less than 1.5 acres to households who owned just more than 1.5 acres, an evaluation can attempt to sort out the effects of microcredit. This strategy requires (a) that households do not manipulate their land holdings to become eligible for the programme; (b) that the microcredit organisation adheres to the rules (perfect adherence is not necessary, but those above 1.5 acres must be less likely than those below 1.5 acres to receive a loan); and (c) that it is possible to account for any differences between households that have more or less than 1.5 acres of land.

²⁷ Roodman and Morduch (2014).

²⁸ Banerjee *et al.* (2015).

end businesses increased. In addition, there were no statistically significant changes in consumption (a typical measure of poverty), health, education or women's empowerment.

Over time, additional studies, covering alternative geographies and conducted by other researchers, were released; six were published together in a special issue of a leading economics journal.²⁹ Summarising these six studies in an introductory essay in the journal, Banerjee *et al.*²⁸ note: "Summarizing and interpreting results across studies, we note a consistent pattern of modestly positive, but not transformative effects", which include a tendency for increased business profit and especially greater business activity but, as in the Spandana study, no systematic effects on consumption or income.

An important, if perhaps discouraging, lesson from these studies is that, even after years of effort and millions of dollars spent on this research, the findings are still, to some degree, inconclusive. The studies face challenges related to statistical power—because take-up of microcredit is often modest (fewer than 20 per cent of those offered loans accept), most studies examine relatively "short-run" effects (two or three years). Most of the learnings come from the "intention to treat" estimate (the effect on the population offered credit) rather than precise treatment effects on those induced to borrow ("treatment on the treated").

However, even with these caveats, it seems evident that this body of work has been quite influential in policy spheres. David Roodman, a fellow at the Center for Global Development (and someone not affiliated with the Poverty Action Lab) cited these studies in an overview of microfinance, noting "the best estimate of the average impact of microcredit on poverty is zero". Thus microcredit as a whole appears to neither live up to the hype nor justify the harshest attacks against it.³⁰ Similarly, the former CEO of the well-respected CGAP (Consultative Group to Assist the Poor, a group of 34 global research organisations), Tilman Ehrbeck, wrote that he "would tend to share the general scepticism that any single, indirect intervention can be found to reduce a multifaceted, deep-rooted, and persistent problem such as poverty".^{31,32}

Implications for impact evaluation work on insurance

Taken together, the above literature suggests some useful lessons for future studies that evaluate the impact of microinsurance policies.

First, and foremost, plan research designs for an abundance of statistical power. This is true for all the reasons that field research is difficult (study participants attrite, surveys are noisy, etc.), but especially true because covered events, almost by definition, do not happen reliably, and a study may require a long time span or a wide range of individuals exposed to different shocks to meaningfully measure the value of coverage.

Second, focus efforts on well-developed insurance products that have already achieved widespread take-up. Several studies that began with the intention of measuring the *impact* of insurance³³ instead resulted in papers that documented limited demand.

²⁹ <https://www.aeaweb.org/articles.php?doi=10.1257/app.20140287>, accessed March 2015.

³⁰ Roodman (2012).

³¹ <http://www.theguardian.com/global-development-professionals-network/dai-partner-zone/does-microfinance-work>.

³² Ehrbeck (2014).

³³ Cole *et al.* (2013); or Banerjee *et al.* (2014).

Third, consider immediate outcomes. For example, Cole *et al.*¹⁷ describe a study in which farmers' willingness to pay for insurance policies was elicited using an incentive-compatible mechanism. The value of this approach was that the outcome was observed almost immediately after the study was implemented and provided a much more concrete measure of the value of an agriculture insurance product to the farmer.

Fourth, recognise the difficulty faced in truly "moving the needle" with respect to poverty. The poor face a range of constraints and challenges and, while many well-meaning individuals (including academics) hope to discover, implement and scale programmes that make a meaningful impact on the lives of the poor, relatively few succeed. A casual survey of the dozens of impact evaluations conducted by Poverty Action Lab-affiliated researchers shows that, while many interventions change outcomes that are very important (test scores, business decisions, health behaviour, etc.), only a few of them have shown durable, meaningful impacts on basic measures of poverty, such as food consumption. Alternatively stated, poverty is a difficult problem and, if there were an easy solution, it would likely have been implemented by now.

Fifth, be careful not to oversell programmes. Seeking government support for the provision of insurance, a range of parties (NGOs, insurance companies, advocacy groups) may be tempted to promise "the moon" (cf. Yunus' promise to put poverty in a museum).

The potential for government actions to promote private insurance coverage among the poor

The scope of the problem

While many have hoped that the private sector alone could deliver financial services to the poor, in reality this is very difficult for a number of reasons. Understanding these reasons is an important first step in identifying ways in which PPPs may promote the development of these markets.

Perhaps the most important challenge is simply the economics associated with serving the poor. While, in developed markets, the rich often pay higher unit prices for products (e.g. business class airfare is more expensive than economy airfare, even adjusting for seat size and service, and luxury clothing has a higher margin than basic apparel), the converse can also be true. Prahalad and Hammond,³⁴ for example, compare costs to the poor of basic goods and services in a pair of poor and rich neighbourhoods in Mumbai. The poor pay much more for credit (600 per cent APR vs 12 per cent APR), water (\$1.12 per cubic meter vs \$0.03), and even rice (\$0.28 per kg vs \$0.24 per kg).

Financial services are in many ways a special product: unlike consumer goods sold anonymously, the financial firm often cares very much about the identity of its customer. I will discuss the implications of this below. But, before discussing the "traditional" market failures of adverse selection and moral hazard, it is useful to enumerate the barriers a company faces in marketing microinsurance to the global poor.

³⁴ Prahalad and Hammond (2002).

Transaction costs

First and foremost may be the distribution challenge: the poor are often dispersed (most of the poor are engaged in agricultural activity) and simply reaching them (or having them come to an office to purchase insurance) often requires significant travel, which is costly and time-consuming. This problem is exacerbated by the fact that, because insurance is a complicated product, it requires individuals with relatively high levels of human capital to sell and service policies. Such individuals demand relatively high wages. These transaction costs do not vary much by policy size: selling a \$1,000 policy to a rich customer in downtown Cape Town may be quite profitable for a local insurance firm, while selling a scaled-down policy (\$100, with one-tenth the coverage) to a poor customer living several kilometres away would incur losses.

There are several ways the government, likely working in cooperation with the private financial services sector, could work to dramatically reduce transaction costs. Perhaps most promising would be the introduction of reliable and cheap mobile payments services. In Kenya (as of April 2011), for example, over 70 per cent of the adult population uses M-Pesa, a service that can be used to send money to virtually anyone (or any firm) in the country via text messages.³⁵ The service was, in fact, developed with the intention of facilitating micro-finance loan repayment but quickly caught on among the general population.

The authors report that M-Pesa itself serves to facilitate informal insurance. Households without M-Pesa who experience negative income shocks (such as a health shock to the primary earner) consume approximately 7–10 per cent less, relative to what they were consuming before the health shock. In contrast, M-Pesa users receive more cash transfers from a greater variety of senders and experience *no* measurable decline in consumption.

The cost of selling and underwriting insurance policies in developing countries has made it difficult to realistically price insurance and increase adoption.³⁶ The mobile phone infrastructure decreases transaction costs and increases efficiency by making claims processing and premium collection easier and faster.³⁷ As of June 2014, over 17 million mobile phone-linked insurance policies have been issued, with 5 of the 33 microinsurance services identified by the Groupe Speciale Mobile Association (GSMA) achieving a scale of greater than one million policies.³⁸ MicroEnsure in Ghana is cited as a particularly successful case, as it has developed policies to cover multiple types of risk (life, accident and hospital).

There is little academic literature on what governments should do to support mobile phone-based financial services. While mobile operators already have a physical infrastructure for moving cash (their airtime vendors), the inherent challenges of the business, such as network economics (the service is only useful if others are using it) and, in some cases, strict government regulation (e.g. India pre-2015), have made it difficult to make the business case for mobile payments. It is worth noting that, as of 2013, only 13 of over 120 attempts to launch mobile financial services have succeeded to achieve a scale of over one million users.³⁹

³⁵ Jack and Suri (2014).

³⁶ Téllez (2012).

³⁷ Prashad *et al.* (2014).

³⁸ GSMA (2014).

³⁹ GSMA (2014, p. 48).

Nevertheless, governments could help jump-start robust digital financial service systems in a number of ways. For example, the government can deliver transfers via mobile payment. Government transfers are sizeable in many developing countries. In India, tens of millions of households receive at least one monthly cash transfer from the government. The government can also establish a robust national identification system to reduce fraud and greatly simplify operations, for example by verifying eligibility for services.⁴⁰ Indeed, there is evidence that biometric identification can even reduce moral hazard.⁴¹

Finally, the insurance industry may benefit by taking a page from the microcredit playbook. One reason microcredit has grown quickly and profitably is that it has dramatically reshaped the nature of lending, shifting transaction costs to the parties which can most efficiently bear them. For example, village borrowers themselves are responsible for screening and monitoring each other, an arrangement that efficiently alleviates problems of asymmetric information, as these borrowers live together and interact on a regular basis. Governments may facilitate such innovation by relaxing regulations on rules and processes related to underwriting or claims processing.

Financial literacy

Second, much of the population, especially the poor, lacks a solid understanding of financial products and may therefore not recognise the value provided by financial services. Even in developed economies like the U.S., low financial literacy has been identified as a barrier preventing the poor from accessing government-supported health insurance programmes.⁴² Cole *et al.*⁴³ report that, in a sample of rural Indians, households with greater measured financial literacy were more likely to own insurance policies.

The strong correlation between financial literacy and financial behaviour has led many to support financial education to improve financial outcomes. Unfortunately, the evidence on this is quite mixed. In a randomised experiment, Cole *et al.*⁴³ show that a standard global educational programme does not meaningfully change behaviours (opening a bank account) of a representative sample of Indonesian unbanked households. In contrast, relatively small incentives (such as a gift of \$14 if a household opens a bank account) do change behaviour.

Cole *et al.*¹⁷ investigate the role of financial education in purchase decisions directly, again through a randomised experiment. Financial literacy may be of particular concern when considering novel products, such as weather insurance: farmers think in terms of soil moisture, while the product payout depends on millimetres of rainfall. When marketing insurance to rural households in Andhra Pradesh, Cole *et al.*¹⁷ randomly add a module that explains in detail the relationship between millimetres of rainfall and soil moisture. However, this additional knowledge has no effect on a farmer's decision to purchase rainfall insurance.

In a separate but related study, Gaurav *et al.*¹⁸ partner with a local NGO and offer a much more elaborate financial education programme, over two days, which includes not only basic financial education but also a simulation game meant to mimic the insurance purchasing decision. They find that financial education does boost demand for insurance: households

⁴⁰ See GSMA (2014) for more discussion.

⁴¹ Giné *et al.* (2012).

⁴² Bauhoff *et al.* (2013).

⁴³ Cole *et al.* (2011).

exposed to the programme were twice as likely to purchase insurance (16 per cent take-up, relative to 8 per cent from those not offered financial education). But, though delivered at the lowest possible cost by the partner NGO, financial education was not a cost-effective marketing tool. The authors calculate the cost to induce an additional purchase of an insurance policy to be very high (\$63), in fact, several times higher than the cost of the premium (\$18) and an order of magnitude greater than the commission the NGO could earn by selling a policy. Other methods, such as offering a “money-back guarantee” (which would refund the premium if no payout were made), were actually more cost-effective ways to induce take-up but still expensive at an estimated cost of \$43 per additional policy sold.

Song⁴⁴ reports on a field experiment in rural China that provided a careful explanation of compound interest. This education, which was offered just days before study participants were offered the chance to participate in a highly subsidised government pension, increased pension contribution rates by 40 per cent. However, the author does not provide a cost-benefit analysis of the financial education.

There is a strong *prima facie* case that financial education should be provided by governments, rather than financial services firms, for many reasons. The government is almost surely the lowest-cost provider, as educational materials can be integrated into school curricula relatively easily. Much of the necessary education serves as public good for the industry, reducing the incentive for any single firm to offer education (once educated, customers may choose to purchase from a competing firm). In addition, customers themselves may be concerned that the education provided by companies is incomplete or biased.

Unfortunately, the evidence on financial education in high school is mixed. Bernheim *et al.*⁴⁵ examine the plausibly exogenous introduction of financial education requirements in U.S. high schools and report a positive effect: those exposed to financial education have higher savings rates. Cole *et al.*¹⁹ re-examine the same natural experiment, using much larger data sets, and find that the financial education requirements had no effect, though they do find that more math education led to improved financial outcomes.

It is important to note that the finding that some programmes are ineffective does not imply that all programmes are ineffective: given the scope of the problem, it surely makes sense to try a range of approaches until an effective programme is identified, and then work to scale up that programme.

One such effective programme in Brazilian high schools led to not only a marked increase in students’ financial knowledge, but also improvement in their financial outcomes like savings for a future purchase as well as in the likelihood of making a budget and of negotiating prices.⁴⁶ The study even found that the programme effects trickled up to parents: there was a significant increase in the savings rate among the parents of students in the programme.

The use of mass media may also be an effective means of education. In an intriguing study, Berg and Zia⁴⁷ report on an experiment in which they introduced financial themes into a popular South African soap opera. Examining behaviour up to four months after the show, they find that those exposed to the financial plot lines scored higher on tests of financial

⁴⁴ Song (2013).

⁴⁵ Bernheim *et al.* (2001).

⁴⁶ Bruhn *et al.* (2013).

⁴⁷ Berg and Zia (2013).

knowledge and were less likely to gamble or engage in costly borrowing behaviour (“hire purchase”).

Taken together, the evidence suggests some lessons. (i) Several of the “standard” financial educational curricula used by schools in the U.S. and NGOs around the world do not seem to affect financial outcomes. (ii) Financial education can change financial behaviour. Nevertheless, it is worth noting that most studies that find an effect examine programmes in which the financial education is provided almost immediately prior to the financial decision, suggesting short-lasting effects of financial education. (iii) Such targeted financial education programmes may be quite expensive and fail cost–benefit analyses. (iv) There, therefore, may well be scope for alternative methods, such as default options.⁴⁸

Behavioural biases

A third reason why insurance markets may not develop quickly is the existence of psychological or behavioural biases. Academic psychologists⁴⁹ have long demonstrated that individuals make inconsistent decisions—while their samples were mostly U.S. citizens, subsequent work has demonstrated the existence and importance of behavioural biases in populations around the world. With respect to insurance, perhaps the most important biases include:

- (i) “Loss aversion”, used to describe the phenomenon whereby individuals are extremely averse to incurring losses, relative to obtaining gains. While economists would suggest that most Americans readily accept a gamble that yields a \$10 gain with 50 per cent probability and a loss of \$9 with 50 per cent probability (the expected value is \$0.50, and the risk negligible), many would, in fact, decline this. Though one might hope that this drives insurance purchasing behaviour, some evidence suggests that framing really matters. For example, someone purchasing a policy but not experiencing a loss might treat the insurance purchase decision as a “loss”.
- (ii) Difficulties evaluating low-probability events. Barseghyan *et al.*,⁵⁰ for example, examine insurance and deductible choices for U.S. property and casualty insurance policies and show that observed insurance purchase decisions in the United States are inconsistent with “rational” models. Their findings suggest that individuals overweight low-probability events when making decisions.
- (iii) Difficulties understanding compound interest. Many individuals underestimate the power of compound growth. Stango and Zinman⁵¹ show that this behavioural bias makes saving less attractive (as individuals do not appreciate how quickly money accumulates) and borrowing more attractive. Studying insurance markets in India, Anagol *et al.*⁵² show that “whole” life insurance products are designed to appear attractive to individuals with this behavioural bias, because they promise nominal payouts, which grow at non-compounded rates, while the purchasing power of these payouts decreases with inflation.

⁴⁸ Beshears *et al.* (2009); Agarwal *et al.* (2014).

⁴⁹ Kahneman and Tversky (1979).

⁵⁰ Barseghyan *et al.* (2013).

⁵¹ Stango and Zinman (2009).

⁵² Anagol *et al.* (2013).

- (iv) Self-control: Buying insurance requires an upfront payment now, for a benefit that will accrue in the future. A range of psychological and economics studies have shown that people in general value present consumption “too much”, and therefore make decisions they later regret.⁵³ Self-control problems are related to inaction biases, whereby individuals do not pay small costs (such as the time to sign up for a retirement account or other benefits) even though the upfront cost is trivial relative to the future benefit.

There are several promising approaches to dealing with behavioural biases. Perhaps the most straightforward is product design. In a well-cited experiment in the Philippines, Ashraf *et al.*⁵⁴ offered bank clients a “commitment savings product”, which allowed them to make deposits but not withdraw until either a pre-specified goal date or a goal deposit level has been achieved.⁵⁵ Approximately 28 per cent of households offered this product took it up, and the average savings level for those offered the product was 81 per cent higher than the control group.

Many life insurance products themselves have features that serve as commitment devices. Many “whole life” insurance products require monthly, quarterly or annual premium contributions, which are eventually paid back to clients. Anagol *et al.*⁵² find that, in the Indian life insurance market, sales agents often speak of the savings features of the insurance, including the required contributions. The paper thus suggests that the policy seems to be designed to *exploit* behavioural biases.

Among the most effective ways to overcome many behavioural biases is to “nudge” consumers in the right direction.⁵⁶ This has been shown to be particularly effective in increasing sign-up rates for 401(k) plans in the U.S.: Choi *et al.*⁵⁷ report that in one study, changing from an opt-in to an opt-out programme increased retirement savings participation by 35 percentage points for employees observed three months after being hired.

In some settings, government action may be necessary, such as declaring “safe harbour” provisions for suitable “nudges”, so that organisations nudging consumers cannot be sued. This has been done for 401(k) plans in the U.S.; one could similarly see a role for this in mobile phone-linked life and health insurance policies.

Trust

A fourth challenge to the development of insurance markets is lack of trust: many insurance policies (e.g. health, property) require some discretion on the part of the insurance company—if customers worry that the company will adjudicate unfairly, they may be unwilling to purchase. In India, the government-owned Agricultural Insurance Company of India undermined the trust of many farmers by delivering disaster relief payments months, or even years, after the insured event.⁵⁸ Cole *et al.*¹⁷ quantifies the role of trust in a private insurance company directly, again studying weather insurance. The sales agent offering

⁵³ For example, Angeletos *et al.* (2001).

⁵⁴ Ashraf *et al.* (2006).

⁵⁵ In case of emergency or hardship, households were allowed access to accounts.

⁵⁶ Thaler and Sunstein (2008).

⁵⁷ Choi *et al.* (2004).

⁵⁸ It is not clear that the fault for these late payments lies totally with the state-owned insurance company, as the company itself required payments from state governments to make claimants whole, and these payments were often delayed.

insurance was either (a) introduced by a local microfinance loan agent, known to most of the community as a “trustworthy person”, or (b) not so introduced. Households receiving the trust endorsement were 6–10 percentage points more likely to purchase insurance than otherwise identical households.

Creating trust is challenging, and private insurance companies do not enjoy high levels of trust everywhere. For example, in India, the most trusted brand is Life Insurance Corporation of India, a government-run provider. High-quality regulation and a complaint resolution programme (such as that offered by the Consumer Financial Protection Bureau) may go a long way towards developing trust. In China, for example, the regulatory agency requires individuals purchasing variable-rate annuities to write a statement, in their own handwriting, words to the effect of “I understand I may lose all my money in this investment”. Because many developing country governments may lack deep technical expertise in insurance, industry self-regulation may also be necessary and effective in building trust.

Liquidity constraints

A fifth challenge is the uncertain cash flow of the poor: a single-premium policy may require too much cash up front from the customer. Customers may also have difficulty with the standard alternative structure, which requires regular monthly or quarterly payments. Moreover, since electronic payments are absent in most base-of-the-pyramid markets, and few have checking accounts, even the very act of paying may be both a hassle and a deterrent to purchasing insurance. Insurance policies lapse when customers fail to pay premiums regularly, and such lapses cost customers a substantial sum of money. In FY 2012, many major life insurance companies in India had an over 20 per cent lapse rate Padmavathi.⁵⁹

Cole *et al.*¹⁷ quantified directly the importance of liquidity constraints: farmers given an extra gift of Rs 75 compensation for participating in a survey were 40 percentage points more likely to purchase insurance—this was by far the largest treatment effect observed in the study.

Effective policy solutions would likely include: ensuring robust mobile phone-based payments infrastructure; enabling low-income households to earmark resources they receive, such as conditional cash transfers, to pay for insurance; introducing or encouraging more flexible insurance policies, such as those whose coverage scales with periodic premium contributions; or even allowing policies to be resold (this could work well in the case of weather or other index insurance policies, because the insurance company is indifferent as to who holds the policy).

Adverse selection and moral hazard

Last but not least, one cannot ignore the standard problems that often challenge insurance markets: adverse selection and moral hazard. Many emerging markets have few or no resources such as credit bureau or medical records that would enable insurance companies to screen potential customers.

Empirical work in this area is challenging for at least two reasons. First, it typically requires high-quality data on individual characteristics and actions—precisely the type of

⁵⁹ Padmavathi (2013).

data that are often missing in emerging markets and often precisely the type of information that insurance customers have an incentive to hide, such as past illness. Second, since adverse selection and moral hazard are often quite nuanced, it may be difficult to cleanly identify a pattern as exclusively one activity or the other. This problem has also plagued credit markets: Karlan and Zinman⁶⁰ report on a clever experiment that does manage to separate out adverse selection from moral hazard in South African lending markets. They find significant levels of moral hazard but weaker evidence of adverse selection.

Banerjee *et al.*¹³ design an experiment in which they hope to quantify adverse selection, working with a microlender in India. The authors find that a large fraction of microfinance customers, when offered a product that bundled microfinance together with microinsurance, actually prefer not to take the loan in order to avoid taking insurance. The majority of these borrowers end up losing access to microfinance altogether. Absent demand, they cannot measure adverse selection.

In contrast, two studies do present evidence of adverse selection in health insurance markets. Dercon *et al.*¹⁵ find Kenyans willing to purchase insurance at full price subsequently use the policy more than those who purchase at a discounted price. Wang *et al.*⁶¹ find a substantial adverse selection in a government-subsidised health insurance scheme in China: the service manages to enrol 74 per cent of the target population, but households with higher pre-programme medical expenditure are significantly more likely to enrol, and enrolled individuals in partially enrolled households have worse health status.

Similarly, monitoring behaviour in rural markets may be quite difficult. Again, the relatively small size of claims relative to the cost of verifying dishonest behaviour may often deter insurance companies from investigating claims, which may increase the amount of misbehaviour.

Technical ability

In two case studies, Cole and Tufano⁶² and Cole *et al.*¹⁷ examine the interaction between government programmes and private insurance companies. In both cases, there was a genuine and urgent government desire to provide greater risk coverage to the rural poor, as well as some regulatory pressure from the government for the private sector to develop new products.

Cole and Tufano⁶² examine the roll-out of agricultural insurance in India, an effort undertaken jointly by ICICI/Lombard, a large private insurance company, and BASIX, a social enterprise, with technical assistance from the World Bank. Cole⁶³ explores the Chinese government's desire to provide improved accident and life coverage to rural populations in China.

Evidence presented in these case studies suggests important lessons regarding technical capacity. First, the government may be unable or unwilling to market, service and underwrite insurance products for the poor, even if it sees this as an important policy goal. In the case of India, the private sector invented a new product, rainfall index insurance, which eliminated many defects of government-run agricultural insurance products such as difficulty to verify

⁶⁰ Karlan and Zinman (2009).

⁶¹ Wang *et al.* (2006).

⁶² Cole and Tufano (2007).

⁶³ Cole (2013).

losses. This soon gave birth to a public–private partnership, the Modified National Agricultural Insurance Scheme, in which state governments worked with private insurers to help farmers manage risk.⁶⁴

In the Chinese case, by working with the largest (state-owned) insurance company, the government was able to leverage an experienced product design team and a large existing network of sales agents and claims adjusters to offer insurance coverage to millions at a dramatically lower cost.

Conclusion and direction for future research

A growing body of evidence documents compellingly that “risk matters” for the poor, and that managing risk presents tremendous scope for improving income and welfare. Indeed, this was the topic of the World Bank’s flagship publication, the *World Development Report*, in 2014.

Over the past decade, the private sector, often in cooperation with academic researchers, has developed a range of creative new products in an effort to bring effective formal risk management to the billions around the world who have been heretofore excluded from the formal financial system.

This review has identified many promising areas for government action to speed up the development of private-sector insurance policies: (i) constructing infrastructure to reduce transaction costs, such as improving mobile payment systems; (ii) continuing to search for cheap, cost-effective ways to improve citizens’ financial decision-making; (iii) encouraging insurance providers, employers and governments to develop effective “nudges” to guide populations towards effective risk coverage; (iv) implementing transparent consumer protection rules, along with fast, efficient and fair complaint resolution; (v) encouraging the private sector to continue to innovate in the contract space; (vi) enabling individuals to automatically use cash transfers they receive to pay for insurance policies.

With respect to a research agenda, it is important first to acknowledge that academic inquiry is still in the nascent stage. This is in part due to the fact that there are relatively few successful, scaled microinsurance products to study. This is not surprising: microfinance, which has reached over 100 million households, took over 40 years to grow from a simple experiment to a successful industry. Improved technology and increasing income levels around the world give hope that microinsurance may grow faster, but it certainly will not happen overnight.

The incomplete body of research is, however, also due to the complicated, changing nature of the world. As academics have focused more carefully on distinguishing causality from correlation, the cost, complexity and required time associated with research projects are increasing dramatically. The advantage of these costlier studies is that they often provide relatively straightforward answers to difficult questions and allow economists to test specific mechanisms and theories in ways that are otherwise impossible. The next decade promises great advances in both research and practice for microinsurance.

⁶⁴ <http://agricoop.nic.in/mnaiso29910.pdf>, accessed April 2015.

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About the Author

Shawn Cole is a professor at Harvard Business School and an affiliate of the National Bureau of Economic Research and the Jameel Poverty Action Lab at MIT. He is on the board of the Poverty Action Lab and has served as a consultant to the World Bank and the Gates Foundation.