

Why the poor are underinsured - A case study on microinsurance in south-east India

Benedikt Link[£]

Major in Finance
Stockholm School of Economics

Max Wirz[¥]

Major in Finance
Stockholm School of Economics

ABSTRACT

This thesis investigates the reasons for underinsurance of the poor in south-east India. Based on data gathered during a six week assignment in Tamil Nadu, India, we analyse which factors have so far hindered the development of a market for microinsurance. Apart from a theoretical analysis, our study is based on field work during which we collected 248 questionnaires, 40 in-depth interviews with low income women and many expert interviews. We in turn test the hypotheses that the market for microinsurance is impeded by (1) transaction costs, (2) adverse selection, moral hazard and fraud, (3) lack of scalability, (4) ill-suited products offered or (5) lack of risk aversion, information, understanding and rationality. We reject the first four hypotheses and find that insurers and NGOs in cooperation can and already have reduced transaction costs, adverse selection, moral hazard and fraud to levels which make microinsurance feasible. Further we find that the products currently offered by Indian insurers are commensurately scalable (with the exception of health insurance) and offer significant risk reduction potential to low income clients, indicating that the products offered are not ill-suited to the clients' needs. However, we find evidence that, although risk averse, the target population for microinsurance products is widely unaware of microinsurance availability, lacks financial literacy and understanding of basic insurance concepts and shows irrational or bounded rational behaviour impeding the demand for microinsurance. Hypothesis 5 can thus not be rejected.

[£] 80336@student.hhs.se, [¥] 80341@student.hhs.se

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Discussants: Alexander Hartman (80333) & Daniel Wallemo (18262)

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Acronyms

BASIX:	<i>Bhartiya Samruddhi Investments and Consulting Services</i>
BPL:	<i>Below Poverty Line</i>
CGAP:	<i>Consultative Group to Assist the Poor</i>
HiH:	<i>Hand in Hand</i>
IFMR:	<i>Institute for Financial Management and Research</i>
ILO:	<i>International Labour Organization</i>
IRDA:	<i>Insurance Regulatory Development Authority</i>
IRR:	<i>Internal Rate of Return</i>
LIC:	<i>Life Insurance Corporation of India</i>
MFI:	<i>Microfinance Institution</i>
NGO:	<i>Non Governmental Organisation</i>
NPV:	<i>Net Present Value</i>
SHG:	<i>Self Help Group</i>
TPA:	<i>Third Party Administrator</i>
USAID:	<i>United States Agency for International Development</i>

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1. Introduction

“Of the four billion people on earth today who live on less than two dollars a day, fewer than ten million have access to insurance.”

Craig Churchill, at the Microinsurance Conference in October 2005, Munich

Almost precisely one year ago, the world looked at Bangladesh where Muhammad Yunus and his Grameen Bank had just won the Nobel Peace Prize in recognition of their effort in designing and providing microcredit to the poor. Since then, there has been a microcredit hype and a surge in donations to what is considered one of the most important financial innovations in the last decades (Armendáriz de Aghion et al., 2005). What started in the mid seventies with US\$ 27 from Yunus’ own pocket has grown exponentially and become a mature financial product today. Despite its largely undisputed impact on poverty relief, it is however only a first step towards financial integration of the poor.

More recently, microinsurance has evolved as an instrument with the potential to become the next revolution (Murdoch, 2002). Insurance services represent the next logical step of financial integration of the poor. But similarly to the beginnings of microfinance, microinsurance is still in a trial and error stage and has only recently come to the interest of the academic as well as the business world. Despite the recent increase in interest for microinsurance it is clear that poor people in developing countries remain largely uninsured or underinsured.¹ Financial integration of the poor remains low despite the success of microcredit.

In many developing countries, insurance is not prevalent and it is interesting to investigate the reasons for the persistent underinsurance of the poor. This paper investigates the problem of underinsurance in a limited geographic area on the basis of a case study on underinsurance in the south-east Indian state of Tamil Nadu. Accordingly, the research question of this thesis is as follows: *Why are most of the poor in south-east India underinsured?*

1.1 Outline

The paper is structured as follows: After clarifying the main concepts of this thesis we establish the background of the study together with some basic concepts of microfinance and insurance regulation in India. This is essential for the comprehensiveness of the thesis and is followed by a section on the theoretical framework of insurance theory. Thereafter, the relevant literature is reviewed and hypotheses are directly derived from the literature. The core of the thesis is the analysis section, where each of the hypotheses is tested against theory and empirical as well as anecdotal evidence. Our conclusion and suggestions for further research finalize the paper. Our contribution is to show that the main reasons frequently held responsible for hampering the development of microinsurance are less relevant in south-east India where underinsurance is mainly a consequence of factors impeding insurance demand.

¹ Strictly speaking, the term underinsurance includes the uninsured as well and henceforth is used to describe both, the people with no insurance as well as the people with insufficient insurance.

1.2 Clarification of terms

It is essential to first clarify the terms *microfinance*, *microinsurance* and *underinsurance*.

The term *microfinance* refers to the credit and banking services to poor people². It was coined when Muhammad Yunus' Grameen Bank started giving out tiny loans (microloan, microcredit) to the poor in Bangladesh in the mid seventies. Novelties were, besides the tiny scale, giving the loans to groups vouching for one another, rather than requiring collateral. (Armendáriz de Aghion et al., 2005). Further, though not preset, the loans were and still are typically given to women. Initially the idea of both, lending to women and lending without collateral made its proponents subject to derision. But the idea turned out successful for two reasons: First, in most developing countries, women still have a subordinate role in society especially with respect to financial matters. Consequently, giving microcredit to women is seen as a means towards achieving women's empowerment in society. Second, it turned out women paid back their loans more reliably and did not spend their money lavishly (Roth et al., 2007). Instead, the loans were invested into high IRR projects. Over the years, microfinance has evolved to become a mature financial product with an astonishingly high penetration and coverage of low income people in many developing countries.

Microinsurance, like microcredit, entails the rigorous down scaling of a conventional financial product, in this case insurance. Unfortunately, "small is different"³ does not only hold true for natural sciences but also for finance: With the downscaling of insurance products some defining characteristics change. The challenges and particularities this brings about are elaborated upon throughout the paper. One of the big hopes resting on microinsurance is granting access to insurance to those previously deprived from any form of formal risk mitigating mechanism.

An individual is referred to as *underinsured* if the current level of insurance is below the optimal level. The latter is defined by the highest possible reduction of ones financial volatility given the supply of insurance products. This definition obviously hinges on the assumption that the policies' premiums are fair.⁴ Throughout the paper we examine the rural south-east Indian population which according to this definition is extremely underinsured as the majority of families do not have any insurance at all with the remainder holding almost exclusively life insurance policies.

2. Background

This summer the authors of this paper went to India on a six week assignment for the NGO Hand in Hand. The assignment was designed to involve a field study on the demand and supply of microinsurance. Hand in Hand organized the stay and provided the necessary infrastructure for the research. The data collected during the project represents the basis of this thesis.

² Kofi Annan on microfinance: 'Microfinance is a way to extent the same rights and services to low-income households that are available to everyone else. It protects people against shocks, and allows the majority of the population to become part of a country's economic activity. It can help to build markets, and show that profits and principles can reinforce each other'. (Churchill, 2006)

³ Landmann et al. (2004), on how physical laws would change on a nano-level.

⁴ We acknowledge that in line with this definition virtually everyone is underinsured and in some cases even over insured (Take for instance someone with a health insurance paying for transportation home in case of an accident abroad. Possibly, his airline, too, covers that transport back. Eventually, even his MasterCard Gold might cover the same). However, the extent of underinsurance is certainly much bigger in developing countries.

2.1 Hand in Hand

Hand in Hand is an NGO operating exclusively in the state of Tamil Nadu in south-east India. Founded in the mid eighties, the organization has evolved over the years to become a professional player in the growing market for microcredit in India. The fast growth is largely due to a strong donor base in Sweden headed by the former CEO and supervisory board member of ABB, Percy Barnevik. The organization is active in various social sectors because it believes in a holistic approach to fighting poverty. Four of the five pillars of Hand in Hand are purely donor funded and deal with citizen rights, health and hygiene, child labour and solid waste management. The fifth pillar, the microfinance pillar is expected to be financially sustainable in the near future. Without elaborating on microfinance in too much detail, we quickly want to sketch the general structures and processes needed to run a microfinance institution. Understanding these is prerequisite for understanding the empirical and anecdotal evidence on microinsurance in this paper.

2.2 Infrastructure of NGOs providing microfinance

The vast majority of microfinance operations are based on a solely female client base. The corresponding reasons have already been outlined in section 1.2 of this paper: Higher repayment rates and empowerment of the women in society. Empowered women are financially less dependent. They will on average have fewer children, spend more money on their children's education and invest more money on household improvements like cooking utensils (Yunus et al., 2003).

In order to become eligible for credit disbursement, the women need to join a self help group (SHG) of around 15 women who meet regularly each week.⁵ During those meetings, the women exchange experiences and discuss general issues. Moreover, the SHG meetings serve as savings forum because the women have to save a specified amount every week/month which is then kept in a common bank account. Minutes are taken every meeting and several ledgers are kept to record the group's financial transactions. After half a year of complete and correct bookkeeping, the women become eligible for a loan from Hand in Hand. This is referred to as bank linkage. In order to facilitate the credit disbursement and collection of interest and principle payments, Hand in Hand - like every other NGO providing microfinance - has established a distribution network reaching down to the grass root level. The latter is depicted in figure 1.

⁵ These specifications apply to Hand in Hand. Other NGO's might have different requirements but the basic structure of most microfinance institutions is more or less similar.

Figure 1. Organization chart of microfinance distribution infrastructure

The below figure illustrates the different layers of the distribution infrastructure of microfinance products and Hand in Hand's corresponding number of offices, CC's, SHG's and clients, respectively.

General structure		Hand in Hand	
Head office		Hand in Hand staff	1
District office			14
Zonal office			72
Cluster coordinator (CC)	20-50 SHG per CC		601
Self help group	10-20 women per SHG	Women	16 511
Woman			260 000

2.3 State of the microfinance sector in India

Hand in Hand has only started to develop its microfinance activities five years ago. Yet, 260 000 women are already organized in SHGs with the ambitious target to grow that number to 1 300 000 in another three years time. Similarly, there are a growing number of other NGOs all across India offering microcredit to their clients. Table 1 shows that the number of SHGs with bank linkage has more than tripled from 2003 to 2006 and is stirred for further growth. According to Ghate (2006) a total of 2.34 million SHGs already reach 31 million poor and marginally poor families. Given an average household size of 5.4⁶ (Census India, 2001) as much as 150 million individuals are quite perceivably reached. According to World Bank (2007) estimates there are 300 million people living below the poverty line (on less than a dollar a day) and another 500 million are marginally poor (living on less than two dollars a day). Consequently, as much as 19% of poor and marginally poor families on the Indian subcontinent are affiliated to SHG's organized by NGO's. However, there is a strong bias towards the three southern states which as of 2006 make up 54% of all SHGs with bank linkage even though they account for only 17%⁷ of the Indian population. Assuming these three states get a proportionate share of India's poor and marginally poor, the NGO coverage of the corresponding population is about three times higher than the coverage rates for India entirely, implying saturation rates as high as approximately 56%⁸. As not all women in a certain area actually join a SHG, it seems reasonable to assume a close to area-wide coverage of poor and marginally poor families in the south. Most probably, the remainder of the Indian states will follow a similar growth trajectory of NGO activity.

⁶ Multiplying the mean household size with the number of households reached might slightly overstate the number of individuals reached as households including more than one generation might well comprise more than one SHG member.

⁷ India's population is estimated to be 1.12 billion as of 2007. The 'three southern states' Tamil Nadu (62.4 million, Karnataka (52.9 million) and Andhra Pradesh (76.2 million) make up 17.1% of India's total population.

⁸ The mean household size for south India is smaller than in the north (4.4 for Andhra Pradesh, 5.0 for Karnataka and 4.8 for Tamil Nadu) so the actual saturation rate is slightly above 56%.

Table 1. SHG bank linkage trends

Table 1 summarizes the latest trends of the SHG bank linkage program in India. It includes [1] the number of SHGs with bank linkage and [2] the percentage of those in south India. Further it includes [3] the growth rate of new loans and [4] the average size of new loans.

	2003	2004	2005	2006
[1] <i>SHGs with bank linkage *</i>	717 360	1 079 091	1 918 456	2 238 565
[2] <i>% of those in south India</i>			58%	54%
[3] <i>Growth rate of new loans</i>	29%	41%	49%	15%
[4] <i>Average size of new loans (Rs)</i>	27 005	32 013	32 019	37 574

* SHGs have on average 15 members so that 31 million households are reached already, 14 million of which are BPL

2.4 Regulatory environment in India

After describing Hand in Hand's organization and the microfinance framework in India, we want to give a short overview of the regulatory environment in India. This section only includes the information strictly necessary to understand the specifics of the Indian microinsurance market. The interested reader is referred to appendix 1-4 for a more detailed overview of insurance regulation in India.

Ever since the emergence of insurance companies in India, two different types of insurers have to be distinguished: Life insurance providers and general insurers. The former are allowed to offer life insurance products like endowment policies and reverse annuity pension schemes. The latter offer all other insurances like motor insurance, cattle insurance, dwellings & content insurance, etc. Both, life as well as general insurers are allowed to provide health insurance.

In the more recent history, there have been substantial changes in Indian insurance regulation: After liberalization of the insurance market in early 2000, the Insurance Regulatory and Development Agency (IRDA) assumed responsibility as insurance regulator in India. Soon after being in place, it enacted regulations which among other things force insurers to generate a predefined portion of gross premiums in the rural and the social sector. As non-compliance is punished with hefty fines the regulation poses a substantial burden on insurance companies. This paved the way for a prosperous microinsurance environment in India. Understandably, legislation has resulted in an unprecedented flood of microinsurance products and India has become the country with the most diverse range of microinsurance products in the world (Roth et al., 2007).

3. Contribution

Our main contribution to the discourse on microinsurance is a comprehensive analysis of the reasons for underinsurance in south-east India.

While most of the case based literature focuses on describing best practices of microinsurance, the few academic papers written on the subject focus on how microinsurance should work in theory. In contrast, our contribution is to examine *why* microinsurance does

not work, i.e. why the poor in south-east India are still underinsured. As such, this paper combines aspects from practitioners and academics alike. More specifically, we analyse if *transaction costs*, *market failures*, *lack of scalability*, *ill-suited products offered* or a *lack of risk aversion*, *information*, *understanding* and *rationality* are possible reasons for underinsurance.

As opposed to what is found in previous studies, we show that *transaction costs* are not a major problem in the south-east Indian context if insurers cooperate with NGO's in providing microinsurance (McCord et al., 2005). Furthermore, it is illustrated that in accordance with previous findings, *market failures* can be overcome by small changes in insurance design and cooperation between insurance company and NGO (Roth et al., 2005).

The *scalability* of insurance is sometimes challenged in the literature. We have not found any paper that tries to separate the scalability effect from transaction cost and market failure effects in a stringent way. In the south-east Indian context, we are able to illustrate that all the products except health insurance are in fact scalable to reasonably low levels of premium and cover allowing for the provision of microinsurance (Churchill et al., 2003).

Next, we draw on the empirical findings of our field study to show that the abundant amount of microinsurance *products offered* suits the needs of the poor, something which is heavily challenged by the previous literature (Cohen et al., 2003).

Our papers' most important contribution is to show that the *lack of information and understanding* as well as the apparently *bounded rational and irrational behaviour* of the poor are major reasons for underinsurance in south-east India. As the analysis relies heavily on the results of our field study, our conclusions are subject to the limitations outlined in section 8 of this thesis.

4. Theoretical framework

In this section, we first give a short introduction on insurance theory in general including its most important assumptions and characteristics. Thereafter we conceptualize microinsurance and illustrate the differences and similarities as opposed to conventional insurance.

Since the 1970s, the academic discourse on uncertainty has gained momentum and both imperfect information and its resulting market failures have been included into contemporary microeconomics. Though not widely discussed in academic textbooks up until now, uncertainty is the foundation of *insurance theory*. Two major assumptions with respect to the consumers are made in the theory of uncertainty (Mas-Collel et al., 1995). First, the expected utility theorem is assumed to hold. It states that utility functions have the expected utility form (Neumann-Morgenstern utility function), i.e. aggregate utility is equal to the sum of the probability weighted utilities of each possible outcome. Second, individuals are assumed to be risk averse. Due to risk aversion, the individual is willing to trade risk for certainty because it derives additional utility from a certain outcome (Dionne, 2000). More generally, if the price for insurance is fair, i.e. the premium equals the expected indemnity payment of the insurance company, the individual prefers the certain outcome over any other outcome with non-zero variance (Schlesinger, 2006). In addition, Mossin's theorem (1968) explains that if all preceding assumptions hold, the individual is fully insured. Loewenstein et al. (2001) argue that even if the price is not fair i.e. the insurance company keeps a profit, the individual might still opt for insurance because of potential non-pecuniary benefits (e.g. peace of mind) from being insured. Directly hinging on the assumption that insurance policies are fairly priced is the assumption that insurers themselves are risk neutral towards risk or are able to perfectly diversify the risks they are insuring. Roth & Athreya (2005) claim that insurance companies

are indeed risk neutral towards microinsurance related exposures as these are dwarfed by the size of their overall portfolio.⁹ Further, some risks are by definition more diversifiable than others: a very high degree of diversification can be reached for life and accident insurance while policies insulating farmers from draughts or natural disasters bear a great deal of covariant risk (Churchill et al., 2006).

In the course of the thesis, we come back to these specific characteristics of insurance theory that are interesting for the microinsurance debate.

Let us now turn to *microinsurance*. Throughout the academic literature we have reviewed, the simplest definition for microinsurance we came across is “insurance for the poor”. This is in analogy to microcredit, which is in fact credit for the poor. Similarly, Warren Brown (2001) defines microinsurance as insurance for low-income people. Churchill et al. (2006) reinforce this point by stating that microinsurance and conventional insurance are similar except that the former referring to a clearly prescribed target market: low-income people. There is no clear cut-off point between microinsurance and conventional insurance. Microinsurance is primarily directed at people below and at the poverty line, sometimes also marginally above it. Apart from addressing different people, microinsurance is not substantially different from conventional insurance theory with respect to the major insurance characteristics. The same assumptions are made as outlined above and microinsurance is also affected by asymmetric information and market failures like adverse selection and moral hazard. In addition, due to its small scale layout microinsurance is much more exposed to transaction costs than conventional insurance (Morduch, 2002). We elaborate on these issues in the previous research section as well as the analysis section of this paper.

Apart from the academic discourse, the Indian insurance regulator (IRDA) clearly defines microinsurance by setting specific parameters for microinsurance products (appendix 2). This definition is of limited relevance in this paper.

5. Previous research and hypotheses

The concept of microinsurance is a recent development in the financial industry which has evolved less than ten years ago. Due to its short history, the amount of academic literature on the topic is neither abundant nor undisputed. Currently, microinsurance is seen as the next step of financial integration of the poor after the microcredit programmes seem to become relatively well established.

This section provides an overview of the previous research on microinsurance. We thereby focus on the relevant literature that relates to our research question. As such, we analyse the reasoning for underinsurance of the poor. The previous research discussion is not geographically restricted to India, however. Specifics of the Indian microinsurance market are discussed in the analysis section.

The majority of the literature is case based and analyzes the experiences with microinsurance in different countries. Most of the studies on microinsurance are prepared by a hand full of world wide operating organizations and working groups.

Five major arguments for underinsurance of the poor can be identified in the literature and are discussed subsequently. Correspondingly, we derive five hypotheses, based on these arguments, on why the poor in south-east India are underinsured.

⁹ TATA-AIG is used as an example. The authors acknowledge that this might be similar for other insurers.

5.1 Transaction cost

The single most important argument for underinsurance of low-income people in the literature relates to transaction costs. Morduch (2002) acknowledges that transaction costs are often preventing microinsurance from being provided by commercial insurance companies. Ahuja et al. (2005) go a step further by stating that this lack of affordability prevents the potential demand from expressing itself in the market. Microinsurance causes higher transaction costs than conventional insurance at almost every stage of the insurance transaction. Selling insurance to the poor is costly due to the large amount of low premium contracts. Servicing insurance, handling and controlling claims and paying out benefits is equally more costly (McCord, 2002).

Transaction costs have to be brought down to make insurance affordable. In order to be able to provide microinsurance on a large scale, the choice of the right distribution channel is crucial (Churchill, 2006). Four different insurance distribution models are outlined in the literature: First, the insurer can distribute the policies himself. This subsequently is referred to as the direct sales channel. Second, NGOs can set up insurance schemes on their own accounts; they are most of the time operating under the radar of regulators because the latter don't want the former to take on excessive risks. Third, mutuals can provide insurance as well. They are usually professionally managed, regulated member-owned and offer the advantage of operating close to the people. Fourth, community-based organizations can offer insurance. They are member-owned, unregulated and by their very nature very close to the clients (Roth et al., 2007). For the purpose of our analysis, we discuss the first model and then focus on a combination of both, the first and the second model, the so-called partner-agent model. Discussing the partner-agent model we implicitly assume an existing network of NGOs providing close to area-wide coverage of poor and marginally poor families. As shown in section 2.3 this is a reasonable assumption to make in the case of south-east India.

Most of the literature focuses on the transaction costs the insurer is faced with. This neglects the fact that those insured also incur substantial transaction costs. We discuss the transaction costs of both parties involved, the insurer as well as the insured.

The central role of transaction costs in microinsurance leads to the derivation of the first hypothesis which is discussed in this paper:

Hypothesis 1: Transaction costs are proportionally higher for microinsurance than for conventional insurance.

5.2 Adverse selection, moral hazard and fraud

Adverse selection refers to an ex-ante asymmetric information problem of hidden information. Akerlof (1970) uses the analogy of the markets for used cars to illustrate that with uncertainty and information asymmetry the market does not necessarily clear resulting in an inefficient allocation. Adverse selection and moral hazard are best prevented by designing the insurance policy such that the incentives are aligned already from the outset. Examples include co-payment which would render a given policy unattractive for risky insurance takers. If prevention by design is not feasible, the insured as well as the insurance will try to reduce adverse selection by signalling and screening, respectively (Jehle et al., 2001). *Moral hazard* is a problem of hidden action and formally is a part of principal-agent theory. It refers to post-contractual actions caused by the principle's inability to observe the agent's actions. Therefore, the principal has to design an incentive scheme so that the agent takes the

appropriate action (Jehle et al., 2001). *Fraud*, i.e. deliberately causing damage or claiming damage which has not occurred is best addressed by monitoring. While moral hazard might occur due to a non-conscious change in behaviour, fraud always happens deliberately. For simplicity, despite fraud not being a market failure in a strict sense, we treat it as such for the purpose of this section.

While these market failures are also prevalent in conventional insurance, they might be more important to microinsurance, preventing the microinsurance market from developing. Previous research suggests that for certain kinds of insurance, these market failures are indeed detrimental. Whenever, these market failures can not be avoided by design, means such as signalling and screening will be employed, leading to transaction cost. Because these tend to accrue as absolute costs rather than as proportions of the premium, small scale schemes are obviously hit harder. Nevertheless, there are innovative ways around both problems: Group insurance is getting more and more popular and co-payments¹⁰ as well as lapsing periods and first year exclusions are not uncommon (Churchill et al., 2003). Typically damage due to negligent behaviour is also excluded. According to Herrera et al. (2004), the problem is fairly small in life and accident insurance as death claims are easy to verify and the sum assured is not high enough to result into reckless behaviour. Mommens (2006) analyzes the case of crop insurance. In agriculture, the costs of screening are very high so the insurance is unable to tell a good from a bad farmer before selling insurance (adverse selection). Moreover, high monitoring costs prevent the insurance from controlling if the farmer still takes care of the field appropriately after taking insurance. In health insurance, adverse selection, moral hazard and fraud are even more detrimental. People might be encouraged to overuse the health system or wait too long to seek medical treatment in the case of critical illness insurance (Churchill et al., 2006).

In this study, we want to investigate the extent to which adverse selection, moral hazard and fraud are responsible for the underinsurance of the poor. Consequently the next hypothesis is as follows.

Hypothesis 2: Microinsurance is exposed to severer problems of adverse selection, moral hazard and fraud than is conventional insurance.

5.3 Scalability

Although not explicitly labelled scalability problem, previous research indicates that it might not be possible to provide some specific microinsurance policies due to the inability to scale the premium and benefits to a level that is affordable for poor people. Two conditions have to be fulfilled for microinsurance to be scalable. The premium needs to be directly related to the benefit and the benefit in turn should be somehow related to the income of the person (Churchill et al., 2003).

The first condition is straight forward. If fair pricing is assumed, the condition should hold automatically. The second condition, however, is more complicated and depends on the type of insurance. While life insurance can easily be scaled down to microinsurance levels (benefits depend on income), health insurance is probably the most complicated insurance to scale down (benefits are almost not dependent on income as they have to cover a certain sickness) (Dror et al., 2005).

¹⁰ In the field study, we found that the interviewees are indeed willing to accept such a measure: In the first questionnaire we asked “would you accept co-payment” (co-payment = deductible) and 90% said they would accept it.

In the literature, the scalability problem is often treated together with the asymmetric information and transaction cost problems. In this thesis, we want to look at all the three effects separately.

The third hypothesis is therefore formulated as follows:

Hypothesis 3: Conventional insurance products can not be scaled down to the extent necessary for providing microinsurance

5.4 Adequacy of supply

The quality of the products supplied is heavily challenged in the literature on microinsurance. Evaluating the quality of a product can be done by looking at its impact on the risk exposure of the insured individual (Cohen et al., 2003). Measuring the risk reduction potential of microinsurance products is complicated because it is characterized by a persistent lack of time series data (Morduch, 2002). Despite this lack of data, it is imperative to at least challenge the quality of the insurance products on a case by case basis. In most of the case studies that we looked at, the insurance provider had to go through a series of trial and error before finding a suitable product for its members (Roth & Athreye, 2005; Garand, 2005 and others). It is therefore questionable if the recent increase in supply in the Indian insurance market due to a change in regulation is suited to meeting the needs of the poor (Roth et al., 2007).

The risk reduction potential of the existing products is therefore to be challenged in our fourth hypothesis:

Hypothesis 4: The supply of microinsurance products does not suit the needs of the poor as the risk reduction potential of the products is insufficient.

5.5 Risk aversion, information, understanding and rationality

The demand for microinsurance is largely unexplored. Most of the studies are rather qualitative in nature and not based on representative samples. Previous research gives different reasons for underinsurance of the poor: First, alternative informal risk mitigation mechanisms like self-insurance¹¹ and communal insurance are mentioned. It is acknowledged, however, that these mechanisms are inherently unstable and cover only small impact events due to idiosyncratic risks (Churchill et al., 2006). Second, lack of information and understanding seems to be a major determinant reducing effective insurance demand (Manje et al., 2002). This includes among other factors mistrust towards the insurance company due to bad experiences or word of mouth, the inability to distinguish between insurance and saving as well as the expectation to get money back at the end of the policy. Third, ignorance about insurance products and risks in life are used to explain the (partial) underinsurance (Roth et al., 2007). We want to add a discussion on rationality to this point and argue that people might think and act bounded rational or even irrational in certain situations which causes demand to fall short of what it could be.¹²

¹¹ Churchill defines coping mechanisms such as borrowing money or reducing consumption as self-insurance. According to our definition of utility, these are examples of inter-temporal choice rather than insurance.

¹² The concept of bounded rationality was introduced by Kahneman et al. (1982) to describe heuristics and biases in decision making.

In line with the questions raised in the literature, we investigate the main factors constraining the demand for microinsurance in south-east India. Due to the limited scope of this thesis, we do not look at alternative risk mitigating mechanisms like self-insurance and communal insurance in detail.¹³ Instead, we use anecdotal evidence on the existing risk mitigation mechanisms to illustrate the risk aversion of the women in south-east India. Issues related to information and understanding as well as bounded rational and irrational behaviour are analysed.

This leads to the following hypothesis:

Hypothesis 5: The client bases for conventional insurance and microinsurance differ in either risk aversion, information, understanding or rationality, thus causing effective demand to fall short of potential demand.

6. Methodology

Our analysis of the first three hypotheses is chiefly based on theory and anecdotal evidence. Hypothesis 4 and 5, however, heavily draw on the interviews we conducted and the data we gathered during the six week assignment in Tamil Nadu¹⁴. As to illustrate the context in which this research took place, the following paragraph first describes the process of gathering information on the microinsurance products offered, i.e. conducting internet research and scheduling meetings with representatives of the respective insurers. Thereafter the research on demand comprising a field testing stage and a series of two questionnaires is dealt with. Our analysis of hypothesis 4 is bolstered with data from the 2nd questionnaire as well as all data on the microinsurance products offered. The analysis of hypothesis 5 is mainly backed up with data from the 1st questionnaire, but also draws on findings in the 2nd questionnaire.

6.1 Product research

The structure of the Indian insurance market is much owed to the regulatory environment which we discussed before. Due to the restriction that one insurer may not offer life insurance *and* general insurance we look at both groups separately. On the homepage of the Indian regulatory and development agency (IRDA) we found an extensive list of 17 life insurers and 17 general insurers licensed by the regulator. Based on internet research and during meetings with Hand in Hand staff we prioritized our selection of insurance companies we would like to look into more detailed. We initially identified the ten insurers we deemed the most promising. Eventually we extended our selection to include five life insurers and seven general insurers in our research. Thereafter we scheduled meetings with respective insurers, mostly facilitated through existing contacts of Hand in Hand staff, and in some occasions through cold calling. To our surprise, most insurers were very eager to be in contact with NGOs as they are desperately in need of finding distribution channels for their rural

¹³ This should be done in a separate study because there is a lot to be done on this topic. As to our knowledge, there is no study that quantitatively evaluates the effect of informal insurance mechanisms on the demand for formal insurance.

¹⁴ All interviews and meetings are listed under references.

products¹⁵ in order to satisfy the regulatory requirements as well as to get a foothold in future markets. Therefore we managed to schedule meetings with senior staff in almost all but a few instances. An exhaustive list of all insurance companies we had meetings with is found in appendix 5. The most senior interview partner of each of those companies is included under references in section 11 of this paper.

While most insurers publish detailed information on their conventional policies, some rural policies are envisioned to be solely sold through NGOs and as such little information can be found on the internet. Though most meetings differed slightly subject to the information already available on the internet, there were a number of similar discussion items. First we would clarify and verify all the product details of all microinsurance products, rural products or social security schemes. Second, terms relevant under the partner-agent model were exemplified. These include documentation requirements, possibility of group discount and group enrolment as well as the possibility to customize the product to the individual needs of Hand in Hand and the commission Hand in Hand would receive. After each meeting we typed up minutes which were thereafter sent to one member of the counterparty for verification.

6.2 **Field testing**

In order to get acquainted quickly with this new environment, Hand in Hand enrolled us for a five day seminar at the Institute for Financial Management and Research (IFMR) during which we met a number of researchers working on topics related to development, microfinance and particularly microinsurance. The other participants of the seminar came from institutions such as the Indian central bank, World Bank or other NGOs such as USAID, BASIX or 'Growing opportunities'. During the seminars, we were able to collect valuable information on how to conduct a meaningful field study in the south Indian context. In the second and third week of our assignment, Hand in Hand set up a substantial amount of meetings for us to get acquainted with Hand in Hand as an organization and its clientele. Apart from the meetings with staff members, bankers and insurance agents, we conducted four group meetings and five individual interviews during which we interviewed 83 SHG women. We used these meetings to ask exemplary questions to draw conclusions on the women's background and to test the viability of our 1st questionnaire draft. During the field testing stage we were able to leverage the variety of contacts that we got in the first week to share experiences on similar questionnaires and to get feedback on our questionnaire design.

The following questions were addressed in the field testing:

- i) What are the women's background, attitude and openness towards interviews and (foreign) interviewers?
- ii) What is the women's literacy level?
- iii) To what extent is the concept of insurance established?
- iv) How many of the women have insurance? What is their motivation to take insurance? What are their experiences?
- v) To what extent are the women able to answer slightly more complex questions that involve e.g. prioritisations and choice or require them to express an opinion?
- vi) Other observations?

In the course of the meetings, we made the following observations:

¹⁵ Please refer to appendix 1-4 for further details on the regulatory environment.

- i) Within any SHG we observed rather similar backgrounds, e.g. having the same job, same capacity to save. This observation is not very surprising as the women organize themselves into SHGs. The overall level of openness was very high. We did not encounter situations in which our questions were not answered or interviewees were in a rush and eager to get back to their work. However, we observed a strong tendency towards consensus within groups with few extroverted women starting the conversation and the others usually agreeing to the opinion first expressed.
- ii) The definition of literacy is not the same across different groups. In addition, the women tend to overstate their own literacy. The ability to write their name is sometimes interpreted as literacy.
- iii) There is a Tamil word for insurance which the women don't use and don't understand. The English word "insurance" is known by almost everybody. The concept is not widely understood, however, as many interpret it as a savings scheme.
- iv) In the four groups that we interviewed, between 4%-40% of the women have some insurance in their family (exclusively life insurance). The main motivation to take insurance is saving for the children's education and the marriage of the daughter as well as security in case somebody dies. Only some of the women have bad experiences with insurance which are often the consequence of not understanding the policy correctly.
- v) Complex questions are viable but we had to try various ways of phrasing them. Prioritizing is sometimes difficult for them, as they seem to be indifferent between the options. Showing pictures illustrating different risks the women are faced with proved a suitable way to overcoming the language barrier and receiving a ranking of the risks' severity.
- vi) The interviewers own views or at least their way of phrasing questions made a huge difference as same interviewers tended to yield similar answers. Recognizing how crucial the choice of interviewer is, we scouted the two zonal managers of Kancheepuram (Johnson) and Thiruvannamalai (Prem) for our questionnaires as both showed strong interest, patience and empathy as well as a good command of English.

Table 2. Key take-aways from field testing of questionnaire

Table 2 illustrates the key take-aways from the field testing stage influencing the questionnaire design.

-
-
- i) Individual interviews are needed to get a diversity of opinions
 - ii) Ask for the degree rather than literacy directly because people overstate their own literacy
 - iii) When asking for the motivation for taking insurance it is therefore crucial to describe the benefits rather than just giving the name of the insurance, also include saving for education of children and marriage of daughter as an answer
 - iv) If a woman claims not to have insurance ask if and how she is saving for the education of her children and the marriage of her daughter
The women have very limited knowledge about the exact specifications of their policies, so the quality of the products cannot be checked
 - v) The women often seem to be indifferent, explaining the risks in more detail helps them prioritize
Continue using the pictures for risk visualization
 - iv) Our presence enhances the clarity and consistency of the results because further enquiry can be done immediately
-

6.3 Sample composition

We realized that it was impossible to draw a true random sample from the population of women organized in SHGs. Instead we imposed restrictions as to achieve pseudo randomness. First, the survey was conducted in two different districts, one semi-urban (Kancheepuram) and one rural (Thiruvannamalai). Second, we made sure to have an age distribution in our sample which represents the true distribution to account for possible age biases induced by the cluster coordinator choosing the interviewees and systematic biases in the availability of the women. Third, we made sure to include women from different income groups¹⁶. Forth, a maximum of five members in the 1st questionnaire and only one member from each SHG in the 2nd questionnaire was allowed to participate in the survey. This was crucial as attitudes tend to be similar within on SHG.¹⁷

6.4 Insurance motivation and risk perception – 1st questionnaire

The first questionnaire was designed to investigate the women's demand for insurance. During the field testing stage, we found out that Hand in Hand is about to launch a customer satisfaction survey including various questions on the personal and financial background of the women. As a big part of our original questionnaire also included this type of information, we decided to design a short version of our questionnaire focussing on insurance, which we added to Hand in Hand's existing questionnaire.¹⁸ This decision turned out to have two major implications: On the one hand, we were able to collect the data quickly and increase the sample size from 50-100 observations as originally planned to 248 observations¹⁹. On the other hand, we were unable to join all the interviews ourselves which might have slightly affected the quality of the results (further discussed in section 8 on limitations). On the first day, we joined both interviewers²⁰ to monitor the quality of their work and give some guidance on how the questions should be phrased. From the second day onwards, the interviewers went in the field by themselves.

The results and findings are discussed in the analysis section of this paper (especially hypothesis 5). The 1st questionnaire itself is attached in appendix 6. In question 34, agreement or disagreement can be expressed on a scale from 1-5. However, as we realized that one interviewer almost exclusively used a scale from 1-3 and the other one almost exclusively from 3-5, we decided to rescale to values from 1-3 to make different districts comparable and avoid a bias.

6.5 Risk reduction potential of Insurance – 2nd questionnaire

In order to test the results from the 1st questionnaire and to get a slightly different perspective on the risks and insurability of the women, we decided to run a second questionnaire with more in depth questions focusing on personal details and all the significant adverse events that have occurred to the women and their families in the recent and distant past. In the 2nd

¹⁶ We included poor (< than 50 Rs (1€) per day), marginally poor (between 50 and 100 Rs (1-2€) per day) and non-poor women (>100 (2€) Rs per day) according to the standard defined by the World Bank.

¹⁷ The sample composition was established together with Hand in Hand

¹⁸ In order to facilitate the process, we decided to change the questionnaire design to multiple choice (in line with Hand in Hand's questionnaire).

¹⁹ We would have had exactly 300 questionnaires but unfortunately 52 got lost in the mail from Thiruvannamalai to Kancheepuram.

²⁰ The zonal managers Johnson and Prem conducted the interviews.

questionnaire, we used almost exclusively open questions. These interviews were conducted by us with the help of our translators Johnson and Prem and each interview took 45-60 minutes. As such we could screen the answers for consistency while the interview was still in the process and in case we would spot inconsistencies we could immediately clarify these. The high level of consistency and detail achieved throughout these questionnaires allows for a thorough analysis of the interviewees' situation. Further, we can infer what risks they are exposed to and which insurance policies may or may not be suited to reducing their exposure to that risk. Due to the length of these questionnaires and the necessity for us to join the interviews, we only interviewed 40 women, 20 in each district.

The results and findings are discussed in the analysis section of this paper (especially hypothesis 4). The open questions on which the 2nd questionnaire was based can be found in appendix 7.

7. Analysis & Results

7.1 Transaction cost

Hypothesis 1: Transaction costs are proportionally higher for microinsurance than for conventional insurance

In the following we examine whether transaction costs are the reason why insurance products are not offered to the poor in south-east India. First, the different kinds of transaction costs are defined. Second, we evaluate whether they are proportionally lower for microinsurance than for conventional insurance in the direct sales model. Third, the partner-agent model is introduced to show how transaction costs in microinsurance can be brought down as to ultimately reject hypothesis 1.

In the context of microinsurance, transaction costs are incurred by the insurance company as well as the insured individual. Transaction costs of the insurer include (1) educating imperfectly informed clients on the merits of taking insurance products to reduce the financial volatility in their lives, (2) conducting due diligence and screening clients to prevent adverse selection, moral hazard and fraud and finally (3) servicing existing insurance contracts e.g. collecting and disbursing money. The clients, too, incur transaction cost largely due to (4) conducting due diligence on different insurance products pre-contract, (5) meeting documentation requirements set by the insurer²¹ and (6) costs associated with the exchange of money, most notably paying monthly or annual premiums to the insurer.

We in turn discuss the six costs mentioned above and analyse the extent to which they differ when insurance products are scaled down to match the demand of the rural poor. This is done for two different microinsurance distribution channels: First, we look at transaction costs if the insurance offers insurance directly to the poor. Second, we analyse the costs in the so-called partner-agent model, where the NGO and the insurance company cooperate to sell insurance to the poor.

²¹ Examples: Medical check-up, proof of age and identity, certificate of good health, etc.

7.1.1 Direct Sales Model (insurance company sells insurance directly to the poor)

Transaction costs for insurance company:

(1) Poor clients are on average less financially literate than wealthy ones. Consequently, the insurance agent needs to spend more time on each client²² increasing transaction costs for the insurance company. However, the salary of the insurance agent in the rural areas is lower, so it is unclear if transaction costs in absolute terms decrease or increase. However, due to the considerably lower scale of premium and cover transaction costs make up a larger share of the premium.

(2) Pre-contractual screening and due diligence are the most common forms of transaction costs related to information asymmetries. The insurance company largely transfers these costs to the client by imposing specific documentation requirements depending on the type of insurance.²³ Nevertheless, it has to bear the cost of collection and processing of these documents. These documents are collected in the central offices of the insurance companies so the costs of processing are probably the same independently of the size of the policy. Hence, transaction costs are higher as a proportion of premiums. As a consequence, insurance companies might be inclined to shift part of their due diligence for the lower premium policies from pre-contract to post claim²⁴ (Churchill et al., 2006). This reduces the costs somewhat and we expect transaction costs to be comparable to conventional insurance in relative terms.

(3) Generally speaking, the cost of collecting premiums and disbursing money in case of adverse events should be relatively constant and independent of the size of the premiums. However, two cost factors differentiate microinsurance and conventional insurance: First, rural clients largely don't have bank accounts so the insurance either needs a local presence or has to send an agent to collect and disburse the money. In urban areas with wealthier clients, all this is done through bank accounts. Second, lower premium products often have lower frequencies of payment reducing transaction costs²⁵. For policies with high premiums, the payments are more likely to take place on a monthly basis. Summarizing, transaction costs of premium collection and benefit disbursement are likely to be higher for microinsurance in absolute and relative terms.

Transaction costs for the client:

(4) Rural clients, except for the very credulous ones, conduct their own due diligence. They incur costs searching for policies, understanding the meaning of the contract and evaluating the contract and its implications. It is impossible to estimate if the costs are higher or lower than for conventional insurance because again two opposite effects might be offsetting each other partly (more time spent at lower opportunity cost). However, relative transaction costs will be higher for microinsurance compared to conventional insurance.

²² It is theoretically possible to imagine that the agent just talks the client into an insurance contract without spending time on explaining the concept of insurance and discussing the product details. We assume that this happens quite often as many of the clients that we interviewed had a limited understanding of insurance in general and the details of their policy specifically. However, a considerable amount of case studies shows that this approach is not viable in the long run due to low levels of client satisfaction (Garand, 2005).

²³ For any insurance policy, an application form and a birth certificate has to be handed in. Health insurance companies might require clients to do a medical check up and certainly require a 'statement of good health' signed by the client. Similarly, for cattle insurance a veterinarian's statement about the insured animal's health is compulsory and an ear tag has to be implanted.

²⁴ Example: In health insurance, the insurance company might contact the hospital to find out if the client has a pre-existing disease instead of requiring a pre-contractual health certificate.

²⁵ All the microinsurance schemes that we have analysed require yearly upfront payments.

(5) In addition to the costs outlined above, the documentation requirements set by the insurer also mean significant transaction costs to the clients. Filling out application and claim forms can be done in a few minutes by a literate person experienced in financial matters. For the average rural poor, however, this probably involves seeking the advice of a trusted person in the village. Again, opportunity costs have to be weighted with time spent on filling out and receiving the forms. In absolute terms, it is unclear if transaction costs are higher. However, it is reasonable to assume that transaction costs of meeting the documentation requirements are substantially higher for lower premium policies.

(6) Finally the client faces the transaction cost of paying the premiums to the insurance company. Most of the clients don't have bank accounts so the client has to bring the money to the local office of the insurance company if the agent does not come to pick it up. Due to the yearly premium payments, this part of the clients transaction cost should be small but still higher than in conventional insurance in absolute and relative terms.

As shown on a qualitative basis, scaling down insurance policies does not automatically mean that transaction cost decreases in proportion. Figure 2 illustrates that quite the opposite is true: Transaction costs as a proportion of premium increase, rendering microinsurance less attractive.

7.1.2 Partner Agent Model (insurance company sells insurance to the poor with the help of NGO intermediary)²⁶

Transaction costs for insurance company:

(1) In the partner-agent model, client education and the entire sales process are taken over by the NGO (Churchill et al., 2006). In return, the insurance pays a commission as percentage of premium to the NGO.²⁷ The organization not only has the necessary grass root staff in place, it also has a lot of experience with the clientele and regularly organizes educational trainings for the women to improve their (financial) literacy. Adding a course module on insurance would be the easiest and most cost efficient way to educate the clients. This reduces the transaction costs of the insurance company substantially and renders the whole sales process more efficient. In this model, we expect the transaction cost of the insurance company to come down well below the costs of conventional insurance.

(2) Under the partner-agent model the NGO does all pre-contractual due diligence. We found that the NGO has significant advantages in conducting due diligence. The organization has field staff that closely interacts with the women and is thereby able to reduce the information gap between insurance and client. This reduces adverse selection and moral hazard problems as well as fraud. Apart from reducing the information gap, the field staff can easily collect application and claim forms during the regular interactions with the SHG's, bundle them and send them back to the insurance company.

All of the insurance companies that we met retain their post claim due diligence in-house in order to prevent fraud. All in all, the due diligence and documentation process becomes more

²⁶ The observations in this section are based on Hand in Hand's organizational structure. We believe it is reasonable to expect the structure to be representative for other NGO's. In that case, the results can be generalized. In this section we only analyse the transaction costs to the insurance company and the client. The costs incurred by the NGO are not analysed in detail. We have performed a feasibility analysis for Hand in Hand acting as microinsurance agent for life insurance and cattle insurance and we found the commission paid to the NGO for selling insurance to be sufficient to cover all of the costs incurred. For other NGO's and/or other insurance policies, this might be different, though.

²⁷ The commission commonly paid to NGO's ranges from 10-15%. This is much below the commission paid to a regular insurance agent (35% in year one thereafter declining, source: LIC).

efficient and transaction cost of the insurance are lower in absolute terms and comparable in relative terms to the conventional insurance.

(3) The NGO collects the premiums once a year during the SHG meetings and transfers the money in bulk to the insurance company. The organization disburses the claimed benefits which the insurance company transfers to its accounts. Disbursement mostly involves personal interaction of the grass root staff with the claimant but most of the time, both live in the same village anyway. As a share of premium, transaction costs related to collection are smaller in absolute and relative terms and costs of disbursement are slightly higher in relative terms than for conventional insurance. In sum, relative transaction costs are likely to be approximately equal (Rademacher et al., 2005).

Transaction costs for the client:

(4) The partner-agent model reduces transaction costs related to sales education in at least two ways. First, by screening and selecting the most suitable insurance schemes for the women, the NGO ensures that the women get the cover they need at low cost.²⁸ Two assumptions have to be fulfilled for this to hold: Clients have to have a reasonably similar risk exposure; this seems to be a reasonable assumption as the women tend to come from similar backgrounds. Moreover, clients need to trust the NGO as intermediary to select reasonable products for them. According to our field study, an overwhelming majority of 93% of the women answer they would trust insurance products offered and recommended by Hand in Hand. Roughly 95% answer that they want to receive more information on insurance by the NGO²⁹. Second, as most NGO's have regular training modules for the women the education on insurance could be added to the existing modules. Transaction costs of the clients are lower because they have to spend less time on due diligence and get a better product on average.

(5) Meeting the insurer's documentation requirements, the NGO's field staff can offer experience on how to obtain a police report, a death certificate or a proof of age. While the insurer could do the same task, NGO staff might be more convenient to deal with for the clients as they are likely to know and trust the staff already. Problems related to insurance policies can also be discussed during the SHG meetings. This reduces transaction costs to the client in absolute terms. In relative term, the costs are probably comparable.

(6) Transaction costs due to transfer of money are reduced for the clients as the NGO's field staff is visiting each SHG at least once a week. As such money can be collected and in some cases even be disbursed during the regular meetings. An insurer would very likely not afford to send one of its agents by each client's door. We conclude that transaction costs of money transfer are lower in absolute terms and about equal in relative terms.

A summary of the above findings is given in figure 2. As transaction costs differ for different insurance types, we want to stress that the table illustrates the example of life insurance. Other insurance types might deviate from this analysis.

²⁸ Almost all 12 insurance companies that we visited were willing to give group discounts up to 30% (for more than 100000 clients insured).

²⁹ Arguably the setting i.e. being interviewed in the presence of Hand in Hand staff might have biased answers concerning the trust in Hand in Hand. In general, however, we observed the women have a very high level of trust in the NGO.

Figure 2. Transaction cost overview

This figure depicts how the transaction costs of microinsurance incurred under direct sales and partner-agent schemes differ from conventional insurance. The difference is shown both in absolute and relative terms (as a percentage of premium). The example illustrated displays the costs for life insurance. Due to many unknowns, the actual costs can differ from what is shown here depending on the surrounding conditions.

	Absolute transaction costs	Relative transaction cost
Direct sales		
<i>Insurer</i>		
Education and sales process	unclear	higher
Due diligence and documentation	lower	equal
Premium collection and benefit disbursement	higher	higher
<i>Insured</i>		
Due diligence and education	unclear	higher
Fulfilling documentation requirements	unclear	higher
Premium collection and benefit disbursement	higher	higher
Partner-agent		
<i>Insurer</i>		
Education and sales process	lower	lower
Due diligence and documentation	lower	equal
Premium collection and benefit disbursement	lower	equal
<i>Insured</i>		
Due diligence and education	lower	lower
Fulfilling documentation requirements	lower	equal
Premium collection and benefit disbursement	lower	equal

7.1.3 Summary and contribution

In the above section we have examined whether transaction costs are suited to explaining why the poor in south-east India are underinsured. We differentiate between six different sorts of transaction cost incurred by insurers and clients alike. In the direct sales model, we have shown that each of these costs declines by less (often by much less) than proportionate to premiums when the policy is scaled down. Consequently, transaction costs make up an ever bigger share of total costs the more an insurance policy is being scaled down. We can not quantify the effect due to too many unknowns. This is in line with the findings of Murdoch (2002) and McCord (2002) who state that the increasing share of transaction costs associated with smaller insurance policies can deter a market for microinsurance. This is not the end of the story, however.

Our next step is to show how transaction costs can be brought down significantly when insurers and NGO's cooperate by means of the partner-agent model. Clearly, this argumentation hinges on a close to area-wide NGO coverage across south-east. In section 2.3 of this paper, we have in fact shown that this is a reasonable assumption in south-east India. In discussing the potential for cost reduction of each sort of transaction cost we show qualitatively that by merits of the cooperation model, transaction costs can be brought down sufficiently for insurance to be provided on a smaller scale suited to the needs of the poor. Hence, we reject hypothesis 1 and conclude that transaction costs are not the major reason for underinsurance of the poor in south-east India.

Our findings concerning transaction costs are in line with Brown (2001) and Ahuja (2005) who describe how deterrent transaction costs can with the help of a NGO be brought down to a feasible level. We go further than Roth et al. (2005) who only recognize that transaction costs make microinsurance too expensive under the direct sales model. Although it sounds reasonable, we can not confirm Churchill, Reinhard et al. (2006) who claim that the direct sales model can be favorable in specific cases as it allows for controlling the distribution channel. This might be favorable for the insurer but according to our results does not bring down transaction costs sufficiently. Our main contribution is to provide a systematic analysis of transaction costs in the two different distribution models of microinsurance. The literature that we have reviewed is restricted to merely stating that transaction costs are reduced in the partner agent model.

7.2 Adverse selection, moral hazard and fraud

Hypothesis 2: Microinsurance is exposed to severer problems of adverse selection, moral hazard and fraud than is conventional insurance

As outlined in section 5.2, we want to investigate if *adverse selection*, *moral hazard* and *fraud* are substantially more relevant in microinsurance than in conventional insurance. In this section, we subsequently discuss the different insurance types with respect to market failures in microinsurance compared to regular insurance. The analysis includes (1) life and accident insurance, enterprise insurance which comprises of (2) dwellings & content, (3) cattle and (4) weather and crop insurance and (5) health insurance.

7.2.1 *Life and accident insurance*

All life insurance policies we came across in India (and probably elsewhere) cover death and accidents leading to disability. The implications for *adverse selection* are quite obvious. Clients who feel their risk to have an accident is above average, e.g. construction workers or rickshaw drivers are more likely to take insurance. Also, families much rather pay premiums for older or sick members or generally anyone likely to die soon. This is a problem all life insurers are facing. At least five measures preventing adverse selection can be identified none of which indicates that for life insurance market failures are a substantially bigger problem in microinsurance compared to conventional insurance.

First, excluding the elderly is one way to keep the expected premium amounts low for both insurance types. However, typical age thresholds chosen by life insurers operating within Tamil Nadu are 55 years for standard policies and 45 years for endowment policies. As such, they are much lower than conventional insurance thresholds due to the lower life expectancy of the poor. Collecting age certificates is merely a question of transaction cost and we argued before how these can be reduced to levels feasible for low income clients.

Second, in order to avoid taking customers already fatally sick, commercial insurers often ask clients to undergo a health test before being insured. This poses too high a cost for most low income customers. To achieve a similar result, rural insurers check whether an illness (probably) already existed once a claim has occurred. Pre-existing diseases are explicitly excluded in low income policies.³⁰ Furthermore, a six month lapsing period can be applied

³⁰ They might also be excluded in conventional policies but the control mechanism is not post claim.

(Herrera, 2004)³¹. This is a rather unpopular measure, however, and not encouraged by Indian regulators (Rademacher, 2005)³².

Third, offering highly competitive rates for additional family members is a very smart move as well, as it is highly unlikely that many family members have high risk at the same time³³. Fourth, by cooperating with NGO's and taking advantage of their SHG structure, insurers offering products to the rural poor can reap further benefits. If the SHG does the underwriting³⁴, the NGO can impose group schemes which by design prevent adverse selection. While the preceding measure addresses adverse selection within the family, this measure eliminates the same between families. Even under a voluntary scheme, the NGOs agents likely have a lot of local knowledge allowing them to avoid adverse selection. In the optimal case they already know the prospective clients from SHG's. McCord et al. (2005) describe how microinsurance agents learn to avoid high risk groups by avoiding areas like e.g. truck stops due to high HIV infection rates. This effectively leads to similar results compared to conventional life insurance where rates are determined based on job, postal zip code or other demographic features.

Fifth, suicide is another risk related to adverse selection. During the interviews we conducted in small villages near Chennai, one woman told us her husband killed himself eating fertilizer while two knew about similar cases in the village. All insurers insulate themselves from this risk by not covering suicide during the first year.

Moral hazard is less prevalent in life and accident insurance.³⁵ It is hard to believe that clients become more risk taking once their lives are covered by a policy. Stories of husbands killing their wives to receive the benefits are not unheard of, yet extremely rare in south-east India, as the covers paid are even by Indian standards not very high³⁶. Furthermore, a significant survival bonus is often paid.

Fraud is not particularly easy in life and accident insurance because the death of a person is a highly significant event and most probably the whole village knows about it and attends the funeral. In the case of accidents, a police certificate is required in order to prove that the accident actually happened. In addition a disability certificate from a doctor is needed. We have not found examples in the literature nor have we heard about cases where fraud in life and accident insurance was a problem. This holds true for conventional as well as microinsurance.

Hence, small adaptations need to be made to the design of life insurance policies in order for the insurance to be provided. However, market failures are not more detrimental in microinsurance compared to conventional insurance.

7.2.2 Dwellings & content insurance

Dwellings & content insurance policies are subject to *adverse selection*, whether for low income or wealthier clients. Some of the adverse selection risk is eliminated by the design of

³¹ COLUMNA which operates in Guatemala has introduced a six month waiting period for natural death benefits but immediately covers accidental death.

³² According to Roth & Athreye (2005) TATA-AIG could not introduce such a waiting period as the regulator did not want financially illiterate clients to become frustrated when claims emerge during that period.

³³ HDFC Standard offers a group scheme to NGOs which insures spouses at very competitive conditions.

³⁴ This is envisioned by Hand in Hand and is already done by Karnataka based Dhan foundation.

³⁵ One might argue that insurance induces people to take more risk in traffic for example because accidents are covered. This argument is invalid, however, because accidents are only covered if they lead to permanent disability. We assume that nobody takes this chance because of having insurance.

³⁶ Typical life covers start as low as 5000 Rs (€100) and seldom exceed 50000 Rs (€1000).

the policy: The cover is multiplied with two per mille for solid brick houses and by a factor six per mille for thatched huts. Thus, there is little adverse selection related to the way the building is constructed. However, the usage of the premises poses a certain deal of adverse selection as its riskiness can not easily be observed. However, microinsurance policies do not differ from conventional insurance in this respect. As for all other insurance policies, compulsory schemes in cooperation with a NGO by design eliminate adverse selection risk.

Due to the difference between personal value and insurable value, *moral hazard* is not considered a substantial risk in dwellings & content insurance. People do not take the risk of loosing their belongings only because the insurance company would replace the building and the contents.

The discussion of *fraud* is different for dwellings & content insurance than for the other insurances that we have seen so far. While nobody is inclined to commit suicide or get sick to reap the insurance benefits, people might very well consider burning down their house if the insured value strongly exceeds the value of the house. As such the insurer needs to ascertain that the sum insured does not supersede the actual value of the premises. This problem also exists in conventional dwellings & content insurance. Moreover, most houses and huts in villages do not have a fixed street with street name, house number and postal zip code and the owners are not registered with local authorities with a fixed address. In order to prevent the policy holder claims compensation for say his neighbours house as well as to scrutinise whether the cover suggested by the client is reasonable, the insurer needs to have an agent in place. Doing so, the insurer overcomes the asymmetric information problem causing both, the incentive and opportunity for fraud. As described in more detail in section 7.2.5 on health insurance, the insurer is not entirely insulated from fraud on the agent's behalf. Upfront lump sum payments reduce this kind of risk.

Again, there is no reason to assume that the risk of market failures in dwellings & content insurance is substantially different from conventional insurance.

7.2.3 Cattle insurance

There is a significant deal of asymmetric information involved in cattle insurance. To avoid *adverse selection*, the insurers require a veterinarian to assess age and health of every animal so that an adequate premium can be calculated. The main adverse selection risk is related to the different kinds of farmers. While some of them might be very caring and wary, others care less about their animals. This might affect the life expectancy of the cattle significantly.³⁷ However, this is a problem that exists for both types of insurances, microinsurance as well as conventional insurance.

The main *moral hazard* risk relates to the farmer caring less due to his herd being insured. While we cannot exclude this risk completely, we believe it is negligible: Buying new animals is always a hassle for the farmer because of the transaction costs involved such as travelling to the local market, bargaining for the price and still suffering from asymmetric information on the cow's physical health. Moreover, insurers avoid moral hazard by offering only one year contracts. After each year, the value of the cow needs to be newly assessed (Roth et al. 2005). Hence, the risk of moral hazard is not substantially different for both insurance types.

³⁷ One woman reported that she never left her cows unobserved during the day because she wants to see what they eat. She also cleaned the cows once per week. The woman claimed that her cows were almost never sick.

In order to avoid *fraud*, each animal has an ear tag and in case of death, the claimant has to cut off the tagged ear which is then sent to the insurance company together with a picture of the dead animal. The NGO can assume the role of an insurance agent and check if the animal is actually dead, take a picture and send it to the insurance company along with the ear tag.³⁸

We conclude that cattle insurance is in no respect substantially different for microinsurance compared to conventional insurance.

7.2.4 Crop and weather insurance

Crop insurance is a product offered to small and large land owners. It insures farmers against loss of crops due to flooding, riots and vandalism³⁹. There is some *adverse selection* involved as farmers who believe their harvest is especially prone to being destroyed by flooding or riots are more likely to buy such insurance, while the insurer clearly has an information disadvantage (Mommens, 2006).

Moral hazard might arise in case the crops have been damaged already as the insured farmer has little incentive rescuing as much of it as possible.

Fraud can happen under the same circumstances as described above, i.e. when the agent is corrupt or the field is overvalued.

Again, adverse selection, moral hazard and fraud risks are fundamentally the same for micro as well as conventional insurance.

A newer alternative also referred to as weather insurance, acknowledges that bad harvests are almost exclusively the consequence of irregular rainfall and pay out compensation to farmers depending on the rain fall measured, regardless of their actual harvest and the effort they exerted.

Adverse selection is not a problem for this kind of insurance as the insurer presumably has information on the historical rainfall statistics.

As claims do not depend on the actual harvest and obviously farmers can not influence the rain, *moral hazard* is not a problem at all.

By design, false claims are not possible. The only perceivable form of fraud is the backdating of contracts.

7.2.5 Health insurance

Health insurance providers face a significant risk of *adverse selection*. Clients who believe their health is at peril or already have a sickness are more likely to take health insurance than those perfectly healthy. The mitigating measures are similar as for life insurance. First, excluding clients as of a certain age threshold, often 55 years, helps limiting adverse selection. Again, thresholds are lower than for conventional insurance. Second, a six month waiting period is a formidable way to exclude those already ill instead of having low income people pay for a medical check up.⁴⁰ Third, family insurance schemes at very competitive rates are offered to circumvent adverse selection. Again, it is unlikely that all members of the

³⁸ Hand in Hand already assumes this role

³⁹ All the four big public insurers offer crop insurance schemes which capture most of the market share in their respective geographic regions.

⁴⁰ Some NGOs nonetheless do not introduce such a waiting period as they feel this hits those in need worst. These NGOs pursuing a social agenda and deliberately overlooking adverse selection are sometimes falsely referred to as a proof that market failures like adverse selection can not be overcome, seemingly rendering microinsurance an unfeasible endeavour.

same family suffer from sickness at the same time.⁴¹ Fourth, NGO's can potentially further reduce market failures with the help of compulsory group insurance schemes.

The most important form of *moral hazard* in health insurance is excessive usage. The problem is not easily tackled but insurance companies include two covenants for low income clients which makes the provision affordable: First, insurers only cover stays in hospital in excess of 24 hours. Second, the insurance sets a maximum cover not to be exceeded by any sickness or patient. Both measures are not common in conventional insurance because of being deemed unsocial. Although these covenants do not reduce moral hazard per se, they at least limit the risk of the insurance company. Moreover, we learned in the field that the excessive usage argument might not be a problem for cultural reasons.⁴²

Insurers operating low income policies (mostly in rural areas) are much more likely to suffer from *fraud*. Collusion between nominee and insurance agent may lead to backdating of insurance policies⁴³. Upfront premium payments effectively prevent this to a certain extent. Collusion between hospitals and clients poses another challenge: Hospitals and doctors have no incentive to verify the person getting treatment is actually the insured client and not someone else. Instead, they stand to cash in extra revenues. One solution to this problem might be that the insurance company requires licensed hospitals to take a photo of the person treated when being admitted (Garand, 2005). Finally, most clients have very little medical knowledge if any. Hospitals can take advantage of this by billing procedures which are much more expensive than the procedures actually carried out. Again, the insurance company is able to control this problem by conducting random interviews with clients who received medical treatment and frequently disguise fraud by doctors (Garand, 2005). While all of these forms of fraud are possible in urban hospitals and with wealthier clients, they are a lot less likely. The transaction cost argument implies that for more expensive health insurance policies the cost of monitoring and conducting interviews constitutes a smaller percentage of total cost. Further, urban clients have pictured IDs to identify themselves at any time. Most of the precautionary measures described above to avoid adverse selection and fraud (moral hazard is tackled by design of insurance policy) for low income policies can be taken over by the NGO in the partner-agent model⁴⁴. With more local knowledge about the people and their sicknesses, the NGO can certainly do a better job in controlling for adverse selection and fraud than the insurance company. Hence, market failures should not be substantially different for low income policies and conventional insurance.

7.2.6 Summary and contribution

We examined the hypothesis that market failures can convincingly explain the degree of underinsurance of the poor in south-east India today. Although market failures are prevalent in microinsurance, they are not particularly more so than in conventional insurance. For some of the insurance types, insurers change the policy specifications for microinsurance slightly to

⁴¹ Even government subsidies are available for health insurance: The Universal Health Benefits Scheme offered by all public insurance companies costs 548 Rs per year for a family of five people and is subsidized with an extra 300 Rs for BPL people.

⁴² In an interview with the project manager of Hand in Hand's health & hygiene pillar, she explained that Indian people don't like going to lawyers and doctors in general. Hand in Hand staff confirmed that low income clients as well as people with a normal income (including them) refrain from seeking medical advice unless they are seriously sick.

⁴³ Bribes are very common in rural areas. In one instance, an interviewee took pride in having secured her son a job as a public bus driver by paying a bribe of 150000 Rs (€3000) financed by a loan from a money lender.

⁴⁴ During interviews with insurance executives in Chennai we found that after an initial phase of checks they were ready to fully trust the NGO they work with as to reduce transaction costs.

avoid adverse selection, moral hazard and fraud caused by a slightly different setting compared to conventional insurance (people not having addresses, ID's, etc.). After customizing the policies to low income clients and in some cases relying on an NGO to take over certain tasks, there is no reason to believe that adverse selection, moral hazard and fraud are more relevant than in conventional insurance. The inclusion of an NGO can even have the effect of reducing market failures below the conventional level. The women seem to be very grateful towards NGO's for how the SHG has changed their lives. Moreover, the women put a lot of trust in the organizations. In itself, this is likely to reduce problems related to adverse selection, moral hazard and fraud because the women are very reluctant to deceive the NGO. However, the quality of the NGO is crucial to eliminating market failures. Much of the adverse selection found with microinsurance in the partner-agent model is owed to NGOs pursuing a social agenda (McCord et al., 2005).

Market failures that cannot be prevented by insurance design and the partner-agent model can only be avoided by incurring higher transaction costs. Relative to the premium, these costs might be very high and in fact impede the provision of microinsurance. We have not found evidence for such market failures.

While most of the findings in previous case studies can be confirmed, our findings diverge at some points: Unlike Herrera et al. (2004) and in line with Roth & Athreya (2005) we find that life insurers can offer death cover from the first day on, rather than imposing a six month waiting period. Alternatively, excluding suicide in the first year seems to be a much wiser option because otherwise people might have valid claims and are not reimbursed. Furthermore, we believe that suicide should be dealt with under adverse selection rather than moral hazard as done by Herrera et al., (2004) and Roth & Athreya (2005). While Rodriguez et al. (2005) suggest a rigid health insurance design where the underwriting process is simple we believe that even more complicated schemes can prevail. Consequently, we agree with Roth & Athreya (2005) that relying on the existing community structures and a trustworthy NGO can be worth much more than designing an insurance scheme with all different kinds of exclusions. Hence, our main contribution with respect to market failure of microinsurance products lies in illustrating the problem in a south-east Indian context and providing a comprehensive overview of all available insurance types. To our knowledge, no case study on microinsurance so far has examined market failures to such extent.

7.3 Scalability

Hypothesis 3: Conventional insurance products can not be scaled down to the extent necessary for providing microinsurance

As explained in the literature review, it is argued that scalability of products might be a problem in microinsurance. Insurance is not necessarily scalable to such extent that a product suitable for wealthy clients can be provided to the poor. This section discusses the scalability problem of insurance in the south-east Indian context. While section 7.1 and 7.2 discuss the effects of transaction costs and market failures on the provision of microinsurance in detail, we try to isolate scalability issues in this section. This point is emphasized as the literature often refers to scalability issues when actually referring to transaction costs related issues. The structure of this section is as follows: First, the concept of scalability is defined. Second, the assumptions for the scalability discussion are provided. Third, for every insurance type it is analysed whether the products are in fact scalable or not.

To define scalability, we need to look at both the relation between cover and premium as well as the relation between cover and the insured person's income. Two conditions need to be fulfilled for the policy to be scalable: First, as the minimum size of the cover determines the minimum premium, the insurance can only be considered scalable if the insured event or object can be partially insured or the insured event or object can be divided into reasonably small pieces. Second, the size of the cover needs to be somehow related to the income of the insured individual and the benefit should be primarily pecuniary (Churchill et al., 2006). The second condition is not straight forward but as we will see, scalability is very much dependent on it. Both conditions individually are necessary but not sufficient conditions. Consequently, only if both conditions are fulfilled, the insurance can be considered scalable. As the below analysis shows, the first condition is fulfilled for all insurance products. The second condition, however, is not fulfilled in the case of health insurance, so this insurance type cannot be considered scalable.

In order to be able to discuss this, the assumptions of this section need to be clearly specified. For that purpose, it is assumed that insurance products are fairly priced and any given person has the same probability of being hit by an adverse event. In addition, transaction costs are disregarded for the purpose of this section.

7.3.1 Life insurance

Pure Life Insurance

If life insurance is to fully cover the financial costs related to the death of a person, the insurance should cover the value of the residual earnings capacity of the person plus the one time costs incurred for funeral etc. This is the cover needed to make the family of the dead person equally well off from a purely financial perspective. However, there is no reason why a person's expected life earnings should not be partially insurable. As such, there is no minimum cover in life insurance. Disregarding transaction costs, premium and cover are proportional. Consequently, the first condition is fulfilled. With regard to the second condition, it is obvious that the life insurance cover is clearly dependent on the income of the person as it is determined by discounting the residual earnings capacity. Consequently, both scalability conditions are fulfilled and life insurance is considered to be scalable.⁴⁵

Pension insurance

Pension insurance has very similar characteristics compared to standard life insurance. The major difference is that the cover is not paid out in the case of death but rather at retirement in the form of a reverse annuity. This does not change the structure of the insurance substantially, so both conditions are fulfilled and it can be considered scalable as well.

7.3.2 Personal accident insurance

Personal accident insurance covers not only the death of a person, but also partial and total permanent disability. Similar to the life insurance, it is meant to cover the residual earnings of the insured in case of death. The case of partial and total permanent disability is more complicated because it also needs to cover medical and living expenses of the disabled. Nonetheless, there is no reason why death and disability should not be partially insured. Again, for the same reason as for life insurance, there is a clear relation between income and cover: Both the death as well as the disability component are of the insurance are calculated

⁴⁵ Life insurance is in fact the insurance type which is most easily scalable due to its simple premium and payoff structure.

on the basis of the expected future earnings of the insured. Consequently, both conditions are fulfilled and the insurance is considered scalable.

7.3.3 *Enterprise insurance*

Dwellings & content

Dwellings & content insurance covers the domestic enterprise as well as the household and private belongings of the insured. The premium and cover are determined by the value of the house and its contents. Dwellings & content insurance is scalable to a considerable extent. As long as the insured objects are clearly defined, there is no reason to assume that dwellings & content insurance cannot be broken down to the individual object insurance or even insuring part of an object. From the perspective of the insurance company this becomes only problematic if the object insured is not specified. But again, this is more a problem of contracting than an argument against scalability. With respect to the second condition, the size and value of the house and its contents (and therefore the amount to be covered) are in most cases be directly depending upon the person's income, such that the second condition is also fulfilled. Summarizing, dwellings & content insurance is scalable.

Cattle insurance

Cattle insurance covers the death of a milk animal. Cover and premium are scalable in the value of the individual cow and the amount of cows to be covered. The minimum premium for covering the death of a cow completely is determined by the minimum value of a milk animal. Theoretically, however, there should be no problem covering the value of the cow only partially.⁴⁶ As a consequence, the first condition is fulfilled. With respect to the second condition, it is clear that there is a strong relation between the amount of cows the farmer has and his income. Similar to agricultural insurance, cows are farmer's income generating asset so their value is by definition related to income. Therefore, cover and income are related and both conditions are fulfilled.

Weather and crop insurance

Weather and crop insurance cover the plants and harvest in agriculture. If a drought occurs, the farmer gets compensation for the sum insured or the actual damage incurred whichever is smaller. Premium and cover move proportionally and the farmer can also insure his field partially. If he opts for the latter, however, the insurance needs to make sure that the farmer bears his share of the costs, i.e. if 30% of the field is insured and 30% of the harvest gets lost due to drought, the insurance pays 9% of the value of the field and not the total amount lost. This however is more a question of contracting theory and moral hazard (dealt with in the next section) than scalability. As mentioned above, the field can be insured partly from a scalability perspective. Moreover, the second condition also applies as the income of the farmer is likely to be proportional to the size and amount of the fields that he has. The field is the farmer's income generating asset so by definition, income and value of the asset to be covered are related. Hence, both conditions are fulfilled and crop insurance is scalable.

7.3.4 *Health insurance*

The case of health insurance is more complicated than the other insurances for a couple of reasons. We analyse these reasons by looking at the two scalability conditions previously defined. First, we investigate if health insurance is scalable in *cover and premium*. We find

⁴⁶ This insurance does not exist currently, but from a scalability perspective, there should be no problem in insuring a cow partially.

that health insurance is scalable in general, but in the very specific environment in India, the scalability is severely constrained. Second, we look at the relation between *cover and income* of the person as was done for the other policies as well.

First, looking at the relation between *cover and premium* it is important to notice that health insurance needs to cover many different sicknesses. Therefore the premium is to be understood as a blended average probability of the various sicknesses. Despite the inherently complicated nature of health insurance compared to other insurance types, one can theoretically imagine that people can insure only a portion of a certain sickness. This is effectively what happens when insurance companies put caps on the maximum cover of certain policies. This is not a problem per se, actually quite the opposite: People can at least hedge a certain portion of a potential sickness. It is assumed that this is still better than having no insurance at all. For the purpose of this argument, we deliberately neglect the fact that in most societies it is morally unacceptable to refuse treatment of e.g. a heart attack on grounds of limited insurance cover.⁴⁷

However, when looking at the Indian health care system more specifically, it becomes clear that health insurance is indeed more problematic than it seems at first glance: *The complication relates to the provision of free healthcare by the Indian state.* As such, health insurance is the only insurance type where people actually have to decide upon taking or rejecting the insurance service after the covered event has occurred. More precisely, they have to choose between a private hospital where treatment is (partly) paid for by the insurance and free treatment in a public hospital. Rejecting the insurance service might sometimes be the wiser choice because for severe diseases heavy co-payments might lead to high indebtedness while it is unclear if the quality difference between the hospitals is worth the money. A second complication arises because health insurance is non-pecuniary as opposed to all other insurances that we have looked at so far: It actually covers a service rather than paying out a predetermined amount of money. The latter, however, has a certain price and can be scaled down only to a limited extent. As such, taking the insurance benefit in most cases of severe sickness also means incurring heavy co-payments. This leaves the insured individual with a decision between public and private treatment with many unknowns. Consequently, the person might end up taking the public service in case of severe sickness despite having insurance because of the fear not being able to afford the remaining part of the expensive private treatment. On the other hand, in the case of smaller sicknesses, the quality difference between public and private hospitals might be so small that health insurance is not worth the money.⁴⁸ Due to the (partial) substitutability of the private and public health sectors, the insured service cannot be broken down to a sufficiently small level without people substituting private for public treatment. Consequently, the first condition of scalability in cover and premium is only partially fulfilled: Up to the point of substitution of the services.

Second, analysing the relationship between *cover and income* of the insured also reveals interesting results: For all the insurances that we have analysed so far, income of the person and cover of the insurance policy are somehow directly related. In health insurance, however, this is not the case. Most of the sicknesses cost the same no matter if a rich or a poor person gets sick. Consequently, the second condition for scalability is not fulfilled. If we assume for the purpose of this argument that from a moral point of view, it is not acceptable that only the rich people get medical treatment we have to accept that health insurance is not be self sustainable for rich and poor people without cross subsidization. The Indian government

⁴⁷ This assumption is relaxed in the following paragraph.

⁴⁸ To complicate things even further, the health insurance policies in the Indian insurance market only cover treatments if the insured was hospitalized for more than 24 hs. So neither for small nor for severe sicknesses, the health insurance seems to be appropriate for the poor.

seems to share this view and has therefore forced the five state owned insurance companies to launch a heavily subsidized health insurance product for BPL people (Universal Health Insurance Scheme).

7.3.5 *Summary and contribution*

In this section we investigate if insurance is scalable to the level required for providing microinsurance. We define two major criteria that need to be fulfilled in order to allow for scalability: First, the insured event or object can be partially insured or the insured event or object can be divided into reasonably small pieces. Second, the cover must be somehow related to the income of the person. We show that the first and second condition is fulfilled for all types of insurances except health insurance. In the case of the latter, the first condition is only partially fulfilled due to the substitutability of public and private services. The second condition is not fulfilled because the service that is covered by health insurance has a certain price irrespective of the income of the insured.

Our scalability section represents an appreciable contribution to the academic dialogue on microinsurance. None of the papers that we have reviewed readily distinguishes between the individual effects of transaction costs, market failures and scalability on the provision of microinsurance. While Churchill et al. (2006) and Dror et al. (2005) admit that health insurance is the most complicated insurance type to provide to the poor, they fail to explicitly separate the scalability effect from transactions costs and market failures.

7.4 Adequacy of supply

Hypothesis 4: The supply of microinsurance products does not suit the needs of the poor as the risk reduction potential of the products is insufficient

After assessing whether transaction costs, market failures and scalability can explain the prevalent state of underinsurance in south-east India we now analyse whether the supply of insurance products is suited to insulating low income families from the adverse events they are faced with.

Throughout this section we maintain the following structure: First, we provide an overview of the women's life regarding the specific insurance category we examine e.g. reasons for death in India for life insurance and describe the Indian health infrastructure for health insurance. Second, *adverse events* are identified in each of those categories and we discuss the observed *frequency* and probable *impact* on the women's lives.⁴⁹ We briefly look at informal *coping mechanisms* and point out their significance and effect when necessary. Third, the most important microinsurance products of each insurance type are matched with our observed adverse events to determine whether the supplied insurance products have sufficient risk reduction potential.⁵⁰

⁴⁹ The observed frequency has only indicative value. The sample is too small to assume it is representative. By assuming that products are fairly priced, we implicitly assume that the frequency is correctly priced into the product.

⁵⁰ For the purpose of this thesis, risk reduction potential is defined as the potential for reduction of financial volatility in the women's lives. Furthermore, we make two assumptions: The women are assumed to be homogeneously exposed to the adverse events, i.e. the adverse events are randomly distributed in terms of impact and probability over the whole set of women. Second, we assume the products to be reasonably fairly priced. This in turn requires the assumption that the insurance company is either risk neutral or the risks are perfectly

7.4.1 Life insurance

Overview

In a south-east Indian context, the most frequent reasons for death are natural death, accidental death and death due to sickness. Murder and suicide also happen occasionally but are less common.

Adverse events covered by life insurance

Death is the only *adverse event* that is covered by the insurance. Some life insurances have permanent disability riders which are discussed under personal accident insurance in section 7.4.3. Our sample comprises of 40 in-depth interviews (see section 6 of this paper on methodology). We observe a *frequency* of 15 cases of death in the women's families⁵¹. Most of them are related to natural death (6 cases) and sickness (5 cases). With three observed fatal accidents and one suicide, these adverse events play a minor role (see appendix 8 for further details).

The *impact* of death on the families' lives has at least two dimensions, the immediate impact and the long run impact due to a breadwinner's loss⁵². Both impacts are discussed subsequently: The funeral is certainly the most important immediate cost related to the death of a person. The average funeral for an adult in our sample costs slightly below 10000 Rs (200 €) which is a substantial burden on the families. To cope with the immediate financial impact, the women rely on different informal *coping mechanisms*: 47% of the women receive financial help from their friends and family, 20% use their savings and 13% rely on taking a loan. The remainder either does not have any expenses (because somebody else pays for the funeral) or relies on other mechanisms.

The long run *impact* of a breadwinner's death is likely to be even more substantial⁵³. In terms of *coping mechanisms*, 33% of the women have to reduce consumption, 20% receive help from their friends and family and 13% of the women have to work more. Interestingly, two of the women report that despite the death of their husbands, the women are better off today because their husbands spent more on alcohol and gambling than they earned.

Summarizing, we find that approximately 40% of the deaths in our sample lead to (temporary) poverty. The vast majority of those have indeed suffered a loss in breadwinner and the coping mechanisms were imperfect in compensating (completely) for the loss of the person. For more details, please refer to appendix 8.

Supply and risk reduction potential of life insurance

Owed to the Indian insurance regulation, a plethora of life insurance policies are found in the Indian market and every life insurance company that we analysed offers at least one product customized for the low income people. There is no difference between insurers with respect to the covered adverse event. Death is always covered with the exception of suicide. All of the

diversifiable. This assumption seems realistic because the share of microinsurance in the companies' portfolio is small and most of the risks are not systematic. Assuming homogenous risk distribution and fair pricing is crucial for concluding that adverse events covered by existing microinsurance policies actually reduce financial volatility and are strictly preferable to having no insurance for risk averse individuals.

⁵¹ Family in this case is defined as the broader family: It includes parents (in law), brothers and sisters (in law) and their families. Due to the broad definition, it is highly likely that some deaths were not observed because the women forgot to mention them.

⁵² Breadwinner is defined as a member of the household contributing to household income.

⁵³ In our sample, 47% of the deaths are breadwinners. However, this number is likely to understate the real share of breadwinner's deaths because by interviewing women our sample by definition only counts male breadwinners.

deaths in our sample with the exception of one suicide would have been covered by all the different life insurance. To find the best product, it is therefore necessary to compare the premium-cover relation. As reliable actuarial data was impossible to come by for us, we can not take an analytical approach in order to calculate expected claims. Consequently, our analysis is qualitative in nature. To make the products comparable we did a NPV calculation of the saving component and obviously obtained negative values. These negative NPV values can then be considered the standalone cost of the insurance cover and as such be compared amongst each other.⁵⁴ For families with children, the LIC life insurance scheme is most attractive, for all others HDFC Standard's scheme is more attractive.

Summarizing, all except one death would be covered and life insurance has very strong risk reduction potential. Products can be customized to the expected loss in case of death and are likely to much better mitigate the financial risk attached to the death of a person than the informal coping mechanisms that we have seen.

7.4.2 Pension insurance

Overview

India does not have a public pension system. Consequently, people are forced to privately save for their retirement. As life length is uncertain, pension insurance helps mitigating the financial consequences of the “adverse event” of living longer than expected.

While low income Indians could historically rely on their children to take care of them when retired, two recent developments challenge this tradition: The decreasing family size and the increasing unwillingness of the children to take care of their parents.

Adverse events in pension insurance

Pension insurance returns a steady income stream to the insured after reaching a predefined age threshold. As such, we define survival until this age as the *relevant event* (in this case, we don't want to call it adverse event for obvious reasons).

For analysing pension schemes, we deviate from analysing the observed *frequency* and *impact* as the sample of women that we interviewed exclusively consists of non-retired women. Instead, we have asked the women when they plan to retire, who they think will take care of them and who takes or is going to take care of their own parents. We made the following observations:

The majority of the women are planning on retiring between 55 and 60. Asked about their envisioned retirement age, we were surprised to find that about one fourth of the women do not plan to retire at all. More precisely 23% of the women stated they would be working until death or until they physically were not able to work anymore.

The lack of an institutionalised pension system requires the women to either save (be it in the form of pension insurance or informally) or rely on their children to take care of them. Only slightly less than 13% of the interviewed are currently saving for their retirement. The vast majority of the women are either planning on beginning to save later (43%) or not planning to save at all (45%). 45% of the women admit that they will depend on their children, with the remainder of 30% conceding this might be the case. Consequently, only one forth of the sample states that they are not going to depend on their children. Please find the details in appendix 12.

⁵⁴ Appendix 9 provides an overview of the IRRs and NPVs of the analysed products.

Hence, the majority of the women will be dependent on an informal *coping mechanism* (saving, depending on their children). Most of the women rely on traditional mechanisms which seem to be dissolving slowly. This constitutes a great risk to the women.

Supply and risk reduction potential of pension insurance

The supply of pension insurance products suited to the poor is limited. Only one insurance company currently offers a pension insurance scheme and we know of one other company currently seeking IRDA approval⁵⁵. As we assume that the products are reasonably fair priced, we do not further elaborate on the NPV of the product.

Summarizing, the risk reduction potential of pension products is enormous, however, subject to affordability as outlined in the next paragraph. The Indian rural society is changing and children are increasingly reluctant to take care of their parents. As the situation is likely to deteriorate further and family size is shrinking, pension insurance's risk reduction potential is likely to be even bigger in future. However, the supply is still limited and a more diverse range of products is needed for customization and to increase risk reduction potential even further.

Further, while we argued that those who can afford having an asset can also afford insuring it to cover the expected loss, this certainly does not hold true for pension insurance. Only those who can afford to save enough to cover for their *expected* pension requirement can as well afford to buy pension insurance to hedge the odds of living longer or shorter than expected. For the poorest who merely manage to make ends meet in the present, retiring per se is a luxury and so is pension insurance.

7.4.3 Personal accident insurance

Overview

Accidental risks are universal risks. Nobody is insulated against accidental risk but the exposure differs with the environment. In the places we have visited, most people face several accidental risks: The single most important cause for death or disability is traffic accidents. Having experienced traffic in India first hand this fact is hardly surprising. Snake bites, as well as mishandling machines or accidents related to alcohol abuse are not rare either.

Adverse events in personal accident insurance

All different kinds of accidents are defined as *adverse events* for the purpose of our analysis. Accidents are low frequency - high impact events. As far as the observed *frequency* is concerned, we find seven families that have suffered from an accident in the last five years. The most common kind of accident is related to traffic (57%). This is in line with what we expected. Other accidents include drowning in the well due to alcoholism (14%), being sacked by a machine because the saree got caught in it (14%) and being stamped to death by a crowd when the government was giving away free sarees (14%).⁵⁶ Appendix 10 provides an overview of the accident statistics retrieved from the second questionnaire.

⁵⁵ TATA AIG's Maha Life and Maha Life Gold schemes are the only schemes in the market suited to serve poor clients. ICICI Lombard and probably some others are currently in the process of rolling out similar schemes, with their policies currently being reviewed by the IRDA.

⁵⁶ As accidents are rare, we artificially increased the sample size by also asking women about accidents in their SHG's and the respective families of SHG members (as we have only one woman per SHG double counting is prevented). Fifteen more accidents were remembered by the women, mostly traffic accidents (11 cases) but also a snake bite, another drunken husband who drowned in the well and two more accidents related to work. Most of the accidents result in temporary disability due to fracture or other injuries that require hospitalization (59% including SHG). An astonishingly high number of accidents results in death (36% including SHG) which might

Looking at the *impact* of the accidents on the financials of the women, we find that it varies substantially with the category of accidental consequences that we observe. Hospitalization costs and forgone income will be discussed extensively in section 7.4.7 of this paper. As we do not have precise figures on the length of hospitalization due to accidents as well as the costs of post accidental treatment, we simply assume that the aggregate costs of accidents are in the range of what we observe for the sicknesses. The average costs of a breadwinner's accident being treated in a private hospital probably ranges from 5000 Rs (100) to 30000 Rs (600 €). Permanent disability, however, results in much higher costs due to the inability or limitation to generate income.

Informal *coping mechanisms* are similar to the ones described in the life insurance section. 57% of the women in our sample rely on friends and family for the immediate financial relief and 29% of the women had to take a loan (14% other). The coping mechanisms related to the long run impact of accidents cannot be assessed on the basis of our sample.

Supply and risk reduction potential of personal accident insurance

Most of the general insurances provide personal accident policies. A comprehensive overview of the available insurance products can be found in appendix 11. The distinguishing feature of the policies is related to the benefits offered in excess of death and disability cover.

Due to the very low expected frequency and high impact of accidents, insurance is most relevant to smooth the financial volatility. In accordance with the above findings, we conclude that temporary and permanent disability covers are the most important features of personal accident due to their very high frequency and financial impact, respectively. All of the insurance companies offer reasonably similar benefits in case of accidental death, permanent total and partial disability. However, the differences between the benefits for total and temporary disability are enormous. Only one company offers reasonably high total temporary disability compensation of 1% of sum insured over a period of 100 weeks.⁵⁷

Hence, personal accident insurance is crucial for the women and their families and the risk reduction potential of the existing supply is substantial. Accidents don't happen a lot, but when they happen, they can be detrimental to the family's financial situation especially in the case of permanent disability. Personal accident insurance that includes temporary disability benefits seems to be the product with the highest risk reduction potential.

7.4.4 Dwellings and content insurance

From an insurance perspective, it makes sense classifying the women's enterprises in two different categories and three different types of insurance: Domestic occupations covered by dwellings & content policies and non-domestic occupations the majority of which are covered by cattle and agricultural insurance.⁵⁸ We discuss the three insurance types subsequently.

be explained by the women better remembering fatal accidents. In our sample, there is only one woman who had a bike accident that resulted in permanent brain damage. This is also in line with our expectations as accidents with permanent disability should be very rare.

⁵⁷ Reliance General's Personal Accident Scheme.

⁵⁸ Appendix 14 & 15 illustrate the insurance categories in detail.

Overview

The majority of the women we met are involved in domestic businesses.⁵⁹ Amongst the businesses observed in our sample, we have identified five businesses in the first questionnaire and three businesses in the second questionnaire which qualify unambiguously for the dwellings & content policy. It is important to clarify that the businesses considered *primarily* domestic, i.e. production, storage and many times sales are domestic. However, there might be some non-domestic activities as well as most of the women source their products and raw materials in local markets and some of them sell the products by going to the villages. As far as the flower vending business is concerned, it is unclear to what extent the business is domestic. Please refer to appendix 13 for a short description of the businesses.

Adverse events in domestic businesses

Three major *adverse events* are identified for the purpose of this study: First, we discuss the impact of (a) fire and natural disaster, second (b) theft and burglary are analysed and finally we elaborate on damage to (c) machines or production material. In case damage occurred, we also look at the informal coping mechanisms that women rely upon.

The following paragraph analyzes the observed *frequency* and *impact* of the above defined adverse events:

(a) The adverse events with probably the biggest impact on the domestic businesses are fire and natural disaster. However, we have not met any woman who even knew anybody who ever experienced a fire.⁶⁰ In the districts that we have visited, none of the women reported that her domestic business had been affected by a natural disaster.⁶¹

(b) Theft and burglary are very rare in south-east India despite the ubiquitous poverty. None of the women we met reported that somebody ever stole anything from her house. Burglaries are also very rare and we have not heard of any case of domestic burglary. One woman reported that her father in law transported new supplies for her fancy store in the bus and the bag got stolen. This resulted in a damage of 6000 Rs (120 €). They eventually took a loan from the money lender to replace the inventory (*coping mechanism*).

(c) As opposed to fire, natural disaster, theft and burglary, some of those women who own productive assets for domestic businesses report irregular machine breakdowns and other technical issues with respect to their production material. The costs of repair are mostly below 200 Rs (4 €) and can be paid for by regular income (*coping mechanism*).

Supply and risk reduction potential of dwellings & content insurance

All of the public insurance companies have dwellings & content insurance covering at least some of the adverse events defined above. Only one insurance company explicitly labels its product as micro enterprise shield.⁶² This insurance policy comprehensively covers all of the above adverse events. More details on the products are provided in appendix 16.

The micro enterprise shield covers the bulk part of the above mentioned adverse events. It does not cover machine breakdowns and other damages related to depreciation which should be viewed as a constant cost rather than an adverse event.

⁵⁹ The question was phrased “is your profession stationary or mobile” and of 232 respondents, 139 or 59.9% answered stationary which corresponds to domestic jobs.

⁶⁰ One woman with a petty shop reported that her neighbours set her shop on fire because of some village rivalry. However, the damage was limited as she was able to extinguish the fire quickly.

⁶¹ This is certainly due to the fact that both districts we have included in our analysis are not situated at the south-east Indian coast. Consequently, they have not been affected by the tsunami on the 26th of December 2004.

⁶² Royal Sundaram’s Micro Enterprise Shield insures brick and concrete houses at 2 Rs (€0.4) per mille, contents at 4 Rs (€0.8) per mille and thatched huts at 6 Rs (€1.2) per mille.

The micro enterprise shield's product characteristics match well with the identified adverse events. Although the current product covers all relevant adverse events, a more diverse supply would allow for a higher degree of customization. Still, the risk reduction potential of the insurance policy is substantial. This is especially true as in addition to the micro enterprise the private household is also covered.

7.4.5 Cattle insurance⁶³

Overview

Almost half of the women in our Thiruvannamalai sample have at least one milk animal (40%). In more urban Kancheepuram district, the share is smaller but still substantial at around 15%⁶⁴. This high share in milk animals might not be representative for whole Tamil Nadu, as occupations differ quite substantially across districts. However, in every district we have visited, milk animals were of substantial importance to the income generation of the women. Most of the time, the milk animal contributes between one fifth and one half of the household income. For more details on the cattle business, please refer to appendix 13.

Adverse events in cattle business

For the purpose of this study, the death of a cow⁶⁵ is the only relevant *adverse event*.

Concerning the observed *frequency*, we find that two (18%) out of the 11 women that we asked have lost a cow due to sickness (in addition, five women (45%) report that the cow has been seriously sick).

Unexpectedly, the financial *impact* of the death of a cow seems to be limited. Most of the women state that they would buy a new cow immediately if it died because they think that it is a profitable business. One of the reasons why we don't find a significant impact of the death of a cow on the family income might be that most of the women are able to pay back the loans they took to buy the cow in the first year. If the cow survives the first year (which we assume is almost always the case), they don't have any problems replacing the loan if the cow dies later. We did not observe any *informal coping mechanisms* related to the death of a cow.⁶⁶

⁶³ Cattle insurance only insures milk animals and does not cover any rearing related businesses.

⁶⁴ According to the first and second questionnaire, the number of the women occupied in non-domestic enterprises is 16% and 40% respectively. The discrepancy between the two questionnaires might be due to several reasons: First, as can be seen in appendix 14, in the first questionnaire there is a lack in data for 26% of the women due to the fact that some of the interviewers did not fill out the questionnaire in a sufficiently careful way. Unfortunately, in the original questionnaire prepared by Hand in Hand, there was no question on what type of employment the women are involved in. Even though we repeatedly told the interviewers to include this information in the questionnaire, some of them seem to have forgotten to do so. Second, many of the women that we interviewed did not mention their milk animals and agricultural labour employment because it does not take much time during the day and is very seasonal, respectively. Therefore, we might have missed several women who actually have non-domestic employments according to our definition and the actual number of non-domestic employments is more likely to be close to 30-40%.

⁶⁵ Does not include death of a calf and cows that are dry due to old age

⁶⁶ Cows give milk for half a year, the other half of the year they are pregnant. This inherent seasonality of income of the cattle business might give an indication on potential coping mechanisms. Most of the women just live of their husband's salary when the cow does not give milk. The remaining women have developed diversity of mechanisms to cope with a reduction in income: One woman takes consumption loans from the SHG or neighbours, another woman has timed the pregnancy cycles of her two cows such that she in fact has a constant income and two women get help from their family (parents, brother).

Supply and risk reduction potential of cattle insurance

The supply of cattle insurance is very homogenous across different insurance companies. Public insurance companies offer premiums of 4% of the sum insured up to a maximum of 30000 Rs (600 €) per cow. For more details on the products please refer to appendix 16. In terms of cover, all of the insurances pay for death of the animal due to accident and disease as well as total and partial permanent disability of the animal. Moreover, the insurance *coverage* seems to be sufficient not only in terms of sum assured but also in terms of adverse events covered. None of the animals in our sample was worth more than 12000 Rs and all of the cases of sick animals in our sample would have been covered had they led to death of the animal. The *premium* might be perceived as high by many women, yet considering the income generated by milk animals, it seems to be quite low: Approximately one week of income is needed to pay the premium for the whole year. The seasonality analysis (footnote 66) of the income shows that this amount cannot be vital for survival of the woman and her family.

We conclude therefore that cattle insurance policies supplied in the market are reasonably well customized and suited to reducing the women's exposure to the risk of their milk animal dying due to accident or disease. Furthermore, informal coping mechanisms are far from sufficient.

7.4.6 Agricultural insurance (weather / crop)*Overview*

Agricultural activities can be divided into two different occupations: First, marginal and small farmers who own land and cultivate it themselves (mostly with the help of some other workers) and second agricultural labourers who work for a land owner, mostly a small to medium size farmer. The income of land owners strongly varies with the size of the acre and is very dependent on the year, so it is not possible to give an income range. Agricultural labourers are employed on a daily basis and earn between 30 Rs (0.6 €) and 100 Rs (2 €) (women at the lower and men at the higher end). 5% (2 women) in our sample are land owners, 15% (6 women) work as agricultural labourers.

Adverse events in agricultural business

Marginal farmers as well as agricultural labourers face at least two kinds of *adverse events*. First, the amount of rainfall determines the success of the plantation. Especially after planting the seedlings, it is crucial that the amount of rain is limited. Both, too much and too little rainfall in this initial phase is detrimental to the amount of harvest. In addition to the weather, the fields are exposed to any kind of natural disaster like floods, cyclones, storms and the like. Marginal farmers and agricultural labourers are affected by either in a similar fashion: While the farmer loses her harvest when variation in rain fall is high, the agricultural labourer loses her job.

We discuss the adverse events (a) weather and (b) natural disaster subsequently:

(a) The experiences with the rainfall of the land owners are quite similar: Revenues from planting rice, nuts or fruits have become increasingly volatile over the last years. As far as the observed *frequency* and *impact* are concerned, both of the land owners in our sample confirm that weather has affected them heavily in the recent past: One land owner reports that she had a very bad harvest last year and the agricultural labourers tried to bargain for higher wages. So she incurred a loss of 5000 Rs (100 €) last year. This year, the rain came too early and destroyed the crops right after they had been brought out. As a consequence, she incurred a loss of 20000 Rs (400 €). Therefore, she decided to lend the land on to a third party rather

than cultivating it herself (*coping mechanism*). The second land owner had similar experiences: She lost the rice crops due to early rainfall and had to take a loan from the money lender (30000 Rs, 600 €) to buy less lucrative fruit crops (*coping mechanism*). She is still indebted this year.

(b) None of the agricultural workers have ever been hit by any form of natural disaster.

Supply and risk reduction potential of agricultural insurance

Two types of agricultural insurances are relevant for our analysis, to cover the respective adverse events: (a) weather and (b) crop insurance. Both insurances are discussed subsequently and their risk reduction potential in the south-east Indian context is illustrated.

(a) Weather insurance

Weather insurance is maybe the most important innovation in the insurance market in the last decade. The insured event is contingent on predefined limits on the variation in weather in a certain period. Specific weather parameters can include rainfall, wind, sunshine, temperature, etc. Most of the time, rainfall is the crucial parameter. If the amount of rainfall falls outside certain predefined limits, benefits are disbursed. Weather insurance is still a very recent product not widely available with many insurance companies. Only one of the companies we met provides weather insurance⁶⁷. Premiums and cover are determined on an individual basis so we can not give examples of specific policies.

As we neither have any figures on rainfall in the specific area we visited nor know the specific rainfall thresholds set by insurance companies for the same area, it is not possible to determine the exact amount of risk reduction potential of the product. Under the assumption that the absolute amount of rain over the year is sufficient to cultivate crops, the risk reduction potential of weather insurance seems high for land owners because all the losses reported were related to rainfall irregularities. However, agricultural laborers who make up a much bigger portion of the employment in the agricultural sector do not benefit from weather insurance which substantially reduces its overall risk reduction potential for the sector as a whole.⁶⁸

(b) Crop insurance

Crop insurance covers the loss of crops due to natural disaster, fire, lightning, riots, strike, and terrorism. It has been available in the market for a long time and many insurance companies provide it. The cover of crop insurance is restricted to the cost of production up to the point when production is lost. This is a substantial disadvantage of the policy because it does not cover for the loss in harvest. When the crops are replaced, it is not possible to just plant them again because the season might be over. In addition, agricultural laborers are not able to hedge their employment with crop insurance. In case of a loss in harvest, they get laid off and unemployed.

In our sample, none of the women working in agriculture (either as laborer or land owner) were ever affected by any of the events covered under crop insurance. However, we have not met any people in more coastal areas which are more exposed to flooding. It is therefore not possible to draw any definite conclusions about the risk reduction potential of crop insurance. However, like weather insurance, it by definition only hedges the risks of the land owner. Hence, the majority of the women working in agriculture cannot be insured. This is certainly a big disadvantage of this kind of policy.

⁶⁷ ICICI prudential is the only company we came across offering weather insurance contracts.

⁶⁸ The assumption is crucial because otherwise weather insurance is not available or excessively expensive.

7.4.7 Health insurance

Overview

The Indian health system comprises of a public and a private sector. Figure 3 illustrates the major health care facilities in both sectors. The public health sector is completely free of charge. In almost every village there is a village nurse who more or less regularly visits the village to look after the old and sick as well as the pregnant women. Primary health centers can be found in every small to medium sized village. They are equipped with 2-15 beds and some professional medical staff. Primary health centers are usually very crowded with patients and close in the early afternoon. Public hospitals are located in the cities and their quality varies substantially.

As far as the private health sector is concerned, doctors are available in every other village and private hospitals can be on the country side or in the bigger cities. These hospitals are mostly owned by religious institutions or private investors.

The quality of the public and private health system seems to diverge the most for more complicated diseases as some private hospitals are specialized in certain sicknesses.

Figure 3. Public and private health infrastructure available in rural India

This figure illustrates the health infrastructure available in rural India in a matrix form. Horizontally sketched is the public/private dimension. Vertically sketched is the size of the facilities from small (primary health facilities) to large (secondary health facilities)

	Public	Private
Primary health facilities	Village nurse Primary health center	Doctor
Secondary health facilities	Hospital	Hospital

Adverse events is health

We define any kind of sickness as adverse event. Sicknesses can be classified in two different groups: high frequency – low impact events and low frequency - high impact events. The first group includes all minor sicknesses which can be cured within a couple of days and for which no hospitalization is required and income earning ability is neither temporarily nor permanently reduced. We do not analyze this group further because the related sicknesses are not insurable in India and their effect on household income is limited. The second group comprises of the more serious illnesses which require hospitalization and substantially influence the person's ability to generate income on a temporary to permanent basis.

We analyze the second group of sicknesses (lower frequency and substantially higher impact) in detail (a complete list of observed *frequencies* can be found in appendix 17)⁶⁹: Of the families that we interviewed, 85% have experienced at least one sickness that required overnight hospitalization during the last five years. By far the most common reason are child birth and pregnancy related illnesses. Consequently, it is no surprise that in almost 100% of the families with at least one case of overnight hospitalization, the woman was hospitalized. Even disregarding all pregnancy and birth related stays in hospitalization, women still have the highest hospitalization rates of all family members with 30% of women being hospitalized

⁶⁹ For simplicity, hospitalization in excess of 24 hs is the only decisive criterion of inclusion into this group. All other reported sicknesses are assumed to be less serious illnesses.

for non-pregnancy and childbirth related illnesses compared to only 23% of their husbands⁷⁰. This figure might be slightly biased as women are likely to better remember their own sickness. The non-pregnancy and child birth related illnesses are very diverse and except for kidney problems none of the sicknesses are substantially more frequent than the others. Kidney problems are mostly related to excessive alcoholism and in the case of children to the contaminated water. For six hospitalizations, we were not able to find out the corresponding sickness.

The *impact* of those sicknesses is very much dependent on the kind of sickness, its duration and whether it is treated in a public or a private hospital. The cost of private treatment ranges from 2000 Rs (40 €) to 25000 Rs (500 €). In addition to that, the loss in income has to be accounted for. For the more serious sicknesses, the hospitalization time varies between three days and three months, so it is impossible to make a precise estimate of the loss in income due to more serious sicknesses. In the case of private treatment and short hospitalization, it is likely to be 3000 Rs (60 €) and higher. For the very serious sicknesses with treatment in a private hospital and long hospitalization time, aggregate costs of the sickness including wage loss and foregone income might be as much as 30000-40000 Rs (600-800 €) or even more.

Supply and risk reduction potential of health insurance

The Indian insurance market is characterized by a high degree of segmentation: No insurance company offers products covering the high frequency – low impact sicknesses. All of the insurers focus on the low frequency – high impact segment. Some of them have narrowed their scope even further down to offer only critical illness insurance covering the illnesses with the lowest frequency and highest impact. The calculation of the risk reduction potential for health insurance is more intricate than for the other insurance types. Therefore, we restrict ourselves to analyzing the general risk reduction potential of health insurance in India in the main part of this thesis. In appendices 20-22, we look more specifically at the risk reduction potential of the Universal Health Benefit Scheme.

The risk reduction potential of health insurance in India is limited from the outset for two major reasons: First, all the available products only cover low frequency – high impact sicknesses. However, we think the effect is limited because private treatment for small sicknesses (no hospitalization) is reasonably cheap. Moreover, as patients can choose between public and private hospitals, the potential for risk reduction strongly depends on poor people's demand elasticity for private health services as public service is for free. We assume that demand is reasonably high due to superior quality and convenience of private treatment. Second, health insurance does not cover forgone income. The impact of this varies with the length of the sickness. While developed countries have established mechanisms to cover for the loss in income, the informal sector in India completely lacks this safety net. Hence, health insurance covers only part of the cost of sickness from the outset. This is illustrated in appendix 23.

Summarizing, despite the two limitations mentioned above, we find evidence that health insurance *in general* has a very high risk reduction potential under the assumption that the quality of the private services is sufficiently high compared to the public sector. According to our observation, the quality gap between public and private treatment is the bigger the more severe the illness. Hence, the risk reduction potential for high impact illnesses is highest.⁷¹

⁷⁰ For this percentage calculation the denominator are all married women. Those unmarried or widowed are excluded.

⁷¹ Two additional positive effects of health insurance should be mentioned at this point: First, it helps the poor to finance at least part of their expensive treatment in private hospitals. Second, the insurance premium might

However, for health insurance, the quality of the product specifications is much more important than for any other insurance.

7.4.8 Summary and contribution

In the literature review, we have seen that the quality of the insurance products supplied is challenged. Roth et al. (2007) as well as Churchill et al. (2006) argue that especially in India where the regulator forces insurance companies to offer microinsurance products, the quality of the latter is questionable. We investigate if the existing supply has sufficient risk reduction potential to suit the needs of the poor. The results are based on our field study in south-east India. In order to analyse the risk reduction potential of the products, we try to investigate the frequency and financial impact of adverse events in the women's lives. These are then compared to the specifications of the respective insurance products. We find abundant supply of insurance products for all but a few insurance types. The overall risk reduction potential is enormous. Hence, we find evidence in favour of rejecting hypothesis 4, i.e. the provided products do have sufficient risk reduction potential.

To our knowledge, there is no study examining the risk reduction potential of microinsurance supply systematically. Some studies explore in how far the supply of microinsurance in India is suited to the needs of the poor (Srinivasan et al., 2002). Recent regulation changes, however, result in most of these studies being outdated. Consequently, our contribution is twofold: Within the limitations of our research methodology, we first compile the current supply of microinsurance products. Second, we use our (admittedly small) sample of in-depth interviews to get a qualitative and quantitative overview of the adverse events affecting the women's lives. The comparison of both datasets gives a proxy for the quality (adequacy) of the supply of microinsurance. To our knowledge this has not been done before, and certainly not for the microinsurance market for low income women in south-east India.

7.5 Risk aversion, information, understanding and rationality

Hypothesis 5: The client bases for conventional insurance and microinsurance differ in either risk aversion, information, understanding or rationality, thus causing effective demand to fall short of potential demand.

In the previous four sections, we have examined whether transaction costs, market failures as well as the lack of scalability and risk reduction potential of existing products can explain underinsurance of low-income people in south-east India to a considerable extent. We find that none of the four hypotheses can explain underinsurance compellingly and rejected each of them except for scalability of health insurance. In this section, we analyse whether the apparent state of underinsurance is related to impediments on the demand side.

The analysis is structured as follows: After introducing the concept of potential and effective demand, we discuss three assumptions which need to hold for potential and effective demand to be reasonably similar. These assumptions are then tested against our sample. We conclude there is evidence that two of these assumptions are not fulfilled and consequently effective stays below potential demand in the south-east Indian context. Hence, we cannot reject

encourage them to seek private medical treatment faster than without insurance because they want to get something in return.

hypothesis 5 and find evidence that lack of information, understanding and rationality are major reasons for underinsurance in south-east India.

The concept of potential and effective demand is derived from Matul (2005).⁷² Potential demand is defined as the demand that would be observed in an efficient market. As opposed to that, effective demand represents the demand that is actually observed in the market.⁷³ In accordance with the above definition, we have identified three assumptions that need to be fulfilled for potential demand for microinsurance not to fall short of effective demand: Clients (a) are risk averse (b) are well informed about the products supplied and understand them and furthermore (c) are rational. In the following we analyse one by one whether these three assumptions are supported by our findings.

First, we explain the assumption in more detail in the *overview* section. Moreover, each section is subdivided into a *descriptive statistics* and a *cultural dimension* part. The former analyzes and interprets the findings in our sample and the latter draws on anecdotal evidence and gives a more general view on the validity of the assumption in the context of south-east India.

7.5.1 Risk aversion

Overview

Risk aversion is a crucial prerequisite for insurability of individuals for obvious reasons. However, we find it hard to prove risk aversion directly. Therefore our line of reasoning in this section is the following: After a short intermezzo on the assumed utility function, we first (1) analyse the amount of people who have insurance in our sample and evaluate their motivation for insurance. We find that a substantial proportion of the clients have life insurance. However, the majority primarily uses life insurance as a savings vehicle due to lack of savings alternatives. Hence, the mere fact of people being insured is not necessarily a sign of risk aversion if the insurance policy includes a savings scheme. (2) Second, we show that people demand certain types of insurance explicitly emphasizing that it helps them to mitigate the financial risk of the underlying adverse event. Assuming that people expect the products to be fairly priced, this finding is interpreted as evidence for risk aversion. Although the evidence is not particularly strong, we believe it is reasonable to assume that people are risk averse.

Intermezzo on utility functions, risk aversion and inter-temporal choice:

As outlined above, we assume von Neumann-Morgenstern utility functions. While risk averse individuals necessarily have concave utility functions this causality unfortunately does not hold the other way around: Concavity of the utility function can have two different reasons: Risk aversion or inter-temporal preferences. While risk aversion is a necessary condition for insurability of the individual and the proximity of effective and potential demand, inter-temporal preferences solely indicate that clients might be inclined to save in order to smooth their consumption and to maximize their utility. As both effects cannot be distinguished we can never be sure if the individual is in fact risk averse when observing concave utility functions.

⁷² Matul is somewhat unclear when defining the concept. Therefore, we use his nomenclature and define potential and effective demand more specifically.

⁷³ Observed in this framework refers to people actually having microinsurance.

Descriptive statistics

(1) Let us now turn to analyse people having insurance in our sample:

Maybe the most striking and at the same time trivial empirical statistic is simply the number of interviewees who have insurance. In our sample, 46% of the women state that they currently have a policy (104 cases) or had insurance in the past (9 cases). Out of the 248 interviewees, 106 women have life insurance, five have cattle insurance and one woman has health insurance. For the remainder of the analysis, we disregard cattle and health insurance. As far as life insurance is concerned, one has to distinguish between pure life insurance and life insurance schemes containing a savings component (money-back policy). We are not able to exactly specify which type of life insurance the women have. From our experience in the field, however, we estimate that the majority of the women have money-back policies. In this section, the word insurance is used synonymously with life insurance.

The sheer number of women with insurance is astonishingly high. At first sight, this finding seems to underline the risk aversion assumption. In order to test if the women actually take insurance to mitigate the financial risk of a breadwinner's death, we asked the women about their motivation to take insurance. The majority of women state to have taken life insurance primarily to save for the education of their children. The second most important reason is to receive a pension after retirement (please find the details in table 3). As none of the women has pension insurance, we assume they plan to use the accumulated savings of the money-back policy for retirement. This result is humbling: Although it shows that a substantial portion of the women actually seems to have a concave utility function, we cannot rule out the possibility that this is solely due to inter-temporal preferences. As such, there is no conclusive evidence on risk aversion when analysing the women with money-back policies.

However, we can safely assume that the interviewees holding pure life insurance policies (without savings component) are in fact risk averse. As stated before, we are unfortunately not able to identify the exact amount of women with pure life insurance policies. This is due to the women's inability to remember policy details sufficiently well and inconsistencies owed to the interviewers when filling out the questionnaires.

Looking at the reasons for not taking insurance might give some further insight on the women's risk aversion. Out of 135 interviewees without insurance, 53% answer they do not have enough information. Another 32% claim not to have enough money and finally 7% answered "people say it is bad" which probably can be traced back to bad experiences made by other villagers which then have been spread by word of mouth. None of these answers reveals evidence of risk neutrality or even risk seeking behaviour of the women. If risk aversion is to be interpreted as the norm rather than the exception, not finding evidence against risk aversion might already be interpreted as evidence in favour of it.

Summarizing, we find weak evidence for risk aversion because some of the women have pure life insurance policies and because no evidence is found in favour of risk neutrality and risk seeking behaviour.

(2) Next, we analyse whether there is demand for other types of insurances which the women do not have. If people are risk averse, we expect to find demand for other types of insurance policies that do not entail savings components. Table 3 summarizes the results of our analysis on insurance demand.

Table 3. Motivation for taking insurance

This table provides the results from the 1st questionnaire on motivation for taking insurance. The interviewees express the importance of the respective points on a scale from 1-3 (1=Yes, 2=Maybe, 3=No). Column [2] and [4] show how the score changes conditional on having insurance or not. Column [1] and [3] show how the different 'motivations' were ranked conditional on having insurance'. In column [5] the total score is shown. Column [6], [7] and [8] look at the entire sample and count how often 'Yes', 'Maybe' and 'No' have been answered.

	Insured		Uninsured		Total Sample			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Rank	Score	Rank	Score	Score	No	Maybe	Yes
<i>Would you want insurance to ...</i>								
<i>Receive money when my business suffers from an unforeseen event</i>	6	2,49	6	2,54	2,52	160	35	39
<i>Receive a regular pension when retired</i>	2	1,94	2	1,90	1,91	91	33	111
<i>Have access to quality medical treatment in case I am sick</i>	4	2,27	5	2,24	2,25	138	17	79
<i>Receive money in case of a natural disaster</i>	7	2,61	8	2,58	2,59	169	35	30
<i>Receive money in case of death / accident of family member</i>	5	2,36	3	2,02	2,18	128	19	87
<i>Save money for education of children</i>	1	1,83	1	1,84	1,84	93	10	131
<i>Save money for marriage of daughter</i>	3	2,26	4	2,22	2,24	137	15	81
<i>Save without temptation</i>	8	2,75	7	2,55	2,64	175	30	27

The insurance ranking indicates that the women's most important motivation for insurance relates to products entailing a savings component. However, as illustrated by table 3, a substantial number of women demand policies other than money-back life insurance schemes even though the latter prove most popular. 87 women state that they want insurance in order to receive money in case of death illustrating that not only the savings component in life insurance is attractive. Moreover, 79 women want insurance to have access to quality medical treatment in case of sickness and 39 women want to insulate their business from the financial consequences of adverse events. Two remarks concerning these results need to be made at this point: First, the underlying questionnaire of table 2 was designed in such a way that lack of understanding of insurance should not bias the results too much. After all we did not ask the women whether they want health or pension schemes but solely how desirable they find the consequence i.e. receiving a pension or quality medical treatment in exchange for a small yearly contribution. Second, the fact that interviewees answered 'No' much more frequently than 'yes' is owed to one of the interviewers who tried to achieve some prioritization by usually only checking the 'yes' box for the two most popular items and 'no' for all others. Therefore, the desirability of insurance should in absolute terms be substantially higher. Concerning the average scores in table 2, we presume that most of them would lie above 2 without the described bias. None the less, we find that the scores we obtained allow for *ranking* the corresponding policies.

We conclude that there is demand for various kinds of insurances including insurance policies without savings component. This is interpreted as sufficient evidence that the women are risk averse.

Cultural dimension:

Informal insurance schemes might be a sign of risk aversion. Several informal insurance mechanisms prevail in the Indian society. We have illustrated a couple of informal coping mechanisms when discussing the risk reduction potential of the existing products in section 7.4 of this paper. Friends and relatives seem to be the most important yet highly imperfect informal insurance mechanism. In addition, we have encountered at least one more mechanism: Burial societies.

Burial societies are the most popular form of informal insurance in south-east India. The concept is fairly straight forward: Typically a number of villagers pay money into a fund that is kept in a common bank account and whenever a member of a participating family dies, that family receives an amount of money to cover the cost for a ceremonial burial and possibly some other expenses which might occur (Churchill et al., 2006).

A burial society is a small scale insurance mechanism because of the uncertainty involved in it. The point of death of the individual is unknown and so is the payoff. People who die soon after entering the society receive more money than they spent, others pay for the length of their lives and thereby finance the funerals of others. Although this informal insurance mechanism is far from perfect, it effectively relieves families from the financial volatility incurred by the immediate costs of unexpected deaths.

Instead of a fund, some villages have social conventions similar to burial societies. One woman we met stated that she had to take a loan from the money lender to donate money in the event of a death in her village. She was very poor but she emphasized that the other villagers would ostracize her if she did not give money to help finance the funeral.

7.5.2 *Information and Understanding*

Overview

In section (b) we examine whether the women we interviewed have sufficient access to information and commensurate understanding of insurance products. In section (c) we investigate if the individuals are taking rational decisions.

Dealing with these three points in this sequence is compelling as philosophically speaking, information is the necessary condition for understanding and understanding a concept is the necessary condition for taking rational choices.

We show that the lack of information and understanding is the main reason for effective demand falling short of potential demand. Hence, we cannot reject hypothesis 5, i.e. there is sufficient evidence for effective demand falling short of potential demand. This section is structured as follows: In the *descriptive statistics* part, we subsequently analyse each of the reasons for not having insurance given by the women in the interviews. We try to evaluate these reasons from an information and understanding point of view. In the section on *cultural dimension*, the south-east Indian context is used to explain an inherent lack of information and understanding that leads to underinsurance.

Descriptive statistics

Our descriptive statistics provide ample evidence that lack of information and understanding is one of the main reasons why many of the women we interviewed are not insured. In the field study, we asked the women for their reasons of not having insurance. Out of the 135 women without insurance 72 (53%) answered that they (1) do not have enough information on insurance. 32% of the women answer that they (2) don't have enough money to buy insurance. Moreover, roughly 7% state (3) not to take insurance because others tell them not to. A minority of 6% give other reasons for not having insurance, the most frequent being that (4) insurance is for rich people. We will also look at (5) other reasons for not taking

insurance. Subsequently, each of these answers is analysed from an information and understanding perspective.

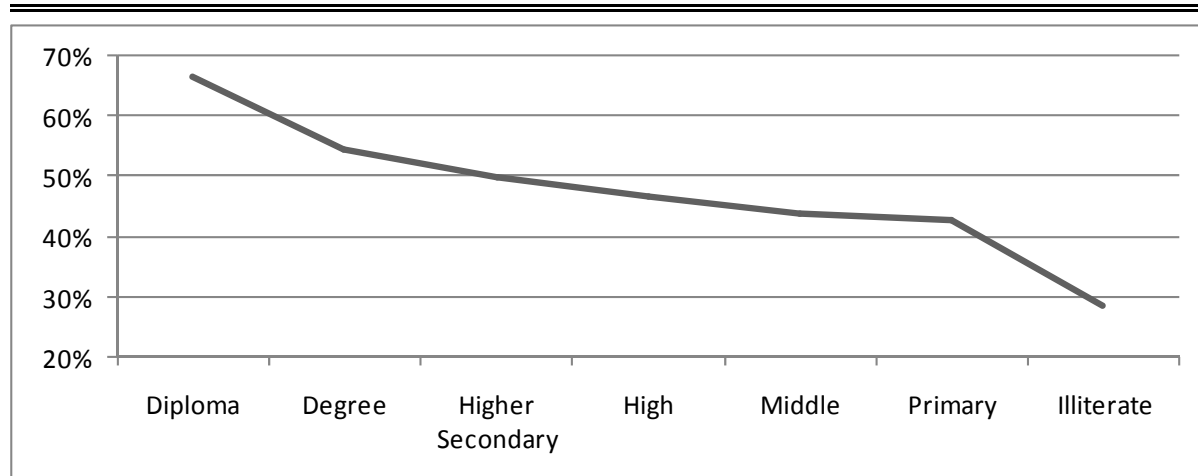
(1) The finding that people admit not to have enough information is both helpful and challenging at the same time: It anticipates the answer to the hypothesis we are testing. If the answer reflected the actual situation, the assumption of perfect information and understanding of insurance would be violated and hypothesis 5 could not be rejected, i.e. the lack of information is at least partly responsible for underinsurance in south-east India.

However, we want to test if this is true, i.e. if information and insurance are indeed related. As such, given the apparent state of underinsurance in south-east India, more information should *ceteris paribus* lead to higher levels of insurance. To validate the women's response, this is to be tested. The analysis is restricted in three ways: First, we can only analyse proxies for the level of information on insurance because our questionnaire is not designed to measure it directly. Second, we can only examine if more information on insurance leads to having more *life* insurance as this is (with only one exception) the only insurance type in our sample. Third, the sample is too small to infer statistically significant results. We restrict ourselves again to descriptive statistics. The line of reasoning to be followed is straight forward: If we find that more information leads to more insurance, we can in turn conclude that the current level of information is insufficient and hence partly explains underinsurance. We first define and explain the chosen proxies and then analyse their effect on insurance of having insurance.

Two different proxies for the exposure to information are chosen: the level of *education* and the type of *profession* of the women. The level of education is assumed to increase financial literacy and leads to a higher ability to gather and process information. If a higher level of education goes along with higher levels of insurance, it is likely that the assumption of perfect information and understanding is violated. As far as the profession of the women is concerned, the reasoning is similar: We believe that different jobs mean different exposure to information on insurance and if the level of insurance varies substantially with the profession, the assumption of sufficient information and understanding might be violated.

Figure 4. Percentage of women with insurance vs. education

Figure 4 depicts how the interviewees' likelihood to have insurance is related to the interviewees' education. On the y-axis the percentage of women with insurance are plotted.



Our analysis shows a relationship between *education* and the likelihood to have insurance. The relation is very strong and positive as can be seen in figure 4. It has to be noted that the number of interviewees with a degree or a diploma is too small to allow for any statistical

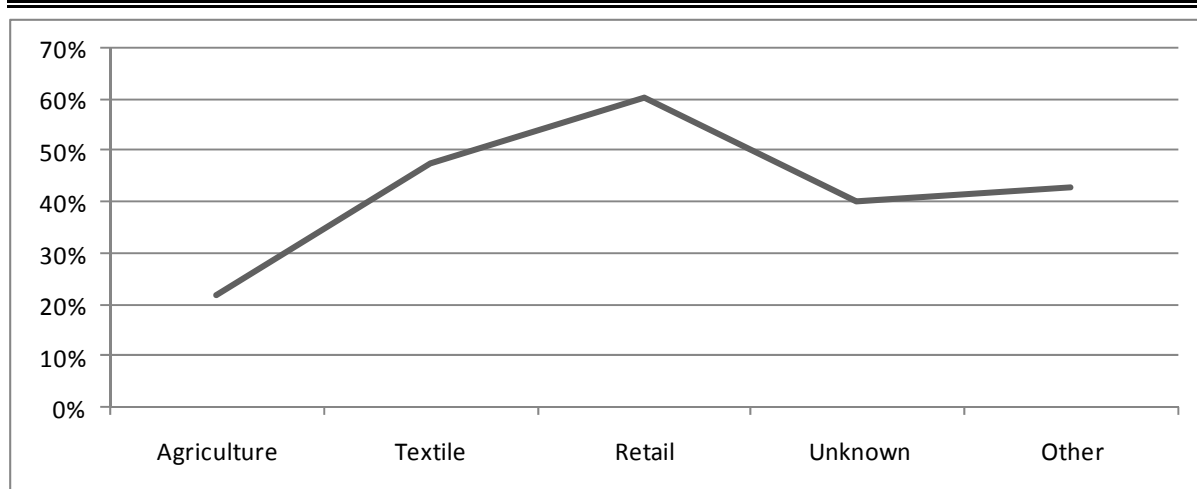
inference, though. Regardless, the trend is much clearer than the relation between income and education which is if anything very weak. Therefore it is likely that the relationship between insurance and education is not biased by the omitted variable income. We find evidence for a positive relation between education and insurance. Hence, the assumption of perfect information and understanding seems to be violated.

Furthermore, we observe that the percentage of those insured differs significantly across different *professions*. Figure 5 illustrates the findings. Of those working in sales or retail related jobs, almost 60% (74) have insurance, the highest share in our sample. As Kancheepuram, the place at which 161 of the interviews we conducted took place, is renowned for its textile industry throughout India, there is an above average share of textile industry found there. As such we interviewed 63 women working in the textile industry. Of these, 48% had insurance in their family. Finally, the last big group consists of all agricultural jobs ranging from goat rearing, milk animals and agricultural labourers to rather well off farmers working their own land. Of the 44 women with an agricultural background which we interviewed, only 22% have insurance in their family.⁷⁴

We find a strong relation between profession and insurance and can therefore conclude that the assumption of perfect information and understanding seems to be violated.

Figure 5. Percentage of women with insurance vs. profession

Figure 5 depicts how the interviewees' likelihood to have insurance is related to the interviewees' profession. On the y-axis the percentage of women with insurance are plotted.



(2) The fact that a substantial amount of women answer not to take insurance because of a lack in money is not understandable for us and taken as evidence for a lack of information and understanding of insurance. The argument has two different aspects, information and understanding: First, the absolute amount of premiums of all of the microinsurances that we have seen seems more than reasonable compared to the income that the women have. In table 4, we compare three microinsurance schemes to the monthly income of the women (annual

⁷⁴ The strong differences in prevalence of insurance across these different profession groups might be partly explainable by just looking at the geographic location of the majority of those working in the respective jobs. For example, we found most of those working in sales and retail related activities in Kancheepuram or Thiruvannamalai city or in the direct vicinity. The villages which had a significant share of agricultural labourers were the most remote and were hard to reach as they had no access to solid roads. Accordingly, those working in the fields and furthermore in remote villages can be expected to have much less exposure to information. Moreover, sales and retail related jobs go along with a great deal of client interaction and accordingly better informal information exchange seems reasonable to assume.

premium is divided by 12 to get monthly premium and this in turn is expressed as percentage of income in table 4). None of the shares exceeds 2.5%.

As opposed to this, the families spend huge amounts of money on (religious) festivals and feasts. In most households, this position is the most significant non-food expenditure. In comparison, the insurance premium is humble. As illustrated in table 4 the insurance premium as a proportion of income is very small. We have experienced in the field that the women do not know any concrete insurance schemes in excess of some life insurance policies. Therefore, it seems very likely that the women lack even the most basic information on the microinsurance policies available to them.

Second, assuming fair pricing and homogenous risk exposure, the expected average benefit should be equal to the premiums paid over time. The argument of insufficient income to pay for insurance becomes therefore void. Rather, the opposite is true: While insurance gives the women the opportunity to smooth a certain expected loss over a couple of years, not taking insurance eventually leads to a situation, where they have to pay a large sum which by far exceeds their payment capacity.

Table 4. Affordability of insurance policies

Table 4 compares the average monthly family income in agriculture, textile and retail to typical annual premiums for three exemplary insurance schemes: Enterprise insurance, Health insurance and Accident insurance. The annual premium is divided into 12 equal installments which are displayed as percentage of monthly income.

		Royal Sundaram <i>Micro enterprise shield *</i>	Royal Sundaram <i>Janshakti Accident Shield</i>	New India Assurance <i>Universal Health Benefits Scheme</i>
	<u>Annual Premium</u>	1 000 Rs (50 000 cover)	60 Rs	365 Rs
	<u>Monthly Income</u>	% of monthly income	% of monthly income	% of monthly income
<i>Agriculture</i>	3 841 Rs	2,17%	0,13%	0,13%
<i>Textile</i>	4 051 Rs	2,06%	0,12%	0,12%
<i>Retail</i>	4 030 Rs	2,07%	0,12%	0,12%
<i>Other</i>	5 057 Rs	1,65%	0,10%	0,10%

* The premium is calculated for a cover of 50 000 Rs for a brick building and therefore at a cost of 2 per mille

(3) Some of the women state that they do not take insurance because others tell them not to. From an information perspective, the effectiveness of word of mouth is astonishing. Moreover, it is interesting to see that bad experiences seem to have a much higher impact and spread faster than good news. This is unfortunate because most of the families do not even try to get information on insurance and understand what it is about. Hence, there is an inherent bias in information and a lack of understanding for the people who rely on the opinion and experiences of others.

(4) Two answers were classified under the category “other reasons for not taking insurance”: Those include “superstitious believes” and “insurance is for rich people”. While the former are discussed in the next section on rationality, the latter is worth looking at briefly as it is quite astonishing: While this answer might indicate certain ignorance on the part of the

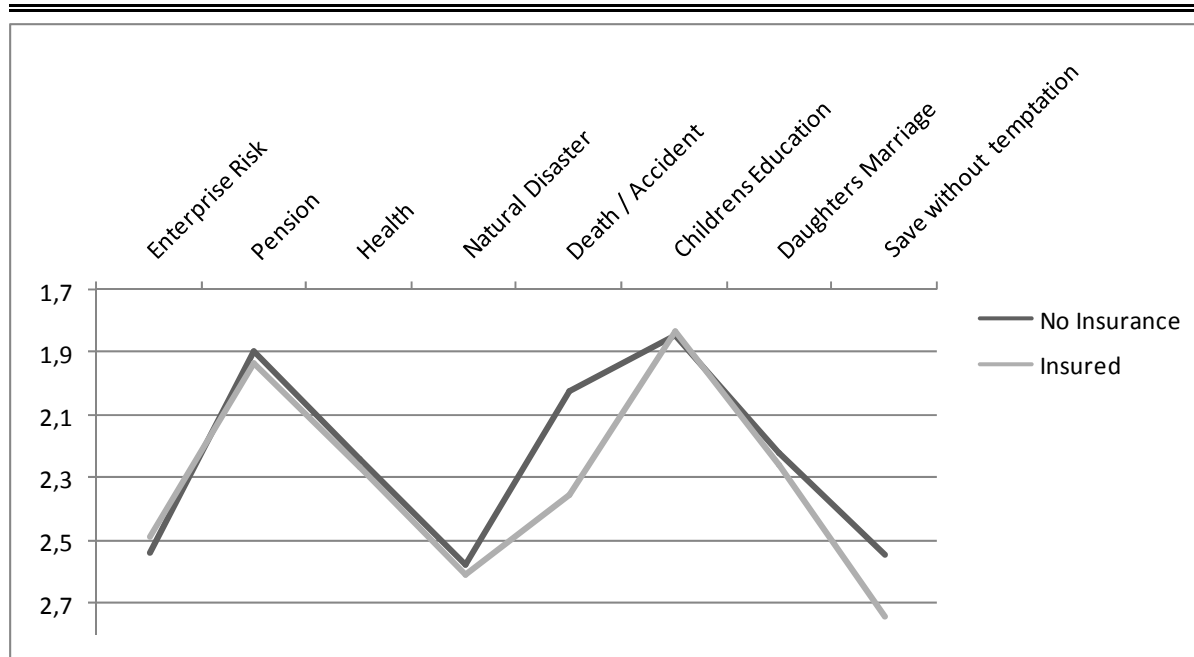
women, it certainly shows that there is a significant lack of information and understanding of insurance. The women neither know about the microinsurance products available to them, nor do they understand that due to scalability of the products, the value of insurance to the insured is independent of the income and wealth of the person.

(5) Other observations on the information and understanding include:

Comparing the motivation of people with and without insurance gives another interesting result. As can be seen in figure 6 the motivation to take insurance is virtually identical for both groups in all points except two. Those without insurance think getting money in case of death of a family member and saving money for the marriage of the daughter are more important than those with insurance. If they all had the same information and exposure to insurance agents we should expect those who find receiving money in case of death of a family member particularly important to take insurance.

Figure 6. Motivation for insurance vs. insurance (Y/N)

Figure 6 depicts how the motivation for insurance differs across those insured and those uninsured. Each interviewee ranks her motivation on a scale from 1 to 3, 1 representing 'yes', 2 'maybe' and 3 'no'. Motivation for insurance is measured by average value on the y-axis.



Moreover, those with insurance in their family were asked to answer the question “I am not sure I understand every detail of my insurance contract” on a scale from 1-3 with 1 indicating agreement. Out of 90 respondents only 14 were indeed sure they understood their contract while the rest was somewhat sure (59 out of 90) or even not at all sure (14 out of 90). This subjective self reflection on their knowledge was more than confirmed during the first as well as the second round of interviews. In the 1st questionnaire, out of 113 women with insurance in their family, 73 could answer what premiums their family was paying but only 28 made indications about their policy’s cover. Moreover, during the second series of in-depth interviews we encountered further difficulty finding out details about their insurance policies. This is a clear sign indicating the limited information and understanding of insurance policies.

Cultural dimension:

During interviews which we joined, we realized that the translators actually use the word insurance rather than the Tamil equivalent. We were stunned that people by and large do neither know nor understand the Tamil word for insurance. This small anecdote shows how little the concept of insurance is engrained in the Tamil culture and is a strong picture of the lack of information on insurance we experienced during field visits.

Furthermore, we noticed that the women themselves do not use the word insurance at all. Much rather, when they report about their policy they use the name of the insurance company synonymously for insurance: LIC. This might be interpreted as evidence that the women view insurance as financial (savings) product rather than appreciating the actual insurance features. Already during the field testing stage, it became clear that most interviewees do not completely understand the concept of insurance. We conducted group discussions and later one on one interviews and found that insurance is at best seen as synonymous with life insurance. Most of the women we interviewed actually thought of insurance as some kind of saving vehicle and did not necessarily understand that they would receive money in case of their husband's death for example. This lack of information directly translates into malcontent of some of the insured women when they realize that they do not receive any survival bonus at the end of their policies' term.

7.5.3 Rationality*Overview*

In microeconomic as well as conventional insurance theory humans are assumed to be rational. This implies optimizing their utility given their budget constraint. It is, however, widely understood that these are not realistic assumptions. Instead, irrational and bounded rational behaviour (as outlined by Kahneman et al. (1982)) are prevalent. Bounded rational behaviour implies that individual's decisions are subject to heuristics and systematic biases. This concept acknowledges that "agents experience limits in formulating and solving complex problems and in processing information" (Simon, 1991). In the following we give a number of examples of irrational and bounded rational behaviour we encountered. The evidence is again divided into a descriptive statistics and a cultural dimension section.

Before elaborating on the findings, we want to stress that bounded rationality and even irrational behaviour is nothing specifically associated with developing countries and as such does not necessarily distinguish agents in developed and developing countries. Bounded rationality and irrational behaviour are also prevalent in our society and certainly lead to inefficiencies in the insurance market as well. Part of the reason why the majority of insurance policies are enforced by the state in most western societies is probably related to this inefficiency. In the following we argue that while bounded rational and irrational behaviour are not exclusively associated with developing countries, the effect might be stronger due to the educational and cultural background of low income women in south-east India.

Descriptive statistics

We have classified our findings into the two different groups outlined above: Irrational and bounded rational behaviour. Admittedly, both groups are not always readily distinguishable so there might be somewhat ambiguous cases. In the following we discuss two examples for (1) irrational and (2) bounded rational behaviour, respectively.

(1) The first and maybe most astonishing example of irrationality is related to superstitious beliefs: When asked for the reason not to take insurance, six out of 135 answered that they think taking insurance would bring them bad luck, possibly related to the event they insure

themselves against⁷⁵. This finding came much unexpected and renders the person *de facto* uninsurable.

The second example of irrationality we came across is related to ignorance, denial and wishful thinking: In the second questionnaire, we strongly emphasized the correctness of income and expense specifications of the women. It turned out that some of the women are in a disastrous financial situation: According to our calculations, some of them are not even able to pay the interest on the loans they hold from money lenders.⁷⁶ Others specified that they wanted to retire at the age of 50 while not having any savings and admitting that their children might not be going to take care of them. While acknowledging these issues, three of the women in our sample responded that god will solve the problem and take care of them.⁷⁷

(2) First, we illustrate bounded rationality of the women in the context of inconsistent discounting. Asked for reasons not to save, 158 of 248 women answered they were not saving due to their own temptation to spend the money, with “not enough income”, “unforeseen events” and “no awareness” far behind (figure 7). Not saving out of temptation is a clear sign of time inconsistent behaviour. Many women are not able to save because they value consumption today higher than proportionally more consumption tomorrow. This finding is underlined by the fact that most women use life insurance as savings vehicle rather than post office accounts (see appendix 24). While interest rates are similar or even worse for life insurance, the women cannot draw down on the savings until the policy matures. This form of forced saving is necessary to overcome the bounded rational behaviour and inconsistency in discounting.⁷⁸

⁷⁵ The answer “superstitious believes” was not indicated on our questionnaire. Instead, the zonal managers conducting the interviews wrote that answer behind “other”. As such it seems perceivable that the real number of clients with superstitious believes is still higher.

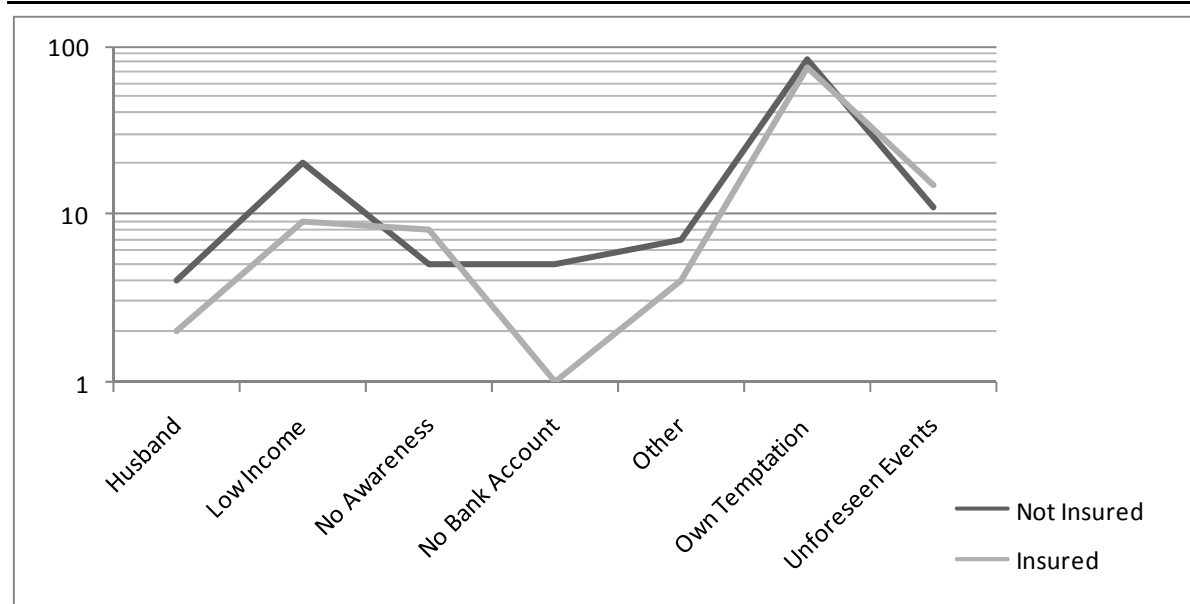
⁷⁶ While there is always a chance of measurement error, we want to emphasize that we repeatedly checked the women’s specifications on income and expenses.

⁷⁷ Faith and ignorance could similarly be classified as bounded rational.

⁷⁸ We experienced the limitations of the human brain to assess the power of discounting first hand: During our meeting with the head of rural sales from TATA-AIG insurance, we were first impressed by the features of the pension insurance scheme offered by TATA-AIG (Maha Life Gold). Premiums are accumulated over 15 years and thereafter disbursed as a reverse annuity for up to the rather hypothetical time of 100 years. When applying a reasonable discount rate however, it became clear that the scheme was far from what it promised to be at first sight. This shows that understanding of insurance products not only a problem for low income people in south-east India. However, the effect is certainly much stronger the lower the level of financial literacy and education.

Figure 7. Temptation not to save vs. insurance (Y/N)

Figure 7 depicts how temptation not to save differs across those with insurance and those without. On the y-axis, the number of respondents is depicted on a logarithmic scale.



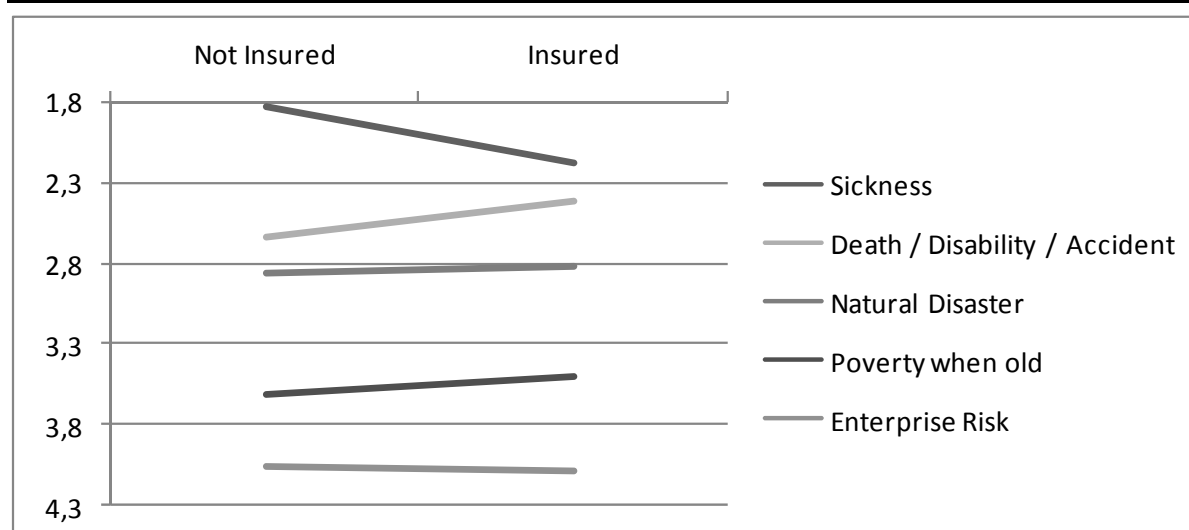
Second, we noticed a certain bias in the first questionnaire when evaluating the women's ranking of the different risks they are exposed to. Bounded rationality can explain that the size of risks is not assessed accurately. The expected loss associated with a certain adverse event should be calculated by *frequency x impact*.

We believe that the women are not always assigning reasonable estimates of frequency and impact to certain adverse events. This is illustrated with the help of two examples: As seen in figure 8, sickness is consistently ranked the most important risk in their lives for both people with and without (life) insurance. We believe that women might overestimate the frequency of serious sicknesses because it is an emotional topic associated with a substantial amount of fear. In the second questionnaire, we noticed that while most women go to the doctor more or less regularly, the financial impact on the family is limited in most cases. Health affects the whole family including children and as such some of the women might be tempted to overestimate the associated expected loss.

Moreover, ranking natural disasters as the third highest risk is clearly exaggerated. The districts in which we conducted the interviews have not been affected by the tsunami in 2004 as they lie 70 to 100 km off the Indian oceans shore. Furthermore, the districts have not been affected by any other natural disasters such as floods or earthquakes in the recent and distant past. One explanation for the high ranking of natural disaster might be that the women implicitly overestimate the impact of natural disasters in the expected loss calculation. Also it is interesting to observe that especially those with much education and those living in less remote Kancheepuram viewed natural disasters as threatening. The interpretation we were given from the district manager of Kancheepuram is that TV sets are a lot more prevalent amongst the more educated and in Kancheepuram generally and those with TV sets have won a much more visual impression of the tsunami.

Figure 8. Risk ranking vs. insurance (Y/N)

Figure 8 depicts the interviewees risk ranking and makes the distinction between those insured and those not insured. On the y-axis, the average ranking is displayed.



Cultural dimension

Although bounded rational and irrational behaviour are prevalent in developed as well as developing countries, we find evidence that *education* and *cultural background* matter substantially.

As we have seen, more *education* including financial literacy leads to a better ability to gather and process information, a higher level of understanding provides the basis for rational decision making. As financial literacy is low in south-east India and low income women are only very slowly being integrated in the financial sector, we can safely assume that bounded rationality and irrational behaviour have a big influence and are partly responsible for underinsurance.

As far as the *cultural background* is concerned, we note that formal insurance is restricted until recently to the bigger cities and higher income classes. Low income people in rural areas are only slowly being exposed to formal insurance and this new concept needs some time to result in familiarity amongst the poor. The apparently widespread lack in savings culture throughout all income classes in India does not facilitate the process either.⁷⁹

7.5.4 Summary and contribution

In the analysis of hypothesis 5, we first define risk aversion, information and understanding and rationality as assumptions for effective demand not to fall short of potential demand. Each of these assumptions is then tested subsequently. We find evidence for risk aversion in our sample, so this assumption is fulfilled. However, the assumption of full information and understanding of insurance is clearly violated. It can furthermore be shown that the rationality assumption does not hold either.

⁷⁹ It has to be noted that our sample is biased in at least two significant ways: We only interviewed *women* and all of them are *members of SHG's*. Both effects are discussed in detail in the limitations section. For now, it is enough to state that we expect the findings to be even more unambiguous if our sample had been comprised of women not organized in SHG's.

There are only a few studies that try to evaluate the demand for microinsurance. The literature is mainly case based and empirical. Matul's (2005) study on microinsurance demand in Georgia is probably the most comprehensive study in this respect. To our knowledge nobody has researched the demand of low income people in south-east India so far. Matul shows that insurance knowledge varies with income and location of the person. We find that the correlation with income is not relevant in our sample. The location as approximated by the profession also crucially determines the knowledge of insurance in our case. Matul states that health and property insurance are the most well known types of insurance which is contradicting our finding that almost none of the women know insurance types other than life insurance. Overall, Matul finds that individuals are risk averse in general, lack basic information and understanding of microinsurance products which is in line with our findings. Rationality issues are not discussed in the empirical literature so far.

Table 5. Summary of findings

Table 5 summarizes the findings of this thesis.

Hypotheses		Findings
H1: Transaction costs are proportionally higher for microinsurance than for conventional insurance	Rejected	In the partner-agent model, transaction costs for microinsurance are not higher than for conventional insurance when measured as a percentage of premiums
H2: Microinsurance is exposed to severer problems of adverse selection, moral hazard and fraud than is conventional insurance	Rejected	When customizing policies to the needs of low income clients and cooperating with NGOs, adverse selection, moral hazard and fraud are not a bigger problem for microinsurance than for conventional insurance
H3: Conventional insurance products can not be scaled down to the extent necessary for providing microinsurance	Rejected (except for health insurance)	We find full scalability for life, accident and enterprise insurance. For health insurance problems with scalability can not be rejected
H4: The supply of microinsurance products does not suit the needs of the poor as the risk reduction potential of the products is insufficient	Rejected	We find that the existing supply of microinsurance policies does offer significant risk reduction potential to low income clients
H5: The client bases for conventional insurance and microinsurance differ in either risk aversion, information, understanding or rationality, thus causing effective demand to fall short of potential demand	Not rejected	While low income people in south-east India are found to be risk averse, they lack information and understanding of insurance products and show bounded rational and irrational behavior. Effective demand falls short of potential demand due to these impediments

8. Limitations

In order to draw valid conclusions from the analytical section, a number of limitations have to be born in mind. We start by (1) pinpointing those limitations with implications for the validity of the first three hypotheses. These are mostly related to the fact that our experience and anecdotal evidence stems from only one NGO stretching over a rather limited area. Thereafter, corresponding to hypothesis four, we discuss (2) limitations concerning the

collection of supply data. Finally we discuss (3) limitations concerning the demand data we collected, first dealing with the 1st questionnaire and thereafter with the 2nd questionnaire. The validity of the demand data has implications for the analysis of hypothesis 4 and 5.

(1) Little of our analysis of transaction cost, market failure and scalability is backed up with statistics. Instead, we heavily draw on interviews we conducted with Hand in Hand staff, hospital staff, and local researchers⁸⁰. Further, we include a great deal of anecdotal evidence from countless field visits etc. Being fully aware that especially our anecdotal evidence is prone to subjectivity, we do challenge our findings by comparing them to findings of similar case studies. Most notably we have only seen one NGO which is rather big (260 000 clients), growing very quickly at the moment and as we believe very well run. As such our assessment of the feasibility of the partner-agent model as to reduce transaction cost or to mitigate adverse selection and moral hazard hinges on the assumption that other NGOs are in fact similar to Hand in Hand. Furthermore, throughout the paper we emphasize that our findings are solely valid in a south-east Indian context. Not having collected data from any other part of India we can not claim that our conclusions are indeed valid for other parts of India but also have no reason to assume the opposite. However, we are definitely sure that our results are not valid outside India as the specific regulatory environment found in India is crucial.

(2) Our collection of supply side data was at first based on information found on the internet. Some companies' homepages may not be up to date so we can not be sure we recognized all the most promising firms. After having recognized firms we would like to conduct interviews with, we were not in all instances able to speak to senior management. For HDFC Standard, Star Health Insurance and ICICI Lombard, we could only organize telephone interviews. In the case of Tata AIG we met the head of rural marketing only after an initial meeting with his staff. Finally, not everyone was happy to share data at all times. All but one TPA refused to share their price lists for medical treatment. Life and General insurers did not share actuarial information or information of existing cooperation's with other NGOs and the respective terms and conditions.

(3) We have conducted two questionnaires to gather data on the demand for insurance. There are a rather extensive number of limitations that need to be mentioned:

First, we have exclusively interviewed women. Information about men, for example how much they need insurance and how prone they are to accidents, poverty or sickness has only been assessed indirectly through the interviewees' claims on household income, cases of accidents in the family and so on and so forth. Moreover, we are not able to assess their risk aversion, information, understanding and rationality. However, taking into account our experiences from the field, we assume that there is no crucial difference between men and women with respect to the analysis in this paper.

Second, we have exclusively interviewed members of Hand in Hand which were organized in SHGs. It is reasonable to assume these are less dependent on their men, more self confident and finally more knowledgeable in financial matters than their counterparts who are not organized in SHGs. They frequently meet to discuss financial matters, save and lend money within their group and keep records of their financial activities. Moreover, they have received a comprehensive training module from Hand in Hand which clearly has improved their financial literacy and made them more knowledgeable in financial matters.

⁸⁰ Our assignment to India commenced with a one week crash course in microfinance and microinsurance theory at the IFMR (Institute for Financial Management and Research).

Third, even within this sample, we could not guarantee to get a random selection of women.⁸¹ Therefore, we applied some distribution criteria on our sample which we think guarantees a reasonable approximation of a representative distribution (as explained in paragraph 6.3 on sample composition).

Forth, during our field visits we depended on the local knowledge of cluster coordinators who know their way in the small villages and know the SHG members personally. The cluster coordinators might have had a bias to choose interviewees who were available at the moment the interview took place or women that they were befriended with. This might have led to an undetermined bias of the sample with respect to age, background and employment of the women.

Fifth, as the 2nd questionnaire focuses on events in the past, it strongly relies on the interviewees' capacity to remember what happened in the past. Consequently, there might be a memory bias. Newly married women may not know about their husbands' hospital visits before their marriage for example. Also, their knowledge of adverse events in the SHG is likely to be limited. In combination the small sample size, we feel it is hard drawing any conclusions on the frequency of events from the 2nd questionnaire. Rather it provides us with exemplary evidence.

Sixth, the language barrier we encountered is not to be underestimated either. We could never directly talk to interviewees. Hence, it is likely that pieces of information and subtleties got lost in translation. Further, we phrased our questions in English. We could not monitor how literally they were translated and in how far the interviewers' views effected the translation of the corresponding answers. We did, however, observe that different interviewers⁸² did yield different results. For example the scale from 1-5 used for assessing the motivation for insurance was not used the same way.

Finally the sample size comes with its own limitations. From the offset, 248 observations is a much bigger size than we initially hoped for. None the less, when looking at a subsample, the sample size often becomes rather small. For example we are only looking at 113 cases of insurance within the family and nine cases of discontinued policies. For the second questionnaire for which we conducted in-depth interviews, the problem is exacerbated as the net duration per interview of 45-60 minutes made it impossible for us to conduct more than 40 interviews in total.

9. Conclusion

On the basis of the data collected during our assignment in Tamil Nadu, India, this summer we have investigated the reasons for underinsurance of the poor in south-east India. In line with the arguments and issues raised in previous research we have tested five hypotheses which are considered relevant: Our analysis illustrates that (1) transaction costs, (2) adverse selection, moral hazard and fraud as well as (3) an inherent lack of scalability of insurance products (with the exception of health insurance) occupy a non-pivotal role in explaining underinsurance of the poor in south-east India. More precisely, while these factors might be deterring the emergence of microinsurance theoretically, it is shown that if insurance companies and NGOs cooperate given the special regulatory environment in India, these factors are almost irrelevant. This argument directly hinges on the assumption of a reasonably

⁸¹ It would have been too complicated to randomly select women from Hand in Hand's client data base because Hand in Hand does not have comprehensive dataset including addresses and telephone numbers as one can imagine. Moreover, distances in the country are much too large to drive to individual randomly selected women.

⁸² While we asked the questions for the 2nd questionnaire ourselves with the help of translators, the 1st one was conducted by Johnson (zonal manager in Kancheepuram), Prem (zonal manager in Thiruvannamalai) and Jagannathan (district manager in Thiruvannamalai) without us being present at all times.

well developed NGO network with microfinance distribution infrastructure in place which is shown to be a reasonable assumption. (4) An assessment of the overwhelming amount of microinsurance products available in the market reveals that the risk reduction potential of the existing products is high. None of the informal risk managing mechanisms can hold up with insurance in terms of risk mitigating potential. Consequently, underinsurance does not seem to be caused by ill-suited supply. (5) We also analyse if effective demand of microinsurance falls below potential demand as defined by a lack of risk aversion, information, understanding and rationality. We find evidence that microinsurance clients are in fact risk averse, one of the crucial prerequisites for insurance provision. However, people have very limited knowledge about product specifications and accessibility of insurance and misunderstand basic insurance concepts and features. Furthermore, the study hints at some irrational and bounded rational behavior that impedes insurance demand. In summary, the last hypothesis cannot be rejected and effective demand staying far behind potential demand is deemed the most important reason for underinsurance in south-east India.

10. Further research

Microinsurance has only recently received increasing attention from the academic community. Therefore, a variety of different topics that relate to our thesis could be investigated. We have identified the three most interesting areas to us:

First, we have shown in this paper that issues related to information, understanding and rationality might be the most important reason for underinsurance of the poor in India. It would therefore be very insightful to investigate the informal risk mitigating mechanisms in detail and estimate their effect on microinsurance demand. According to Churchill (2003), liquid saving, emergency loans and informal and formal insurance schemes are relevant risk managing mechanisms. Investigating their importance and analysing in how far they are complements or substitutes would probably be very interesting.

Second, we suggest analysing the impact of education, information and training on the demand for insurance. This is particularly interesting because we expect demand to heavily depend on the level of awareness and understanding of insurance in general and insurance products specifically.

Finally, due to the lack of reliable data over a longer period of time, it is crucial to encourage insurers and NGO's providing microinsurance to collect as much information as possible on the topic. This would be crucial for the development of the academic discussion. Therefore, it would be very interesting to conduct a long term analysis on the impact of microinsurance on the financial situation of the insured. Obviously, the work load of collecting reliable data would be substantial and this would certainly require the scope of a PHD thesis to be investigated. Nonetheless, this would strongly contribute to the academic discussion because it is currently to a large extent based on case studies and anecdotal evidence of good and bad practices in microinsurance rather than a sound analytical data set.

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11.3 Interviews & Meetings

11.3.1 *Insurance companies and others*

- Barucha, C., Doctor in primary health centre in Kancheepuram, 60 min visit & interview at primary health centre, Kancheepuram, 04-10-2007
- Bhagvath, C., Head of Rural Products at ICICI Lombard, 20 min telephone interview, Chennai, 04-10-2007
- Chelladurai, A. et al, Area Manager (Rural & Social Business) at Birla Sunlife Insurance, 60 min meeting, Chennai, 24-09-2007
- Harshavardhan, V. et al., General Manager at United India Insurance Company, 70 min meeting, Chennai, 27-09-2007
- Janu, S., Sales Manager Micro Policies at Star Health Insurance, 20 min telephone interview, 27-09-2007
- Kalyanasundaram, S., Deputy General Manager at National Insurance Company, 45 min meeting, Chennai, 05-10-2007
- Mohan, S., General Manager Rural Business at Royal Sundaram, 60 min meeting, Chennai, 26-10-2007
- Narayanam, S., Banc assurance Co-ordinator at New India Assurance Company, 45 min meeting, Chennai, 26-09-2007

Srinivas, R., Area Manger Rural Business at ICICI Prudential, 45 min meeting, Chennai, 25-09-2007

Sundaresan, K.R., Area Manager Rural Sales at Tata AIG, 90 min meeting, Kancheepuram, 04-10-2007

Ramakrishna, P., Sales Manager at Reliance General Insurance, 45 min meeting, Chennai, 04-10-2007

Ramanan, K., Regional Manager at Life Insurance Corporation, 75 min meeting, Chennai, 12-09-2007

Vaidyanathan, V., Manager Group Sales at HDFC Standard, 15 min telephone interview, 05-10-2007

11.3.2 Hand in Hand staff

Appendix 25 contains a list of the Hand in Hand staff who directly or indirectly contributed to this thesis.

12. Appendix

Appendix 1. Regulatory environment of the Indian insurance industry

Appendix 1 explains the role of IRDA, the Indian insurance regulator in the Indian market for insurance. It also provides a detailed overview of the current regulatory framework.

The regulator distinguishes between two different types of insurance companies: Life insurance providers and non-life insurance providers, so-called general insurers. The former are only allowed to offer life insurance products like endowment policies and retirement annuities. The latter offer all other insurances like motor insurance, cattle insurance, hut insurance, etc. Both, life insurers as well as general insurers are allowed to provide health insurance.

In the course of its almost 100 years of history, the Indian insurance regulator has evolved as one of the most proactive insurance regulators in the world. More recently, instead of its pure regulatory tasks, the Indian insurance regulator has increasingly adopted a social and political agenda and has effectively become a powerful political instrument. This becomes apparent when looking at the most recent legislation: Soon after its establishment in 1999, the Insurance Regulatory and Development Agency (IRDA) recognized the importance of promoting insurance to the poor in order to provide them with risk mitigating mechanisms. Therefore it enacted an unprecedented series of legislation stimulating insurance companies to provide insurance products to the bottom of the pyramid population, the people previously excluded from the financial services industry.

IRDA has undertaken three successive measures to stimulate product innovation and market penetration in the Indian insurance market towards the poorer sectors of society:

- First, IRDA passed the Insurance Amendment Act in 2002, which amongst other things regulates the rural and social sector obligations of registered insurers. Appendix 3 illustrates the corresponding regulation (non-compliance is charged with hefty fines). The rural sector requirements pose a big challenge on new entrants and private insurers alike as the market of wealthy customers in the rural sector is completely penetrated and the distribution network of the private insurers in the rural areas is immature. As opposed to this, the big public corporations have fewer problems fulfilling the targets as they have been around for much longer with established distribution networks and large clients in rural areas.
- Second, in order to define the microinsurance market, IRDA issued a legislative paper called Microinsurance Regulations in 2005 which specifies the characteristics of microinsurance products as well as some relaxations of existing regulation for microinsurance. Products with corresponding characteristics can be licensed as microinsurance products with IRDA (see appendix 2). The advantage of licensing low premium/low coverage products under the microinsurance act is related to the relaxation of regulation on the corresponding distribution channel: In addition to the conventional channels (banks, individual licensed agents, etc.) microinsurance products can also be marketed by NGO's, MFI's and Non Banking Finance Companies (NBFC, "for-profit" organization providing microfinance). Appendix 4 illustrates the details of the relaxation of regulation for microinsurance distribution channels. It substantially reduces transaction costs of the insurer because most of the NGOs have an established network in rural areas that can be used for microinsurance product distribution. As many NGO's have rapidly

grown over the last years to cover substantial parts of the rural and social sector in India, they are the optimal distribution vehicle for insurance companies with a less developed distribution network.

The Microinsurance Regulations emphasizes the importance of the partner-agent model (where the NGO becomes a microinsurance agent to the insurance company) in promoting microinsurance. As such, the NGO is able to use its existing grass root network to distribute insurance while at the same time not taking any risks. This seems to be a reasonable setup, as both insurers as well as NGO's focus on what they do best: Mitigating risk and serving the poor population respectively.

- Third, the recently announced and partly executed de-tariffing of the insurance industry increases competition in the sector. Although not primarily directed at promoting microinsurance, it is expected that de-tariffing vastly increases product variety and design by increased competition in the market. Additionally, the highly profitable segments like property, real estate and engineering become more competitive redirecting the focus of the insurers on the development of the less profitable segments like microinsurance instead of simply cross-subsidizing these product segments.

Appendix 2. Definition of microinsurance according to IRDA

Appendix 2 illustrates the requirements on microinsurance products imposed by IRDA. Any microinsurance product needs to be designed in line with the below illustrated basic parameters. Only then can it be sold with the help of the partner-agent model.

Life insurance

Type of cover	Min. cover (Rs)	Max. cover (Rs)	Min. term (years)	Max. term (years)	Min. age (years)	Max. age (years)
Term Insurance with or without return of premium	5 000	50 000	5	15	18	60
Endowment Insurance	5 000	30 000	5	15	18	60
Health Insurance Individually	5 000	30 000	1	7	Insurers' discretion	
Health Insurance Family	10 000	30 000	1	7	Insurers' discretion	
Accident benefit as rider	10 000	50 000	5	15	18	60

General Insurance

Type of cover	Min. cover (Rs)	Max. cover (Rs)	Min. term (years)	Max. term (years)	Min. age (years)	Max. age (years)
Enterprise Insurance *	5 000	30 000	1	1	NA	NA
Health Insurance Individually	5 000	30 000	1	1	Insurers' discretion	
Health Insurance Family	10 000	30 000	1	1	Insurers' discretion	
Personal Accident	10 000	50 000	1	1	5	70

* Dwelling & contents, or livestock or tools or implements or other named assets or crop insurance against all perils.

Appendix 3. Rural & social sector obligations in the Indian insurance market

This table illustrates the regulatory requirements imposed on all insurance companies in India by the Insurance Regulatory and Development Authority (IRDA). Non-compliance leads to heavy penalties.

Year ⁽¹⁾	Rural sector obligations ⁽²⁾		Social sector obligations ⁽³⁾
	Life Insurance *	General Insurance **	Life / General Insurance ***
1	7%	2%	5 000
2	9%	3%	7 000
3	12%	5%	10 000
4	14%	5%	15 000
≥5	16%	5%	20 000

⁽¹⁾ Year of operation of insurance company

⁽²⁾ As defined by Indian census: Place that has a population of less than 5000, population density not more than 400 / km² and at least 75% of the male population is engaged in agriculture

⁽³⁾ As defined by the unorganized sector of the economy (outside India called: Informal sector)

* Of total policies written in that year

** Of gross premium income written that year

*** Lives insured (includes personal accident and crop insurance for general insurer)

Appendix 4. Relaxation of insurance regulation for microinsurance agents

This table illustrates how the regulatory requirements differ with respect to the qualification of the agents for different entities through which microinsurance can be sold.

	Insurer / Bank	MFI*	NBFC**
Product allowed to sell	Insurance, Microinsurance	Only microinsurance	Only microinsurance
Agent	IRDA certified agent	Micro insurance agent	1 IRDA certified agent - all others can be microinsurance agents
Training	100 hours training at certified training institute	25 hours training by a certified agent	IRDA agent needs 100 hours, others only 25 hours
IRDA exam	Yes	No	Yes for IRDA certified agent - No for others

* Microfinance Institution

** NBFC: Non Banking Finance Company

Appendix 5. Meetings with life insurance and general insurance companies

Appendix 5 lists the life insurance and general insurance companies the authors have been in contact with to obtain data on the microinsurance products offered.

Life insurance	General insurance
Meetings: Life Insurance Corporation (LIC) Birla Sun Life Tata-AIG ICICI Prudential	Meetings: United India Insurance (UIIC) New India Assurance (NIAC) National Insurance (NIC) Reliance General Royal Sundaram
Telephone: HDFC Standard	Telephone: ICICI Lombard Star Health

Appendix 6. 1st questionnaire

248 women in two districts and more than 10 different villages have been interviewed based on the below questionnaire. The majority of the answers is in multiple choice format. In order to illustrate the risks they were asked to rank, we prepared a sheet with icons symbolizing the respective risks.

Insurance Policy:

28) Did you ever have insurance in your family? (if yes, continue with question 30)

- o Yes ☐ Yes, discontinued ☐ No ☐

29) Reason for NOT having insurance: (multiple selection possible, thereafter please continue with question 34)

- o People say it's bad ☐ No money ☐ Not enough information ☐ Other _____

30) Which kind of insurance do you have? (multiple selection possible)

- o Life insurance ☐ Cattle ☐ Health ☐ Other _____

31) Name of Insurance company(s) _____

(if NO life insurance, continue with question 34)

32) If life insurance, on who's name is the insurance policy?

- o Mother ☐ Husband ☐ Daughter ☐ Son ☐

33) If life insurance, what are the features?

- o Duration: <5 years ☐ 5-10 years ☐ 10-20 years ☐ More than 20 years ☐
o Monthly premium _____ Unknown ☐
o Money to be received at end of policy if nothing bad happens _____ Unknown ☐

34) Motivation for Insurance:

Why did you take insurance?

For what purpose would you want insurance?

- to receive money when my business suffers from an unforeseen event (animal dies, drought, fire, theft ...)
- to receive a regular pension when retired
- to have access to quality medical treatment in case I am sick
- to receive money in case of a natural disaster
- to receive money in case of death / accident of family member
- to save money for education of children
- to save money for marriage of daughter
- to save without temptation
- other

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Does not apply
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐

35) What is the main constraint affecting your ability to save?

- o Husband ☐ Own temptation ☐ No bank account ☐ Unforeseen events ☐ Other _____

36) Risk perception:

Rank risks from 1 to 5 (1 is most important risk, 5 is least important) using the photos on the separate sheet (write ranking in boxes)

- o Enterprise Risk ☐
- o Poverty when old ☐
- o Sickness ☐
- o Natural Disaster ☐
- o Death / Disability / Accident ☐

37) Insurance Experiences (if no insurance, continue with question 38):

I was well informed by the agent

I received aid from my SHG in choosing / deciding on my insurance policy

Others say it's a good / fair policy

I had to wait long to receive money from my insurance and they were unfriendly / process was complicated (if applicable)

I would chose the same policy again

I am not sure I understand every detail of my insurance contract (i.e. claim procedures or amount paid)

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Does not apply
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐

38) HiH trust / insurance policy

- Would you trust an insurance product recommended as useful and fair by HiH?
o Yes ☐ No ☐ Maybe ☐ Don't know ☐
- Would you want HiH to inform you about insurance products?
o Yes ☐ No ☐ Don't know ☐
- Would you accept co-payment (pay part of cost yourself, rest covered by insurance) in exchange for a lower premium?
o Yes ☐ No ☐ Maybe ☐ Don't know ☐



Natural disaster



Poverty when old



Sickness



Death/Accident/Disability



Enterprise risk

Appendix 7. 2nd questionnaire

40 women in two districts have been interviewed by the authors guided by the questions in the 2nd questionnaire

2nd Questionnaire, Friday and Saturday, 28th and 29th of September 2007

Districts: Kanchipuram, Thiruvannamalai, Sample size: 40 SHG women, 10 per day, maximum one woman per SHG, all age groups, interviews of 45-60 minutes each

Purpose of study: Impact of adverse event on life of SHG women / Coping mechanism

- 1) **Personal details:**
 - a. Name of SHG
 - b. Number of members in SHG
 - c. How long does SHG exist?
 - d. Age of woman:
 - e. Martial status: married other _____
 - f. Woman (Job):
 - g. Husband (Job):
 - h. Since when do you run the business?
 - i. Number of children (Job, if applicable):
 - j. Other members of family:
 - k. ST SC MBC BC OC, (Refers to caste system: ST=Scheduled tribe, SC=Scheduled caste, MBC=Most backward caste, BC=Backward caste, OC=Ordinary caste)
- 2) **Financial details:**
 - a. How many family members earn?
 - b. How much does each family member earn?
 - c. Do you have savings? (What kind? How much?)
 - d. Do you have debt? (Money lender, SHG, Bank, other?)
 - e. Food expenditure (alcohol, rice, chicken, local market, etc.):
 - f. Non-food expenditure (school, festivals, flowers, transportation, medicine, assets, rent):
(check if remainder + savings adds up to total salary)
 - g. Describe your business in detail:
 - h. Seasonal business (when is season?)
 - i. Who helps you with business?
 - j. Revenue per week (only business)?
 - k. Cost per week (only business)?
 - l. Do you write down income and expenses?
- 3) **Enterprise (scope last five years):**
Fire, theft, vandalism, machine breakdown, cow dies, no customer/demand, weather
 - a. In the last five years, did you encounter any of the above adverse events? (if applicable)
Which one?
Impact:
 - b. What was the consequence for your business?
 - c. How much did it cost to overcome the damage?Coping module:
 - d. What did you do/would you do if cattle dies/house burns down/machine breaks down?
 - e. How did you/would you pay for it? Did you/would you borrow the money? (money lender, SHG loan, savings,...)
 - f. How did you/would you pay the money back
- 4) **Pension (scope as of today):**
 - a. Until what age are you planning to work?
 - b. Are you saving for your retirement? - Why/why not? Where?
"Impact:"
 - c. Are you planning to save later? When? Why should you have more money then?Coping module:
 - d. What are you going to live of when old/retired?
 - e. How do your parents finance their retirement?SHG level:
 - f. Do you know of any people in your SHG who save for their retirement?

5) Health (scope last five years):

- a. Do you have access to a medical facility of any kind?: Village nurse, primary health center, hospital, ... (where?, travel time, cost of travel)
- b. When do you go to public hospital/private hospital? Opinion on public hospital?
- c. Have you ever been to a hospital/health center? If yes, did you stay overnight?
- d. Where did you give birth to your children?
- e. Same questions for family members

Impact:

- e. How often were you seriously sick? (as defined by: could not work/called nurse)

Family member?

- f. What kind of sickness?

- g. What were the consequences for your business/family?

Coping module:

- h. When you were seriously sick, did you go to hospital? Where did you go, how did you go there? How was your sickness treated?

- i. How much did you have to pay for hospitalization, for what kind of treatment?

- j. How did you/would you pay for it? Did you/would you borrow the money? (money lender, SHG loan, savings,...)

SHG level:

- k. Any cases when people were seriously sick?

- l. Did they go to hospital?

- m. Could they afford treatment? How did they pay for it?

6) Death/Accident resulting in disability (scope last five years)**Death**

- a. Did you have death in your family?

Who died?

Breadwinner?

Impact:

- b. How much did you have to pay for the funeral?

- c. How did the death influence your family income?

Coping module:

- d. How did you change your income generating activities to make up for loss of earning member?

- e. Did you have to reduce your expenditures/consumption?

- f. Did your family help you?

- g. How did you/would you pay for it? Did you/would you borrow the money? (money lender, SHG loan, savings,...)

SHG level:

- h. How many deaths did you have in your SHG + families over period?

- i. How did they manage to deal with loss of earning member?

- j. Did they borrow from SHG, other source? Are they poor now?

Accident

- k. Did anyone of your family ever have an accident resulting in temporary or permanent disability?

Who?

- l. What kind of accident?

- m. What kind of treatment did he get?

Impact:

- n. How long was the person sick/disabled/not able to work?

- o. How did the accident influence your family income?

Coping module:

- p. How did you deal with the accident?

- q. How did you/would you compensate the loss in income?

- r. How did you/would you pay for it? Did you/would you borrow the money? (money lender, SHG loan, savings,...)

- s. Who pays for the person's living now?

Appendix 8. Death statistics

This table provides the results from our 2nd questionnaire on frequency, cause, impact and coping with death in the sample.

	Total		Thiruvannamalai		Kancheepuram	
	#	%	#	%	#	%
Case of death in the family (of total sample)	15	38%	11	55%	4	20%
Husband	6	40%	4	36%	2	50%
Son	0	0%	0	0%	0	0%
Daughter	1	7%	1	9%	0	0%
Other	8	53%	6	55%	2	50%
Short term coping						
Loan	2	13%	1	9%	1	25%
Own money	3	20%	1	9%	2	50%
Friends / Relatives	7	47%	7	64%	0	0%
No expenses	2	13%	2	18%	0	0%
Other	2	13%	1	9%	1	25%
Long term coping						
No breadwinner	8	53%	7	64%	1	25%
Breadwinner	7	47%	4	36%	3	75%
Friends / Relatives helped out	3	20%	2	18%	1	25%
Start business / work more	2	13%	1	9%	1	25%
Reduce consumption	5	33%	3	27%	2	50%
No change in income	2	13%	1	9%	1	25%
Death resulting in (temp.) poverty	6	40%	4	27%	2	13%
Reasons for death						
Natural death	6	40%	5	45%	1	25%
Sickness	5	33%	4	36%	1	25%
Accident	3	20%	2	18%	1	25%
Suicide	1	7%	0	0%	1	25%
Average funeral cost in Rs	9 208		9 550		7 500	

Appendx 9 shows IRR and NPV calculations the authors have conducted for all relevant life insurance schemes on the market. Main pupose was to calculate the standalone value of the schemes' saving component. The schemes typically granted a negative NPV which then could be viewed as the cost of getting life insurance cover. This way, endowment policies and pure insurance policies without saving scheme become comparable.

Discount Rate		7%	Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Birla Sunlife	Face Value:	10000		CF	-100	0	0	110												
Bima Kavach Yoyana	Term in Years:	3		NPV	-€9.54															
	Net cost of Insurance:	-€0.32 per mille		IRR	3%															
Birla Sunlife	Face Value:	10000		CF	-50	0														
Social Development Plan	Term in Years:	1		NPV	-€50.00															
	Net cost of Insurance:	-€5.00 per mille		IRR	NA															
ICICI-Prudential	Face Value:	5000		CF	-50	0														
Suraksha	Term in Years:	1		NPV	-€50.00															
	Net cost of Insurance:	-€10.00 per mille		IRR	NA															
HDFC	Face Value:	10000		CF	-25	0														
Development Insurance Plan	Term in Years:	1		NPV	-€25.00															
	per person (spouse	-€1.25 per mille		IRR	NA															
Tata - AIG	Face Value:	55000	IRR: 4%			See Tata numerical sheet														
Maha Life	Term in Years:	100				Assun Begin policy with 30 Years														
	Net cost of Insurance:	-€7.48 per mille (NPV)				Death at age 70														
Tata - AIG	Face Value:	100000	Net cost of Insurance:			See Tata numerical sheet														
Maha Life Gold	Term in Years:	100	Best: €0.84 per mille (NPV)			Assun Begin policy with 30 Years														
			Worst: -€11.39 per mille (NPV)			Death at age 70														
Tata - AIG	Face Value:	10000		CF	-300	-300	-300	-300	-300	-300	-300	-300	-300	-300	0	0	0	0	0	3000
Sampoorn Bima Yojana	Term in Years:	15		NPV	-€1,090.87															
	Net cost of Insurance:	-€7.27 per mille		IRR	0%															
Tata - AIG	Face Value:	10000		CF	-3500	0	0	0	0	0	0	0	0	0	4375					
Ayushman Yojana	Term in Years:	10		NPV	-€1,192.50															
	Net cost of Insurance:	-€11.92 per mille		IRR	2%															
LIC	Face Value:	30000		CF	-100	Value of education coupons for children not included														
Social Security Scheme - JANAS	Term in Years:	1		NPV	-€100.00	Value of accident rider not included														
	Net cost of Insurance:	-€3.33 per mille		IRR	NA															

Appendix 10. Accident statistics

This table provides the results from our 2nd questionnaire on frequency, impact and coping with accidents accross the sample.

	Total		Thiruvannamalai		Kancheepuram	
	#	%	#	%	#	%
	Only family		Incl. SHG			
In Family						
Interviewee	1	14%			0	0%
Husband	3	43%			2	50%
Son	1	14%			0	0%
Daughter	0	0%			0	0%
Other	2	29%			2	50%
Immediate relief						
Loan	2	29%			0	0%
Own money	0	0%			0	0%
Friends / Relatives	4	57%			3	75%
No expenses	0	0%			0	0%
Other	1	14%			1	25%
Loss of breadwinner						
Family	2	29%			1	25%
Start business/work more	0	0%			0	0%
Reduce consumption	0	0%			0	0%
No change in income	5	71%			3	75%
Consequence of accident						
Death	2	29%	8	36%	2	50%
Disability permanent	0	0%	1	5%	0	0%
Disability temporary	5	71%	13	59%	2	50%
Kind of accident						
Traffic	4	57%	15	68%	2	50%
Fell in well	1	14%	2	9%	1	25%
Work / machine	1	14%	3	14%	0	0%
Stamped to death by crowd	1	14%	1	5%	1	25%
Snake bite	0	0%	1	5%	0	0%

Appendix 11. Product overview personal accident insurance

This table depicts selected features of the accident insurance policies offered by Royal Sundaram, Reliance General, ICICI Lombard and public insurers

	Royal Sundaram	Reliance General	ICICI Lombard	Public insurers
<i>Date of visit</i>	2007-09-26	2007-10-04	2007-10-04	2007-09-25
<i>Location</i>	Chennai	Kanchipuram	Telephone	Chennai
	<i>Janshakti Accident Shield</i>	<i>Personal Accident</i>	<i>Personal Accident</i>	<i>Raja Rajeshwari</i>
<i>Premium (Rs / year)</i>	60	50	10-45	15
<i>Accidental death (Rs)</i>	25 000	25 000	50 000	25 000
<i>Permanent total disability (Rs)</i>	25 000	25 000	50 000	25 000
<i>Permanent partial disability (Rs)</i>	12 500	12 500	25 000	12 500
<i>Temporary total disability (benefit per week in Rs)</i>		25 000, (250)		15 000, (500) Cost: 8 Rs
<i>Other disability benefits (finger, toe,...)</i>	No	Yes	?	No
<i>Hospitalization expenses after accident (Rs)</i>	1 000			
<i>Funeral expenses (Rs)</i>	2 000	500 for body transport		
<i>Educational grant to child (Rs)</i>	5 000	5 000		
<i>Wage loss (per day in Rs)</i>	500, (100)			
<i>Household contents(Rs)</i>	5 000			2 000
				Cost: 8 Rs (same as above)
<i>Legal divorce</i>				2 000
<i>Spouse insurance possible</i>	Yes: Extra 30 Rs	No	?	Yes: Extra 9 Rs
<i>Add-on</i>	Health add-on possible: 300 Rs / day of hospitalization for max. 5 days irrespective of treatment and cost Cost: extra 60 Rs	Health add-on possible: 20% of sum insured or 40% of valid claim for medical expenses due to accident if valid claim Cost: extra 30% on premium (to be confirmed)	Health insurance add-on for hospitalization after accident, only if claim goes through, so either accident	Mother teresa add-on possible: In case of death of 1 parent, child gets 1 200 Rs per year for schooling (1-11years); 2 400 Rs (12-17years) Cost: extra 15 Rs per child
<i>Comments</i>		Calculated for a cover of 25 000 Rs, scalable Benefits increase by 5% for each claimfree year (max. 50%)		More products available

Appendix 12. Retirement statistics

This table provides the results on retirement from our 2nd questionnaire. Across two districts it illustrates the envisioned retirement age, savings for retirement, dependence on children and who takes care of the own parents.

	Total		Thiruvannamalai		Kacheepuram	
	#	%	#	%	#	%
Age of retirement						
Average Retirement age	25	63%	8	40%	17	85%
No retirement	9	23%	9	45%	0	0%
Don't know	6	15%	3	15%	3	15%
Saving for retirement						
Yes	5	13%	4	20%	1	5%
No but Intention	18	45%	6	30%	12	60%
No	17	43%	10	50%	7	35%
Depend on children when old						
Yes	18	45%	10	50%	8	40%
Maybe	12	30%	5	25%	7	35%
No	10	25%	5	25%	5	25%
Parents						
Look after parents in (law)	12	30%	9	45%	3	15%
Someone in family takes care	30	75%	14	70%	16	80%
Parents need no / get no support	7	18%	6	30%	1	5%

Appendix 13. Employment descriptions

Appendix 13 contains the job description for five sales and retail related jobs covering most of the sales and retail activity within the entire sample. Furthermore, it describes the cattle business.

Petty shop: A petty shop is a small grocery store selling mainly sweets, crackers and some very basic grocery. The income generation depends on location, opening hours and size and ranges between 800 Rs (16 EUR) and 6000 Rs (120 €) per month.

Other shop: Some of the women have very small shops for special items like soap, bangles, jewellery, medicine, etc. Income depends very much on the products sold and ranges between 1000 Rs (20 €) and 20000 Rs (pharmacy, 400 €) per month.

Mini restaurant: The women typically provide two tables and chairs outside their house and cater the customers with very simple food and drinks. Income depends on location, quality of food and competition in the village but is around 3000 Rs per month. By locals they are being referred to as mini-hotels.

Tailoring/weaving/mat-making/saree business: Especially in the Kancheepuram district, saree weaving is a very popular business and the region is famous for its saree industry. The women that we have met either have a loom or a sewing machine and they typically either make fabric or use the fabric to tailor and repair clothes. Income mainly depends on the client base, quality of work and competition within the village and ranges between 1200 Rs (24 €) and 3000 Rs (60 €) per month.

Flower vending: The women buy flowers on the local market and knot them together to flower necklaces which are used as presents in the temples and at marriages. Income depends on the selling location, season and competition and is approximately 1000 Rs (20 €) to 2000 Rs (40 €) per month.

Cattle business: Most of the time, the milk animal contributes between one fifth and one half of the household income. In terms of hours worked, the milk animal is incredibly profitable: The women spend approximately 30-60 minutes every day on milking the cow. The average return is 4-8 litres per cow / day and each litre can be sold at 10 Rs (0.2 €). This leads to a monthly income of approximately 1200-2400 Rs (24-48 €) per month (during the season). The milk animal business is seasonal by its very nature. The cow usually gives milk for half a year, the other half of the year the animal is pregnant.

Appendix 14. Professions of 1st questionnaire sample

This table provides an overview of the job composition of the women interviewed for the 1st questionnaire. When attributable, the most suitable insurance scheme is indicated.

	Total		Thiruvannamalai		Kancheepuram		Corresponding insurance
	#	%	#	%	#	%	
Milk animal	31	13%	22	25%	9	6%	Cattle
Agriculture	6	2%	2	2%	4	2%	Crop / Weather
Animal rearing	4	2%	3	3%	1	1%	No insurance
Flower vendor	15	6%	4	5%	11	7%	(Dwellings & content)
Saree	18	7%	0	0%	18	11%	Dwellings & content
Tailoring/Weaving	45	18%	18	21%	27	17%	Dwellings & content
Petty shop	27	11%	9	10%	18	11%	Dwellings & content
Other shop	19	8%	15	17%	4	2%	Dwellings & content
Mini restaurant	12	5%	7	8%	5	3%	Dwellings & content
Other	7	3%	3	3%	4	2%	
Unknown	64	26%	4	5%	60	37%	
Total	248	100%	87	100%	161	100%	

Appendix 15. Professions of 2nd questionnaire sample

This table provides an overview of the job composition of the women interviewed for the 2nd questionnaire. When attributable, the most suitable insurance scheme is indicated. Jobs which are domestic are considered immobile while non-domestic ones are considered mobile.

	Total		Thiruvannamalai		Kancheepuram		Corresponding insurance
	#	%	#	%	#	%	
Milk animal	11	28%	8	40%	3	15%	Cattle
Agriculture	5	13%	0	0%	5	25%	Crop/Weather
Tailoring/Weaving	5	13%	3	15%	2	10%	Dwellings & content
Sales/Retail	11	28%	6	30%	5	25%	Dwellings & content
Mat making	2	5%	2	10%	0	0%	Dwellings & content
Other	1	3%	0	0%	1	5%	
Housewife	5	13%	1	5%	4	20%	No insurance
Total	40	100%	20	100%	20	100%	

Appendix 16. Product overview enterprise insurance

This table depicts selected features of the enterprise insurance policies offered by Royal Sundaram, ICICI Lombard and public insurers

		Royal Sundaram	ICICI Lombard	Public insurers
	<i>Date of visit</i>	2007-09-26	2007-10-04	
	<i>Location</i>	Chennai	Phone call	Chennai
		<u>Livestock shield</u>	<u>Cattle insurance</u>	<u>Cattle insurance</u>
	<i>Premium (% of cover)</i>	3,85%	3% (negotiation)	4%
	<i>Maximum cover</i>	15 000 Rs	8 000 Rs	30 000 Rs
		The policy is subject to negotiation	The policy is subject to negotiation	Cattle details are always almost the same
	<i>Comments</i>			
			<u>Weather insurance</u>	<u>Crop insurance</u>
	<i>Details</i>		There are no details available, it is to be negotiated on an individual basis	There are no details available, it is to be negotiated on an individual basis
		<u>Micro enterprise shield</u>		<u>Hut insurance</u>
	<i>Premium (per mille)</i>	2 Rs for brick house 4 Rs for contents 6 Rs for thatched hut		3 Rs for home
	<i>Add-on</i>	Electrical and mechanical breakdown of machine (extra 2 Rs)		
	<i>Covered</i>	Natural disaster, burglary, fire, lightning, etc.		Fire, other risks
	<i>Not-covered</i>	War, depreciation,		

Appendix 17. In-hospital medication of families in 2nd questionnaire

This table provides the results about the 2nd questionnaire families' history of private hospital and public hospital treatment. The results are sorted by family members

	Total		Thiruvannamalai		Kancheepuram	
	#	%	#	%	#	%
# of women interviewed	40		20		20	
<i>thereof with overnight hospital stay</i>	34	85%	16	80%	18	90%
Interviewee	33	83%	16	80%	17	85%
<i>Public</i>	27	82%	15	94%	12	71%
<i>Private</i>	10	30%	3	19%	7	41%
<i>Thereof pregnancy unrelated</i>	12	36%	6	38%	6	35%
Husband	7	18%	2	10%	5	25%
<i>Public</i>	4	57%	0	0%	4	80%
<i>Private</i>	3	43%	2	100%	1	20%
Child	6	15%	3	15%	3	15%
<i>Public</i>	3	50%	2	67%	1	33%
<i>Private</i>	3	50%	1	33%	2	67%
Other	2	5%	0	0%	2	10%
<i>Public</i>	1	50%	0	0%	1	50%
<i>Private</i>	2	100%	0	0%	2	100%
General						
<i>Goes to doctor more than once / month</i>	18	45%	8	40%	10	50%
<i>Private treatment better than public</i>	27	68%	13	65%	14	70%

Appendix 18. In-hospital medication of families in 2nd questionnaire

This table provides the results of the 2nd questionnaire on frequency of various illnesses as well as their average treatment cost when treated in a private hospital.

	Total		Thiruvannamalai		Kancheepuram	
	#	Avg. cost if private	#	Avg. cost if private	#	Avg. cost if private
<i>Pregnancy related/Sickness</i>						
Child birth, abortion, pregnancy	26	5 400	13	3 500	13	6 667
Diarrhea	2	NA	2	NA	0	NA
Kidney problem	4	15 000	1	15 000	3	15 000
Fever	2	NA	1	NA	1	NA
Water infection	1	NA	1	NA	0	NA
Uterus problem	1	20 000	1	20 000	0	NA
Paralysis	1	NA	1	NA	0	NA
Blood pressure and diabetes	2	25 000	2	25 000	0	NA
Tuberculosis	2	9 000	1	3 000	1	15 000
Leukemia	1	15 000	1	15 000	0	NA
Stroke	1	8 000	0	NA	1	8 000
Backbone problem	2	NA	0	NA	2	NA
Heart problem	1	NA	0	NA	1	NA
Typhoid	1	3 000	0	NA	1	3 000
Malaria	1	NA	0	NA	1	NA
Concussion	1	3 000	0	NA	1	3 000
Unknown	6	4 500	2	2 000	4	5 750

Appendix 19. Product overview health insurance

This table depicts selected features of the accident insurance policies offered by Reliance General, ICICI Lombard, United India Insurance, National Insurance and New India Assurance

	Reliance General	ICICI Lombard	United India Insurance	National Insurance*	New India Assurance
<i>Date of visit</i>	2007-10-04	2007-10-04	2007-09-25	2007-10-05	2007-09-26
<i>Location</i>	Kanchipuram	Telephone	Chennai	Chennai	Chennai
<i>Name</i>	HealthWise	Health insurance	Universal Health Benefits Scheme	Universal Health Benefits Scheme	Universal Health Benefits Scheme
<i>Premium (Rs)</i>	700 (dep. on age) 1 Pers 1 248 (dep. to age) 2+2	? 800 Rs 2+2 Pers	365 (subsidy 200) 1 Pers 548 (300) 2+3 Pers 730 (400) 2+2+3 Pers	365 (subsidy 200) 1 Pers 548 (300) 2+3 Pers 730 (400) 2+2+3 Pers	365 (subsidy 200) 1 Pers 548 (300) 2+3 Pers 730 (400) 2+2+3 Pers
<i>Maximum cover (Rs)</i>	100 000	20 000	2 x 15 000	2 x 15 000	2 x 15 000
<i>Family floater</i>	Yes	Yes	Yes	Yes	Yes
<i>Pre-existing diseases included</i>	After 1 year	No	No	No	No
<i>Comments</i>	Critical illness insurance, thus rather for	This is a rough projection, it depends on the age and structure of the group, also critical illness can be given	Subsidized scheme for BPL Possible inclusion of more services Staff training provided by insurance company	Subsidized scheme for BPL Discounts can be negotiated	Subsidized scheme for BPL Discounts can be negotiated
<i>Cashless facility available (with ID card)?</i>	Yes, in 3 000 network hospitals	Yes, if treated in network hospitals	?	Yes, 6% on top of premium	?

* National Insurance has to products currently going through the process of IRDA approval

Product1: Comprehensive product covering hospitalization up to 30 000 Rs, personal accident up to 25 000 Rs, fire/contents to be defined; Premium range 300-400 Rs

Product 2: Mediclaim product for coverage up to 50 000 Rs; Premium range: 200-400 Rs

Appendix 20. Risk reduction potential for Universal Health Benefits Scheme

Appendix 20 assesses whether the features of the Universal Health Benefits Scheme with respect to maximum cover and diseases included are suitable to reducing the health risk low income people in south-east India are faced with. As such the frequency of diseases covered and not covered are examined. Further, the typical cost of treatment for diseases is set against the Universal Health Benefits Scheme's maximum cover.

In the main text we have analysed the risk reduction potential of health insurance in general. In appendix 20, we want to illustrate the risk reduction potential of the Universal Health Benefits Scheme specifically. The Universal Health Benefit Scheme offered by the public insurers in India is by far the most attractive micro health insurance product. The policy does not discriminate between age groups and the premium for an individual is as low as 365 Rs (7.3 €) per year, payable upfront for the whole year. Family policies are also available at very low rates. The scheme has two major restrictions, though: Various policy exclusions and a maximum cover (15000 Rs (300 €) per illness, 30000 Rs (600 €) per year). Two steps are required to show that the scheme actually has a relatively high potential for risk reduction despite the restrictions: First, the policy exclusions need to be compared to the most frequent sicknesses to see if the scheme actually covers the latter. Second, we compare the prices of the individual treatments to the maximum cover of the policy in order to analyse if it is sufficiently high to cover the most important sicknesses.

Frequency of sickness compared to policy exclusions

A list of all exclusions is provided in appendix 21. As analyzed in section 7.4 and shown in appendix 21 of this paper, the most relevant reasons for overnight hospitalization according to our sample are child birth and pregnancy related illnesses followed by kidney problems. Other relevant illnesses include diarrhea, virus fever, blood pressure, diabetes, tuberculosis and back bone problems. As depicted in appendix 22, our findings are relatively well in line with the answers of health experts that we interviewed. In addition to our findings, the experts add ulcer, cataract and respiratory infections.

Unfortunately, the most frequent reason for overnight hospitalization, child birth and pregnancy related illnesses are not covered under the policy. Also, cataract remains uncovered in the first year. Other than that, it is safe to assume that the policy covers all major sicknesses. Hence, the risk reduction potential of the policy is high, but not nearly as high as it could if child birth and pregnancy related illnesses were covered.

Cost of treatment compared to maximum cover of policy

Assessing the prices for medical treatments is crucial for understanding the coverage of a policy.

We have tried to pin down the prices of various treatments in two ways: First, we rely on the information from our own survey, to get a rough estimate on prices of treatments. According to the findings illustrated in appendix 18, only two treatments exceed the 15000 Rs limit, the uterus surgery and the blood pressure and diabetes illness which required hospitalization of three months. As the vast majority of the treatments remains below the limit, we are confident that the cover is sufficient.

Second, in order to get an unbiased overview of the price of private treatments we asked the insurance companies we met if they were able to provide us with such a price list. All of the companies claimed not to have access to price lists as they had outsourced their claim settlement to third party administrators (TPA). Contacting 30 TPA's with a corresponding information inquiry led to very few responses only. The Healing Fields Foundation, a subsidiary of a TPA providing customized health insurance solutions for poor people was willing to provide at least some prices for specific treatments. None of the treatments exceeds 15000 Rs (300 €) so the cover seems to be sufficient. The information is included in appendix

22. Hence, the coverage of the United Health Benefits Scheme seems to be sufficiently high. In case a person wants a better coverage, she can buy critical illness insurance on top of the benefits scheme.

Appendix 21. Policy exclusions of Universal Health Benefits Scheme

Appendix 21 provides a complete list of the policy exclusions of the Universal Health Benefits Scheme. The most relevant exclusion are bold.

All pre-existing diseases

All diseases contracted during the first 30 days from the commencement date of the policy provided that in the opinion of the panel doctor/s the insured person could not have known about the existence of disease or its symptoms at the time of making the proposal AND had not taken any consultation, treatment for the disease prior to taking the insurance

Some of the diseases such as **Cataract**, Benign Prismatic Hypertrophy, Hysterectomy, Hernia, Hydrocele, Fistula in anus, Piles, Sinusitis, Congenital internal disease are not covered in the first year of the policy

Corrective, cosmetic or aesthetic dental surgery or treatment

Cost of spectacles, contact lens and hearing aid

Vaccination, inoculation, change of life or cosmetic treatment or surgery **HIV, AIDS**, Sterility, Venereal disease, Intentional self injury, use of Intoxicating Drugs/ Alcohol

Primarily diagnostic expenses not related to sickness / injury.

Treatment for **Pregnancy, Childbirth, Miscarriage, Abortion etc.**

Appendix 22. Prices for treatments and most common diseases

Appendix 22 depicts exemplary prices for very common diseases. Further, two expert opinions on which diseases occur most frequently are shown. Those diseases written in bold capital letters are covered by the United Health Benefit Scheme.

Prices in private hospital		5 most common 24 hs hosp. diseases
Sickness	Price	Barucha, C. - Doctor in Kancheepuram
<i>Normal pregnancy and childbirth</i>	1 500 Rs	Surgery (Appendix, broken leg, ...)
<i>OP like fracture</i>	1 289 Rs	Respiratory infection (for children)
<i>Diarrhea</i>	975 Rs	Complicated child delivery
<i>Typoid</i>	1 125-2 900 Rs	Cataract
<i>Fever of unknown origin</i>	750 Rs	Virus fever
<i>Poisoning</i>	1 925 Rs	Alwar, N. - Project director training HiH
<i>Appendectomy</i>	9 000 Rs	Complicated child delivery
<i>Renal calculi</i>	14 500 Rs	Surgery (Appendix, broken leg, ...)
		Ulcer
		Kidney problems
		Removal of uterus
		BOLD = Covered by scheme

Source: The Healing Fields Foundation

Note: We could not confirm the prices for treatments properly and within Hand in Hand, it was suspected they might be too low on average. It is also possible that poor people get better rates in private hospitals than non poor

Appendix 23. Insurance coverage of sicknesses in rural India compared to developed countries

This figure illustrates how/if insurance coverage insulates from the financial consequences of sickness. The situation in the informal sector in India is compared to developed economies.

India, informal sector	Public	Private
Forgone income	Not covered, unless extra insurance	Not covered, unless extra insurance
Cost of treatment	Free	Health insurance
Developed countries	Public	Private
Forgone income	Covered by employer or separate insurance	Covered by employer or separate insurance
Cost of treatment	Health insurance	Health insurance

Appendix 24. Overview of savings mechanisms available to the poor

Appendix 24 compares the features of chit funds, post office schemes, saving through the SHG and insurance saving schemes. Points of interest are the effective interest paid as well as the convenience.

In section 7.5, we briefly mention that insurance in the south-east Indian context serves as a savings mechanism. This argument can be utilized to show that the discrepancy between potential and effective demand is even bigger than implied by the risk aversion of the individual. More precisely, this appendix illustrates that among a couple of imperfect savings mechanisms available to the poor, life insurance has the most attractive features. As such, inter-temporal preferences should lead to people demanding insurance. Consequently, if risk aversion *and* inter-temporal preferences imply insurance demand in a world of imperfect saving alternatives, we expect many more people to be insured. As less than half of the interviewed are in fact insured, we conclude that lack of information, understanding and rationality might also be a problem impeding demand for insurance as a savings vehicle.

The vast majority of the people that we have met do not have a bank account. Consequently, the women have to rely on four (partly) formalized savings mechanisms⁸³: *Chit funds*, *post office*, their *SHG* and *life insurance*.

Chit funds have been around in the Indian civilisation since ancient times and still live on today. Typically, a number of participants pay a monthly fee into the chit fund. At the end of the month, the amount is auctioned to one of the members. There are as many periods as there are members so each member gets to draw down on the money once. Those who once received money are not eligible for bidding in further rounds. Accordingly, in the later periods fewer members participate in the bidding. The highest bidding member gets to draw-down the money in any given round and her bid amount is subtracted from the pot. In the next round, the winner's bid divided by the number of participants is subtracted from each participant's

⁸³ For simplicity we will not discuss informal saving mechanisms as they are assumed to be inferior to formal saving mechanisms in terms of interest, security of the money, etc.

contribution. As there are fewer bidders in later rounds the bids should go down over time until the last remaining bidder gets the full pot without bidding.

Today, informal rural chit funds live on in many southern Indian villages while organized chit fund companies are now prevalent all over India. The magnitude of the chit fund business in Tamil Nadu is best illustrated by the following statistic: In 2001, the amount of money in chit funds in Tamil Nadu was estimated to be Rs 100bn while bank deposits at the same time only totaled Rs 55bn (Klonner, 2002). While conducting in-depth interviews for our second questionnaire, we asked all interviewees about their assets and about how much they were saving. Out of 40 women we interviewed, five save money in chit funds.

Despite the high penetration of chit funds, the mechanism involves a high degree of uncertainty: First, every participant is dependant on the payments of the others. Default is not secured, so that a substantial part of the money is at peril depending on the others' default probability. Second, in case the money is desperately needed, the individual has no chance to draw down on the money immediately. She has to wait for the next bidding round and presumably has to pay a high price if the others know that she needs the money. Third, the interest rate received at the end is not locked in upfront. The participant only knows the effective rate of interest after all bidding rounds are completed. As the money is not saved in a bank account, it is possible that the real interest is negative.

Post office savings offer the opportunity to deposit amounts from as little as 50 Rs monthly, paying 2-3% effective annual interest. There are different time-horizons to be chosen from. This offer seems rather puny considering that regular banks pay up to 9% annual interest on deposits and the inflation is in the range of 4-5% annually (however, for large parts of the rural population, a bank account is hard to come by). Post offices can be found in every remote village, therefore accessibility is not a problem. It is obvious, however, that the mechanism is far from sufficient: First, the real interest offered on post office savings accounts is negative as the nominal interest rate remains below inflation. Second, people can deposit as much as they want and also withdrawal is free from restrictions. As 64% of the women in our questionnaire answer that their own temptation to spend the money is the major reason not to save, a voluntary savings mechanism seems not be the optimal savings vehicle.

SHG members, too, have to save an amount from 50 Rs to 120 Rs each month. The money is lent on among the *SHG* women whenever one of the women would like to borrow and the others agree that she should get a loan. Interest on the savings are not predetermined because usually only some part of the money is lent on. More importantly, by proving their discipline to frequently save money and record their financial transactions in a ledger, they become eligible for bank linkage in the form of a loan. We believe that saving within the *SHG* mostly does not take place for the sake of building up an asset base but in order to become eligible for a loan. Women do not get any interest as the money is kept within the group. The interest portion that the individual group member is entitled to is decided upon on by the group when a member wants to leave the *SHG*.⁸⁴ Consequently, *SHG* saving is designed more as disciplining and signalling mechanism rather than an actual savings mechanism that generates interest.

Life *insurance* schemes often entail a savings component. In most schemes a survival benefit is accumulated over periods ranging from one to 15 years. In the majority of the schemes, the survival benefit is disbursed as a lump sum payment at maturity. Some schemes pay the benefit in the form of a reverse annuity which is received till death. Not at all valuing the insurance component, most schemes' saving component standalone has a negative NPV and a very low IRR (appendix 9). In this respect, they are in fact comparable to post office savings

⁸⁴ Very few women actually leave the group so this is not a big problem so far.

schemes which also offer a negative real interest rate. However, insurance has some advantages over the post office scheme: First, the insurance component is an extra service that the product entails in excess of the savings function. The insured individual is able to lock in a certain amount of money to be received in the future, no matter if she dies or not.⁸⁵ This indeed seems a reasonable way of saving for large future expenses that arise with certainty like e.g. education for children and marriage of a daughter. Second, life insurance is a form of forced saving, i.e. people have to save a certain amount every month in order not to lose the money. As many people we met do not save at all or only very irregularly, this is interpreted as an advantage of the scheme. If the person is in urgent need for money, however, the contract can be cancelled and the accumulated portion of the survival benefit is paid out. A substantial penalty will be deducted for premature withdrawal which effectively prevents the policy holder from spending the accumulated money lavishly.

Hence, after analysing the four savings mechanisms available to the poor in south-east India, we conclude that life insurance entailing a savings component is amongst the most attractive options.⁸⁶ Our finding that still less than the majority of the people we interviewed are insured illustrates that some of the inefficiencies explained in section 7.5 (lack of information, understanding and rationality) might cause effective demand for insurance as a savings vehicle to fall short of potential demand.

⁸⁵ Given that the premiums are regularly paid.

⁸⁶ Three assumptions have to hold to draw this conclusion: 1st, people do not have access to bank accounts. 2nd, people need to be forced to save; else they will not save at all or very irregularly. 3rd, people need to be held from withdrawing the savings because they have a high temptation to spend the money lavishly.

Appendix 25. Hand in Hand's contribution

Appendix 25 lists the most important people at Hand in Hand we obtained information from. In various formal and informal meetings the below listed persons helped us getting deep insight into microfinance in the south-east Indian context.

Name and function	Sort of information obtained
<i>Dr. Kalpana Sankar (CEO-HiH)</i>	Provided guidelines for the microinsurance project Provided contacts of insurance companies Discussed results and interpretations of underinsurance of the poor
<i>Mr. H.K. Pamarthy (CEO-HiH MFI)</i>	Provided information on general NGO activity in India Provided information on HiH's financials (income statement, balance sheet) and on regulatory considerations.
<i>Mr. V. Karuthovian (Project director SHG)</i>	Discussed content and execution of questionnaires Discussed roll-out scenarios for microinsurance schemes
<i>Mr. Jagannathan (District manager Thiruvannamalai)</i>	Conducted questionnaires in Thiruvannamalai
<i>Mr. Prem (Zonal manager Thiruvannamalai)</i>	Conducted questionnaires in Thiruvannamalai
<i>Mr. Johnson (Zonal manager Kancheepuram)</i>	Conducted questionnaires in Kancheepuram
<i>Ms. S. Skandan (Project coordinator health & hygiene)</i>	Provided information on health infrastructure and Indian customs
<i>Mr. C. Meenakshisundaram (Director planning)</i>	Provided information on cattle insurance Provided overview of general insurance schemes
<i>Mr. Murugan (Director - Operations / village upliftment)</i>	Provided folder containing all existing Hand in Hand insurance policies of e.g. Hand in Hand premises and micro enterprises
<i>Mr. K. Muniratnam (Chief project coordinator)</i>	Discussed which insurance companies are potentially interesting to look at Informed us on insurance policies already in place e.g. micro enterprises being insured Joined us for a number of meetings with insurers