

Crayen, Dorothee; Hainz, Christa; de Martinez, Christiane Ströh

**Working Paper**

## Remittances, Banking Status and the Usage of Insurance Schemes

ifo Working Paper, No. 137

**Provided in Cooperation with:**

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

*Suggested Citation:* Crayen, Dorothee; Hainz, Christa; de Martinez, Christiane Ströh (2012) : Remittances, Banking Status and the Usage of Insurance Schemes, ifo Working Paper, No. 137, ifo Institute - Leibniz Institute for Economic Research at the University of Munich, Munich

This Version is available at:

<https://hdl.handle.net/10419/73839>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# **ifo** Working Papers

## Remittances, Banking Status and the Usage of Insurance Schemes

Dorothee Crayen  
Christa Hainz  
Christiane Ströh de Martínez

Ifo Working Paper No. 137

September 2012

An electronic version of the paper may be downloaded from the Ifo website  
[www.cesifo-group.de](http://www.cesifo-group.de).

## Remittances, Banking Status and the Usage of Insurance Schemes\*

### Abstract

Empirical evidence that migrants send home more remittances after disasters raises the question of whether remittances are used to self-insure, substituting for both formal and informal insurance. We investigate this question using a unique dataset on the usage patterns of financial services by households in South Africa. We show that the likelihood that a respondent has a formal funeral cover increases with income and banking status. However, it is lower for individuals receiving remittances, which supports the idea that remittances act as self-insurance. We also show that other risk management strategies influence the purchasing of formal funeral cover. Finally, we find that determinants of informal insurance differ from those of formal insurance.

JEL Code: D14, F24, G22, O16.

Keywords: Remittances, insurance, risk management strategies.

Dorothee Crayen  
University of Tübingen  
dorothee.crayen@gmail.com

Christiane Ströh de Martínez  
Free University of Berlin  
christiane.stroeh@gmx.de

Christa Hainz\*\*  
Ifo Institute – Leibniz Institute for  
Economic Research  
at the University of Munich,  
Poschingerstr. 5  
81679 Munich, Germany  
Phone: +49(0)89/9224-1237  
hainz@ifo.de

\* We thank Hans Degryse, Manfred Nitsch, Barbara Dietz and Sven Neelsen, as well as the participants in the Micro-insurance Summit in Dakhar, the CESifo Area Conference on Applied Microeconomics in Munich, and the German Development Economics Conference in Hannover for comments and discussion. We gratefully acknowledge the FinMark Trust ([www.finscope.co.za](http://www.finscope.co.za)) team for providing the data and kind support for our research. Of course, all remaining errors are our own.

\*\* Corresponding author.

## 1. Introduction

“A good share of rural households borrow, many more save, but all seek to insure against the vagaries of life. In the view of the virtually complete absence of formal insurance markets and social security systems accessible by the poor [...], they use a multitude of measures to reduce the likelihood or impact of risks, either through ex-ante or ex-post measures for smoothing income, consumption or both.” (Zeller and Sharma, 2000, p. 162)

This statement shows that households in developing countries need access to some kind of insurance. In principle, households possess a wide range of measures to cope with risk. In industrialized countries, formal insurance is widely used. Often, it is mandatory or even provided by the social security system. In less-developed countries, households rely less on formal insurance and more on semi-formal insurance, including additional risk management strategies to deal with income shocks. The choices households make in selecting ex-ante and ex-post mechanisms to deal with risk are interrelated. One way to deal with risk ex-post is to increase the flow of remittances, and empirical studies show that remittances act as insurance. Obviously, different risk management strategies are interrelated. However, many aspects of their interrelationships remain unclear. Do remittances influence the decision to buy formal funeral cover or to insure informally? How important is saving, borrowing, and selling assets to deal with shocks? Furthermore, to what extent does the banking status matter for the kind of insurance selected?

In this paper, we address these questions both in a simple theoretical model and in an empirical analysis using data on funeral cover in South Africa. We argue that remittances provide an income and a self-insurance effect. As remittances increase income, low-income recipients of remittances, *ceteris paribus*, are more likely to possess formal funeral cover. This is due to the fact that the higher income relaxes their budget constraint. For higher income individuals, an increase in income reduces the need to insure if they show absolute decreasing risk aversion; therefore, their use of funeral cover may decrease. However, remittances also provide self-insurance and thereby substitute for formal insurance. Because remittances may increase strongly after risk or disaster occurs, we believe that the self-insurance effect overrides the income effect if (for lower incomes) the latter is positive. We therefore expect that recipients of remittances are less likely to possess formal funeral cover.

We investigate this question empirically, using the FinScope survey, a unique dataset for South Africa where funeral expenses are generally very high and extremely difficult to afford. Indeed, a formal funeral cover is the insurance policy most widely used by households in South Africa, in addition to burial societies, which are an informal insurance arrangement. A substantial share of households also receives remittances.

Indeed, the data support our hypothesis. Once we account for the level of income, the fact that an individual receives remittances decreases the probability that he<sup>1</sup> has a formal funeral cover. Moreover, we see that different risk management strategies interact. For instance, among uninsured households, we observe a higher likelihood of taking informal loans. Interestingly, the determinants of formal funeral cover differ in many ways from those pertaining to a burial society. This situation is possibly due to the additional social and cultural aspects of burial societies, apart from informal funeral insurance. Finally, we provide evidence that the usage of

financial services (“bancarization”) matters. In particular, we find that households with a bank account are more likely to have funeral cover, both formal and informal.

The literature to date has mainly emphasized the determinants of remittances. Besides the motives of altruism, self-interest and mixtures of these concepts (e.g., Lukas and Stark, 1985; Rapoport and Docquier, 2006), insuring in terms of family-based co-insuring arrangements has been proposed in the context of the New Economics of Labour Migration (Rapoport and Docquier 2006) and portfolio theory (Stark, 1991). In spirit, our research question is similar to that of the few papers focusing on the behavioural changes of households receiving remittances, including the effects on education and household income generating patterns (e.g., Acosta et al., 2008; Azam and Gubert, 2006; Grigorian and Melkonyan, 2012). We provide direct evidence that remittances are a co-insurance arrangement that influences the insurance decision of households. We thereby contribute to the literature on remittances by showing that they change decisions of a financial nature.

The paper is organized as follows: section 2 describes the risk management strategies used by low-income populations; section 3 provides information on the usage patterns of financial services in South Africa; section 4 presents a simple theoretical model from which we derive the testable hypotheses; section 5 describes the data, the regression framework and results; and section 6 discusses the results and offers some conclusions.

## **2. Risk management strategies used by low-income populations**

All households have exposure to some kinds of risk, but with huge differences in the intensity and the frequency of the related shocks and the ability to deal with them. Low-income or poor populations often live in riskier or unhealthier environments than those who are better-off and

have fewer resources to prevent or mitigate risks and to cope with the consequences of the related shocks (Arun and Steiner, 2008; Churchill, 2006; Dercon, 2005). Vulnerability to risks, such as illness, disability or natural disasters, relates closely to material poverty. Financially, shocks can translate into both sudden expenditure needs and income shortfalls. Many people also remain poor for extended periods after their descent into poverty, which is caused by ‘ordinary events’, such as illness (Hulme and Shepherd, 2003; Krishna, 2010).

In the context of limited coverage through social safety nets and access to formal insurance products in most developing countries, low-income populations employ a large variety of strategies for dealing with risk (Collins et al., 2009; Dercon, 2005). Risk mitigation can take place at two different stages (Dercon, 2005; Morduch, 1995). The first stage refers to ex-ante arrangements to avoid exposure to risk, which shows low-income populations’ awareness of relevant risks and preventive strategies. Measures for preventing income shortfalls before they occur consist mainly of conservative production choices, such as planting safe, low-yielding seed varieties or mixed cropping (Dercon and Christiaensen, 2011; Kurosaki and Fafchamps, 2002) and of diversification of the household’s economic activities (Banerjee/Duflo, 2007). Such arrangements, however, often entail losses in the profitability of the respective economic activities (Morduch, 1995; Ruthven and Kumar, 2002).

The second stage refers to both ex-ante and ex-post mechanisms for dealing with damage and related negative income shocks that occur within households. Ex-ante arrangements for dealing with potential damage include reducing consumption, creating savings and insuring through both formal and informal insurance schemes. Ex-post mechanisms comprise borrowing, receiving remittances, reducing consumption and increasing working time (Morduch, 1995). The coping mechanism of reducing consumption may affect the family’s nutrition or education level (Jacoby

and Skoufias, 1992); whereas, the extension of working hours may affect the health or social situation of the family. Financial arrangements therefore constitute important options for dealing with damage and related shocks.

In-depth studies on financial management of low-income households, such as the Financial Diaries, show that formal, semi-formal and informal financial arrangements and services are frequently combined to meet expenditure needs from small and unstable income streams. The main purposes of financial management include coping with risk and emergencies; besides daily consumption smoothing, dealing with life-cycle needs and taking advantage of opportunities (Rutherford, 2003; Ruthven and Kumar, 2002; Collins et al., 2009). Thereby, various financial devices besides insurance help to mitigate risk (e.g., Collins et al., 2009). Here, we use this wider notion of “insuring” which refers to different risk-prevention and risk-management strategies. Therefore, a comprehensive analysis needs to consider the financial devices used for risk management such as savings, borrowing, funeral cover schemes and remittances.

Although combining mechanisms is possible, ex-ante and ex-post mechanisms for dealing with damage events are substitutes for each other. Literature on this topic argues that remittances act like insurance, with evidence on both the macro and the micro levels. On the macro level, Mohapatra, Joseph and Ratha (2009) show that, in countries with a significant proportion of migrants, the flow of remittances significantly increases, both statistically and economically, after a natural disaster.<sup>2</sup> Yang (2007) focuses on the impact of hurricanes in a sample of developing countries. In the poorer half of the sample, remittances increase significantly after a hurricane. Several researchers have studied the effects of income shocks on the level of remittances by using household data. For instance, Gubert (2002) provides evidence for a region in Mali in which crop failure engendered an increase in national and international remittances. Other studies use natural



disasters as their identification strategy. Yang and Choi (2007) analyse household panel data for the Philippines and measure changes in local rainfall as an exogenous shock. They show that remittance inflows from other countries replace roughly 60 per cent of the exogenous declines in income in households with overseas migrants. Using a panel of the LSMS from Jamaica, Clarke and Wallsten (2003) find that remittances increased by 25 per cent for every dollar of damage inflicted by hurricane Gilbert at the household level.

### **3. Remittances and characteristics of financial services in South Africa**

The most recent Human Development Report 2011 (UNDP 2011) shows that inequality and life expectancy remain central challenges for human development in South Africa. As in many other developing countries, there is not only a significant percentage of international, but also national migration. By 1999, the percentage of rural South African households containing migrant household members had risen to 36 per cent (Posel, 2003). Estimates based on a non-representative survey from 2006 indicate that almost a fifth of South Africans report that they regularly receive money from other locations (Landau and Kabwe-Segatti, 2009).

Access to and usage of financial services differ significantly in this heterogeneous society. While roughly half of the South African population had bank accounts in 2006, the white and the wealthiest of the population continue to retain the highest level of bancarization, at over 90 per cent. However, increasing proportions of black and coloured populations<sup>3</sup> have bank accounts, reaching 45 and 53 per cent in 2006, respectively. The differences in banking practices between urban and rural populations remain large, although both urban and rural populations have become increasingly familiar with banks. Considering the differences by the Living Standards Measure (LSM)<sup>4</sup>, around 20 per cent of the lowest classes have a bank account. However, this probability

increases strongly in the low and medium classes from 32-48 to 35-61 per cent (FinScope Data, 2004-2006). The most important link to a bank, corresponding to 48 per cent of the population, consists of ATM cards. This link may be partly due to the payment system of governmental social grants and pensions through ATMs (Overbye, 2005).

The second most popular financial service – even more popular than savings/transaction accounts – is funeral insurance, with 39 per cent of the population either holding a formal funeral cover or belonging to a burial society. Hence, as indicated by the nationally representative FinScope data sample, funeral cover is the only widely used insurance or risk-mitigating financial service. The most popular providers of this kind of insurance are burial societies, which serve 23 per cent of the population. Membership to burial societies generally covers up to six people and is most common among black and coloured populations. Formal funeral cover directly from an undertaker is another popular form of insurance used mostly within the coloured community. Banks and insurance companies offer formal funeral cover and are most frequently purchased by white populations. The usage patterns of funeral cover are quite different from bancarization trends and much more equally distributed by race. The coverage of black, white and coloured is between 36-59 percent; only the Asian population shows low coverage at 25 percent. The fact that burial societies generally cover large families adds up to significant equality in funeral coverage.

Financial Diary research in South Africa shows that because of the elaborate gatherings before, during and after funerals, the costs of a funeral are generally very high, adding up to five to ten months of income. Households use a variety of financial instruments to prepare themselves financially for these expenses and spend around three percent of their gross monthly income on financial precautions for funeral. The rising number of premature deaths of people under 60 years

of age related to HIV/AIDS make these events more frequent. Even though households spend a significant proportion of their income on funeral insurance schemes, pay-outs from the burial society and the formal insurance coverage generally require subsidization by remittances or by in-kind contributions from relatives, savings, or a loan to cover the expenditures related to a funeral (Collins et al., 2009).

During the last decade, insurance companies in South Africa have moved away from their focus on the high-income market.<sup>5</sup> Instead they now offer various types of insurance for the low-income populations, with very moderate monthly premiums of around USD 3-7 and with simple and flexible terms (Bester et al., 2008). Monthly premiums are paid in cash or through a debit order from a bank account. In the case of a death, a lump sum distribution, requiring a death certificate (Collins et al., 2009), is generally paid out in cash.

Burial societies are community-based, informal or semi-formal insuring schemes administered by groups at the local level. These groups generally have a common link to social institutions such as a church or a neighbourhood. Although there are different organizational schemes, the members generally pay regular premiums – all the same amount – in cash at monthly meetings. These premiums are then saved in a bank account in the society's name. If death occurs, the relatives receive a previously fixed payout that may be in cash, kind, or both (Collins et al., 2009). Besides the financial resources, the emotional and practical support of burial society members plays an important role, especially with regard to preparing and serving the feasts during the elaborate burial ceremonies and providing utensils for cooking, for example (Collins et al., 2009).

#### 4. Links between different financial arrangements and hypotheses

We investigate the relationship between different risk management strategies. In particular, we study the ways in which receiving remittances influences the demand for insurance. We look at this question from the ex-ante perspective, i.e. the point in time when an individual decides to buy insurance coverage before damage occurs. Using our data, we determine whether an individual has funeral cover. However, we do not consider the coverage rate usually derived from a theoretical model. Thus, we explain the individual's decision to purchase the optimal coverage rate in a theoretical model and argue that this coverage rate influences whether or not an individual has an insurance policy.

We use the model and notation similar to those in Rees and Wambach (2008) but add expected remittances. In the model, the individual has an income of  $W$ .<sup>6</sup> He may suffer a loss,  $L$ , in the bad state of the world, which occurs with probability,  $p$ . In the context of our research, the bad state occurs when there is a death and funeral costs,  $L$ , are due. Individuals can buy cover  $C$ , paying a fair premium of  $pC$ . We assume that the insurance premium is fair in order to keep the analysis as simple as possible. In addition to the standard model, individuals expect remittances, denoted as  $R^g$  in the good state of the world and  $R^b$  in the bad state, with  $R^b > R^g$ . The empirical evidence that a migrant increases the amount of remittances after the individual faces a loss justifies this assumption. Thus, the expected utility,  $\bar{u}$ , with  $u' > 0$  and  $u'' < 0$ , is as follows:

$$\bar{u} = (1-p)u(W + R^g - pC) + pu(W + R^b - L - pC + C) . \quad (1)$$

The individual maximizes the expected utility through the choice of  $C$ . When solving the optimization problem, the individual has to respect that there are the following constraints:

- a lower threshold,  $\underline{C}$ , below which no insurance cover is offered, which we call feasibility constraint

$$C \geq \underline{C} \quad (2)$$

- and the budget constraint

$$W + R^g \geq pC. \quad (3).$$

Given that we assume a fair insurance premium, the result of the optimization is that the marginal utilities between the good and bad states are the same. This result implies that the payoffs in both states must be identical, i.e., the optimal coverage  $C^*$  is determined by the following equations:

$$W + R^g - pC^* = W + R^b - L - pC^* + C^* \text{ or}$$

$$R^b - R^g = L - C^* \text{ or}$$

$$C^* = L - (R^b - R^g). \quad (4)$$

Because  $R^b - R^g > 0$ , it is optimal to buy only partial coverage. In the standard model without remittances, the optimal solution is to have full coverage. In addition, the individual must respect feasibility and budget constraints. This requirement implies that if  $C^* < \underline{C}$ , the individual must decide whether to buy more ( $C = \underline{C}$ ) or less coverage ( $C = 0$ ) than optimal. The existence of the feasibility constraint renders the budget constraint more demanding. For an individual with remittances, the budget constraint is more likely to be fulfilled, which means that he is more likely to possess funeral cover.

In our simple model, we do not capture the effect of the degree of risk aversion. In a more comprehensive model, a change in income influences the demand for insurance, depending on the individual's degree of absolute risk aversion. If an individual has decreasing (increasing) absolute risk aversion, he chooses a lower (higher) coverage rate when income increases. For analytical purposes, we can split  $R^b = R^g + I$ . Thus, an individual who receives remittances in the amount

of  $R^g$  has a higher income than he otherwise would without remittances. If the individual has decreasing absolute risk aversion (which the literature considers to be the case), he is less likely to have funeral cover. Thus, we basically have two countervailing effects, which remittances exert on the demand for insurance due to higher income. However, the direction of the effects differs for individuals, depending on their income level. For low-income individuals, remittances increase income and the budget constraint is no longer binding. This allows individuals to buy insurance cover. For higher income individuals, for whom the budget constraint is not binding, even without remittances, the latter decrease demand for insurance. Therefore, the probability that an individual has a funeral policy decreases. Accordingly, we derive the following testable hypothesis:

*Hypothesis 1.* Higher income increases (decreases) the probability that an individual will possess formal funeral cover, if the income level is low (high).

The difference between income and remittances is that the amount of remittance varies between good and bad states. The empirical evidence shows that remittances increase in the case of an adverse event, i.e., the bad state of the world. Thus, for an individual with remittances, optimal cover is lower than for an individual without remittances. Remittances provide what Schlesinger (2000) calls self-insurance. Therefore, we expect that individuals with remittances are less likely to possess funeral cover. When we control for income, we can formulate the next hypothesis:

*Hypothesis 2:* An individual is less likely to possess formal funeral cover if he receives remittances.

Furthermore, different distribution channels sell formal funeral coverage. Banks give financial advice and sell insurance. If an individual regularly interacts with a bank, the bank can use this contact to sell insurance products. Our hypothesis is as follows:

*Hypothesis 3:* An individual is more likely to possess formal funeral cover if he regularly interacts with a bank.

One option that individuals can choose, besides buying formal funeral cover or having no insurance cover, is informal insurance obtained by becoming a member of a burial society. In addition to providing insurance, being a member of a burial society has bearings on the individual's network and community relations and implies various non-monetary benefits, such as practical assistance with funeral arrangements. Thus, joining a burial society is a much more complex decision than buying formal funeral cover. Accordingly, we expect that the effects captured in hypotheses 1-3 will show significant differences between membership in a burial society and formal funeral cover.

## **5. Empirical Analysis**

We use a unique dataset, the surveys of FinScope ([www.finscope.co.za](http://www.finscope.co.za)), to determine the access to and usage of both formal financial services, as well as semi-formal and informal financial products. This FinMark Trust initiative consists of a series of comprehensive national household surveys on people's perceptions, needs and usage patterns related to all kind of financial services and arrangements. We use the 2004 South African data because they comprise the first household survey to include a wide set of questions on financial behaviour. In 2004, the data were benchmarked to Census 2001 figures. The sample was drawn from the national household data.

### ***The regression framework***

Our hypotheses revolve around individual choices for formal funeral cover.<sup>7</sup> We define our dependent variable accordingly. The binary dependent variable 'formal funeral cover' takes the value 1 if the respondent holds either a funeral policy or takes part in a formal funeral scheme (0,

if not). The probability of having formal funeral cover is modelled as a maximum-likelihood logit function of both individual and household characteristics, added to remittances, household income per capita, banking status, risk coping information and risk perception.<sup>8</sup> All models are estimated using robust standard errors and sampling weights provided by FinMark Trust.

### *Variables*

The binary dependent variable indicates whether or not the individual holds a formal funeral cover, which might be a funeral scheme or a funeral policy (yes=1, no=0). As shown in Table 1 of the descriptive statistics, about one fifth of the respondents hold some type of formal funeral cover.

[Insert Table 1]

Although formal funeral cover is most common in formal urban areas, it permeates all sectors of society and exists among 12-13 percent of the people living in tribal lands and in rural, formal and urban informal areas (FinScope Data, 2004; see, also, Napier et al., 2007). As can be seen from the descriptive statistics, membership in burial societies is generally slightly higher.

We construct a variable capturing monthly household income per capita (given in South African Rand) to test Hypothesis 1.<sup>9</sup> To account for a changing pattern of income effects along the entire set of income ranges, we generate seven income classes (thresholds at the 10th, 25th, 50th, 75<sup>th</sup>, 90<sup>th</sup> and 99<sup>th</sup> percentiles, plus one category for “no income”). We include one dummy for each of the classes in the regression analysis.

[Insert Figure 1]



Figure 1 shows the distribution of monthly household income per capita for both the entire sample and the sub-group of respondents holding formal funeral cover. It appears that formal funeral cover is associated with higher incomes. A disproportionately large share of respondents holding formal funeral cover is from higher income classes, implying an income above USD 195 per month and per household member. In contrast, the income distribution for burial society members is similar to the income distribution for the entire sample, with the bulk of observations receiving a per capita income between USD 20 and USD 195.

For testing Hypothesis 2, we identify respondents who receive remittances. Our explanatory remittance variable takes the value 1 for about a quarter of the respondents, who state that their individual source of income is ‘through family members or friends’. We control for the level of monthly household income per capita.<sup>10</sup> If the self-insurance effect dominates the (possibly) positive income effect, our analysis will yield a negative coefficient of the remittance variable. We also consider the combined effects of income and remittances because remittances may have a greater effect on some income categories than on others by interacting the various income categories with the remittances dummy.

[Insert Figure 2]

As can be seen in Figure 2, the shape of the income distribution for recipients of remittances broadly follows the form of the overall income distribution. There is a higher concentration of middle-income groups up to a monthly per capita income of USD 195 and a thinner right tail of distribution. This result indicates that middle-income families depend on remittances more often than others do.

Besides remittances, the household can use different risk-coping mechanisms to deal with income shocks. From the questionnaire, we know the preferred risk-coping strategy by household and can

regard these mechanisms as substitutes for formal insurance cover. We define several binary variables, reflecting the individual's risk management strategies, based on the individual's statement of how he deals with occurrences. Controlling for other factors, such as income and remittances, we are thus able to understand the impact of the respondent's attitude towards different ex-post risk management strategies on his preference for formal or informal insurance products. One-third of the respondents note that they will secure an informal loan if they experience a negative income shock. Other relevant risk-coping strategies include selling assets, undertaking formal loans, cashing in insurance policies, applying for government grants and withdrawing savings. As a complementary factor to an individual's risk management strategies, we include the explanatory variable "help available," indicating whether the respondent confirms the statement, "I have friends and family to turn to whenever I need them" (0-no, 1-yes).

We also include psychological factors, such as risk perception. We define three variables indicating whether the respondent perceives general threats, such as droughts and floods ('general risk'), or household-specific risks, such as theft or fire ('household risk'), as likely to happen. Because we assess the determinant of funeral cover purchases, we specifically account for respondents who perceive financial danger if the family's main wage earner dies ('death risk'). Given their reduced capability to compensate for negative income shocks, we expect people who feel sick to take more precautionary measures than do those who feel healthy and strong. For this reason, we include information on the respondent's individual well-being, captured by the statement, "I feel well and am in good health" (0-no, 1-yes).

In Hypothesis 3, we emphasize insurance distribution channels and the individual's interaction with banks. There are several approaches for analysing this interaction, and we include different measures in our regression analysis. A first approximation of people's interaction with banking

facilities is their banking status. We regard individuals as banked if they currently have or have previously had a bank account. We also examine whether individuals with money usually transferred to a bank have a systematically higher probability of buying formal funeral cover than others because they are regularly exposed to the marketing activities of bank employees. The binary variable indicator “Institutionalized money transfer” is based on the answer to the question, “How do you usually receive money?” It takes the value 1 if the respondent uses institutionalized services when receiving money.<sup>11</sup> Because multiple answers are permitted, channels of money transfer are not mutually exclusive. We probe the determinants of buying formal funeral cover more deeply using the more differentiated “Index of physical access to formal financial institutions,” which summarizes the time respondents spend traveling to the bank and related statements. Based on their access to formal financial institutions, respondents are grouped into eight tiers, with higher scores indicating better access to formal financial institutions. We expect respondents with easier access to banking facilities to be more prone to interact with banks and more likely to purchase formal funeral cover.

We limit our analysis to individuals of legal age, i.e., aged 18 years and older, which is a requirement for buying a formal insurance policy. We account for the level of education using seven categories, ranging from 1, ‘no formal education’, to 8, ‘master’s degree or higher’. As additional control variables, we include a set of personal and household demographics, such as gender, age, race, type of settlement (urban vs. rural; formal vs. informal) and province, in our regression model.<sup>12</sup>

## ***Results***

Table 2 reports the estimated marginal effects of each explanatory variable evaluated at the mean of all variables. For binary variables,  $dy/dx$  stands for a discrete change of the dummy variable

from 0 to 1. Our first regression explains the probability of having acquired a formal funeral cover by per capita income and remittances. Successively, we add information on the degree of interaction of individuals with banks and comparable institutions, as well as variables capturing the interaction effect between remittances and different levels of income. In the third regression, we account for the respondent's risk assessment, his risk-coping strategies and additional control variables, such as education and ethnic group. Our last regression analyses the probability of being a member of a burial society in the same way as counting formal funeral cover.

Our results show that higher household income per capita significantly increases the use of formal funeral cover, as in Hypothesis 1. For the groups between the 10th and the 99th percentile of the income distribution, the positive effect is strong and consistent, even when we include additional explanatory variables in our regression on formal funeral cover. In the lowest income group (monthly income up to USD 19 per capita), additional income does not increase the propensity to buy formal funeral cover once we account for familiarity with the banking system. This result suggests that for low-income individuals, the budget constraint, influenced by the feasibility constraint, is binding and they therefore cannot afford to buy the lowest available coverage (Hypothesis 1). For higher-income individuals, the probability that they will buy formal funeral cover is higher than in the reference category. Thus, they are more likely to be able to afford funeral cover. Interestingly, the income effect becomes larger as income increases. Finally, individuals in the highest income class have the same low probability of possessing funeral cover as individuals without income, which is the reference category. This result is in line with our prediction that an income increase for individuals above a certain threshold decreases the use of formal funeral cover, which is based on the assumption of decreasing absolute risk aversion.

From the magnitude of the marginal effects, we see that income is the most important of all explanatory variables.

[Insert Table 2]

Remittances are a common phenomenon in low- and middle-income countries. Money from family and friends increases income, enabling the recipient to buy more insurance products. The income variable captures this effect. At the same time, remittances can be regarded as self-insurance. As seen in Table 2, if the respondent receives remittances, he is seven percent less likely to have a formal funeral cover. Given that about a quarter of the population holds a formal funeral cover only, the impact of remittances is of economic importance. The effect proves robust in all three regressions. This result is in line with Hypothesis 2. The self-insurance effect is evident, controlling for the household's income level. The interaction term capturing additional effects through the mutual influence of remittances and income level does not emerge as statistically significant in any model specification. This outcome indicates that the self-insurance effect of remittances is independent of income.

We can probe the determinants of the funeral cover choice more deeply by evaluating the banking variables. The Physical Access to Formal Financial Institutions Index has a positive and, statistically, a highly significant impact on the dependent variable, increasing the probability of having formal funeral cover by two percentage points. Currently having or previously having had a bank account has an even greater impact on formal funeral cover. Another approximation of the respondent's familiarity with the banking system, the way the respondent receives his income ("Institutionalized money transfer"), also has a strong and significant positive impact on the choice of formal funeral cover, making it more likely that the respondent has a funeral policy or takes part in a funeral scheme by about five percentage points. These results suggest that having a

bank account, being physically close to financial institutions, or regularly using banking services increases the probability of having a formal funeral cover, thus confirming Hypothesis 3. This effect might reflect the concept that familiarity with important aspects of an institutional system and the functioning of the banking system augments an individual's willingness to acquire formal insurance. Furthermore, regular interaction with a bank selling insurance raises the exposure to the bank's marketing activities.

Respondents who are inclined to deal with adverse occurrences by engaging in an informal loan are systematically less likely to opt for formal funeral cover. The effect is rather sizeable at five percentage points. From the variables capturing risk perception in the model, we can deduce that respondents who expect the death of the main wage earner as likely to happen in the near future have a five percentage point higher probability of owning a formal funeral insurance product. Notably, it makes no systematic difference for the purchase of formal funeral cover if some other household-specific or general risk may seem likely to happen.

To test the hypothesis that the decision to join a burial society is driven by factors different from those driving the purchase of formal funeral cover, we run the same regression model on a dependent variable, with the value 1 if the respondent belongs to a burial society and 0, otherwise. It becomes very clear from column 4 in the regression table that income does not influence burial society membership and neither do remittances. Rather surprisingly, the fact of being banked exerts a positive impact on the probability of having informal funeral cover. Furthermore, people who indicate that their strategy of dealing with risk includes cashing in insurance policies after a negative income shock are less inclined to join a burial society.

The empirical results suggest that the decision to join burial societies is fundamentally different from the decision in favour of formal funeral cover. As the community of a burial society offers

various non-monetary benefits, such as practical assistance with funeral arrangements, and has bearings on an individual's network and community relations, membership in a burial society is a very different form of insuring than formal funeral cover.

## **6. Discussion of results and conclusions**

We start our analysis with the question of whether the fact that an individual receives remittances influences his use of funeral cover. From the empirical literature, we know that remittances increase after a disaster. This result suggests that remittances act as self-insurance. At the same time, remittances increase income, which, *ceteris paribus*, should increase the use of insurance for low-income individuals and decrease it for high-income individuals. Our empirical analysis confirms these income effects. We also provide evidence that remittances decrease the likelihood that an individual has formal funeral cover after controlling for income. Thus, our results suggest that both risk management strategies are substitutes with respect to formal insurance. This outcome does not apply to informal group-based insurance arrangements.

We also examine the ways in which formal funeral cover is influenced by other risk management strategies. Here, we find some self-insurance effect. Individuals who consider undertaking an informal loan as an option for dealing with adverse occurrences are less likely to possess formal funeral cover. In contrast, access to banking services may increase the use of insurance. Indeed, we find that banked individuals are more likely to possess formal funeral cover, which is unexpectedly also true for membership in a burial society. This may be related to the preference for certain products and their combination: Even though access to the formal financial system exists, the preference for traditional financial services leads to mixed usage of formal and informal financial services. The increased likelihood of being a burial society member and being

banked constitutes an interesting case of coverage of different financial management needs through a mix of formal and informal financial services. This relationship should be explored further.

Our results have important policy implications. First, as remittances are a substitute for formal insurance, the households receiving remittances depend on the migrant in multiple ways. Besides the dependency on the additional (remittances) income, they depend on the migrant for coping with risk. To lower this dependency and the need of the migrant to respond to his relatives in the case of negative shocks, formal insurances could be sold to the migrant with a coverage for the entire transnational family. Such insurances have already been piloted in different countries; however, upscaling remains still a challenge (Powers et al., 2011). Second, during an economic crisis, the financial independence of membership in a burial society from factors such as remittances and income can be an advantage for migrant and low-income families compared to formal funeral cover. Considering the importance of funeral cover in preventing the detrimental effects of a death on the family, traditional coping mechanisms, such as burial societies, are fairly resistant to external influences. From the point of view of human development, it is accordingly fundamental not to replace traditional group-based coping mechanisms with individual financial products. Finally, the type of coverage of burial societies is more comprehensive and cannot be replaced by formal policies. These findings should be considered when promoting financial inclusion for the poor.

---

<sup>1</sup> For simplicity, we use the gender-specific pronoun “he” when referring to the individual.

<sup>2</sup> They also show that remittances influence decisions in the first stage. Households with remittances are more likely to possess a concrete house and have better access to means of communication (Mohapatra, Joseph & Ratha, 2009).

<sup>3</sup> In a Southern African context, the term “Coloured” refers to an heterogeneous ethnic group ethnic group who possess ancestry from EuropeEurope and Africa or Asia. During the apartheid eraapartheid era, four main racial groups were identified by law: Blacks, WhitesWhites, Coloreds and IndiansIndians.



---

<sup>4</sup> The LSM is a categorization ranging from 1 to 10 that provides a rough proxy for wealth; the lower numbers comprise the poorest part of the population.

<sup>5</sup> This re-focusing has been especially true since the Financial Sector Charter was signed in 2003, as the charter includes a commitment by formal financial service providers to extend access to financial services to the low-income market (Bester et al., 2008).

<sup>6</sup> We do not discriminate between income and wealth.

<sup>7</sup> We provide regression results for membership in a burial society, at the end, to highlight the differences.

<sup>8</sup> For basic diagnostics on model specification, multicollinearity, and influential data, see the appendix.

<sup>9</sup> We exclude all respondents unwilling or unable to provide information on their monthly household income. We approximate monthly household income by the mean of the respective income group. For the open income class, “ZAR 200.000 and higher,” we define an approximate household income of ZAR 300.000. Next, we divide monthly household income by the total number of people in the household.

<sup>10</sup> If the part of income made up of remittances is not perfectly captured by the household income variable, remittances will have a positive effect on the probability of individuals buying formal funeral cover.

<sup>11</sup> The variable takes the value 1 if the respondent receives money through a bank, by check, by electronic bank transfer, by collecting money from the post office, by using services such as Western Union, or by telegraphic transfer, and 0, otherwise.

<sup>12</sup> We do not report the coefficients of these variables in order to maintain clarity in the main regression table. See the appendix for marginal effects of all control variables.

## References

- Acosta, P., Fajnzylber, P. and López, J. H. (2008) Remittances and household behavior: Evidence for Latin America, in: P. Fajnzylber and J.H. López (eds.), *Remittances and development. Lessons from Latin America* (Washington, D.C: The World Bank)., pp. 133-169.
- Arun, T., and Steiner, S. (2008) Micro-insurance in the context of social protection, BWPI Working Paper No. 55. Brooks World Poverty Institute, Manchester, United Kingdom pp. 1-13.
- Azam, J.-P., and Gubert, F. (2006) Migrants' remittances and the household in Africa: a review of evidence, *Journal of African Economies* 15, 426-462.
- Banerjee, A., and Duflo, E. (2007).. *The Economic Lives of the Poor*. *Journal of Economic Perspectives* 21 (1), pp. 141-168.
- Bester, H., Chamberlain, D., Hougaard, C., Smith, A., and Hendrie, S. (2008) *Facilitating Inclusive Financial Markets: The Role of Regulation in the Development of Microinsurance. Focus note: South Africa*. (Johannesburg: FinMark Trust).
- Clarke, G., and Wallsten, S. J. (2003) Do remittances act like insurance? Evidence from a natural disaster in Jamaica, World Bank. [http://www.ssrc.org/workspace/images/crm/new\\_publication\\_3/%7Bdfae0da7-7650-de11-afac-001cc477ec70%7D.pdf](http://www.ssrc.org/workspace/images/crm/new_publication_3/%7Bdfae0da7-7650-de11-afac-001cc477ec70%7D.pdf) .
- Churchill, C. (2006) What is insurance for the poor?, in: C. Churchill (ed.), *Protecting the poor. A microinsurance compendium*. Munich Re Foundation, Munich/ International Labor Organization (ILO), Geneva., pp. 12-24.
- Collins, D., Morduch, J., Rutherford, S., and Ruthven, O. (2009) *Portfolios of the Poor: How the World's Poor Live on \$2 a Day*. (Princeton: Princeton University Press).

Dercon, S. (2005) Risk, insurance, and poverty: a review, in: S. Dercon (ed): Insurance against poverty, (Oxford: Oxford University Press), pp. 9-37.

Dercon, S., and Christiaensen, L. (2011) Consumption risk, technology adoption and poverty traps: Evidence from Ethiopia, *Journal of Development Economics*, 96 (2), pp. 159-173.

Grigorian, D., and Melkonyan, T. (2012) Microeconomic Implications of Remittances in an Overlapping Generations Model with Altruism and Self-Interest. *Journal of Development Studies*, forthcoming.

Gubert, F. (2002) Do migrants insure those who stay behind? Evidence from the Kayes area (Western Mali), *Oxford Development Studies*, 30 (3) pp. 267-287.

Hulme, D., and Shepherd, A. (2003) Conceptualizing Chronic Poverty. *World Development*, 31 (3), pp. 403-423.

Krishna, A. (2010) *One illness away. Why people become poor and how they escape poverty* (Oxford: Oxford University Press).

Kurosaki, T., and Fafchamps, M. (2002) Insurance market efficiency and crop choices in Pakistan. *Journal of Development Economics*, 67(2), pp. 419-453.

Landau, L., and Kabwe-Segatti, A. (2009) Human Development Impacts of Migration: South Africa Case Study, Human Development Research Paper No.5, United Nations, New York.

Lucas, R. E. B., and Stark, O. (1985) Motivations to remit: Evidence from Botswana. *Journal of Political Economy*, 93 (5), pp. 901-918.

Mohapatra, S., Joseph, G., and Ratha, D. (2009) Remittances and natural disasters: Ex-post response and contribution to ex-ante preparedness. World Bank Policy Research Working Paper No. 4972, World Bank, Washington, DC.

Morduch, J. (1995) Income smoothing and consumption smoothing. *Journal of Economic Perspectives*, 9 (3), pp. 103-114.

Napier, M., Higgs, N., Beghin, D. and Powell, R. (2007) Going out in style: The culture and finance of death in South Africa. TNS Research Surveys. Fin Mark Trust, Vorna Valley, South Africa.

Overbye, E. (2005) Extending social security in developing countries: a review of three main strategies. *International Journal of Social Welfare*, 14, pp. 305-314.

Posel, D. (2003) Have migration patterns in post-Apartheid South Africa changed?

Paper prepared for Conference on African Migration in Comparative Perspective, Johannesburg, South Africa, June, 4-7.

Powers, F., Magnoni, B., Zimmerman, E. (2011) Formalizing the Informal Insurance Inherent in Migration, Exploring the Potential links between Migration, Remittances and Microinsurance, Microinsurance Paper, 7 (Geneva: International Labour Office).

Rapoport, H., and Docquier, F. (2006) The economics of migrants' remittances, in: S. Kolm and J.M. Ythier (eds) *Handbook of the economics of giving, altruism and reciprocity 2* (Amsterdam: Elsevier), pp. 1135-1198.

Rees, R., and Wambach, A. (2008) Microeconomics of insurance, Now Publishers: Hanover.

Rutherford, S. (2001) *The poor and their money* (New Delhi: Oxford University Press).

Rutherford, S. (2003) Money Talks Conversations with Poor Households in Bangladesh about Managing Money. *Journal of Microfinance*, 5 (2), pp. 43-75.

Ruthven, O., and Kumar, S. (2002) Fine-grain finance: Financial choice and strategy among the poor in rural North India. University of Manchester Finance and Development Research

Programme Working Paper Series 57, Institute for Development Policy and Management, University of Manchester.

Schlesinger, H. (2000) The theory of insurance demand, in: G. Dionne (ed) *Handbook of insurance* (Boston: Kluwer Academic Publishers), pp. 131-154.

Stark, O. (1991) Migration in LDCs: Risk, Remittances, and the Family. *Finance and Development*, 28 (4), pp. 39-41.

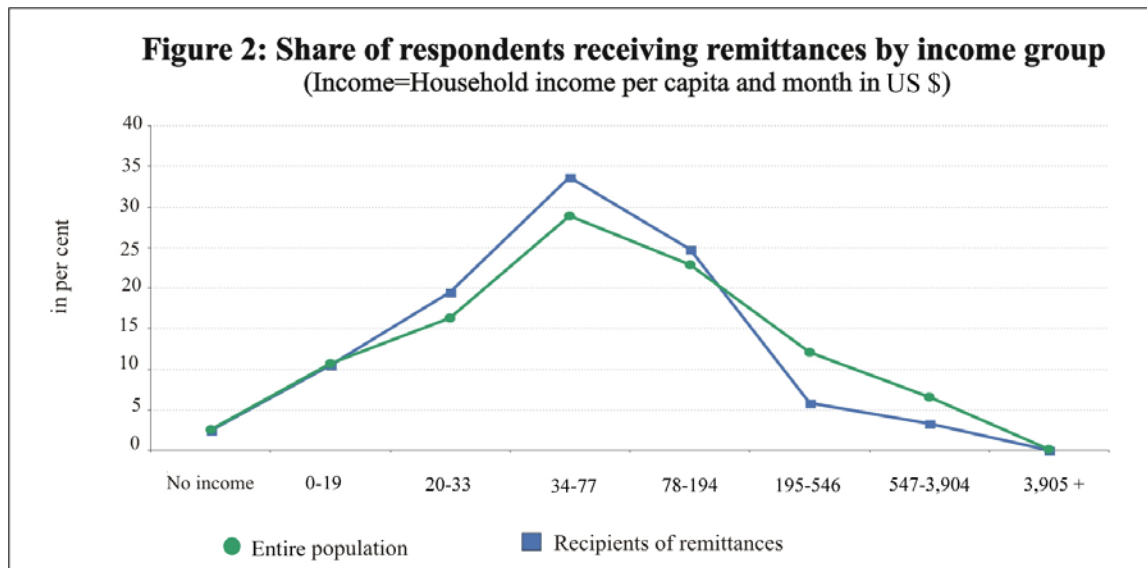
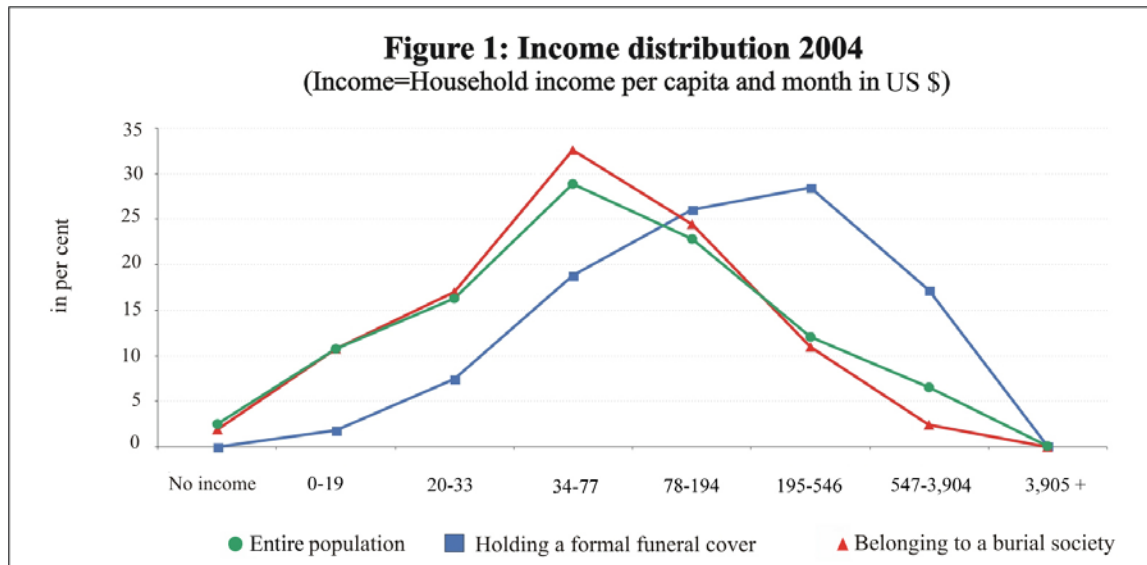
UNDP (2011) Human Development Report 2010 - *Sustainability and Equity: A Better Future for All* (New York: United Nations Development Programme).

Yang, D. (2007) *Coping with disaster: The impact of hurricanes on international financial flows, 1970-2002*, Mimeo, Department of Economics, University of Michigan, Ann Arbor.

Yang, D., and Choi, H. (2007) Are remittances insurance? Evidence from rainfall shocks in the Philippines. *World Bank Economic Review*, 21(2) pp.-219-248.

Zeller, M., and Sharma, M. (2000) Many borrow, more save, and all insure: Implications for food and micro-finance policy. *Food Policy*, 25 (2), pp. 143-167.

## Figures



## Tables

**Table 1: Descriptive Statistics**

	Mean	Minimum	Maximum
Holding a formal funeral cover	0.19	0	1
Belonging to a burial society	0.23	0	1
<i>Monthly household income per capita in USD<sup>1,3</sup></i>	173.07	0	48,000
<i>Remittances</i>			
Remittances	0.26	0	1
Interaction remittances and hh income p.c.	26.76	0	3,600
<i>Banking information</i>			
Being banked	0.60	0	1
Institutionalized money transfer	0.29	0	1
Physical access to formal fin. institutions	3.48	1	8
<i>Risk perception</i>			
A household-specific risk is likely to happen	0.61	0	1
A general risk is likely to happen	0.19	0	1
The main wage earner is likely to die	0.14	0	1
<i>Coping strategies</i>			
Sell Assets	0.03	0	1
Take a formal loan	0.09	0	1
Take an informal loan	0.34	0	1
Cash in insurance policies	0.03	0	1
Apply for a govt. grant	0.07	0	1
Withdraw Savings	0.09	0	1
<i>Other Controls</i>			
"Help available"	0.72	0	1
"Feel well"	0.50	0	1
Head of household	0.54	0	1

Data source: FinScope South Africa 2004; see main text for details.

**Table 2: Funeral cover: marginal effects from logit**

Dependent variable Independent variable	<i>Formal funeral cover</i>			<i>Burial society</i>
	dy/dx	dy/dx	dy/dx	dy/dx
<i>Monthly household income per capita in USD</i>	(1)	(2)	(3)	(4)
No income		reference		reference
]0;20[	0.48* (0.25)	0.33 (0.25)	0.17 (0.20)	0.09 (0.09)
[20;34[	0.68*** (0.17)	0.56*** (0.22)	0.38* (0.23)	0.10 (0.08)
[34;78[	0.68*** (0.16)	0.50*** (0.19)	0.29* (0.18)	0.10 (0.07)
[78;195[	0.80*** (0.11)	0.60*** (0.19)	0.42** (0.21)	0.06 (0.07)
[195; 547[	0.88*** (0.05)	0.75*** (0.14)	0.59*** (0.22)	0.09 (0.09)
[547; 3,905[	0.88*** (0.03)	0.77*** (0.12)	0.59** (0.24)	0.03 (0.10)
3,905 USD p.c. and month and more	0.81*** (0.09)	0.50 (0.38)	0.21 (0.37)	dropped
<i>Remittances</i>				
Remittances	-0.12*** (0.02)	-0.08*** (0.02)	-0.07* (0.04)	0.02 (0.08)
Interaction remittances and household income				
Remittances*]0;20[			0.00 (0.00)	0.00 (0.00)
Remittances* [20;34[			0.00 (0.00)	0.00 (0.00)
Remittances* [34;78[			-0.00 (0.00)	0.00 (0.00)
Remittances* [78;195[			0.00 (0.00)	0.00 (0.00)
Remittances* [195;547[			0.00 (0.00)	-0.00 (0.00)
Remittances* [547;3,905[			0.00 (0.00)	-0.00 (0.00)
<i>Banking information</i>				
Being banked		0.07*** (0.02)	0.04** (0.02)	0.07*** (0.03)
Institutionalized money transfer		0.06*** (0.02)	0.05*** (0.02)	0.02 (0.03)
Physical access to formal financial institutions		0.02*** (0.00)	0.02*** (0.00)	0.00 (0.01)
<i>Risk perception</i>				
A household-specific risk is likely to happen			0.02 (0.02)	0.00 (0.03)
A general risk is likely to happen			0.02 (0.02)	-0.02 (0.03)
The main wage earner is likely to die			0.05* (0.03)	0.00 (0.03)
<i>Coping strategies</i>				
Sell assets			-0.02 (0.03)	0.00 (0.10)
Take a formal loan			reference	reference
Take an informal loan			-0.05*** (0.02)	-0.02 (0.03)



Cash in insurance policies			0.07 (0.05)	-0.10*** (0.04)
Apply for a govt. grant			0.01 (0.03)	0.01 (0.05)
Withdraw savings			-0.01 (0.02)	0.03 (0.04)
<i>Other Controls</i>				
Control for gender (2 categories)			yes	yes
Controls for age (13 categories)			yes	yes
Controls for educational level (8 categories)			yes	yes
Controls for national province (9 categories)			yes	yes
Controls for geographical area (4 categories)			yes	yes
Controls for ethnic group (4 categories)			yes	yes
"Help available"			-0.00 (0.01)	0.03 (0.02)
"Feel well"			-0.00 (0.01)	0.04* (0.02)
Head of household			0.03** (0.02)	0.00 (0.03)
Number of observations	2227	2227	2227	2224
Predicted Probability of y	0.14	0.12	0.08	0.18
Pseudo-Rsquare	0.16	0.23	0.35	0.16
Prob > chi2	0.00	0.00	0.00	0.00

*Notes:* marginal effects of coefficient estimates from logistic regression evaluated at means of all variables; for binary variables,  $dy/dx$  indicates the discrete change of the dummy variable from 0 to 1. Robust standard errors are in parentheses. Column (1)-(3): The dependent variable is 1 for holding a funeral policy/funeral scheme, 0 otherwise. Column (4): The dependent variable is 1 for belonging to a burial society, 0 otherwise. The income class `3,905 USD p.c. and month and more´ have been dropped due to a low case number.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Data source: FinScope South Africa 2004; see main text for details.

## Appendix (*Not for Publication*)

### A.1 Basic diagnostics

The logistic regression analysis is based on various assumptions. In order for our analysis to be valid, our model has to satisfy the assumptions of logistic regression analysis. Therefore, we need to check that our model fits sufficiently well and check that the independent variables are not linear combinations of each other. We also need to assess whether influential observations might impact the estimates of the coefficients.

#### A.1.1 Specification Errors

After conducting our regressions (displayed in Table 2), we use a link test to ensure that our model has all the relevant predictors and if the linear combination of them is sufficient. The link test uses the linear predicted value ( $\hat{y}$ ) and linear predicted value squared ( $\hat{y}^2$ ) as the predictors to rebuild the model.

**Table A1: Link test to detect a specification error (following regression (3), Table 2)**

dependent variable: holding a formal funeral cover

<i>independent variable</i>	<i>Coefficient</i>	<i>Robust Std. Err.</i>	<i>z</i>	<i>P&gt; z </i>
$\hat{y}$	0.93	0.07	13.69	0.00
$\hat{y}^2$	-0.04	0.03	-1.17	0.24
$\_cons$	0.03	0.10	0.29	0.77
Number of observations				2227
Pseudo-Rsquare				0.35
Prob > chi2				0.00

**Table A2: Link test to detect a specification error (following regression (4), Table 2)**

dependent variable: belonging to a burial society

<i>independent variable</i>	<i>Coefficient</i>	<i>Robust Std. Err.</i>	<i>z</i>	<i>P&gt; z </i>
_hat	1.00	0.13	7.49	0.00
_hatsq	0.00	0.05	0.04	0.97
_cons	0.00	0.10	0.01	0.99
Number of observations				2224
Pseudo-Rsquare				0.16
Prob > chi2				0.00

As can be seen in Tables A1 and A2 , the variable \_hat is a statistically significant predictor. The fact that \_hatsq is insignificant (with  $p$ -value = 0.24 and 0.97, respectively) confirms that the models are properly specified. These results indicate that we have not omitted relevant variables and that the logit function is the correct function to use.

### *A.1.2 Multicollinearity*

Multicollinearity occurs when two or more independent variables in the model are determined by a linear combination of other independent variables in the model. Severe multicollinearity inflates the standard errors for the coefficients and it is impossible to obtain a reliable estimate of regression coefficients with all the independent variables in the model.

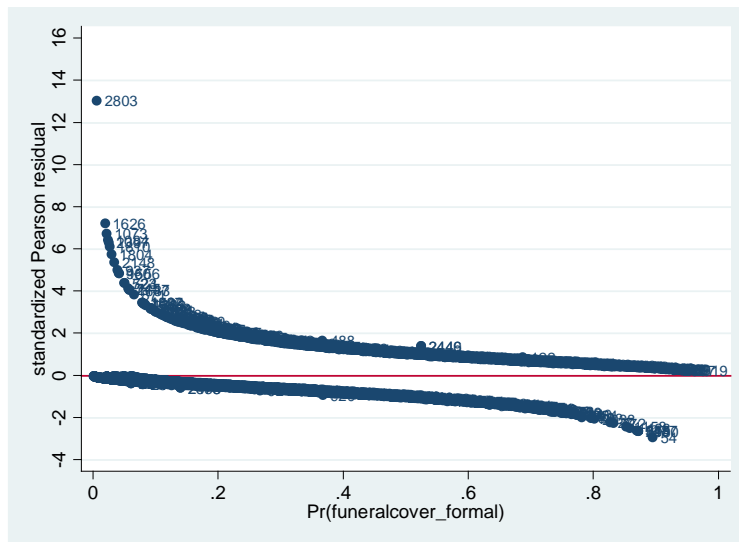
When we look at the correlation coefficients of the independent variables, the correlations between “Physical Access to formal fin. Institutions” and “Institutionalized money transfer” as well as between “Physical Access to formal fin. Institutions” and “Being banked” yield the highest coefficients with  $\rho=0.42$  and  $\rho=0.65$ , respectively.

To measure the strength of the relationship among these independent variables more closely, we use the variance inflation factor (VIF). The VIF is close to 1 if all of the variables are completely uncorrelated with each other, and gets very large for high degrees of multicollinearity. We first run three ordinary least square regressions that have “Physical Access to formal fin. Institutions,” “Institutionalized money transfer” and “Being banked,” respectively, as a function of all the other explanatory variables. From the VIFs for “Physical Access to formal fin. Institutions”(2.04), “Institutionalized money transfer” (1.28) and “Being banked” (1.81), we can conclude that there appears to be no multicollinearity problem (Kutner, Nachtsheim, & Neter, 2004).<sup>14</sup>

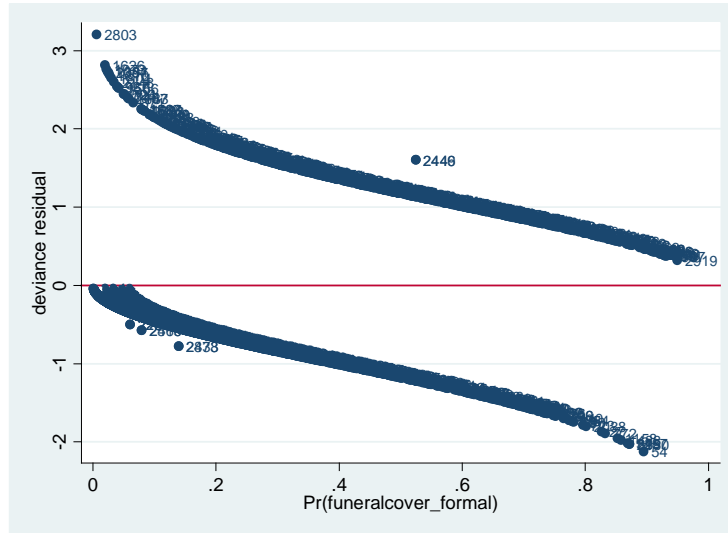
### A.1.3 Influential Observations

Observations that have a significant impact on the model may skew the regression estimation. To identify potential outliers, we will make use of the Pregibon leverage, the standardized Pearson residuals, and the deviance residual. We look at these diagnostic measures by plotting them against the predicted probabilities of holding a formal funeral cover.

**Figure A1: Plot of standardized Pearson residuals versus predicted probabilities**



**Figure A2: Plot of deviance residuals versus predicted probabilities**



It becomes evident in Figure A1 and A2 that the observation with number 2803 is far away from the other observations. In Figure A2, observation 2440 appears to have a larger deviance residual than expected as well. The Pregibon leverage of observation 2803 amounts to 0.002, while the leverage of case number 2440 totals 0.026. Given an average leverage of 0.022 (standard deviation: 0.018), it seems that both observations are not characterized by an unusually high leverage. That is to say, both observations should not have a big influence on the logistic regression estimates. The comparison of the logistic regressions including the observations 2440 and 2803 and without them confirms that our regression coefficient estimates are not noticeably influenced by these cases (Table A3).

**Table A3: Formal Funeral Cover: Marginal effects from logistic regression**

dependent variable: holding a formal funeral cover	all observations	observation 1440 excluded	observation 2803 excluded
independent variable	(1)	(2)	(3)
<i>monthly household income per capita in USD:</i>	dy/dx	dy/dx	dy/dx
No income		reference category	
]0;20[	0.17 (0.20)	0.17 (0.20)	0.17 (0.20)
[20;34[	0.38* (0.23)	0.38* (0.23)	0.38* (0.23)

[34;78[	0.29*	0.29*	0.29*
	(0.18)	(0.18)	(0.18)
[78;195[	0.42**	0.42**	0.42**
	(0.21)	(0.21)	(0.21)
[195; 547[	0.59***	0.59***	0.59***
	(0.22)	(0.22)	(0.22)
[547;3,905[	0.59**	0.59**	0.59**
	(0.24)	(0.21)	(0.21)
More than 3,905 USD per capita and month	0.21	0.21	0.21
	(0.37)	(0.37)	(0.37)

---

*Remittances*

Remittances	-0.07*	-0.07*	-0.07*
	(0.04)	(0.04)	(0.04)
interaction remittances and household income p.c.			
]0;20[	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
[20;34[	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
[34;78[	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
[78;195[	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
[195; 547[	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
[547;3,905[	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)

---

*Banking information:*

being banked	0.04**	0.04**	0.04**
	(0.02)	(0.02)	(0.02)
Institutionalized money transfer	0.05***	0.05***	0.05***
	(0.02)	(0.02)	(0.02)
Physical access to formal fin. Institutions	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)

---

*Risk perception:*

a household-specific risk is likely to happen	0.02	0.02	0.02
	(0.02)	(0.02)	(0.02)
a general risk is likely to happen	0.02	0.02	0.02
	(0.02)	(0.02)	(0.02)
the main wage earner is likely to die	0.05*	0.05*	0.05*
	(0.03)	(0.03)	(0.03)

---

*Coping strategies:*

Sell Assets	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)
Take a formal loan		reference	
Take an informal loan	-0.05***	-0.05***	-0.05***
	(0.02)	(0.02)	(0.02)
Cash in insurance policies	0.07	0.07	0.07
	(0.05)	(0.05)	(0.05)
Apply for a govt. grant	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)
Notes: marginal effects of coefficient estimates	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.02)

---

*Other Controls*

Control for gender (2 categories)	yes	yes	yes
Controls for age (13 categories)	yes	yes	yes
Controls for educational level (8 categories)	yes	yes	yes

Controls for national province (9 categories)	yes	yes	yes
Controls for geographical area (4 categories)	yes	yes	yes
Controls for ethnic group (4 categories)	yes	yes	yes
"Help available"	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
"Feel well"	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
head of household	0.03** (0.02)	0.03** (0.02)	0.03** (0.02)
Number of observation	2227	2226	2226
Predicted Probability of y	0.08	0.08	0.08
Pseudo-Rsquare	0.35	0.35	0.35
Prob > chi2	0.00	0.00	0.00

*Notes:* marginal effects of coefficient estimates from logistic regression, evaluated at means of all variables; For binary variables, dy/dx is for discrete change of dummy variable from 0 to 1. Robust standard errors in parentheses. The first column is equal to Column (3) in Table 2. Column (1)-(3): Dependent variable is 1 for holding a funeral policy/funeral scheme, 0 otherwise.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
Data source: FinScope South Africa 2004; see main text for details.



## A.2 Regression coefficient estimates of the control variables

For clarity, the coefficient estimates of the full set of control variables have not been shown in Table 2. Table A4 lists the regression results of the logistic regressions reported in Column (3) and (4) of Table 2 for the remaining control variables.

**Table A4: Marginal effects from logistic regression**

dependent variable: holding/ belonging to a...	formal funeral cover (3) dy/dx	burial society (4) dy/dx
<i>Control for gender:</i>		
male	reference	
female	0.02 (0.01)	0.04* (0.02)
<i>Age:</i>		
18-24 years	reference	
25-29 years	0.13* (0.07)	0.11* (0.07)
30-34 years	0.19** (0.08)	0.20*** (0.07)
35-39 years	0.24*** (0.09)	0.24*** (0.08)
40-44 years	0.31*** (0.11)	0.29*** (0.09)
45-49 years	0.34*** (0.12)	0.25*** (0.09)
50-54 years	0.37*** (0.13)	0.45*** (0.09)
55-59 years	0.25** (0.12)	0.52*** (0.10)
60-64 years	0.40*** (0.13)	0.52*** (0.09)
65 and older	0.28*** (0.11)	0.54*** (0.09)
<i>Educational level:</i>		
No formal education	reference	
Some primary school	0.02 (0.04)	-0.02 (0.04)
Primary school completed	0.04 (0.05)	0.01 (0.05)
Some high school	0.02 (0.04)	0.03 (0.04)
Matriculated	0.10* (0.06)	0.03 (0.05)

Some university	0.33*	0.02
	(0.17)	(0.11)
University completed	0.13	0.03
	(0.10)	(0.10)
Any other post-matric qualification	0.15	-0.09*
	(0.10)	(0.05)
<b>Provinces:</b>		
Eastern Cape	reference	
Free State	0.01	-0.11***
	(0.03)	(0.03)
Gauteng	-0.05***	-0.00
	(0.02)	(0.04)
Kwazulu Natal	-0.05***	-0.05
	(0.02)	(0.04)
Mpumalanga	-0.04***	-0.03
	(0.02)	(0.04)
Northern Province/Limpopo	-0.06***	0.12**
	(0.02)	(0.06)
Northern Cape	-0.02	-0.02
	(0.02)	(0.04)
North West	-0.05***	0.13**
	(0.01)	(0.06)
Western Province	-0.01	0.03
	(0.02)	(0.04)
<b>Geographical Area:</b>		
Rural formal	reference	
Tribal Land	-0.03	0.10*
	(0.03)	(0.05)
Urban formal	-0.02	0.03
	(0.02)	(0.04)
Urban informal	-0.02	0.09
	(0.03)	(0.06)
<b>Ethnic group:</b>		
Black	reference	
White	-0.01	-0.19***
	(0.02)	(0.01)
Coloured	0.11***	-0.08***
	(0.04)	(0.02)
Asian	-0.03	-0.15***
	(0.02)	(0.02)

*Notes:* marginal effects of coefficient estimates from logistic regression, evaluated at means of all variables; For binary variables, dy/dx is for discrete change of dummy variable from 0 to 1. Robust standard errors in parentheses. The first column refers to Column (3) in Table 2: Dependent variable is 1 for holding a funeral policy/funeral scheme, 0 otherwise. The second column refers to Column (4) in Table 2: Dependent variable is 1 for belonging to a burial society, 0 otherwise.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Data source: FinScope South Africa 2004; see main text for details.

---

<sup>13</sup> While all our calculations have been conducted in ZAR, all values in the tables and figures have been converted to USD for the ease of comparison, using the average exchange rate for 2004 of 0.16 ZAR/USD.

<sup>14</sup> Kutner, Nachtsheim, Neter, *Applied Linear Regression Models*, 4th edition, McGraw-Hill Irwin (2004) propose 10 as a cut off value when multicollinearity is high.

## Ifo Working Papers

- No. 136 Crivelli, P. and J. Gröschl, The Impact of Sanitary and Phytosanitary Measures on Market Entry and Trade Flows, August 2012.
- No. 135 Slavtchev, V. and S. Wiederhold, Technological Intensity of Government Demand and Innovation, August 2012.
- No. 134 Felbermayr, G.J., M. Larch and W. Lechthaler, The Shimer-Puzzle of International Trade: A Quantitative Analysis, August 2012.
- No. 133 Beltz, P., S. Link and A. Ostermaier, Incentives for Students: Evidence from Two Natural Experiments, August 2012.
- No. 132 Felbermayr, G.J. and I. Reczkowski, International Student Mobility and High-Skilled Migration: The Evidence, July 2012.
- No. 131 Sinn, H.-W., Die Europäische Fiskalunion – Gedanken zur Entwicklung der Eurozone, Juli 2012.
- No. 130 Felbermayr, G.J., A. Hauptmann and H.-J. Schmerer, International Trade and Collective Bargaining Outcomes. Evidence from German Employer-Employee Data, March 2012.
- No. 129 Triebs, T.P. and S.C. Kumbhakar, Management Practice in Production, March 2012.
- No. 128 Arent, S., Expectations and Saving Behavior: An Empirical Analysis, March, 2012.
- No. 127 Hornung, E., Railroads and Micro-regional Growth in Prussia, March, 2012.
- No. 126 Seiler, C., On the Robustness of the Balance Statistics with respect to Nonresponse, March 2012.
- No. 125 Arent, S., A. Eck, M. Kloss and O. Krohmer, Income Risk, Saving and Taxation: Will Precautionary Saving Survive?, February 2012.
- No. 124 Kluge, J. and R. Lehmann, Marshall or Jacobs? Answers to an Unsuitable Question from an Interaction Model, February 2012.

- No. 123 Strobel, T., ICT Intermediates, Growth and Productivity Spillovers: Evidence from Comparison of Growth Effects in German and US Manufacturing Sectors, February 2012.
- No. 122 Lehwald, S., Has the Euro Changed Business Cycle Synchronization? Evidence from the Core and the Periphery, January 2012.
- No. 121 Piopiunik, M. and M. Schlotter, Identifying the Incidence of “Grading on a Curve”: A Within-Student Across-Subject Approach, January 2012.
- No. 120 Kauppinen, I. and P. Poutvaara, Preferences for Redistribution among Emigrants from a Welfare State, January 2012.
- No. 119 Aichele, R. and G.J. Felbermayr, Estimating the Effects of Kyoto on Bilateral Trade Flows Using Matching Econometrics, December 2011.
- No. 118 Heid, B., J. Langer and M. Larch, Income and Democracy: Evidence from System GMM Estimates, December 2011.
- No. 117 Felbermayr, G.J. and J. Gröschl, Within US Trade and Long Shadow of the American Secession, December 2011.
- No. 116 Felbermayr, G.J. and E. Yalcin, Export Credit Guarantees and Export Performance: An Empirical Analysis for Germany, December 2011.
- No. 115 Heid, B. and M. Larch, Migration, Trade and Unemployment, November 2011.
- No. 114 Hornung, E., Immigration and the Diffusion of Technology: The Huguenot Diaspora in Prussia, November 2011.
- No. 113 Riener, G. and S. Wiederhold, Costs of Control in Groups, November 2011.
- No. 112 Schlotter, M., Age at Preschool Entrance and Noncognitive Skills before School – An Instrumental Variable Approach, November 2011.
- No. 111 Grimme, C., S. Henzel and E. Wieland, Inflation Uncertainty Revisited: Do Different Measures Disagree?, October 2011.
- No. 110 Friedrich, S., Policy Persistence and Rent Extraction, October 2011.