

# SECURING THE AFTERLIFE: THE PUZZLE OF FUNERAL INSURANCE<sup>a</sup>

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## Abstract

Funeral insurance is a global phenomenon that has existed throughout history and remains hugely popular in Africa today. Yet it has received very little attention from economists. The puzzle is why it seems, in many contexts, to be preferred over standard life insurance even though the latter is a more flexible product. This paper presents a simple model in which funeral insurance differs from life insurance in that there is a constraint on how the payout is spent. Funeral insurance can therefore serve as an intergenerational commitment device. The model's key prediction is consistent with South African household data.

Key words: funeral insurance, life insurance, insurance demand, commitment device.

JEL codes: D14, D81, D91, G22, O12, O16.

## I INTRODUCTION

Funeral insurance is one of the earliest documented forms of insurance. It has existed throughout history and across the globe, and it is probably still the most popular type of insurance in sub-Saharan Africa. Yet little is known about the reasons for its enduring appeal.

Funeral insurance is not life insurance. What these two types of insurance have in common is that the covered event is the death of one or more specified individuals. But

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it is a remarkably consistent feature of ‘death-triggered insurance’, both historically and in contemporary developing countries, that the payout takes the form of funeral-related goods and services. This is funeral insurance. In contrast, a life insurance policy typically pays out in cash or liquid assets, and there is no restriction on how the payout is spent. This paper claims that the distinction is fundamental and that the type of insurance preferred will depend on the circumstances and characteristics of the decision-maker.<sup>1</sup>

As far as I know, this paper is the first to present and analyse funeral insurance as a distinct form of insurance, and to address the ‘puzzle’ of its enduring popularity: why would there be a demand for funeral insurance over life insurance, when the latter comes with fewer strings attached? It draws on historical and anthropological sources to document the characteristics, continuity and importance of the phenomenon. A simple theoretical framework is presented in which funeral insurance is modelled as life insurance with a constraint on the use of the payout. Because of this constraint, funeral insurance can serve as an intergenerational commitment device that resolves a conflict of interest the policy-holder (‘the parent’) and the beneficiary (‘the child’) over the use of the payout. Conditions are derived under which funeral insurance is preferred to life insurance.

Implicit in the framework is the idea that people have preferences over what happens after their own death. While economic models often assume that agents care about their children’s welfare after their own lifetime, this is typically captured in a simple altruistic or warm-glow bequest term. However, the notion that people should care about resource allocation when they are themselves no longer present is consistent with anthropological evidence, as well as a long tradition of economic thought emphasising that utility is derived from anticipation of the future as well as consumption in the present.

The main testable prediction from the theory is that funeral insurance is demanded only for intermediate wealth and income levels. This prediction is tested using survey data from South Africa, and the results of the analysis are consistent with it. Several alternative explanations for the enduring popularity of funeral insurance are discussed,

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<sup>1</sup>At least in South Africa, it is common for policies to pay out partly in funeral-related goods and services and partly in cash. Such policies can be viewed as a mix of pure funeral insurance and pure life insurance as defined here.

but none of these are consistent with what is known about the market for funeral insurance in contemporary South Africa. Still, the tested prediction is fairly general and might also be generated by alternative models. In that sense, the test is a weak one: it fails to reject the model rather than endorses it. Hence, the main objectives are to draw the attention of economists to the importance of funeral insurance as a phenomenon, historically and today; to propose a conceptual distinction between funeral insurance and life insurance; and to use this insight to set up a model that provides a possible explanation for the enduring popularity of funeral insurance. The theory is shown to be consistent with the data.

The model also provides conditions under which funeral insurance is not demanded at any level of wealth and income. This may explain why funeral insurance is less popular in developed countries, even in unequal societies where segments of the population remain poor.

Today, formal funeral policies are offered by insurance companies in many parts of the world. But the history of funeral insurance, and insurance generally, is closely related to that of *funeral associations*. From ancient Greece and Rome, via medieval Europe and Victorian Britain, to large parts of modern-day sub-Saharan Africa, the most common way to take out funeral insurance has been to join a funeral association. The primary function of these groups is to pool the risk associated with the death of members or their close relatives by using members' contributions to organise funerals. Historians have argued that funeral associations are the precursors of modern insurance companies (Fingland Jack, 1912; Trenerry, 1926). More recently, funeral associations have attracted the attention of economists as instances of informal or semi-formal risk-pooling groups.

While the link between funeral insurance and informal insurance provision continues to be important, both formal and informal insurers can and do offer funeral insurance. Funeral insurance as an economic concept should therefore be distinguished from its implementation. The model presented here abstracts from organisational form, and in order to focus on the mechanisms of interest neither insurance type is presented with a cost or efficiency advantage over the other.

The theory relies on the fundamental assumption that the parent cares more about her own funeral than does the child. This assumption, which may be controversial as it contrasts with a prevailing view in academia that ‘funerals are for the living’, is supported by several well-documented facts about the market for funeral insurance.

South Africa may be unique in that both formal and informal funeral insurance, as well as life insurance, are widely available. Traditional funeral associations compete with undertakers and modern insurance companies in providing funeral insurance, and the latter also offer standard life insurance. Traditional African communities co-exist with a fully industrialised modern economy and world-class formal-sector financial institutions. The South African case demonstrates that funeral insurance is not simply a symptom of under-developed financial markets and provides an ideal context in which to study under what circumstances one type of death-triggered insurance is preferred over the other.

The next section provides an overview of relevant literature. Next is an introduction to funeral associations and funeral insurance, followed by a discussion of the high levels of funeral expenditure observed in Africa and South Africa, and for whom this matters. Thereafter, the model is presented, solved and interpreted. Next is the empirical section, and finally a discussion of alternative explanations.

## II RELATED LITERATURE

This paper is related to the literature on the demand for life insurance. Modern economic analysis of the problem starts with Yaari (1965), who introduced life insurance as a way of coping with an uncertain lifetime in a model with either a bequest motive or a credit market combined with a non-negative terminal wealth requirement. He derives differential equations for the evolution of consumption and savings, but does not have much to say about the properties of the demand function. Fischer (1973) characterises insurance demand functions in a discrete-time model. Campbell (1980) derives insurance demand functions from the Taylor expansion of the agent’s problem in a short interval  $(t, t + \Delta t)$ , but relies on the present value of future income being exogenously given. Lewis (1989) was the first to consider the point of view of the insurance beneficiaries. He lets insurance

demand be determined by the intended beneficiary. In this paper it will be shown that a conflict of interest between policy-holder and beneficiary may be the key driver of demand for funeral insurance.

Economists have long been interested in why people leave bequests. Some believe bequests are accidental and caused by a combination of uncertain lifetimes and imperfect insurance markets. On the other hand, Bernheim (1991) uses evidence on life insurance demand to argue that bequests are intentional. This paper nuances the discussion by positing that even if they are intentional, bequests are not necessarily altruistic in the usual sense. Insurance demand may be explained in part by a concern for specific types of post-mortem expenditure that may have more to do with preserving one's own good name and afterlife than with either 'warm glow' or true altruism.

While preferences over post-mortem resource allocation could arise from religious or supernatural beliefs, this is not required if the associated utility is derived while alive, in anticipation. The notion that utility can be derived from anticipation as well as consumption goes back to Bentham (1789). Jevons (1905) emphasises the importance of both anticipation and memory, alongside the sensation of present events, in economic decision-making. More recently, Loewenstein (1987) modifies the standard discounted utility framework to take account of anticipation, and Rick and Loewenstein (2008) discuss the role of anticipation in their survey of research on the role of emotion in decision-making. From a philosophical perspective, Scheffler (2013) defends the view that humans derive value from what happens after our own deaths, even in the absence of a belief in a supernatural afterlife.

There is a large literature on informal arrangements for coping with risk in developing countries. Besley (1995), Morduch (1999) and Dercon (2002) provide overviews. Townsend (1994) tests for, and rejects, full risk-sharing in Indian villages. This finding has been verified by many later studies, and the robustness of the result has inspired a substantial body of theoretical work relating imperfect enforcement to bounds on the risk-sharing contracts that may be entered. Ligon et al. (2002) is a key contribution to this tradition. This paper departs from that literature by focusing on the specifics of the

insurance policy rather than whether full risk-sharing is achieved.

Arnott and Stiglitz (1991) is perhaps the best-known article on the interaction of formal and informal insurance. The authors find that in the presence of moral hazard and formal insurance, informal insurance is beneficial if the informal insurers have an information advantage, but can be harmful if not. The model presented here abstracts completely from moral hazard, arguing that death insurance is much less likely to be subject to this problem than many other types of insurance. This is in line with Fafchamps and Lund (2003) who find that funerals are better insured than other events such as crop failure and mild illness.

A small literature focuses on commitment devices in developing countries, a good example of which is Ashraf et al. (2006). These papers are related to the theoretical literature on hyperbolic discounting (Harris and Laibson, 2003). Devices that operate between generations have received little attention, but see Takagi (2015) for a recent exception.

Although their popularity in many parts of the developing world is well known, the economic literature on funeral insurance is still relatively small. Dercon et al. (2006) discuss funeral associations in Ethiopia and Tanzania, and Bold and Dercon (2014) test for risk-sharing in Ethiopian funeral associations. LeMay-Boucher (2009) compares funeral associations in Ethiopia and Benin. Bryant and Prohm (2002) ask why funeral association premia in a village in North-Eastern Thailand are equal for all households irrespective of risk. Rutherford (2000) describes funeral associations in Cochin, India. A good source of information on the workings and characteristics of funeral associations in South Africa (known locally as *burial societies*) is Thomson and Posel (2002). Roth (2001) is a case study of formal and informal funeral insurance in a rural South African township. Ardington and Leibbrandt (2004) find a strong correlation between formal employment and the take-up of funeral insurance. Keswell (2004) looks at the relationship between employment and membership of informal networks such as ROSCAs and funeral associations. Case et al. (2013) find that households who receive an insurance payout at the time of a death spend more on the funeral.

This paper parallels parts of the literature on rotating savings and credit associations (ROSCAs). In an early article, Geertz (1962) saw ROSCAs as a ‘middle rung’ in the ladder of development, implying that they would eventually give way to formal institutions. This paper will show that funeral insurance is demanded for intermediate income and wealth. Levenson and Besley (1996) look at the determinants of ROSCA participation in Taiwan. Much like the case of funeral associations in South Africa, they deem ROSCA membership in Thailand surprisingly high (at least a fifth of all households are members) for an industrialised country.

### III FUNERAL ASSOCIATIONS AND THE HISTORY OF INSURANCE

Funeral associations are mutual risk-pooling groups designed to ensure decent funerals for members and/or other persons nominated by them, typically close relatives or household members. When a covered person dies, the group will provide a pre-specified payout—in the form of labour, goods or cash, or a combination of these—towards the funeral. Many associations collect fixed cash premia at regular intervals and use this fund to finance payouts, while others transact only when a death occurs.<sup>2</sup>

Funeral associations have a long history and global reach. Solon the Athenian statesman (ca 638–558 BC) passed a law regulating their activity (Parrott, 1985). They were widespread in the Roman empire, operating on the same basic principles as they do today.<sup>3</sup> In medieval Europe they were linked to the professional guilds. In England around

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<sup>2</sup>Funeral associations are distinct from rotating and accumulating savings and credit associations (ROSCAs and ASCAs). In all these types of arrangements, a fixed amount of money is typically collected regularly from each member. But in a ROSCA, payout rotates amongst the members in a systematic fashion, typically determined either randomly or by bidding. During a cycle of ROSCA operation, each member will receive the payout exactly once (Besley et al., 1993). ASCAs operate on a similar principle but, as the name suggests, funds may be accumulated and held or invested jointly rather than being paid out immediately after collection. In contrast, funeral association payouts are triggered by a random event (the death of a covered person), so there is no guaranteed relationship between contribution and payout over the the period of membership. Therefore, whereas ROSCAs and ASCAs are fundamentally savings and credit devices (though various other functions have been suggested in the literature), a funeral association is at the core a risk-pooling arrangement.

<sup>3</sup>Early in the Empire, associations were formed for the purpose of meeting the funeral expenses of their members [...]. These co-operative associations [...] started originally among members of the same guild [...] or among persons of the same occupation. [They] provided for the necessary funeral expenses

the time of the industrial revolution, funeral associations could be set up as local community groups, or organised as large friendly associations (Cordery, 2003). For a vivid description of the importance of funeral associations in British working class life in the late 19th and early 20th centuries, see Johnson (1985). The history of funeral associations is yet to be written, but Van der Linden (1996) covers the history of mutual benefit associations more generally in 26 countries across Europe, North and South America and Asia. Though many of the institutions described also cover events other than death, funeral cover seems to have been the main, or one of the main, components of most of them, and not infrequently the only insured event.

Funeral associations still exist in many countries, though in rich countries their importance has declined relative to formal insurance. They are, however, still widespread in many parts of sub-Saharan Africa, possibly related to the fact that the expenditure on funerals is generally very high across much of the region.

Funeral associations are sometimes regarded as providers of informal insurance, but it is worth clarifying what is meant by ‘informal’ in this context. As Dercon et al. (2006) point out, funeral associations often operate according to a clearly defined, sometimes written, set of rules. The terms of the policy are specified in detail, including who is covered, conditions of cover and the sizes of premia and payouts. Often there is also a system of fines for non-compliance with these rules, and at least in South Africa it is not uncommon for funeral associations to have a special uniform which is compulsorily worn by members at meetings and funerals. Well-defined and strictly enforced policy terms appear to be the norm rather than exceptional.

On the other hand, most funeral associations are not registered with the authorities and not regulated. They are not part of the formal economy. In particular, it is uncertain whether a member of a funeral association who feels unfairly treated has recourse to the formal judiciary. This clearly distinguishes funeral association membership from policies

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by paying into the common fund weekly a small fixed sum, easily within the reach of the poorest of them. When a member died, a stated sum was drawn from the treasury for his funeral, a committee saw that the rites were decently performed, and at the proper seasons [...] the association made corporate offerings to the dead.’ (Johnston, 1903)



offered by formal insurance companies.<sup>4</sup>

While funeral associations pre-date formal insurance companies, today funeral insurance is also offered by the latter. Formal insurance companies offer explicit funeral policies in rich countries (including the USA, the UK, Spain and Germany) as well as in the developing world.

A possible objection to the arguments presented here is that funeral associations offer more than insurance. After all, whereas formal insurance is close to being a purely financial device, fellow funeral association members are often also friends, colleagues or relatives who may provide mental support and a sense of belonging, especially in times of grief. Nonetheless, virtually all writers on the subject agree that participants think of their funeral associations as a financial arrangement first and foremost. In support of this, a nationally representative South African survey asked funeral association members why they belonged to these groups. The three most popular responses were ‘Help with funeral arrangements’ (79%), ‘To help when there is a death’ (53%), and ‘Provide funerals the family deserves’ (24%). Far fewer respondents selected ‘To provide comfort and support’ (13%) or ‘To socialise’ (4%) (FinMark Trust, 2003). Likewise, Dercon et al. (2006) report that in both in Ethiopia and Tanzania, the primary focus of funeral associations is to provide funeral cover. Funeral associations undeniably have social aspects, but these alone cannot explain their popularity.

The history of funeral insurance is closely linked with that of funeral associations, and even today funeral insurance is much more likely than life insurance to be offered informally. Nevertheless, formal-sector funeral insurance exists in many places (and is common in some, such as South Africa), as do informal insurance groups that are not exclusively concerned with funeral cover. It is a key message of this paper that the type of insurance (life versus funeral) should be distinguished from the organisational form of the provider. Neither depends on the other, though funeral insurance appears to be popular in circumstances that favour informal insurance provision.

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<sup>4</sup>It is possible that Bloch et al. (2008) have in mind another sense of the word ‘informal’ when they write that most informal insurance is bilateral and that ‘our existing idea of insurance as taking place within an explicit “club” of several people may be misleading.’

## IV WHO CARES ABOUT A FUNERAL?

Funerals are expensive events in Africa,<sup>5</sup> and South Africa is no exception. Case et al. (2013) find that funerals amongst black households in a region of KwaZulu-Natal on average costs a median annual income. Roth (2001) conducted in-depth interviews with twelve households in a township in Eastern Cape, ten of whom had recently been involved in the funeral of a relative. He reports that the average expenditure on a funeral in his small sample was 15 times monthly household income.

Why spend so much? Funerals are of great cultural importance in sub-Saharan Africa. Traditional belief holds that the spirits of the dead can influence the living and must be treated with respect. Relatives will travel from far to attend, and the cost of catering for them for several days can be substantial (Roth, 2001). But often there is also a strong component of ‘conspicuous consumption’, and a sense of shame if the family of the deceased cannot afford an elaborate funeral.<sup>6</sup> Case et al. (2013) deem the importance of funerals to be ahead of births, graduations and weddings in traditional family and community life.

The social importance of funerals, and no doubt the toll of the AIDS epidemic, also help explain why both formal and informal funeral insurance are ‘big’ in South Africa. Porteous and Hazelhurst (2004) estimate that funeral association membership is around 18% of the population (8 million out of 45 million). As a proportion of black adults, membership reaches 31%. In the formal sector, too, funeral insurance is the single most popular type of policy, with about 8% (3.5 million) of the population being policy-holders. Since a typical policy will cover close relatives as well as the policy-holder, the proportion of the population that is covered by some form of funeral insurance is substantially larger than these numbers suggest.

It is a key assumption of the model presented here that in the cultural context, the policyholder (‘the parent’) places a greater relative utility weight on (the anticipation of)

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<sup>5</sup>Arhin (1994) and Van der Geest (2000) describe lavish funeral customs in Ghana, and Adamolekun (2001) does the same for Nigeria. Dercon et al. (2006) report ‘substantial’ costs in Ethiopia and Tanzania.

<sup>6</sup>In some funerals the price tag on the coffin is not removed, but displayed for everyone to see (Warnecke 1994 as cited by Thomson and Posel 2002).

her funeral than do the survivors ('the child'). This may seem puzzling to many readers, and contrasts with the view held by some academics, so it is worth considering the claim in some detail and contrast it with the alternative notion that 'funerals are for the living' (Van der Geest, 2000).

Utility functions are not directly observable. However, the assumption is supported by two key observations. First, if the assumption did not hold, that is if people cared more about their parents' funeral than their own, then one would expect funeral insurance to be designed to cover primarily parents or other household members rather than the policyholder herself. In fact, although many funeral insurance policies do cover the deaths of household members, the emphasis is consistently on the main member: many policies cover *only* the policyholder, and those policies that also cover parents and other household members typically do so at lower rates.<sup>7</sup>

Second, if funeral insurance were geared towards children covering their parents' funerals, then a majority of funeral policyholders should be of an age where their parents are alive. In fact, at least in South Africa, funeral policyholders as a group seem to be dominated by pensioners.<sup>8</sup> These are in their sixties and older, and given the life expectancy of black South Africans it is very unlikely that many of them have parents who are still alive. This is a strong indication that those who take out funeral insurance do so first and foremost to cover their own funeral.

In addition, though evidence supports the importance of social pressure in maintaining high levels of funeral expenditure (e.g. Case et al. 2013), it is not clear that this has a stronger effect on the young ('the child') than on the elderly ('the parent'). Social pressure

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<sup>7</sup>Bähre (2002), based on his anthropological study of 19 funeral associations in Cape Town, writes: 'How much the burial would cost depended on who had died. Members received most assistance: on average R3,250, or the organisation would cover most of the costs of the funeral. Dependants often received less, according to the category to which they belonged: spouse, child, member's parent, spouse's parent, and "those under one roof".' One funeral association member interviewed by Thomson and Posel (2002) was very explicit that when a new association is started, the initial priority is on covering the funerals of the members themselves. As membership and assets grow, they are able to expand cover: 'See, we put money from the bank, nè? Then we see that money is a little bit more. Then we are able to do children. That's why, before, we didn't mention the children, we didn't bury children. Then we see, no . . . we've got some little money, we add some children and the parents. Ja, it goes like this.'

<sup>8</sup>Case and Menendez (2011) study a sample of deaths in Limpopo, South Africa. They find that 70% of pension-aged people who died had a funeral policy, whereas only 27% of the younger deceased did. Case et al. (2013) report that in their data from KwaZulu-Natal, South Africa, 79% of pensioners participated in a funeral association, whereas only 18% of non-pensioners did.

may induce a sense of shame at ‘pauper’s funerals’ and influence the parent while alive, informing her expectations and preferences over her own funeral, as well as the child both before and after the death has occurred. According to Van der Geest (2000), funerals in Ghana are ‘more for the living than for the dead,’ but he also writes: ‘When thinking about their own funeral, the elderly are ambivalent. On the one hand, they criticise the overemphasis on funerals at the expense of proper care during their lives. On the other hand, they would certainly not want to turn the tables. For them, too, a poor funeral would be an unbearable disgrace.’ Van der Geest also argues that some of his elderly interviewees may wish to appear more modest in their expectations of their own funerals than they really are, indicating that at least some people do have preferences over post-mortem resource allocation.

This paper is not the first to regard funeral insurance as a response to a conflict of interests over funeral inputs. In his anthropological study of informal mutual aid groups in Soweto, after describing what is expected of family, neighbours and friends in times of bereavement, Kramer (1975) writes: ‘I do not by any means wish to assert, however, that the categories of people discussed above unfailingly come forward and do their duty in all cases of death. This is not the case, firstly because they are not always in a position to do so and secondly because the city does offer people the opportunity for “disappearing” and thus avoiding their responsibilities. Consequently, the formation of burial societies can be seen as a recognition of this fact and an attempt to counteract it.’

## V THEORY

### V.1 The model

There are two agents, a parent and a child, and two periods. In the first period the parent, endowed with wealth  $W$ , decides how much (if any) insurance cover to buy and pays the premium.

The parent survives to the second period with probability  $q$ . If she survives, she receives labour income  $y$  and consumes everything before the game ends. If she dies, there

is no labour income but the child inherits the parent's remaining wealth and receives any insurance payout. The child allocates her resources between the parent's funeral and her own consumption.

There are two types of funeral; basic ('pauper's funeral') and elaborate ('dignified funeral'). An elaborate funeral costs  $p$ , and the cost of a basic funeral is normalised to zero.

There are also two types of insurance. Both pay out if and only if the parent dies. The only difference between them is that a life insurance payout  $L$  can be spent as the beneficiary chooses, whereas a funeral insurance payout  $F$  can only be spent on the parent's funeral. In both cases the premium per unit of cover is  $1 - q$ , the actuarially fair rate. The assumption of actuarially fair rates will be relaxed later.

In addition there is a fixed contract cost associated with each insurance type that the parent buys. The contract cost is initially assumed to be positive but infinitesimal. This implies that it can be ignored for the purposes of determining the level of insurance cover demanded, and that the insurance premia remain actuarially fair, but also that the parent is induced to prefer a single insurance contract whenever she is otherwise indifferent between a single contract and a mix of both types of insurance. The relaxation of the assumption that the contract cost is negligible is discussed below.

The parent's consumption in period 1 is assumed to be static and netted out of the model by adjusting the endowment  $W$  and the parent's utility. For simplicity, both parent and child are assumed have logarithmic consumption utilities, but the case of general CRRA utility is considered below. If she survives to the second period, the parent derives utility from the consumption of all her resources,  $U = \ln(C)$ . If not, she derives utility from (the anticipation of) her own funeral and, altruistically, the child's consumption,

$$U = BD + \ln(c).$$

Here,  $B$  is the fixed utility gain to the parent associated with an elaborate funeral, and  $D$  is an indicator equal to 1 if an elaborate funeral is held and 0 if not. The child's consumption is denoted  $c$ . Without loss of generality, the altruism coefficient (the weight

on the child's consumption utility in the parent's utility) has been normalised to 1 by adjusting  $B$ .

The child's utility is given by

$$u = \mu BD + \ln(c).$$

The constant  $\mu$  determines the relative importance of the funeral and consumption terms from the child's point of view. A key assumption is  $\mu < 1$ , so that although the parent and the child derive utility from the same two sources in the case of death (namely, the parent's funeral and the child's consumption), in relative terms the funeral matters less to the child than it does to the parent. It is this conflict of interest that will drive the demand for funeral insurance.<sup>9</sup>

The parent's problem is to determine the insurance portfolio that maximises her expected utility conditional on the child's decision function.

It is immediately clear that the parent will never take out more funeral cover than  $p$ , the cost of an elaborate funeral, since doing so would be wasteful.

The child's problem is to allocate her available resources  $w$  (bequest plus any insurance payout) between the funeral and her own consumption so as to maximise utility, subject to the restriction that a funeral insurance payout can only be spent on the funeral. Her choice is binary: she can either arrange a basic funeral and consume all her resources (except any funeral insurance payout), or she can arrange an elaborate funeral at cost  $p$  and consume  $w - p$ .

It is immediately clear that the child will always arrange an elaborate funeral if she receives a funeral insurance payout of  $p$ .

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<sup>9</sup>The assumption that the parent cares more about her funeral than does the child is discussed in detail in Section IV. Note that if it did not hold, so that  $\mu \geq 1$ , there would be no justification for funeral insurance as a separate form of insurance in this model: there would be no case in which either the parent or the child would strictly prefer funeral insurance to life insurance, and the introduction of even a small degree of uncertainty about the future, for example over prices, would make life insurance strictly preferred to funeral insurance.

## V.2 Demand for life and funeral insurance

Define the parametric quantities  $J$  and  $K$  as follows,

$$J(q, B) = \frac{1 - q}{1 - e^{-(1-q)B}}$$

$$K(\mu, q, B) = \frac{1}{1 - e^{-\mu B}} - q,$$

and let real expected lifetime resources  $R$  be given by

$$R(W, q, y, p) = \frac{W + qy}{p}.$$

*Proposition 1.* If

$$J < K, \tag{1}$$

then the parent's insurance demand, represented by  $F$  and  $L$ , can be characterised as follows:

Resource condition	$F$	$L$
$R < J$	0	$y$
$J < R < K$	$0 < F \leq p$	$y + p - F$
$K < R$	0	$y + p$

In the intermediate resource case,  $J < R < K$ , funeral cover  $F$  is generally not uniquely determined, but it is strictly positive and, moreover,  $F = p$  is always a solution.

If (1) does not hold, then funeral insurance is not demanded for any combination of  $W$ ,  $y$  and  $p$ .

*Proof.* See Appendix A.

The term  $W + qy$  represents expected life-time resources in the absence of insurance. Dividing by  $p$  is just a price normalisation that expresses these expected resources in terms of the number of units of elaborate funerals that the expected resources can afford.

Proposition 1 says that for low expected resources, the parent buys full life insurance cover for the potential loss of labour income, but does not take out any funeral cover because both parent and child prefer a basic funeral. For high expected resources, the

parent buys life insurance to cover both the income loss and the cost of an elaborate funeral. Since the child is in agreement concerning the type of funeral, funeral insurance is not required and a pure life policy avoids the extra contract cost of a mixed insurance portfolio.

For intermediate expected wealth, the parent prefers an elaborate funeral but the child does not. By buying a portfolio of funeral and life insurance, the parent can achieve an elaborate funeral at the first-best level of total cover ( $F + L = y + p$ ). Funeral insurance will not exceed  $p$  since that is wasteful, implying that the amount of life cover is at least  $y$ . The amount of funeral cover is also strictly positive, since otherwise the child would not hold an elaborate funeral. There is a critical level of funeral cover (between zero and  $p$ ) above which an elaborate funeral is guaranteed. Any insurance portfolio satisfying these conditions is a valid solution. But setting funeral insurance equal to  $p$ , the full cost of an elaborate funeral, and life insurance equal to  $y$ , is always a valid solution in the intermediate case.

### V.3 An approximate derivation for general CRRA

Proposition 1 shows that, with logarithmic utility, funeral insurance is only demanded for intermediate resource levels. Logarithmic utility function is a special case of the constant-relative-risk-aversion (CRRA) family of utility functions. The next result shows that the main result also holds, approximately, for general CRRA utility.

*Proposition 2.* Let the setup be as above, but let the agents' instantaneous utility functions be CRRA with coefficient of relative risk aversion  $\rho$ . Then, using first-order Taylor approximations, funeral insurance is demanded if and only if

$$\left(\frac{p}{B}\right)^{\frac{1}{\rho}} < W + qy < \left(\frac{p}{\mu B}\right)^{\frac{1}{\rho}} - qp.$$

*Proof.* See Appendix B.



## V.4 When is funeral insurance ruled out?

Inequality (1), which must hold for there to be any demand for funeral insurance, depends only on  $q$ ,  $B$  and  $\mu$ . That is, for certain combinations of these three parameters, there is no demand for funeral insurance irrespective of initial wealth, labour income and funeral cost.

In fact, rearranging (1) yields

$$\mu < \frac{\ln\left(\frac{e^{(1-q)B}-q}{1-q}\right)}{B}.$$

This defines a critical value  $\mu^*(q, B)$  such that funeral insurance is never demanded if  $\mu \geq \mu^*(q, B)$ . The next result provides a further characterisation of the conditions that rule out funeral insurance.

*Proposition 3.* When  $\mu + q > 1$ , there is a  $B^*$  such that for  $B > B^*$ , funeral insurance is ruled out in the sense that there will be no demand for it irrespective of  $W$ ,  $y$  and  $p$ . The critical value  $B^*$  is decreasing in  $\mu$  and  $q$ . When  $\mu + q \leq 1$ , funeral insurance cannot be ruled out for any  $B$ .

*Proof.* It can be shown that:

$$\begin{aligned}\lim_{B \rightarrow 0} \mu^* &= 1 \\ \lim_{B \rightarrow \infty} \mu^* &= 1 - q \\ \frac{\partial \mu^*}{\partial B} &< 0 \\ \frac{\partial \mu^*}{\partial q} &< 0\end{aligned}$$

Then the single-crossing property implies that for any  $q$  and  $\mu$  satisfying  $\mu > 1 - q$ , that is  $\mu + q > 1$ , there is a unique  $B^* > 0$ . For  $B > B^*$ , (1) does not hold and funeral insurance is ruled out. The inequalities  $\frac{\partial \mu^*}{\partial B} < 0$  and  $\frac{\partial \mu^*}{\partial q} < 0$  imply that  $B^*$  depend negatively on  $\mu$  as well as  $q$ .

For  $\mu + q \leq 1$ , there is no finite, positive solution for  $B^*$ , so funeral insurance cannot be ruled out for any  $B$ . ■

Intuitively, if  $\mu > 1 - q$ , the child’s utility weight on the funeral is greater than the parent’s expected utility weight—probability—of the death scenario. In this case, for sufficiently large  $B$ , there is no level of resources  $R$  at which the parent prefers an elaborate funeral and the child does not. In the opposite case, when  $\mu < 1 - q$ , for any  $B$  there is an interval of expected resources in which the parent prefers an elaborate funeral and the child does not.

Proposition 3 cannot readily be tested with the data used here. But it is interesting to note that it may explain why funeral insurance is less popular in some countries, even among relatively poor people. Holding the ‘cultural’ parameters  $\mu$  and  $B$  fixed, there is a threshold for  $q$  above which there is no demand for funeral insurance irrespective of  $W$ ,  $y$  and  $p$ . So if general health levels (proxied by the survival probability  $q$  in the model) rise, then demand for funeral insurance may drop off even if ‘culture’ and the distribution of income are unchanged.

## V.5 Non-negligible contract costs

The model as presented above assumes positive but infinitesimal contract costs. This simplifies the analysis by allowing actuarially fair premia (and hence a full-insurance solution) while ensuring that a single insurance contract is preferred over two insurance contracts when the agent is otherwise indifferent.

However, in reality, transaction costs are likely to be important and the insurance premium greater than the actuarially fair rate, especially for the low-value contracts typically taken out by poor people. Introducing a non-negligible fixed cost per contract would give a more realistic cost structure for the insurance providers and also result in the net premium per unit of cover being higher for small transactions, which corresponds with anecdotal evidence.

An important effect of introducing a non-negligible contract fee in the above framework is that in some parameter regions it would become optimal not to take out any insurance at all.

Non-negligible transaction costs would not, however, change the main prediction of

the model: funeral insurance would not be demanded outside an intermediate region of wealth and income. Denoting the contract cost by  $t$ , a similar argument to the above quickly establishes that there is no demand for funeral insurance unless

$$J < \frac{W + qy - t}{p} < K. \quad (2)$$

The main result—namely, that funeral insurance is only ever demanded for intermediate wealth and income—thus survives the introduction of transaction costs and actuarially unfair premia. However, even when (2) holds, there might be parameter values for which only funeral insurance, or only life insurance, is taken out.

Furthermore, demand for life insurance as a function of expected wealth is no longer necessarily increasing everywhere.

## VI EMPIRICAL TEST

### VI.1 Predictions from the theory

The data only provide binary information on whether insurance policies of each type are held. Hence, predictions about the *amount* of insurance cover are not testable. The main testable prediction from the theory is that only agents with intermediate levels of expected resources  $W + qy$  should demand funeral insurance. In other words, plotted as a function of expected resources, take-up of funeral insurance should be ‘box-shaped’: zero for low values, one for intermediate values and zero for high values of expected wealth.

However, this assumes that households are homogeneous with respect to model parameters and that there is no measurement error. Allowing for heterogeneity and measurement error, aggregate take-up of funeral insurance is expected to be hump-shaped rather than box-shaped: first rising and then falling as the levels of wealth and income increase.

The prediction, while falsifiable, is fairly general and it is not unlikely that it could be generated by alternative models. As such, what follows is necessarily only a partial test of the theory. Several alternative stories are considered in the Section VII.

Studying take-up as a function of  $W + qy$ , taken as a single quantity, requires scaling income to wealth equivalents by fixing a time period over which the insurance policy is valid,  $q$  is the survival probability and the expected income is  $y$ . An alternative approach is suggested by the fact that holding wealth fixed, funeral insurance take-up should be hump-shaped in income, and vice versa. This is the approach taken here.

The model also predicts that life insurance demand should be weakly increasing in wealth and income. The base model predicts that all agents should have some life insurance, but the presence of non-negligible transaction costs would introduce a region of no insurance take-up for lower resource levels. The prediction that demand for life insurance should be weakly increasing in income is borne out by the data, but since many models would predict this outcome, the emphasis here will be on the demand for funeral insurance.

## VI.2 Data

The household data are taken from the 2004 wave of the *All Media and Products Survey* (AMPS) published by the South African Advertising Research Foundation. AMPS is a long-running series of cross-sectional surveys covering South Africans aged 16 and over. The surveys are primarily intended for commercial market research. The sample of 24,489 in the 2004 wave over-represents the higher income brackets, but weights inversely proportional to the probability of selection are provided to allow inference about the underlying population. This paper analyses the 11,882 black (African) households in the data set.

The survey respondent is a randomly chosen person aged 16 or above in the selected household. The emphasis of the questionnaire is on commercial product usage and media consumption, but there are also sections covering personal data, family and housing situation, and leisure activities. There is information on formal and informal funeral insurance uptake as well as life insurance.

For a number of the most relevant variables, only binary or binned information is available. For instance, respondents are asked whether they have life insurance, but no further details on the policy are provided. Appendix C provides more detail on the

construction of the variables used.

It is worth noting that the constructed measure of wealth is crude: the household is asked whether they own each of a list of durable goods, and the simple count of goods present in the household is used here as the proxy for wealth. Also, income is provided only as a discrete (binned) variable. The income variable used here is the midpoint of the reported income category.

Weighted summary statistics are provided in Table 1. They suggest that 27.8% of black South Africans aged 16 or above have informal funeral insurance.<sup>10</sup> Furthermore, 6.8% personally have a formal funeral policy. Some 32.1% of black South African adults have either formal or informal funeral cover. Given the data it is not possible to distinguish those who do not personally have funeral insurance but are covered by someone else's policy, from those who are not covered at all. 5.5% have life insurance.

One-year survival rates  $q$  by sex and age in five-year bands were obtained from the WHO Life Tables for South Africa (World Health Organization, 2011). The numbers for 2000 and 2009 were interpolated to provide an estimate for survival rates in 2004.

### VI.3 Results

As a graphical precursor to the results, consider Figures 1 and 2. Here the take-up of funeral insurance (formal or informal) and life insurance are plotted against household assets and income, respectively. The general pattern is consistent with the theoretical prediction that the take-up of funeral insurance should be hump-shaped with respect to assets and income. Life insurance take-up shows a strong positive relationship with income and assets. This is consistent with there being significant transaction costs associated with taking out life insurance.

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<sup>10</sup>A respondent is coded as having informal funeral insurance if they report attending funeral association meetings 'weekly' or 'monthly'. If those who report attending funeral association meetings only 'annually' are included, the proportion with informal funeral insurance rises to 35.6%. This compares to Porteous and Hazelhurst (2004), who calculate that 31% of black South Africans aged 18 or above were members of funeral societies in 2003.

The empirical specification is

$$f_i = \alpha + \gamma W_i + \delta W_i^2 + \lambda q_i y_i + \nu (q_i y_i)^2 + \beta X_i + \epsilon_i,$$

where  $f_i$  is a binary take-up variable for funeral insurance (formal or informal) for household  $i$ ,  $W_i$  is household assets,  $q_i y_i$  is life expectancy-adjusted personal income and  $X_i$  a vector of control variables.

The control variables are sex, age, age squared and education of the respondent, dummies for whether he/she is married, has own children and lives in a rural area. Province dummies and house/car ownership are also included.

The main results are presented in Table 2. The indicator for take-up of funeral insurance is regressed on assets, assets squared, expected income and expected income squared using weighted least squares. In column 1 there are no control variables. The coefficients on the linear asset and income terms are positive and significant, and the coefficients on the squared asset and income terms are negative and significant, indicating a hump-shaped relationship. Here and throughout, standard errors are robust and clustered at the province level.

Column 2 adds control variables for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls: marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit over the past year. The qualitative findings are unchanged.

Column 4 drops observations in the seven highest income categories, corresponding to 0.54% of the sample. The purpose is to alleviate concerns that outliers at the upper end of the distribution are driving the results. It also avoids having to rely on an arbitrary ‘midpoint’ value for the highest income category, which is, in principle, unbounded. But clearly there is also a danger that the exercise will ‘cut off the right leg of the hump’. However, the qualitative findings are unchanged.

Table 3 presents the results of weighted probit regressions (as opposed to weighted least squares). The column order is the same as above, and again the coefficient on the

squared asset and income terms are negative throughout.

Table 4 presents the results of OLS regressions. For these regressions, the frequency weights supplied with the data are ignored. The column order is the same as above, and the qualitative findings are unchanged.

In the regressions presented in Table 5, the analysis is confined to respondents classified as household decision makers, i.e. heads of households and housewives. In columns 1–3, the coefficient on the squared asset term is only marginally significant, but otherwise the qualitative findings remain the same. In column 4 (where the highest-income respondents are dropped), the signs of the coefficients remain practically the same, but both the linear and the squared asset terms lose significance.

In Table 6, raw income rather than life expectancy-adjusted income is used. The qualitative findings are significant and unchanged.

Hitherto the analysis has been based on including linear and quadratic terms of income and assets in the regressions, and showing that the linear terms are positive and the quadratic terms, negative. However, strictly speaking the signs on these coefficients establish concavity rather than a hump-shape. A concave quadratic function is necessarily ‘hump-shaped’ if it is drawn from negative to positive infinity, but there is a chance that the asset and income distributions in the data cover only a part of the quadratic that is either all increasing or all decreasing. Although Figures 1 and 2 suggest that this is not the case, Table 7 presents the results of piecewise linear regressions where the sample is split into low and high income and asset segments. In columns 1 and 2, only the linear income term is included, and the sample is restricted to respondents with monthly income either below or above 10,000 rands,<sup>11</sup> respectively. (The cut-off was rather arbitrarily chosen by looking at the figures.) The results confirm that the take-up of funeral insurance is first increasing and then decreasing in income. Column 3 and 4 repeat the exercise for the asset index. The linear asset term is positive and significant for respondents with an asset index less than 10, and negative and significant for respondents with an asset index greater than or equal to 10. A full set of controls is included in all these regressions. This

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<sup>11</sup>In mid-2004, the exchange rate was 6.13 South African rands (ZAR) per US dollar. Source: [www.oanda.com](http://www.oanda.com)

should allay concerns that the quadratic is not hump-shaped in the support of the sample distributions of income and assets.

All in all, the prediction that the take-up of funeral insurance should be hump-shaped in wealth and income is well supported by the data.

## VII DISCUSSION

This paper is, as far as I know, the first to present a model of funeral insurance as a distinct form of insurance. Funeral insurance is modelled as classic life insurance bundled with a constraint on how the payout is spent. When there is a conflict of interest between the insurance holder (the parent) and the beneficiary (the child) on how a life insurance payout should be spent, funeral insurance can resolve it in favour of the parent by functioning as an intergenerational commitment device. This gives a possible answer to the puzzle of why funeral insurance has been, and still is, in many contexts preferred to unconstrained life insurance: because some people are willing to pay for this type of commitment device.

The key assumption of the model is that the policy-holder cares more, in relative terms, about her own funeral than does the beneficiary. This assumption is supported by several stylised facts from sub-Saharan Africa, including the observation that most funeral policies cover the death of the policyholder first and foremost. The death of other family members, including parents, is associated with a lower payout or none at all.

The model predicts that the take-up of funeral insurance should be hump-shaped in income and wealth. Using a nationally representative data on black households in South Africa, where both life and funeral insurance are widely available, this prediction is confirmed.

While the data are consistent with the theory, the hypothesis tested is fairly general and the data only provide binary take-up information. It is hard, therefore, to rule out other explanations of the empirical relationship than the one proposed here. As such, the empirics fail to reject the model rather than endorse it. It is worth noting, however, that on its own the existence of social pressure to spend lavishly on funerals can hardly explain the existence of funeral insurance. If children value their parents' funeral more



than the parents do themselves, then they might want life insurance or other financing options, but they would not prefer funeral insurance over life insurance. This is because if the policyholder is also the one disposing of the payout then there is no need to constrain the use of the payout, barring time-inconsistency arguments. In fact, introducing even a very small element of ex-post uncertainty would make life insurance strictly preferred to funeral insurance.

Another rival explanation for the popularity of funeral insurance is that it may have a cost advantage over life insurance. In the presence of dysfunctional labour markets, or in a barter economy, people may be unable to exchange their labour for cash due to unemployment. Then it may become attractive to exchange labour over time rather than selling it for cash: if you help me now, I'll help you later. This might explain why groups are set up to exchange labour in conjunction with big events such as funerals. But it cannot explain the fact that in South Africa, funeral insurance is increasingly provided by commercial undertakers. These companies accept only cash premium payments, *but still pay out, at least in part, in goods and services*. In many cases, undertakers offer this type of policy directly to individual consumers. But it is also widely reported that some funeral associations have decided to 'outsource' the actual provision of insurance to an undertaker, so that in effect the association itself is reduced to a vehicle for collecting the insurance premium, and its members no longer exchange labour.<sup>12</sup> The fact that many pay pure cash premia for a policy that pays out in funeral-related goods and services cannot be explained by inefficient labour markets or a barter economy.

Another, behavioural, explanation for the enduring popularity of funeral insurance is related to the concept of 'mental accounting'. People might demand funeral insurance as a way to keep their mental 'funeral account' separate from their 'bequest account'. However, the market response to this psychological phenomenon should be a life insurance policy labelled 'for funeral expenses', rather than actual funeral insurance, since the latter constrains the use of the payout. In a world with uncertainty, for example over post-mortem prices, such constraints come at a cost (in expected utility terms) if not needed

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<sup>12</sup>Thomson and Posel (2002) refer to these as 'hybrid' funeral associations.

for reasons other than mental accounting.

While it is possible to rule out some alternative explanations, the empirical test of the model provided here is fairly weak. Hence, the main contribution is to document and propose a novel explanation for the persistent popularity of funeral insurance, and to show that this explanation is consistent with the data at hand, rather than to conclusively settle the puzzle of funeral insurance.

The model also predicts that there are conditions under which funeral insurance is not demanded at any level of income or wealth. This prediction is not testable with the data used here, but it corresponds well with a notion that general improvements in public health (proxied by an increase in the model's survival probability  $q$ ) may reduce the demand for funeral insurance, even holding fixed the distributions of income and wealth in the population. This could explain why funeral insurance is relatively unpopular in developed countries, even those characterised by high inequality in income and wealth.

Finally, it should be noted that though the model simply posits differing utility weights on the funeral and the child's consumption, it is possible to think of this as the outcome of a more complex process. In the presence of uncertainty about events occurring after the parent's death, and/or information asymmetry about the child's type, it is possible that the parent may act *as if* she had a higher utility weight on funeral, even if the parent and the child would otherwise value the funeral equally. Also, if 'the child' in fact consists of a large group of family members who share responsibility for the funeral, the prospect of co-ordination failure due to free-riding could lead to the same outcome.

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## A PROOF OF PROPOSITION 1

Consider first the situation where only life insurance is available. Then the child’s problem can be written:

$$\max_{D \in \{0,1\}} \{\mu BD + \ln(w - pD)\}$$

The solution to this problem is straight-forward: there is a critical level of child resources,

$$w^* = \frac{p}{1 - e^{-\mu B}},$$

such that the child arranges a basic funeral if  $w < w^*$ , is indifferent between the two types if  $w = w^*$  and prefers an elaborate funeral if  $w > w^*$ . To emphasise that the child’s decision depends on her available resources, the notation  $D(w)$  is introduced.

In the absence of funeral insurance, the parent's problem can be written

$$\max_{L \geq 0} \{q \ln(C) + (1 - q)[BD(w) + \ln(w - pD(w))]\}$$

where

$$C = W - (1 - q)L + y$$

$$w = W - (1 - q)L + L$$

denote next-period wealth in case of survival and death, respectively. Recall that the parent consumes all resources in the case of survival.

To solve the parent's problem, first assume that the child decides to arrange a basic funeral,  $D = 0$ . Then the problem simplifies to

$$\max_{L \geq 0} \{q \ln(W - (1 - q)L + y) + (1 - q) \ln(W + qL)\}.$$

This is the standard insurance problem with an actuarially fair premium and 'loss'  $y$ , so the solution is full insurance,

$$L = y.$$

It follows that, in this case:

$$C = w = W + qy$$

$$EU = \ln(W + qy)$$

Next assume that the child arranges an elaborate funeral ( $D = 1$ ). Now the parent's problem is

$$\max_{L \geq 0} \{q \ln(W - (1 - q)L + y) + (1 - q)[B + \ln(W + qL - p)]\}.$$

The first-order condition yields

$$L = y + p,$$

and it follows that, in this case:

$$C = W + qy - (1 - q)p$$

$$w = W + q(y + p)$$

$$EU = (1 - q)B + \ln(W + qy - (1 - q)p)$$

The parent prefers the solution candidate conditional on  $D = 0$  over the solution candidate conditional on  $D = 1$  when the expected utility associated with the former is

greater, leading to the condition

$$R < J. \quad (3)$$

However, the parent's preferred solution is only feasible if the assumption regarding  $D$  is justified, that is if the child 'agrees' with the parent in the choice of funeral type. When the parent sets  $L = y$ , the left-hand side of (3) is  $w/p$ , and the right-hand side is less than  $w^*/p$  under the assumption  $J < K$  (equation 1). Hence, whenever the parent prefers  $D = 0$ , the child agrees.

But when  $L = y + p$ , the child only agrees with the parent's preference  $D = 1$  if

$$w = W + q(y + p) > w^* = \frac{p}{1 - e^{-\mu B}},$$

leading to the condition

$$R > K. \quad (4)$$

If (4) holds, the solution is  $L = y + p$  and  $D = 1$ . However, if neither (3) nor (4) hold, the best the parent can do while achieving  $D = 1$  is to set  $L$  such that the child's resources are at the critical level,  $w = w^*$ . Ultimately the choice of life cover is then a matter of comparing the expected utility at this level, leading to  $D = 1$ , and that of setting  $L = y$ , implying  $D = 0$ .

Next consider how the introduction of funeral insurance will change the solution. It will not affect the case when parent and child agree on a basic funeral, since taking out funeral insurance is not in the parent's interest then. And when parent and child agree on holding an elaborate funeral, funeral insurance up to the level of  $p$  makes no difference except to introduce an additional contract cost. And a level of funeral insurance greater than  $p$  would be wasteful, so the parent takes out the whole amount of cover  $y + p$  in life insurance.

Therefore, compared to the situation with only life insurance, funeral insurance is only of interest in the intermediate case that neither (3) nor (4) hold, that is, when there is a conflict of interest between parent and child. In this case, funeral insurance can be used to force an elaborate funeral while holding total insurance cover at the first-best (the parent's preferred) level  $y + p$ . Here, both  $L$  and  $F$  are demanded at strictly positive levels, in such a way that their sum is  $y + p$ .  $F = p$  and  $L = y$  is always a solution, and  $F$  can never exceed  $p$ , but in general the critical level of  $F$  needed to enforce an elaborate funeral is positive but may be less than  $p$ . The critical level  $F^*$  is the one that makes the child indifferent between the two types of funeral, and can be identified by thinking of  $F$  as deducted from the insurance payout but functioning as a price subsidy on the elaborate funeral. This yields

$$F^* = \min \{p, e^{\mu B}p + (1 - e^{\mu B}) [W + q(y + p)]\}.$$

Note that the critical level decreases as  $W + qy$  increases, as the conflict of interest is attenuated.

If (1) does not hold, then the conflict of interest is reversed in the sense that there is a region in which the child wants an elaborate funeral but the parent does not. Funeral insurance is of no interest to the parent (or the child) in this case, and hence is never demanded.

## B PROOF OF PROPOSITION 2

The setup is as above, except that the agents' consumption utility is of a general CRRA form,  $\frac{x^{1-\rho}}{1-\rho}$ , where  $x$  is consumption and  $\rho$  is the coefficient of relative risk aversion.

Now the child will choose an elaborate funeral if

$$\mu B + \frac{(w-p)^{1-\rho}}{1-\rho} > \frac{w^{1-\rho}}{1-\rho}$$

First-order Taylor approximation of  $\frac{(w-p)^{1-\rho}}{1-\rho}$  around  $w$  leads to the condition

$$w > \left( \frac{p}{\mu B} \right)^{\frac{1}{\rho}}.$$

Fair premia imply full insurance,  $L = y$  or  $L = y + p$ , as before. The parent prefers  $D = 1$  over  $D = 0$  when

$$(1-q)B + \frac{(W+qy - (1-q)p)^{1-\rho}}{1-\rho} > \frac{(W+qy)^{1-\rho}}{1-\rho}$$

Taylor approximation gives

$$W + qy > \left( \frac{p}{B} \right)^{\frac{1}{\rho}}$$

It is straight-forward to show that the  $D = 1$  solution is feasible without funeral insurance when

$$W + qy > \left( \frac{p}{\mu B} \right)^{\frac{1}{\rho}} - qp.$$

Hence, following the same argument as in the case of logarithmic utility, funeral insurance is demanded (approximately) if and only if

$$\left( \frac{p}{B} \right)^{\frac{1}{\rho}} < W + qy < \left( \frac{p}{\mu B} \right)^{\frac{1}{\rho}} - qp.$$

Insurance can be ruled out for all levels of wealth  $W$  and income  $y$  when



$$\left(\frac{p}{\mu B}\right)^{\frac{1}{\rho}} - qp < \left(\frac{p}{B}\right)^{\frac{1}{\rho}}$$

or

$$q > \frac{\left(\frac{p}{\mu B}\right)^{\frac{1}{\rho}} - \left(\frac{p}{B}\right)^{\frac{1}{\rho}}}{p}.$$

## C VARIABLE CONSTRUCTION

Under the heading ‘Financial Services’, AMPS 2004 asks: ‘Here is a list of different types of policies and investment plans which you can take out with a financial services company. Can you please tell me which, if any, you *PERSONALLY* have? This excludes any cover or benefits provided by your employer/company’ (original emphasis). Respondents indicating either ‘Life cover policy’ or ‘Endowment, investment, savings or education plan/policy *with life cover*’ (original emphasis) are coded as having life insurance. Those who indicate the option ‘Funeral insurance’ are coded as formal funeral policy holders.

In the ‘Sport, entertainment and leisure’ section, the following question is asked: ‘For the activities listed below, please indicate your *personal frequency of each activity*, if at all’ (original emphasis). The options given were ‘weekly’, ‘monthly’, ‘yearly’ and ‘not at all’. Respondents reporting that they attend funeral association meetings ‘weekly’ or ‘monthly’ are coded as having informal funeral insurance. (All qualitative results are robust to also including those who report attending funeral association meetings only annually.)

A respondent is coded as having funeral insurance (formal or informal) if he/she has a formal funeral policy or is a member of a funeral association. No information on premia, cover or conditions is provided for either type of insurance.

In the survey, monthly income is recorded not as a number but categorised as being in one of 33 income ranges. Income is coded as the midpoint of each band. The highest band, 40,000 rands and above, is coded as 45,000. 1% of households report this income band. For robustness we also present regressions where the highest income bands are dropped.

The available information on assets is crude. The respondents were asked which of a list of durable goods ‘are presently in the household’. The asset index used here is a simple count of how many of these assets are reported by the respondent. It would be possible to obtain an approximate value for a typical good of each category, but the associated uncertainty makes it questionable whether this would substantially increase the quality of the index. The list of assets is: electric stove, other (gas or coal) stove, electric hotplate, microwave oven, refrigerator or combined fridge/freezer, free standing deep freezer, vacuum cleaner/floor polisher, dishwasher, automatic front loading washing machine, automatic top loading washing machine, semi-automatic/twin tub washing

machine, tumble dryer, sewing machine—electric or manual, television set, video cassette recorder, personal computer/personal laptop in home, hi-fi/music centre, DVD player.

A household was coded as owning a ‘proper’ home if all of the following are satisfied: (1) It owns its dwelling. (2) The dwelling is a ‘House’, ‘Cluster House’, ‘Town House’ or ‘Flat’, as opposed to a ‘Matchbox House’, ‘Traditional Hut’, ‘Hostel’, ‘Hotel / Boarding House’, ‘Compound’, ‘Room in Backyard’, ‘Squatter Hut’, ‘Caravan’ or ‘Other’. (3) The dwelling is electrified and has water on tap, a hot water tank, a toilet and a sink.

Clearly the value of a ‘proper house’ has the potential to dwarf the value of the asset index discussed above. But property values are not provided, and since the regression specification needs to include the square of assets, house ownership cannot be used in the main wealth metric. It is, however, included as a control variable in some of the regressions.

There is no information on debts except a binary indicating whether the household has a ‘home loan/mortgage bond’, and whether the respondent has ‘bought any durable items, such as appliances/furniture, on credit during the *PAST 12 MONTHS*? Credit includes hire purchase, instalment sale and payment on terms’ (original emphasis). Clearly buying on credit could artificially inflate the asset index used here, so a binary variable for having purchased items on credit is included as a control in some of the regressions.

The ‘Rural’ indicator is set to 1 if the household’s community size is ‘Less than 500/Rural’.

The respondent is coded as having own children if he/she answered yes to the question, ‘Do you have any young or unmarried children of your own?’ There is no information on children more generally.

The respondent is coded as married/cohabiting if he/she reported ‘Married or living together’ under marital status.

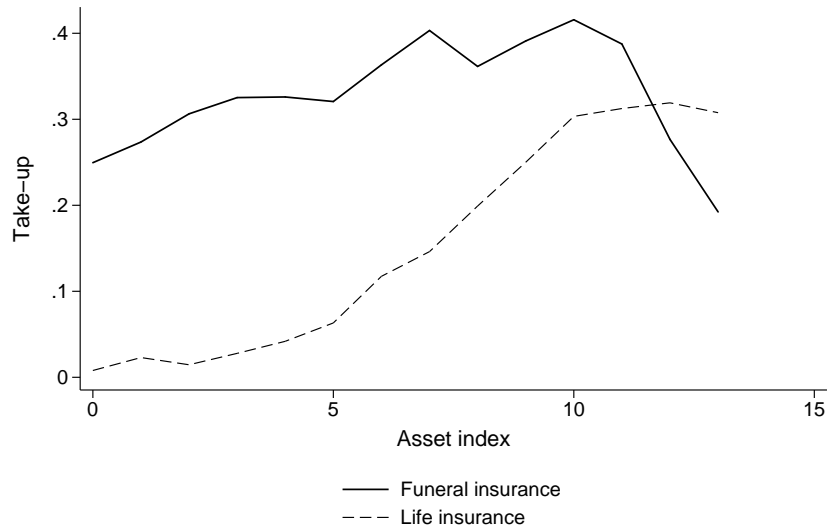


FIGURE 1: The take-up of life and funeral insurance as a function of household assets. Funeral insurance take-up is hump-shaped in assets, in accordance with the theory. The fact that life insurance take-up is increasing with income is consistent with the presence of transaction costs.

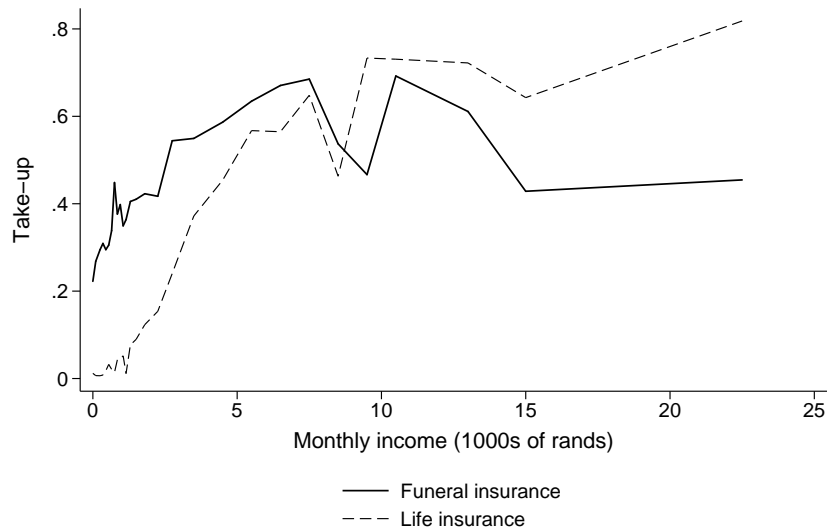


FIGURE 2: The take-up of life and funeral insurance as a function of personal income. Funeral insurance take-up is hump-shaped in income, in accordance with the theory. The fact that life insurance take-up is increasing with income is consistent with the presence of transaction costs.

TABLE 1: Descriptive statistics (weighted)

	Mean	StDev	Obs
Has funeral insurance (0/1)	0.321	0.467	11882
informal	0.278	0.448	11882
formal	0.068	0.251	11882
Has life insurance (0/1)	0.055	0.228	11882
Asset index (0–14)	3.226	2.485	11882
Monthly personal income (rands)	810	1840	11735
Life expectancy-adjusted monthly personal income (rands)	795	1811	11735
Monthly household income (rands)	2412	3319	11882
Female	0.500	0.500	11882
Age	35.7	15.5	11882
Completed primary school	0.508	0.500	11882
Completed high school	0.270	0.444	11882
Married or co-habiting	0.363	0.481	11882
Has child	0.605	0.489	11882
Lives in rural area	0.509	0.500	11882
Owens ‘proper’ home	0.078	0.268	11882
Has purchased on credit in the last 12 months	0.057	0.232	11882
Is household decisionmaker	0.681	0.466	11882

*Notes:* In mid-2004, the exchange rate was 6.13 South African rands (ZAR) per US dollar. Source: [www.oanda.com](http://www.oanda.com)

TABLE 2: Main results—weighted least squares

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.0361** (0.0123)	0.0261*** (0.00686)	0.0239** (0.00719)	0.0223** (0.00710)
Household assets, squared	-0.00276** (0.000957)	-0.00188** (0.000649)	-0.00175** (0.000627)	-0.00152** (0.000608)
Adjusted personal income	0.0731*** (0.00954)	0.0520*** (0.00770)	0.0436*** (0.00742)	0.0547*** (0.00816)
Adjusted personal income, squared	-0.00212*** (0.000495)	-0.00146*** (0.000338)	-0.00121*** (0.000318)	-0.00244** (0.000835)
Observations	11735	11735	11735	11672

*Notes:* Weighted least-squares regressions. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is monthly income in 1000s of rands, adjusted for life expectancy. Column 2 includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls for marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Column 4 drops observations in the seven highest income categories. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 3: Weighted probit results

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.108** (0.0427)	0.0897*** (0.0292)	0.0830*** (0.0303)	0.0782*** (0.0300)
Household assets, squared	-0.00838** (0.00340)	-0.00686** (0.00269)	-0.00643** (0.00267)	-0.00570** (0.00260)
Adjusted personal income	0.193*** (0.0275)	0.143*** (0.0241)	0.119*** (0.0224)	0.157*** (0.0271)
Adjusted personal income, squared	-0.00541*** (0.00125)	-0.00395*** (0.000890)	-0.00327*** (0.000825)	-0.00781*** (0.00255)
Controls	No	Yes	Yes	Yes
Observations	11735	11735	11735	11672

*Notes:* Weighted probit regressions. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is monthly income in 1000s of rands, adjusted for life expectancy. Column 2 includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls for marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Column 4 drops observations in the seven highest income categories. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 4: Unweighted OLS results

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.0270*** (0.00774)	0.0225*** (0.00601)	0.0207** (0.00630)	0.0187** (0.00650)
Household assets, squared	-0.00247*** (0.000541)	-0.00175*** (0.000436)	-0.00161*** (0.000426)	-0.00132** (0.000430)
Adjusted personal income	0.0723*** (0.00846)	0.0489*** (0.00829)	0.0419*** (0.00840)	0.0683*** (0.0102)
Adjusted personal income, squared	-0.00216*** (0.000417)	-0.00145*** (0.000342)	-0.00124*** (0.000338)	-0.00434*** (0.000852)
Observations	11735	11735	11735	11672

*Notes:* OLS regressions. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is monthly income in 1000s of rands, adjusted for life expectancy. Column 2 includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls for marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Column 4 drops observations in the seven highest income categories. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 5: Results with only decision-maker respondents

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.0420** (0.0143)	0.0291** (0.0100)	0.0246** (0.0105)	0.0225* (0.0104)
Household assets, squared	-0.00252* (0.00122)	-0.00198* (0.001000)	-0.00187* (0.00100)	-0.00157 (0.000985)
Adjusted personal income	0.0526*** (0.0102)	0.0475*** (0.00990)	0.0396*** (0.00917)	0.0544*** (0.0132)
Adjusted personal income, squared	-0.00152** (0.000463)	-0.00135*** (0.000383)	-0.00110** (0.000353)	-0.00275** (0.00118)
Controls	No	Yes	Yes	Yes
Observations	7641	7641	7641	7586

*Notes:* Weighted least-squares regressions. Only household heads and housewives are included. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is monthly income in 1000s of rands, adjusted for life expectancy. Column 2 includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls for marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Column 4 drops observations in the seven highest income categories. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 6: Results using raw income (not adjusted for survival probability)

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.0362** (0.0123)	0.0261*** (0.00686)	0.0239** (0.00719)	0.0223** (0.00710)
Household assets, squared	-0.00277** (0.000958)	-0.00188** (0.000649)	-0.00176** (0.000627)	-0.00152** (0.000608)
Personal income	0.0722*** (0.00949)	0.0512*** (0.00760)	0.0429*** (0.00731)	0.0539*** (0.00794)
Personal income, squared	-0.00206*** (0.000490)	-0.00142*** (0.000333)	-0.00117*** (0.000313)	-0.00237** (0.000805)
Controls	No	Yes	Yes	Yes
Observations	11735	11735	11735	11672

*Notes:* Weighted least-squares regressions. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is unadjusted monthly income in 1000s of rands. Column 2 includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school) and province dummies. Column 3 adds further controls for marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Column 4 drops observations in the seven highest income categories. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



TABLE 7: Results from piecewise linear regressions

	(1)	(2)	(3)	(4)
	Funeral insurance	Funeral insurance	Funeral insurance	Funeral insurance
Household assets	0.0220** (0.00680)	0.0792 (0.0719)	0.0112** (0.00371)	-0.0456** (0.0149)
Household assets, squared	-0.00150** (0.000573)	-0.00555 (0.00360)		
Adjusted personal income	0.0391*** (0.00684)	-0.0125** (0.00421)	0.0435*** (0.00667)	0.00931 (0.00971)
Adjusted personal income, squared			-0.00107** (0.000348)	-0.000404 (0.000302)
Controls	Yes	Yes	Yes	Yes
Subsample	Income<10	Income≥10	Assets<10	Assets≥10
Observations	11637	98	11420	315

*Notes:* Weighted least-squares regressions. The dependent variable is a binary indicator for whether the respondent has funeral insurance. Income is monthly income in 1000s of rands, adjusted for life expectancy. All columns includes controls for respondent sex, age, age squared, education (binary variables for having completed primary school and high school), province dummies, marital status, having children, living in a rural area, owning a ‘proper’ home and a binary indicator for having bought anything on credit in the past year. Standard errors are robust and clustered at the province level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$