God insures those who pay? Formal insurance and religious offerings in Ghana.[*]

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Abstract

This paper provides experimental support for the hypothesis that insurance can be a motive for religious donations by members of a Pentecostal church in Ghana. We randomize enrollment into a commercial funeral insurance policy, then church members allocate money between themselves and a set of religious goods in a series of dictator games with significant stakes. Members enrolled in insurance give significantly less money to their own church compared to members that only receive information about the insurance. Enrollment also reduces giving towards other spiritual goods. We set up a model exploring different channels of religiously based insurance. The implications of the model and the results from the dictator games suggest that adherents perceive the church as a source of insurance and that this insurance is derived from beliefs in an interventionist God. Survey results suggest that material insurance from the church community is also important and we hypothesize that these two insurance channels exist in parallel.

Keywords: economics of religion, informal insurance, charitable giving

JEL codes: D14, G22, O12, O17, Z12

1 Introduction

Do religious believers give money to their churches in the hope of receiving insurance against economic shocks? And if so, is this because they expect the church to look after them when shocks occur, or

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God to look after them by making such shocks less likely to happen? Recent studies have emphasized the important economic functions that religious institutions fulfil across the world, of which the provision of informal insurance is one that has recently gained attention (Chen (2010), Ager and Ciccone (2016)). Such insurance is likely to be particularly important in settings with weak formal institutions and where individuals are exposed to a variety of uninsured risks. In this paper we report a study examining the effect of providing formal market-based insurance on the demand for informal church-based insurance in Accra, Ghana.

We conduct a lab-in-the-field experiment with members of a Pentecostal church in Accra to test whether insurance is one motive behind religious participation. We do not claim it is the only or even the most important motive. We perform our experiment by randomly assigning free enrollment into a formal, commercially available funeral insurance policy and measuring how this affects willingness to contribute money in a dictator game to the church and two other charitable recipients.

The additional recipients - a secular charity and a nationwide prayer event - provide a means of differentiating between two possible mechanisms by which members might expect insurance to work. The first mechanism, consistent with a club good interpretation of church involvement, is one in which the church provides financial support to those who suffer economic hardship provided they have previously given money to the church. The second mechanism is one in which members expect God to intervene to reduce the risk of adverse economic shocks provided the individuals concerned have demonstrated spiritually meritorious actions. Giving money to a secular charity or to a nationwide prayer event might be considered meritorious actions but they do not involve a contribution to the church, and so would be consistent with belief in the second mechanism but not with belief in the first.

Urban Ghana is a particularly interesting setting in which to study interactions between religious participation and insurance. First of all, as we describe below, Pentecostalist churches are massively present in Ghana and many members of the population give very significant shares of their income to their church. This setting therefore allows us to examine the motives for costly participation in activities that are also present in many other countries in the world. In our model we envisage multiple motives for participation - both the consumption of spiritual activities as such and the purchase of insurance against various shocks, and our survey evidence indicates that both of these motives matter.

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Secondly, in our main sample of church members we find that only 31% of all those interviewed participate in the National Health Insurance Scheme (NHI), Ghana's public health insurance program. Only 19% indicate that they hold any other types of insurance (see Table 6). Relatively low rates of insurance mean that enrollment in a formal policy is likely to be a meaningful and significant treatment for many of our participants. Overall, therefore, our results are likely to be relevant for other settings characterized by low penetration of formal insurance and the importance of religious institutions, including other Sub-Saharan African countries but also other parts of the world such as Latin America.

We find that enrollment in the formal insurance policy causes church members to give less money to the church in a dictator game, compared to members that only receive information about the insurance. Interestingly, we find that formal insurance also causes church members to give less to the other recipients who are not directly linked to the church, but are associated with church teachings on "good behaviour". Furthermore, we find that church members who receive only information about the funeral insurance but are not enrolled, increase their giving to the church and other charitable recipients as compared to participants who are not informed about the content of the insurance. This finding is interesting since many of the church's communications place a heavy emphasis on the ever-present risk of death, and our results suggest that information which increases the salience of this risk is highly effective at increasing individual willingness to donate.

We set up a simple model to illustrate the conditions under which we can interpret these results as evidence for insurance. In the model, a church member derives utility from secular and religious consumption. We first show that if religious consumption does not have an insurance motivation, a reduction in perceived losses (through our enrolment treatment) should increase the amount allocated to religious consumption, via an income effect. However, if religious consumption does have an insurance motivation, and if the insurance is perceived as sufficiently effective, the substitution effect of a reduction in perceived losses will outweigh the income effect and lead to a reduction in the amount allocated to religious consumption. This is what we find in our experiment.

This insurance motive can work either through a reduction in perceived losses from negative shocks because of transfers from other church members or from the church organisation, or through a reduction in perceived probabilities of adverse shocks because of belief in a divine response to religious

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giving. Our experiment finds strong evidence for the latter mechanism: church members change donations to the church as well as to the non-church recipients in a manner that is consistent with interpreting giving as a demand for divine protection. Indeed, church members who receive only information about funeral insurance react to the increased salience of a potential loss with an increase in donations to the church and other non-church recipients. Provision of formal insurance decreases the need for this type of risk-coping mechanism, and we find that insured church members decrease charitable giving compared to those that are primed with risk.

Finally, we find that subjects who give substantially more than the average, or who participate in the game during intensive "revival weeks" – events in which churchgoers donate much more than in an average week – demonstrate treatment effects that are of the opposite sign to the average for the sample. This is consistent with the interpretation that exogenous factors that increase religious giving, thereby reducing the marginal insurance utility from religious consumption, can reduce the probability that the substitution effect outweighs the income effect.

Although our model is an instance of standard micro-economic analysis as applied to the allocation of resources between secular and religious consumption, our empirical study is methodologically innovative in two main ways. First, we have provided an experimental intervention that directly affects the demand for religious insurance by providing an institutional substitute. Secondly, we have sought to distinguish carefully between different channels through which religious insurance might work - notably, through influencing the behavior of other members of the religious community as opposed to influencing the probabilities of adverse events themselves that are believed by subjects to be determined by God. To this end our study experimentally links the religious practice of church giving to an insurance motive, and we find clear evidence that subjects believe their donations can induce God to intervene causally in the world. A Pentecostal church is a particularly good setting to test this because participation costs and expected outcomes are made explicit, and "giving to God" has a clear doctrinal mandate.

1.1 Link with the literature

The macro-economic literature, in the wake of Weber (1905), has long recognized the potential importance of culture, and especially religion, for economic growth. However, most empirical studies in this literature face a challenge in surmounting endogeneity problems, and it is generally hard to rule out the possibility that confounding factors explain both the religiosity of a population and the growth of its economy. For instance McCleary and Barro (2006a) find in their instrumental variable model that higher GDP per capita causes a reduction in average religiosity. They also find that the relationship between economic development and religiosity depends on the particular dimension of development. For example, education has different effects than urbanization (McCleary and Barro (2006b)). Thus, even when it is possible to estimate the magnitude of aggregate causal effects, such large-scale studies have difficulty pinpointing the mechanisms involved. Experimental methods are therefore helpful both in establishing causality and in identifying the likely mechanisms. Our paper aims at understanding a specific economic function of religious organizations: their role as informal insurers.

In examining religious organisations as insurers, our work follows that of Chen (2010), who finds that religious intensity increased with the need for ex-post insurance after financial shocks in Indonesia, and Ager and Ciccone (2016), who find a relationship between higher rainfall risk and religious participation. However, each study is compatible with a number of possible causal mechanisms, which our experiment is designed to elucidate. In particular, while the findings of Chen (2010) suggest an insurance motive for religious participation, they are also compatible with other explanations for religious participation, such as that religion provides comfort in distress after shocks strike. The findings of Ager and Ciccone (2016) are compatible with interpretations where other characteristics associated with rainfall risk are also the proximate cause of religious membership (such as the amount and type of education). Our experiment allows us to allocate insurance randomly to subjects to test the insurance mechanisms more directly.

In other studies, religious participation has also been shown to provide partial insurance against fluctuations in consumption and well being (Dehejia et al. (2007)). Other evidence from cross-country surveys, and historical evidence from the Great Depression demonstrate a degree of substitution between access to social welfare and religious participation (Gruber and Hungerman (2007); Scheve and Stasavage (2006)). We add experimental evidence to this literature, causally demonstrating that

access to secular insurance can reduce religious involvement. More importantly, the experimental approach allows us to test for the mechanism at hand and therefore acts as a complement to previous research done with observational data.

Our finding that spiritual insurance is an economically important reaction to risk of those that are not formally insured has important implications for the interpretation of the previously mentioned studies. Indeed, the previous literature on the interplay between religion and insurance is not able to distinguish between those two channels and might overstate the role of religious institutions as a provider of community-based financial insurance and understate the importance of a spiritual or psychological response to risk that is reflected in increased religiosity. This problem of identification is vindicated by some recent studies showing that beliefs in divine intervention in the daily lives of individuals can be an important determinant of real and costly social decisions (see Hadnes and Schumacher (2012), Gershman (2016) and Nunn and de la Sierra (2017)).[1]

Our experiment contributes to the microinsurance literature by studying in a controlled environment how religious participation might affect demand for formal insurance. In recent years, microinsurance policies have been proposed and tested as poverty alleviation tools with limited success (Cole et al. (2013); Giesbert et al. (2011); Giesbert and Steiner (2015); Karlan et al. (2014)). Consistently across studies, take-up has been lower than expected and this has been attributed to a variety of factors including liquidity constraints (Cole et al. (2013)), limited attention (Zwane et al. (2011)), trust in the insurance mechanism (Karlan et al. (2014)), and the existence of informal insurance substitutes (Mobarak and Rosenzweig (2013)). Our results suggest that religious institutions, which are an important instance of informal networks in developing countries, already provide global spiritual insurance to their members (although we do not claim that this is the only motive for church participation), and this may partly explain the puzzle of the limited success of specific formal insurance in some contexts. Since our survey results suggest that churches are also important sources of financial assistance to their members, we hypothesize that an informal, community-based material insurance exists in parallel, reducing further the need for formal insurance.

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[1]Gershman (2016) demonstrates a negative association between trust and the presence of witchcraft beliefs, while Hadnes and Schumacher (2012) experimentally find that priming vodoo beliefs increases trust and trustworthiness. Nunn and de la Sierra (2017) document the prevalence of beliefs in protective spells in South Congo, arguing that these beliefs helped village residents coordinate a stronger resistance against enemy fighters.

In the following section, we describe the religious context of our study. In section 3, we present the experimental design. In section 4, we use a simple model to derive our experimental hypotheses to identify an insurance effect and to distinguish between community-based insurance and spiritual insurance. In section 5, we discuss the experimental results and conclude in section 6.

2   Context

2.1   Pentecostalism

Pentecostalism represents one of the fastest-growing segments of global Christianity. Approximately one quarter of the world's two billion Christians are members of churches that can be classified as Pentecostal or Charismatic. These are related movements of Protestant Christianity that emphasize the work of a Holy Spirit and claim that spiritual gifts, such as prophecy, divine healing and speaking in tongues are expected to be present in the lives of believers (Pew Research Center (2006)). Although Pentecostal and Charismatic movements differ on some aspects, these aspects are marginal for our study, and we will use the term Pentecostal broadly. This makes sense especially in Ghana and across Africa, where popular speech hardly draws a distinction between the two (Okyerefo (2011); Botha (2007)).

The striking growth of this movement of global Christianity has largely taken place over the last three decades (Botha (2007); Thelen (2017)). The speed with which Pentecostal congregations have grown is particularly remarkable as most typical definitions of the movements only date their beginnings to the early 1900s. This marked change in the composition of global Christianity has been so significant that a number of commentators refer to the "Pentecostal explosion" as a "new Reformation"(Thelen (2017); Jenkins (2011)).[2] Sub-Saharan Africa has been an important centre of this change. Estimates from 2015 suggest that almost 40% of the continent's Christians identify as Pentecostal or Charismatic.[3] This reflects the wider shift in the Pentecostal revival from the Global North

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[2]Comparing the reformation of 16th century Europe with the "new reformation" of Pentecostal-charistmatic Christianity, theologian Harvey Cox states that "today, Christianity is living through a reformation that will prove to be even more basic and more sweeping than the one that shook Europe during the sixteenth century That earlier reformationwas confined to one small corner of the globe. The current reformation, however, is an earth-circling one. The present reformation is shaking the foundations more dramatically than its sixteenth century predecessor, and its results will be more far-reaching and radical."Cox (2011)

[3]Todd M. Johnson and Gina A. Zurlo, eds. World Christian Database (Leiden/Boston: Brill, 2007). http://worldchristiandatabase.org

to the Global South. Although many early Pentecostal churches in sub-Saharan Africa were planted and funded by American missionaries, much of the dramatic growth that has taken place since the 1980s has been fuelled by indigenous developments in theology, teaching and practice. Many scholars argue that preexisting belief systems and economic conditions made sub-Saharan Africa particularly receptive to Pentecostal teachings (see for instance Ukah (2005)).

Participants in our experiment were recruited from different branches of the Assemblies of God (AoG), one of the oldest and most established Pentecostal denominations. Founded in 1914 in the United States of America, the denomination now has an international reach that covers approximately 360 000 churches in more than 250 countries (Assemblies of God World Missions (2017)). National AoG bodies are largely autonomous, but are united by some shared beliefs and a common history. Taken together, Assemblies of God fellowships form the largest Pentecostal denomination, and the sixth largest religious grouping in the world. [4]

About a third of the worldwide Assemblies of God adherents are found in sub-Saharan Africa. This represents approximately twenty-two million adherents (Assemblies of God World Missions (2017)), about 2.5 million of whom are in Ghana[5]. In Ghana they represent just under 10% of the national population, attracting members from all social strata. Table 1 presents some descriptive statistics of the six church branches where we recruited participants for our study. We approached these churches using a snowball sampling strategy. The church branches are heterogeneous in terms of age, size, members' characteristics, and geographical locations in the city. They represent the great diversity of Assemblies of God branches that can be found in Accra.

Many of these teachings that have taken root and been developed in sub-Saharan churches are shared by Pentecostal believers across the world in the transnational exchange of ideas and resources that characterises Pentecostalism today (Gifford (2004); Kalu (2008)). There is of course considerable heterogeneity in beliefs and practices within individuals in a given church, across branches within a single denomination, and across denominations of the broader Pentecostal movement. However, the key features of Pentecostal belief and practice which are important for the interpretation of our study

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[4]www.adherents.com

[5]Todd M. Johnson and Gina A. Zurlo, eds. World Christian Database (Leiden/Boston: Brill, 2007). http://worldchristiandatabase.org

design are widely shared. By focusing recruitment from a popular and established denomination, we are able to draw out insights that should be applicable to this large and growing movement, and to other religious practices that share certain features of these beliefs.

2.2 The role of the church in Pentecostalism

In terms of practice, the church is an essential part of life for Pentecostal adherents. They go to church more regularly than other Christians and perform other religious practices more frequently. For example, compared to the general population, Pentecostals pray and read the Bible more often, and more frequently watch or listen to religious programs on television and radio. They are also more likely to share their beliefs with others to spread their faith (Pew Research Center (2006)).

Members also enjoy non-spiritual benefits from their church. An essential function of Pentecostal churches in Ghana, in particular in urban areas, is to offer a place for social gathering. Table 2 shows descriptive statistics of selected answers from our study questionnaire about the social role of churches. For instance, 40% of our study participants declare that they have found their spouse (or are most likely to find their future spouse if not already married) in church. This does not mean that for them, church is just or even mainly a place to meet potential marriage partners. On the contrary, precisely its appeal in this dimension consists in providing access to marriage partners who are there for other, at least partly spiritual or ethical motives.

Some church members even report that they favor church members as business partners (48% of church members in our study). More fundamentally, people seem to be attracted to such churches because they feel part of a broader community which looks after them, be it through other church members, church leaders, or God. When faced with any personal or family problems, 71% of our participants would call their pastor and 25% would ask another church member for help. This is consistent with survey evidence from the Afrobarometer and the World Values Survey showing that across Africa, religious leaders are considered amongst the most trustworthy members of civil society. They are expected to take responsibility for their members' welfare in the absence of government-led social interventions and urbanization enhances these expectations (McCauley (2013)).

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Pentecostal adherents are expected to support their church financially. Giving is often multi-layered and different ways of transferring money might have different motivations. *Tithing*, the practice of giving away a tenth of all income, usually takes the form of a non-anonymous monthly payment to the church for which church members receive a receipt. This type of giving is akin to a membership fee to the church community. On the other hand, there is giving for specific purposes such as *pledges*, which are occasional non-anonymous donations involving large amounts of money, often for investment in church infrastructure. Finally, there are *spontaneous offerings*, made on a more regular basis, which are generally anonymous and the amounts given unobserved (though during collections in Sunday services the fact of going forward to give may be very visible to a member's friends and family). Opportunities for this form of giving are frequent and contributions are expected beyond the other regular or earmarked forms of giving. This includes among others *seed offerings* - the practice of giving money in anticipation of a future material benefit, or *thanksgivings* in gratitude for already materialized benefits (Maxwell (1998); Gifford (2004)). The type of giving we observe in our experiment falls into this category of spontaneous giving.

2.3 Giving to God to access insurance

Giving to the church might interact with the use of the church as an insurer in a number of ways. Firstly, individuals might give to the church in expectation that the church as an institution would reward this sign of commitment by disbursing funds in times of need. Secondly, individuals might use their public giving to send signals that they are good community members to other church members, and expect that other church members then contribute to help them in times of need. The costs of religious participation can be seen as screening mechanisms to ensure that members are reliable and to prevent free-riding (Iannaccone (1992)). Additionally, the community structure of the group with repeated interactions reduces monitoring costs (Berman (2000)). These two types of community-based insurance could be considered "material" insurance.

In addition to its role as a social network, the church is also believed by its members to be a setting for encounters with the divine. The church therefore has a value as an insurer because it facilitates access to an interventionist God who can prevent negative shocks and favor positive ones. We call this type of insurance "spiritual" insurance. This form of insurance is interesting because it does not rely

solely on giving to the church but on "giving to God", which can be interpreted as "sowing on any fertile ground" - undertaking projects that will be blessed by God (Gifford (2004)). This expansive interpretation of "giving to God" allows us to extend our experimental design to investigate how participants react to giving to recipients which are separate from the church, but which still fulfil the spiritual mandate. This allows us to make some distinctions about the different types of insurance experienced in the church. These mechanisms are formalised in the model in Section 4 of the paper, and the doctrinal features are discussed here.

The first and most prominent feature is the forthright relationship between giving to God and material well-being. Pentecostal preachers across Africa speak of a God who does not want His people to be poor or to suffer.[6] This mandate is often described as a variant of the "Prosperity Gospel", the set of teachings that say that "Christianity has to do with success, wealth, and status" (Gifford (2004)).[7] And in contrast to other Christian groups where rewards are generally given out in the after life, it is usually pointed out that the expected timeframe of miracles is short and immediate.[8] The immediacy of the miraculous work is reflected in the structure of many church services that are themed around the material successes of its members proclaimed in lively testimonies.[9] Pastors emphasize how behaving in a manner that unlocks God's blessing helps to avoid the risks that get in the way of achieving these successes. Their preaching makes a particularly strong and explicit link between giving to God and insurance: "The Lord will remember your offering; it is comprehensive assurance" (Gifford (2004) Pg 65).[10] And unlocking God's blessings is invariably achieved by "doing something special that will move God and cause him to bless you more than you intended" i.e. giving money, preferably to the church (Ukah (2005)).

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[6]Enoch Adeboye, head of the Lagos-based international Pentecostal megachurch Redeemed Christian Church of God, teaches, "God is not poor at all by any standard...the closest friends of God [in the Bible] were wealthy people... Poverty is a curse and prosperity is not evil" (Ukah (2005) pg 260). Similarly Gifford (2004) pg 50 cites a pastor proclaiming "God is in the business of addition and multiplications; Satan is in the business of substraction and division."

[7]While the term "Prosperity gospel" has typically been used to describe teachings from some Evangelical churches in North America, some scholars of African Pentecostal theologies argue that the "African prosperity gospel" is more nuanced, certain aspects of it "are borrowed from external sources; others are home-grown. Still others are derived from external sources and adapted to fit local contexts" (Kalu (2008))

[8]Some declarations made during a church service include: "Before the year comes to an end, there are people here who will be counting millions of dollars in their accounts...", "This month, no accident sickness, stagnation will affect you" or "Marriages dont collapse here, businesses dont collapse here, nobody fails here" (Gifford (2004) Pg 50 and 58)

[9]Gifford cites some testimony themes that include the following: "I am a millionaire today!", "Jobs started coming in!", "My own choice car!", "Now they pay me in dollars!", "A Baby, Two Cars, and Promotion".

[10]Other examples include: 'The preacher asked the congregation if they were putting aside for a rainy day, but promised: If you give, you wont have a rainy day" (Gifford (2004) Pg 50). "Every part of your destiny is assured by God, insured by God" (Gifford (2004) Pg 58).

3   Experiment

We ran an experiment in Accra, Ghana involving 576 participants in 69 sessions, with a median number of participants per session of 10 and a mean of 9.3. Randomisation was done at the session level. At the start of each session, one participant per group was invited to pick one out of three unmarked envelopes. Participants were told that the envelopes contained a piece of paper that would determine the type of session they would play. The pieces of paper were labelled "Insurance", which corresponded to our insurance enrolment treatment; "Insurance information", which corresponded to the control, and "No insurance", which corresponded to the no insurance information treatment (i.e., groups who were not enrolled in the policy and did not have any sort of discussion about insurance). The insurance was a funeral insurance policy offered by a leading micro-insurer active in the Ghanaian market. The outcomes we measured were allocations out of an endowment (which subjects were free to keep, all or in part) towards a participant's church and two other non-church recipients.

3.1   Enrolment treatment: Funeral insurance policy

Funerals are large and costly events in many sub-Saharan African societies (Berg (2016); Case et al. (2013)). Surviving family members are expected to honor the dead through lavish commemorations. The rising toll of funeral costs has received attention from media, academics and political leaders.[11] More recently private financial service providers have begun to offer savings and insurance products designed specifically to meet these costs.

In Ghana, guests and other members of the bereaved's community typically make contributions that help to cover the funeral costs. It is important to note that community support is not only financial - churches also organise provision of food and moral and logistical support, so any formal insurance product will only be addressing a single aspect of the church contributions. The degree of formalisation of this type of support varies across the churches in our sample. In interviews with church leaders, most confirmed that observed commitment from members was a prerequisite for church involvement in their funerals. Definitions of commitment always included attendance of church events

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[11]See for instance "The long goodbye: Why funerals are big deals in Ghana" By Paula Newton available at http://edition.cnn.com/2014/03/11/world/africa/on-the-road-ghana-funerals/index.html and "Bankruptcy and burials: Can Ghanaians afford such splendid funerals?" The Economist 2007 available at http://www.economist.com/node/9234475, and also "Death around the world: Funerals and fantasy coffins in Ghana" available at https://www.funeralzone.co.uk/blog/death-around-the-world-funerals-in-ghana

and financial commitment to the church in terms of tithes and offerings.

The funeral policy we offered to participants is a micro-insurance offered in the Ghanaian market for pre-existing groups and needs to be coordinated by a member of the group. In our case, the coordinators were the Pastors of each church branch. The policy covered the life of the participant and a member of his or her immediate family. If either of these parties were to pass away within a year, the policy would pay GHS 1000 ($265) to the surviving family members. This policy cost GHS 12.5 ($3USD) for two family members per year.[12] Individuals in this treatment were enrolled on the spot after completing a demographic survey and before playing the dictator game.

3.2 Control group and no insurance information treatment

During pre-tests it became clear that discussions of death and planning around death would be sensitive topics. Reluctance to contemplate large unpleasant risks has been raised in the literature, particularly in other developing country settings where people are severely limited in the steps they can take to address these risks (Case et al. (2013)). Furthermore, findings in psychological research show that awareness of mortality can modify Christians religiosity and beliefs in a supernatural entity (see for instance Jong et al. (2012); Norenzayan and Hansen (2006)). As the insurance treatment was designed to isolate the effect of being *enrolled* in insurance, we offered the same information about the insurance policy to the control group, so that the same issues of death would be salient in both settings.

Furthermore, we were interested in isolating the potential effect of risk priming which we expected would modify participants' behaviour. Since discussion about risky events are part of church services as described in the context section, participants' reaction to a risk prime can be linked to their giving behaviour in church. We therefore added a second treatment where people were not informed about the content of the insurance policy. Comparisons between this group that did not discuss death and the control group that received insurance information allow us to see how church members react to an increase of perceived risk in the absence of formal insurance.

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[12]One main goal of the group micro-insurance is to have a simplified scheme and low coordination costs. This implied that the tariff was independent of the gender, age or other characteristic of the insured. The main insurance taker only had to be above the age of 18 and below the age of 75 who could then insure his/her children and other close family members under the age of 75.

3.3 Recruitment

We recruited 576 study participants from different church branches within one particular denomination. Participants for the main study were recruited from six church branches through announcements made on Sunday mornings during regular church services, and to avoid confounds with normal Sunday offering, all sessions took place during the subsequent work week in a neutral location. A subset of 122 participants were inadvertently recruited during "revival weeks" when their churches were engaged in active fundraising services during the work week. We found interesting results for this subset. They are discussed after presenting the main experimental results, which involve 454 participants.

We were also interested in seeing how our hypothesised mechanisms operate within a secular organisation, so we recruited an additional 242 market sellers. Traders in this market are organized into an association that could provide financial assistance such as credit or insurance to dues-paying members. During the first round of data collection, we realized that the insurance treatment did not operate in this sample as it did within the group of church members. Indeed, the funeral insurance was coordinated by the head of the market association and informal discussions with study participants as well as their answers to survey questions warned us that trust in the insurance coordinator might be low. It therefore seemed likely to us that participants would not trust that the insurance would be actually implemented, thus discrediting the insurance treatment. Furthermore, questionnaire answers informed us that the market association is not a commonly-used risk sharing structure, and is by no means similar to the church community in that respect. We therefore stopped collecting data on market members after the first round of the study and the sample for this group is too small to be able to detect treatment effects. Results from this smaller additional sample are available from the authors on request.

3.4 Experimental Setup and Design

It was very important for the credibility of our study that, at the exception of recruitment, all interactions with participants took place off church premises and that participants be assured of anonymity so as to avoid any contamination of the results by perceived pressure from the church authorities. This involved a substantial effort to transport the recruited individuals to a study location at some distance from the church, as well as the setting up of a proper lab-in the-field with laptops and room

dividers between subjects so as to make the assurance of anonymity credible. All participants were compensated for transport to the neutral locations.

Interested participants were assigned to sessions of 8 - 12 people, randomized between treatments and control. A session consisted of an extended survey where each participant was interviewed by an enumerator who spoke the participant's local language and a set of dictator game decisions.

Participants privately played 10 modified dictator games. Each game asked participants to allocate GHS 11 (a little less than average daily income) between two recipients. The set of recipients consisted of the participant's church, a secular charity, a national prayer organisation, and the possibility of keeping the money. There were also two ways in which individuals would give to the church: the first being an anonymous donation, the second being a named donation. The pairs of recipients are listed in Table 3. The order of the 10 dictator games was randomized by the computer program.[13]

The Street Children's Fund is a charity that takes care of the education needs of homeless and vulnerable children. The charity operates in a district of the city that is geographically and culturally distinct from the ones where we recruited participants. Giving to this charity could largely be understood as an altruistic action. The thanksgiving offering is part of an annual inter-faith prayer event. Leaders and members of various faiths join together in prayer for Ghana. Giving towards this event was meant to be interpreted as giving towards a largely spiritual interest. Pre-tests and focus groups during piloting confirmed that study participants would see these two recipients in this manner.

Participants were paid a flat show-up fee of GHS 20. After all decisions had been made in the dictator games, one game was selected at random individually for each participant, and further payments were made according to the decision taken for that game. This meant that participants had the opportunity to earn up to GHS 31. Average overall earnings from the experiment were GHS 22.50 which were paid privately to participants.

The experiment protocol and the questionnaire can be found in the appendix. This experiment

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[13]Regarding anynonymous and non-anonymous donations, one concern is that participants that see named donations before anonymous choices may think about the latter in a different way. We randomize the order of the dictator games precisely to address this type of concern. However, we also checked whether seeing named donations before anonymous ones affect later choices to give to church anonymously and we find that this is not the case.

was pre-registered in the AEA registry.[14]

4   Model

We develop a simple model to formalize the types of behaviour we expect our experiment to capture, and use results from the model to motivate the experimental hypotheses. First we establish how church members who derive utility from secular as well as spiritual consumption would behave given the risk of an exogenous income shock in a bad state of the world, if there is no insurance offered by the church. We then consider two church-based insurance channels. Community-based insurance is modelled as a payment given to a church member in the case of a loss where the size of the payment depends on how much the church member gives to his/her own church. Spiritual insurance is modelled as a belief that the subjective probability of a loss is reduced by giving to the church and other goods used for religious signalling, such as the spiritual and secular charities.

The mechanisms of our experiment are captured in the model as changes to the size of the loss. The insurance scheme into which we enrolled individuals paid out in the event of their own death or the death of a relative. The loss we model is a financial loss and is not intended to cover all of the aspects of the distress suffered by an individual facing the death of a loved one, let alone the adverse emotional and other consequences to them of their own death. As in any life insurance decision, the individual does not expect to be compensated for their own death, but intends rather to offset in part the financial consequences of a death to those still left alive. Individuals are capable of anticipating the benefit of that payout and considering it as a (possibly vicarious) benefit in anticipation of which they are willing to pay a premium, even if they do not expect to be alive when the payout occurs.

There are two ways in which our insurance treatments affect the size of the loss. The first is when insurance information is provided to participants. The process necessitates a lengthy discussion about death both of the participating individual and his or her loved ones. This discussion brings home to participants the reality of a risk they had perhaps been inclined not to think about, and thereby makes death more salient. We represent this as an increase in the perceived size of the loss, compared to the situation before they had received this information.

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[14]AEA RCT Registry ID: AEARCTR-0000558

The second way in which our insurance treatment affects the size of the loss is when individuals are actually enrolled. We represent this as a reduction in the perceived size of the loss.

We show how in the presence of an insurance motive in the church, the main insurance treatment can lead to a decrease in giving, and the provision of only insurance information can lead to an increase in giving.

4.1 Setup

We assume that a church member has an income of Y and chooses to give an amount g to the church. The church member enjoys utility $u(Y - g)$ from consuming $Y - g \geq 0$ secular goods, and utility $\theta f(g)$ from contributing $g \geq 0$ to church goods. Thus a church member who gives g to the church enjoys a total utility of $u(Y - g) + \theta f(g)$. The parameter θ reflects the relative weight the individual puts on church activities compared to secular consumption. This weight might differ from one individual to the next (there may be individual heterogeneity). More importantly for our empirical analysis it might also differ in time (for instance, in revival weeks individuals go to church every day and are focused on spiritual activities). Both utility functions u and f are increasing and concave in their arguments. We therefore make the assumption that religious consumption is a normal good.[15]

In each period, church members face a probability π of an income loss of size D. Under the assumption that insurance is offered through the church, giving an amount g also has the impact of reducing the size of the loss by an amount $l(g)$, thus the total loss would be $D - l(g)$. Under the assumption that church members believe in spiritual insurance, the probability of a loss is decomposed into a basic probability of loss $\tilde{\pi}$, and a reduction in the probability of loss that can be mitigated by giving money to spiritual goods. Therefore, the total subjective probability of loss is $\pi = \tilde{\pi} - p(g)$.

The following subsections set-up the maximization problems and show how optimal giving varies with the perceived size of loss. All proofs are in the appendix.

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[15]This assumption contradicts the secularization hypothesis that higher income leads to lower religiosity. However, it is in line with new studies using panel or micro data (Becker and Woessmann (2013) and Buser (2015)). A theoretical rationale for the positive association of income on religious consumption can be found in club good models of religion (Iannaccone (1992), Berman (2000), Berman and Laitin (2008)).

4.2 Optimal giving to the church in the absence of any insurance

In this section we assume that church members choose a particular level of giving g to maximize their total expected utility. There is no insurance offered through the church. We label this Hypothesis H0. The optimization is:

$$\max_{g} \quad (1 - \pi)u(Y - g) + \pi u(Y - g - D) + \theta f(g) \tag{1}$$

Solving for the first order conditions and taking optimal giving g^* as a function of D allows us to show that giving is decreasing with the size of the loss D:

$$\frac{\partial g^*}{\partial D} < 0 \tag{2}$$

This classical result of consumption smoothing comes from the standard concavity assumptions of the utilities derived from secular and religious consumption. When faced with an increase in the potential loss D, church members shift spending from religious consumption to secular consumption to ensure a higher level of secular consumption in case of loss. We call this result the "income effect".

Therefore, this subsection predicts that if there is no insurance mechanism in the church (neither community-based, nor spiritual), the information about the funeral policy in the control group, by increasing the perceived loss D, would lead individuals to decrease church giving g^*.

We summarize this empirical prediction of Hypothesis H0 in the form of:

Empirical prediction H0a: Compared to no information, insurance information decreases giving to the church.

Correspondingly, compared to the control group, the enrolment treatment reduces the perceived risk of loss, therby decreasing D, and thus would increase giving to the church.

The second empirical prediction of Hypothesis H0 is therefore:

Empirical prediction H0b: Compared to insurance information, insurance enrollment increases

giving to the church.

4.3 Community insurance: optimal giving when giving reduces the size of a loss

In this section we assume that the church community provides material insurance such that church giving reduces the size of the loss. We call this Hypothesis H1, and we write $L = D - l(g)$, where l is an increasing and concave function with $l(0) = 0$ and $l'(0) > 1$ (this last condition means that the community insurance in the bad state more than offsets the amount previously donated by the individual). In this case, church giving can be seen as payment of the premium of an informal insurance that covers part of the possible loss. As it is offered by the church community, only giving to the church - and not giving to other religious goods - provides access to this type of insurance. The utility maximization problem is as follows:

$$\max_{g} \quad (1 - \pi)u(Y - g) + \pi u(Y - g - D + l(g)) + \theta f(g) \tag{3}$$

We solve for the first order conditions and express optimal giving g^* as a function of the loss D. We find that:

$$\frac{\partial g^*}{\partial D} > 0 \Leftrightarrow l'(g^*) > 1 \tag{4}$$

When there is an insurance motive behind church donations, an increase in the potential loss D triggers two opposite effects: the substitution effect, whereby church members try to mitigate the increase in loss by buying more informal insurance; and the income effect, described in the section 4.2 where church members reduce giving to the church to have more money available for secular consumption smoothing.

Condition (4) shows that as long as community-based insurance is effective enough in decreasing the loss, which is the case for low enough g^*, the consumption-smoothing effect from the baseline model (income effect) is outweighed by the increased demand for church insurance (substitution effect). Therefore, the overall effect of an increase in D is an increase in the optimal giving.

This subsection therefore predicts that if there exists an effective community insurance that reduces the size of a loss in case of a shock, the information about insurance should increase church giving

(compared to no insurance information) while the enrolment treatment would decrease church giving (compared to the control group). These effects are the *opposite* of the predicted effects discussed in the previous section, when there is no insurance motive for giving to the church. There should be no impact of either treatment on giving to other recipients.

The three empirical predictions of Hypothesis H1 are therefore:

Empirical prediction H1a: Compared to no information, insurance information increases giving to the church.

Empirical prediction H1b: Compared to insurance information, insurance enrollment decreases giving to the church.

Empirical prediction H1c: There is no effect of either insurance information or enrolment on giving to the other recipients (the thanksgiving offering and the street children's fund).

4.4 Spiritual insurance: optimal giving when giving reduces the subjective probability of a loss

In this section we assume that there is a spiritual insurance motive such that giving reduces the subjective probability of the loss $\pi = \tilde{\pi} - p(g)$. It is important to stress that giving can be to the church or to any other charitable/spiritual organizations that can be used for religious signalling. The mechanism here works through God: being a good Christian reduces the subjective probability of a negative shock. We call this Hypothesis H2. Utility can now be written as:

$$\max_{g} \quad (1 - \tilde{\pi} + p(g))u(Y - g) + (\tilde{\pi} - p(g))u(Y - g - D) + \theta f(g) \tag{5}$$

We can show that:

$$\frac{\partial g^*}{\partial D} > 0 \Leftrightarrow p'(g^*)u'(Y - g* - D) > (\tilde{\pi} - p(g^*))u''(Y - g^* - D) \tag{6}$$

This condition is harder to interpret intuitively in the non-parametrized form, and for the second order condition to hold requires that the second derivative of the utility function not increase too fast in the size of the loss, which means that the income effect must not be large. So we defer the discussion to

the appendix where we investigate it using a CARA utility function. In short, we find that the optimal giving g^* is increasing in the size of loss D when the spiritual insurance is effective enough. Indeed, when this is the case, individuals prefer to invest in decreasing the subjective probability of loss by increasing their religious giving rather than smoothing consumption (in other words, the substitution effect of the loss dominates the income effect).

Therefore, this subsection predicts that providing participants with insurance information would increase giving to any charitable or spiritual organization (compared to no insurance information) while enrolling them in the insurance treatment would decrease giving to any charitable or spiritual organization (compared to the information treatment).

The three empirical predictions of Hypothesis H2 are therefore:

Empirical prediction H2a: Compared to no information, insurance information increases giving to the church.
Empirical prediction H2b: Compared to insurance information, insurance enrollment decreases giving to the church.
Empirical prediction H2c: The effects on giving to the thanksgiving offering or the street children's fund are similar to the effects on giving to the church.

4.5 Experimental hypotheses

We collect here all the empirical predictions of the three different insurance hypothesis so they can be compared and tested against one another.

H0 There is no insurance provided through the church (section 4.2).

    H0a Compared to no information, insurance information decreases giving to the church.

    H0b Compared to insurance information, insurance enrollment increases giving to the church.

H1 *Community* insurance is provided through the church (section 4.3).

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H1a Compared to no information, insurance information increases giving to the church.

H1b Compared to insurance information, insurance enrollment decreases giving to the church.

H1c There is no effect on giving to the thanksgiving offering or the street children's fund.

H2 *Spiritual* insurance is provided through God (section 4.4).

H2a Compared to no information, insurance information increases giving to the church.

H2b Compared to insurance information, insurance enrollment decreases giving to the church.

H2c The effects on giving to the thanksgiving offering or the street children's fund are similar to the effects on giving to the church.

Our experimental design allows us to test for an insurance mechanism in giving (test for H0a against H1a/H2a and H0b against H1b/H2b) and then test the two insurance channels of spiritual and community-based insurance against each other (H1c against H2c). Spiritual insurance effects should be similar across recipients. However they might be different in magnitude since, for instance, church members could see church donations as the most effective tool to decrease the probability of a loss.

Our model and experimental design do not allow us to make a clear prediction of the result if we compared the group that received no insurance information to the group that received insurance. This is because, as described in the model setup, the insurance treatment is composed of both the actual insurance effect which we are interested in and a salience effect. The model demonstrates how these two effects work in opposing directions. While we are unable to formulate an ex-ante hypothesis about the overall comparison between receiving insurance and not receiving any information, we discuss the results in subsection 5.3.3, where we suggest some interpretations about the relative magnitudes we observe and discuss what they might further tell us about the potential mechanisms of church-based insurance.

5 Experimental Results

5.1 Descriptive statistics

Our main results include 454 church members recruited during regular service weeks from six different church branches and we have additional socio-demographic information for 404 of those.[16] Table 4 summarises basic demographic variables of these participants. The final column in this table also includes nationally representative demographic information. Consistent with the recruitment process taking place in churches that are not gender-balanced, we find that our study population had more women than men. Only a fifth of our participants had completed at least a high school education. On average, our participants earned approximately GHS 350, equivalent to $92 dollars, per month or roughly GHS 12, a little more than $3, per day. Only 31% held National Health Insurance and only 19% held any other sort of insurance prior to participating in the study. Table 6 presents a summary of these results.

Compared to the national population, our participants had lower incomes and were less likely to be employed. Again, this is consistent with the fact that we recruit relatively active church members. We believe that this selection is not a threat to external validity: we are interested in the attitudes towards insurance in precisely this significant subgroup of the general population who are likely to be particularly vulnerable and face a greater number of formally uninsured risks.

Table 5 shows that the groups were balanced across treatments for all key variables except gender (women tend to be over-represented in the insurance information and no insurance groups) as shown in Table 5. An F-test rejects the hypothesis that these main demographic variables jointly explain assignment to any of the treatments. We report results of regressions with and without control variables for individuals' demographics (gender, age, education, income, employment status, ethnicity) and measures of religious behavior (church attendance and prayer frequency) as well as church fixed effects. The treatment effects remain quantitatively similar and their statistically significance is unchanged whether or not we include the demographic variables.

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[16]The questionnaire software malfunctioned during the first few sessions, so some survey data were not saved. There were no problems with data from the dictator games.

5.2 Summary of the allocation decisions

In this subsection and the following we focus on the three dictator games among the ten played where anonymous donations to the three recipients were paired with the possibility to keep the money. Results from the other games are discussed in subsection 5.4. The histograms in Figure 1 plot the distributions of giving to the three different recipients. On average, participants chose to keep 5.77 GHS or 52% of their endowment, and give 5.22 GHS or 48% of the endowment. We find that 40% of participants selected an allocation of either 5 GHS or 6 GHS. Across recipients, roughly 7% of participants gave nothing, and 10% of participants gave everything away. These spikes at the extreme values highlight that allocations to the recipients may have been censored. To account for this, we report all experimental results using a Tobit regression.

We also find that giving towards the three recipients is significantly correlated, with the correlation coefficients between the pairs of choices ranging from 0.52 to 0.59. If the experimental design induced any order effects, these high degrees of correlation could be problematic for interpretations across recipients. However, the order of dictator decisions was randomised across participants, mitigating the concern that any order effects could interact with treatment effects.

5.3 Treatment effects

5.3.1 The effect of insurance information

The first treatment effect tests the hypothesis that a more salient threat of death and a discussion of the associated risk coping strategies affects giving. Table 7 presents the basic results of the insurance information on giving relative to the no insurance information treatment (even columns show results of regressions including control variables, odd columns show results of regressions without controls). In the sessions with no insurance information, participants gave an average of GHS 5.05, or 45% of the endowment to the church. Participants who received insurance information increased giving to the church by GHS 0.78, an effect which is statistically significant at 10% and economically large, representing 7% of the endowment and 15% of the mean amount donated by the control groups. This increase in giving is consistent with the hypothesis that the focused discussion of risk puts participants in a fearful state, which makes them more likely to give money to the church. Interestingly there was

also an increase in giving of similar magnitude to the street children's fund (an increase of GHS 1.00) and the thanksgiving offering (an increase of GHS 0.75). Tests for equality of the coefficients on the treatment effects across these different outcomes do not reject the null that the difference between them is zero.

These findings are therefore incompatible with Hypotheses H0a and H1c, and compatible with Hypotheses H1a, H2a and H2c.

The GHS 11 endowment used in the dictator games is a little bit more than the median weekly offering to the church. Comparing giving in the no insurance information treatment with the insurance information control, it is interesting to see that a relatively brief discussion about insurance and death could raise giving by 15%, and provides an indication of the importance of the church in this context where there is a lot of uncertainty, but few institutions to deal with it. Furthermore, if this were a pure framing effect unrelated to any insurance motive, we would have expected to see a negative effect on donations to the church instead of the observed positive effect.

5.3.2   The effect of being enrolled in an insurance policy

Table 8 presents the results of the effect of actually being enrolled in an insurance policy. These results are obtained by comparing people who received insurance with people receiving only insurance information. Column 1 demonstrates that enrolment in the formal insurance policy reduces giving to the church by GHS 0.92. Again, we find similar effects regarding giving to the street children's fund and giving to the thanksgiving offering (a decrease of GHS 0.93 in both cases as shown in column 3 and 5). These numbers correspond to an effect size of approximately 0.55 standard deviations across the three recipients. The effects are once again statistically significant at 10%. They are also economically important in magnitude, representing a reduction in giving equal to over 15% of the mean amount donated in the control group.

These effects are robust when we control for a large set of church and demographic characteristics as demonstrated in columns 2, 4 and 6 of Table 8. These controls should pick up variation in church structure on important characteristics such as the level of formal church support during members'

funerals and any variation in church teaching on giving. Neither the individual level characteristics nor the church characteristics explain the treatment effects on giving.

These findings are therefore incompatible with Hypotheses H0b and H1c, and compatible with Hypotheses H1b, H2b and H2c.

From this and the previous section we can see that only Hypothesis H2 - the spiritual insurance hypothesis - emerges unscathed from this confrontation with the evidence. Both predictions of Hypothesis H0 - no insurance - are falsified by the experimental results, while Hypothesis H1 - community insurance - though compatible with the findings about the effect of the treatments on giving to the church, is not compatible with the findings on giving to the other recipients.

5.3.3 Comparing those being enrolled in the insurance policy with those that do not receive information about the insurance

As mentioned before, our model and experimental design do not allow us to make a clear prediction on the direction of the results when we compare the group of people who were enrolled in the insurance treatment with those in the no insurance information one. The insurance treatment includes both the actual insurance effect and a salience effect. These two effects play in opposite directions.

Table 9, which compares those being enrolled in the insurance policy with those that do not receive information about the insurance, shows that the overall effect is not significant. Providing insurance information to participants without giving them insurance leads them to increase donations to the church and the two charitable recipients, while the provision of the formal insurance policy leads our participants to decrease their donations to the church and the two charitable recipients. These two effects are of similar magnitude and they cancel out. In other words, providing secular funeral insurance counteracts the effect that a discussion about death has on individuals' behaviour.

The fact that our experiment identifies an enrollment effect that is able to completely offset the salience effect suggests that insurance coverage can provoke immediate behavioural changes. This is in line with recent studies that explore the impact of agricultural insurance policies in developing

countries and find strong and immediate responses by farmers regarding production decisions of the insured crop or animal (see Cai et al. (2015); Cole et al. (2017); Karlan et al. (2014)). Provided that they trust the insurance, farmers begin to take riskier decisions such as choosing rain-sensitive crops or a different level of fertilizer shortly after enrollment. The most important behavioural changes in these settings took place on margins associated with the insured products with little change for other uninsured investments, suggesting that risk and insurance coverage (or the lack of it) were salient features in the farmers' decisions.

This does not imply that insurance against funeral expenses is already salient among the motivations for which the group with no insurance information gave donations to the church. Indeed, in many of the situations when church members make donations, as members of this group do in our dictator games, these are unlikely to be mentally earmarked with the specific goal of decreasing the risks of death. However, the behavior of our two other groups not only shows that making these risks salient has a real effect on donations - it also tests for the mechanism by which making the risks salient brings about this behavioral change, namely by inducing church members to seek insurance from the church.

This is how communication within the church operates: pastors' sermons frequently make the risk of death salient while suggesting donations as a means of coping with this risk. In this way, the church sermons themselves frequently combine the two effects that our experiment seeks to disentangle (salience and insurance). An interesting avenue for research would investigate the ancillary comparison separately: what behavioural responses could we expect from insurance when risks are not made salient?

5.4   Discussion

5.4.1   How does insurance work ?

These experimental results point to an interesting relationship between the type of insurance parishioners might believe they receive from the church and their willingness to engage in costly behaviours to signal membership. Firstly, treatment effects are present across the three recipients. As discussed earlier, neither the street children's fund nor the national thanksgiving offering are linked to the participant's church; and the configuration of our experimental laboratory, with physical partitions between

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the subjects, rules out any signaling motive. If the type of insurance the participant associates with his/her church membership is purely community based, there should not be a treatment effect on giving to these external recipients.

Thus, the fact that we find similar effects of giving to them, of similar magnitude as effects on giving to the church, indicates that a substantial part of the insurance channel works through beliefs that encourage giving as an act of worship to an interventionist god.

To investigate this spiritual insurance mechanism, we also look at the treatment effects in other dictator games played by participants (as described in Table 3). First, we investigate the possibility to give to the church where the participant's name would be attached to his donation rather than an anonymous giving. Table 13 in the Appendix shows that the priming and enrolment treatments have qualitatively the same effect on church giving when donations are not anonymous as when they are. The fact that our subjects do not try to signal their generosity through the use of nominal donations strengthens the interpretation that charitable behaviour is used as a spiritual mechanism to cope with risk.

We also show in Table 14 in the Appendix that both the insurance information and the insurance enrollment treatment do not modify the participants' decisions to allocate money to their own church against charitable recipients (columns 1 to 4), nor the money allocation between the two NGOs (column 5 and 6). Additionally, Figure 1 shows that distributions to the different recipients are very similar. It seems that the three different beneficiaries are equally important in the participants' mind for coping with risk.

5.4.2 Heterogeneous treatment effects: church members during fund-raising events

Up to this point, we have discussed results for church members recruited during normal service weeks. After recruitment, we learnt that two churches had hosted revival weeks during the course of our experiments. Revival weeks are special periods of church activity where members are encouraged to attend church daily. The services consist of prayer, teaching, singing, and exhortation to give money to the church.

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Kwabena (2015) describes revival meetings as an essential feature of contemporary Pentecostal liturgy. In his view, Pentecostal teaching is focused on "scriptures applied in ways that encourage members to invest in financial markets, seize opportunities in education, business, politics and entertainment and wherever able, increase their spheres of influence in the world". Access to these material benefits is accomplished through religious activities including "massive revival meetings, summits and conferences, all day prayer services and all-night prophetic vigils and mass evangelistic crusades".

In total, 122 church members participated in the experiment while they were in the middle of a revival week.[17] In terms of demographics, we do not find them to be different from members recruited during regular service weeks. However, participants sampled during revival week are more religiously active (see Table 10). This could be due to selection or, more likely, to a revival week effect. For this sample, we find important differences in treatment effects. After receiving insurance information, revival week members *decreased* giving to the church and after being enrolled in insurance, they *increased* giving to the church (see Table 11).

Referring back to the model, these results are consistent with interpreting the revival week as an upwards shift of θ, the relative weight in our subjects' utility function of church activities compared to secular ones. As equation (38) in the Appendix demonstrates, when equilibrium giving is higher than a given threshold, even in the presence of spiritual insurance, church members respond to an exogenous shock increasing the size of a loss by a decrease in optimal giving. Intuitively, there is a point at which members have already given so much money to the church, that when faced with the prospect of a negative income shock, they prefer to keep money to smooth secular consumption (i.e., when g^* is large, the income effect dominates the substitution effect).

This explanation of the revival week effect is consistent with the types of activities and benefits members are supposed to derive from revival weeks. Additionally, we find suggestive evidence that people who self report to be habitually high givers respond to treatment in the same manner as people who completed the experiment during a revival week (see Table 15 in the Appendix). In other words, their reaction to our treatments is the reverse of the reaction of people who are not in revival week,

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[17]Survey answers were saved for 117 individuals

suggesting that for high givers the income effect dominates the substitution effect.

The results highlight that the spiritual state of church members (captured by θ in the model) matters. Intensive religious participation seems to decrease the demand for spiritual insurance and one might derive that overall demand for insurance, formal or informal, is low during important religious events when individuals already "feel protected". This result would point to a degree of substitution between church participation and church giving; again, this calls for further research.

6   Conclusion

We conducted a lab-in-the-field experiment with church members from an established Pentecostal church in Accra, Ghana. We find evidence for religious and charitable giving being part of a church member's risk-coping strategy. This spiritual insurance channel does not contradict the possibility that other church community-based mechanisms exist in parallel. Indeed, survey responses from church members and leaders emphasize the important role the church plays as a financial contributor. However, our experimental findings add nuance to the literature on religious institutions as coordinating platforms by demonstrating that adherents might care at least as much about spiritual insurance (affecting outcomes through signalling to an interventionist God) as they do about material insurance (accessing transfers of goods and services from other church members).

The treatment effects obtained within the church population depend on three important factors. First, Pentecostal churches stress the involvement of God in terms of blessings in everyday life and teach about God rewarding religious and charitable giving. This particular religious discourse makes members of these churches more prone to see charitable behaviour as a means to decrease the risk of bad events happening and to increase the occurrence of good events. Second, trust in the insurance is fundamental, especially in a context where formal institutions are generally weak. In our case, the church was used as a coordinator for the insurance scheme and participants seemed to trust the insurance because it was coordinated by their pastor.[18] Finally, our results obviously depend on the absence (or limited presence) of better institutions to deal with risk. As long as these three conditions are met we expect our results to hold. In particular we believe that our results would hold in other

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[18]By contrast when we tried to run a similar experiment with the market association, the insurance enrollment failed to yield any effect because market participants did not trust the head of the market association who was chosen to administrate the insurance scheme.

Pentecostal churches and settings where the development of formal insurance is low. Since the focus on beliefs in religious rituals that influence immediate events are common among a variety of religions and faiths in developing countries, it would be interesting to reproduce the experiment in a different religious setting.

The experiment stressed the importance of religion for economic decisions made by individuals in a setting with weak formal institutions. While individuals might go to religious institutions in those settings because they offer risk-mitigating strategies, we show that formal, private insurance can at least partially substitute spiritual based insurance mechanisms. Since the church was used as a credible coordinator for the insurance scheme, we are inclined to see religious institutions in this context as opportunities to spread formal insurance rather than as an obstacle to its development.

7   Tables and figures

Table 1: Summary statistics of church branches

| | (1) |
	mean
Age	26.17
Number of church members (approx.)	1035.67
Church members have an education level higher than average	0.33
Church members have income higher than average	0.17
Average number attending Sunday service	610.00
Average amount received on a Sunday	1150.00
The church owns its building	0.83
The church owns other properties	0.17
Number of paid staff	6.67
The church has a welfare fund	1.00
Observations	6

Note: Information about each individual church branch can be found in Table 12 in the appendix.

Table 2: Social role of the churches

	(1)
	mean
I have found (or I am most likely to find) my spouse:	
In church	0.40
Through friends	0.08
Through family	0.10
Through work	0.15
Through school	0.04
Thanks to other social gathering	0.14
On the Internet	0.00
Other	0.04
Do you do business with people from the same church as you?	
Yes, only	0.09
Yes, I try	0.39
No, not important	0.49
No, I avoid	0.01
Who do you call when you need counselling about personal or family issues?	
No one	0.05
Government or NGO social services	0.00
Friends	0.20
Family	0.39
Pastor	0.71
Church member	0.25
Work superior	0.04
Medical professional	0.03
Other	0.06

Table 3: Pairs of dictator game recipients.

A	Self	Church (anonymous)
B	Self	Street children
C	Self	Thanksgiving
D	Self	Church (non-anonymous)
E	Church (anonymous)	Street children
F	Church (anonymous)	Thanksgiving
G	Church (anonymous)	Church (non-anonymous)
H	Street children	Thanksgiving
I	Street children	Church (non-anonymous)
J	Thanksgiving	Church (non-anonymous)

Table 4: Summary statistics of study participants and comparison with general population

	(1) Study participants mean	(2) General population mean
female	0.61	0.52
married	0.43	0.39
higher education	0.28	0.15
employed	0.62	0.76
income	362.08	445.50

Note: Figures for general population are from Ghana Living Standard Survey Round 6 (Ghana Statistical Service (2014)).

Table 5: Summary statistics of study participants across treatments

	(1) Insurance mean	(2) Insurance information mean	(3) No insurance mean
female	0.54 (0.05)	0.64 (0.77)	0.65
age	36.77 (0.45)	35.68 (0.99)	35.69
married	0.45 (0.49)	0.44 (0.66)	0.41
higher education	0.29 (0.94)	0.26 (0.65)	0.29
employed	0.62 (0.61)	0.59 (0.34)	0.65
monthly income	378.97 (0.40)	361.41 (0.72)	346.67
going to church daily	0.08 (0.88)	0.07 (0.69)	0.08
frequent prayer	0.90 (0.30)	0.93 (0.05)	0.86
any insurance	0.44 (0.83)	0.45 (0.71)	0.42
Observations	144	107	153
F stat		.53	.76
p-value		.85	.65

Note: P-values of a t-test of equality of mean between insurance or insurance information and no insurance groups are reported between parentheses.

Table 6: Financial role of the churches

	(1)
	mean
Main reason for your church choice:	
Teaching about God	0.87
Moral guidance	0.53
Atmosphere of the services	0.38
Friends and relatives	0.28
Welcoming community	0.21
Presence of interesting and succesful people	0.08
Meeting good marriage partner	0.04
Location of church building	0.15
Comfortable facilities	0.04
Other	0.04
Who would go for financial help?	
No one	0.09
Government or NGO social services	0.02
Friends	0.26
Family	0.53
Church community	0.25
Bank	0.16
Informal financial services	0.08
Work superior	0.04
Others	0.06
Church assistance	
I have received financial assistance from my church in the last 2 years	0.26
Financial decision	
I usually participate to financial decisions in my household	0.62
I usually participate to financial decisions in my household - women only	0.60
Do you hold other type of insurance?	
Yes, NIH	0.31
Yes, other type of insurance	0.19
Yes, NIH or other insurance	0.44

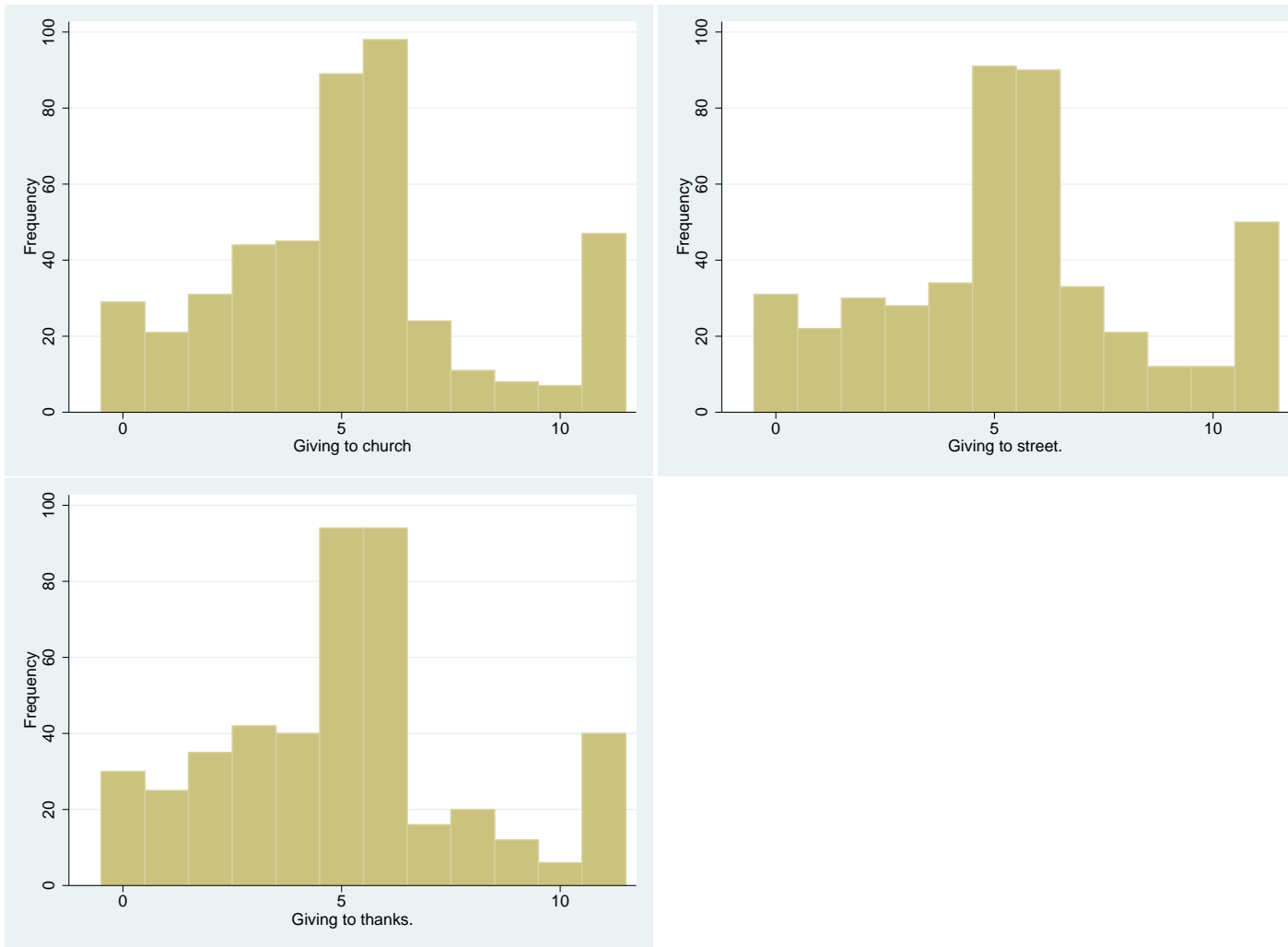Figure 1: Distribution of giving among normal church population.

Table 7: Giving after receiving insurance information compared to giving with no insurance nor insurance information

	(1) Giving to church	(2) Giving to church	(3) Giving to thanks.	(4) Giving to thanks.	(5) Giving to street.	(6) Giving to street.
model						
Insurance information	0.778*	0.756*	0.746*	0.662	1.004**	1.024**
	(0.450)	(0.412)	(0.448)	(0.412)	(0.457)	(0.473)
Constant	5.045***	4.561***	4.937***	4.575***	5.220***	5.254***
	(0.256)	(1.403)	(0.204)	(1.500)	(0.266)	(1.708)
sigma						
Constant	3.222***	3.089***	3.255***	3.192***	3.547***	3.422***
	(0.193)	(0.208)	(0.176)	(0.198)	(0.195)	(0.214)
Individual controls	No	Yes	No	Yes	No	Yes
Church dummies	No	Yes	No	Yes	No	Yes
Observations	289	260	289	260	289	260

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Control variables include participants demographics and measures of religious behaviour. Standard errors (between parentheses) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table 8: Giving after enrolment in insurance compared to giving with insurance information only

	(1) Giving to church	(2) Giving to church	(3) Giving to thanks.	(4) Giving to thanks.	(5) Giving to street.	(6) Giving to street.
model						
Insurance	-0.915*	-0.698*	-0.930*	-0.973*	-0.926**	-1.029**
	(0.471)	(0.396)	(0.502)	(0.497)	(0.434)	(0.451)
Constant	5.846***	4.733***	5.703***	7.309***	6.227***	7.145***
	(0.385)	(1.501)	(0.408)	(1.642)	(0.377)	(1.389)
sigma						
Constant	3.569***	3.459***	3.532***	3.506***	3.587***	3.592***
	(0.210)	(0.242)	(0.210)	(0.256)	(0.218)	(0.242)
Individual controls	No	Yes	No	Yes	No	Yes
Church dummies	No	Yes	No	Yes	No	Yes
Observations	285	251	285	251	285	251

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Control variables include participants demographics and measures of religious behaviour. Standard errors (between parentheses) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table 9: Giving after enrolment in insurance compared to giving with no insurance nor insurance information

	(1) Giving to church	(2) Giving to church	(3) Giving to thanks.	(4) Giving to thanks.	(5) Giving to street.	(6) Giving to street.
model						
Insurance	-0.116	-0.166	-0.159	-0.185	0.0827	0.0198
	(0.387)	(0.290)	(0.347)	(0.292)	(0.377)	(0.329)
Constant	5.044***	3.957**	4.937***	7.568***	5.219***	5.024***
	(0.259)	(1.657)	(0.203)	(1.535)	(0.267)	(1.679)
sigma						
Constant	3.436***	3.298***	3.255***	3.122***	3.611***	3.539***
	(0.189)	(0.209)	(0.175)	(0.202)	(0.216)	(0.238)
Individual controls	No	Yes	No	Yes	No	Yes
Church dummies	No	Yes	No	Yes	No	Yes
Observations	334	297	334	297	334	297

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Control variables include participants demographics and measures of religious behaviour. Standard errors (between parentheses) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table 10: Comparison of regular and revival week participants

	(1) Non revival participants mean	(2) Revival participants mean
female	0.61	0.61
age	36.07	34.96
married	0.43	0.32
higher education	0.28	0.35
employed	0.62	0.56
monthly income	362.08	367.24
going to church daily	0.08	0.11
frequent prayer	0.89	0.96
any insurance	0.44	0.48
Observations	404	117
F stat		1.59
p-value		.12

Table 11: Treatment effects on church giving for total sample (column 1) and revival week only (colmun 2)

	(1) Giving to church	(2) Giving to church
model		
Insurance	-0.911*	2.249***
	(0.475)	(0.661)
No insurance	-0.878*	2.033**
	(0.460)	(0.956)
Revival week	-2.247***	
	(0.619)	
Revival week X Insurance	3.065***	
	(0.824)	
Revival week X No insurance	2.866***	
	(1.062)	
Constant	4.726***	2.468
	(0.956)	(1.877)
sigma		
Constant	3.447***	3.585***
	(0.151)	(0.261)
Individual controls	Yes	Yes
Observations	521	117

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Standard errors (between parenthesis) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

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8 Appendix

8.1 Additional Tables

Table 12: Information on church branches

	(1)	(2)	(3)	(4)	(5)	(6)
	mean	mean	mean	mean	mean	mean
Age	27.00	22.00	21.00	22.00	43.00	22.00
Number of church members (approx.)	2500.00	300.00	500.00	500.00	2114.00	300.00
Church members have an education level higher than average	1.00	0.00	0.00	0.00	1.00	0.00
Church members have income higher than average	0.00	0.00	0.00	0.00	1.00	0.00
Average number attending Sunday service	1500.00	250.00	200.00	300.00	1260.00	150.00
Average amount received on a Sunday	.	2000.00	.	300.00	.	.
The church owns its building	1.00	0.00	1.00	1.00	1.00	1.00
The church owns other properties	0.00	0.00	0.00	0.00	1.00	0.00
Number of paid staff	8.00	4.00	6.00	8.00	13.00	1.00
The church has a welfare fund	1.00	1.00	1.00	1.00	1.00	1.00
Observations	1	1	1	1	1	1

Table 13: Non-anonymous church giving

	(1)	(2)
	Giving to Church named (vs keep)	Giving to Church named (vs keep)
model		
Insurance	-1.013**	-0.928*
	(0.473)	(0.483)
No insurance	-0.548	-0.607
	(0.493)	(0.495)
Constant	5.607***	4.492***
	(0.413)	(1.520)
sigma		
Constant	3.574***	3.528***
	(0.203)	(0.214)
Individual controls	No	Yes
Church dummies	No	Yes
Observations	454	404

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Standard errors (between parenthesis) are clustered at session level. Significance levels: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 14: Treatment effects for other dictator games

	(1) Thanks (vs church)	(2) Thanks (vs church)	(3) Street (vs church)	(4) Street (vs church)	(5) Thanks (vs street)	(6) Thanks (vs street)
model						
Insurance	-0.082	-0.129	0.006	0.024	-0.255	-0.389
	(0.330)	(0.298)	(0.271)	(0.307)	(0.266)	(0.262)
No insurance	0.093	-0.114	0.169	0.234	-0.127	-0.388
	(0.335)	(0.303)	(0.258)	(0.300)	(0.254)	(0.243)
Constant	4.901***	7.658***	5.702***	6.772***	4.841***	6.769***
	(0.249)	(1.050)	(0.205)	(0.831)	(0.185)	(0.963)
sigma						
Constant	2.712***	2.651***	2.496***	2.509***	2.456***	2.408***
	(0.135)	(0.145)	(0.131)	(0.139)	(0.132)	(0.133)
Individual controls	No	Yes	No	Yes	No	Yes
Church dummies	No	Yes	No	Yes	No	Yes
Observations	454	404	454	404	454	404

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Standard errors (between parenthesis) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table 15: Comparing revival church members and church members giving relatively high amounts to the church

	(1) Giving to church	(2) Giving to thanks.	(3) Giving to street.
model			
Insurance	-0.952*	-1.233**	-1.220**
	(0.544)	(0.591)	(0.490)
No insurance	-1.196**	-1.393***	-1.331***
	(0.525)	(0.479)	(0.477)
High givers	-0.976*	-1.697***	-1.675***
	(0.570)	(0.560)	(0.554)
High givers X Insurance	0.634	1.267	1.285
	(0.858)	(0.818)	(0.820)
High givers X No insurance	1.388*	2.425***	0.981
	(0.784)	(0.813)	(0.818)
Revival week	-1.925***	-2.505***	-2.411***
	(0.626)	(0.494)	(0.454)
Revival week X Insurance	2.840***	3.004***	2.919***
	(0.954)	(0.743)	(0.536)
Revival week X No insurance	2.296**	2.465**	2.225***
	(1.024)	(0.971)	(0.722)
Constant	6.124***	6.149***	6.698***
	(0.463)	(0.437)	(0.391)
Observations	514	514	514

Note: Tobit regression censored at 0 and 11. Dependent variables measure donations intended for the own church branch, the street children's fund (secular NGO) and the Inter-denominational Thanksgiving (religious NGO) with the alternative option to keep the money. Standard errors (between parenthesis) are clustered at session level. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

8.2 Model Appendix

8.2.1 Setup

We assume that a church member has an income of Y and chooses to give an amount g to the church. The church member enjoys utility $u(.)$ from consuming secular goods, and utility $\theta f(.)$ from consuming church goods. Thus a church member who gives g to the church enjoys a total utility of $u(Y - g) + \theta f(g)$. Both utility functions are concave, thrice differentiable, and increasing in their arguments. In each period church members face a probability π of an income loss of size D.

Under the assumption that insurance is offered through the church community, church giving also has the impact of reducing the size of the loss, thus the total loss would be $D - l(g)$. The function $l(g)$ is assumed to be increasing and concave. Under the assumption that church members believe in spiritual insurance, this probability is decomposed into a basic probability of loss $\tilde{\pi}$, and a portion of the loss that can be mitigated by giving money to spiritual goods. Therefore, the total subjective probability of giving is $\pi = \tilde{\pi} - p(g)$. The function $p(g)$ is assumed to be increasing and concave.

8.2.2 Optimal giving to the church in the absence of any insurance

In this section we assume that church members choose a particular level of giving to maximise their total expected utility. There is no insurance offered through the church.

$$\max_{g} \quad (1 - \pi)u(Y - g) + \pi u(Y - g - D) + \theta f(g) \tag{7}$$

This leads to the following first order condition:

$$(\pi - 1)u'(Y - g) - \pi u'(Y - g - D) + \theta f'(g) = 0 \tag{8}$$

The second order condition is satisfied:

$$(1 - \pi)u''(Y - g) + \pi u''(Y - g - D) + \theta f''(g) < 0$$

To determine how optimal giving varies with D the size of the loss, we rewrite the FOC in terms of $g^*(D, \theta)$,

$$(\pi - 1)u'(Y - g^*(D, \theta)) - \pi u'(Y - g^*(D, \theta) - D) + \theta f'(g^*(D, \theta)) = 0 \tag{9}$$

This equation implicitly defines the optimal giving g^*, which is a function of the expected loss D and θ.

We want to know the impact of experimentally manipulating D on the level of giving of individuals, in other terms the sign of $\dfrac{\partial g^*(D, \theta)}{\partial D}$.

Let $g_D^{*'}(D, \theta) = \dfrac{\partial g^*(D, \theta)}{\partial D}$. Taking the derivative of the FOC with respect to D leads to the following equality:

$$g_D^{*'}(D, \theta) * [\pi[u''(Y - g^* - D) - u''(Y - g^*)] + u''(Y - g^*) + \theta f''(g^*)] = -\pi u''(Y - g^* - D) \tag{10}$$

The right-hand side of the expression is *positive*. Each individual term of the expression multiplied by $g_D^{*'}$ is *negative*. Therefore $g_D^{*'}$ must also be *negative*.

Let us call $g_\theta^{*'} = \dfrac{\partial g^*(D, \theta)}{\partial \theta}$. We can also show that $g_\theta^{*'}$ is positive: a positive shock on the utility from consuming church goods increases church donations. Taking the derivative of the FOC with respect to θ leads to the following equality:

$$g_\theta^{*'}(D, \theta) * [(1 - \pi)u''(Y - g^*) + \pi u''(Y - g^* - D) + \theta f''(g^*)] = -f'(g^*) \tag{11}$$

The right-hand side of the expression is *negative*. Each individual term of the expression multiplied by $g_\theta^{*'}$ is *negative*. Therefore $g_\theta^{*'}$ is *positive*.

8.2.3   Community insurance: optimal giving when giving reduces the size of a loss

In this section we assume that giving to church reduces the size of the loss. $L = D - l(g)$ This assumption illustrates the channel of community insurance.

$$\max_{g} \quad (1 - \pi)u(Y - g) + \pi u(Y - g - D + l(g)) + \theta f(g) \tag{12}$$

This leads to the following first order condition:

$$(\pi - 1)u'(Y - g) + \pi(-1 + l'(g))u'(Y - g - D + l(g)) + \theta f'(g) = 0 \tag{13}$$

The secod order condition is satisfied:

$$(1 - \pi)u''(Y - g) + \pi l''(g)u'(Y - g - D + l(g)) + \pi(l'(g) - 1)^2 u''(Y - g - D + l(g)) + \theta f''(g) < 0$$

Rewriting the FOC in terms of $g^*(D, \theta)$:

$$(\pi - 1)u'(Y - g^*(D, \theta))) + \pi(-1 + l'(g^*(D, \theta)))u'(Y - g^*(D, \theta) - D + l(g^*(D, \theta)))$$
$$+ \theta f'(g^*(D, \theta))) = 0 \tag{14}$$

Taking the derivative of the FOC with respect to D leads to the following equality:

$$g_D^{*'} * [(1 - \pi)u''(Y - g^*) + \pi(l'(g^*) - 1)^2 u''(Y - g^* - D + l(g^*))$$
$$+ \pi l''(g^*)u'(Y - g - D + l(g^*)) + \theta f''(g^*)] = \pi(l'(g^*) - 1)u''(Y - g^* - D + l(g)) \tag{15}$$

On the right-hand side $u''(Y - g^* - D + l(g))$ is always *negative* while the expression multiplied by $g_D^{*'}$ of the left-hand side is also always *negative*. Therefore the sign of $g_D^{*'}$ depends on $(l'(g^*) - 1)$.

This provides a relationship between the efficiency of community based insurance and the optimal response of giving.

$$g_D^{*'} > 0 \text{ when } l'(g^*) > 1, \text{ or } g^* < l'^{-1}(1) \tag{16}$$

and

$$g_D^{*'} \leq 0 \text{ when } l'(g^*) \leq 1, \text{ or } g^* \geq l'^{-1}(1) \tag{17}$$

These conditions tell us that for low levels of optimal giving, experimentally increasing the perceived loss D will decrease optimal giving.

We show below that the variation in optimal giving g^* can be the result of a variation in θ. More

particularly, we demonstrate that $g_\theta^{*'} > 0$. Taking the derivative of the FOC with respect to θ gives:

$$g_\theta^{*'} * [(1-\pi)u''(Y-g^*) + \pi l''(g^*)u'(Y-g^*-D+l(g^*))$$
$$+ \pi(-1+l'(g^*))^2 u''(Y-g^*-D+l(g^*)) + \theta f''(g^*)] = -f'(g^*) \quad (18)$$

The right-hand side of the expression is *negative*. Each individual term of the expression multiplied by $g_\theta^{*'}$ is *negative*. Therefore $g_\theta^{*'}$ is *positive*.

Therefore our model predicts that there exist a threshold level for θ that will trigger a switch in the sign of $g_D^{*'}$.

Numerical illustration   Graphs 2 and 3 illustrate a numerical example, in which we simulate the case of $g_D^{'*}(D,\theta)$ changing sign around the threshold $\tilde{\theta}$.

This example uses a CARA utility function $(u(c) = 1 - exp(-ac))$, and assumes that $l(g) = s \, log(1+g)$. The parameters D, s are chosen such that $D - l(g) \geq 0$. Figure 2 shows that the optimal giving $g^*(D,\theta)$ is increasing in θ while Figure 3 indicates that $g^*(D,\theta)$ is an increasing function of D until the threshold $\tilde{\theta} = 0.345$.

8.2.4   Spiritual insurance: optimal giving when giving reduces the subjective probability of a loss

In this section we assume that giving reduces the size of the loss. $\pi = \tilde{\pi} - p(g)$ This assumption illustrates the channel of spiritual insurance.

$$\max_g \quad (1-\tilde{\pi}+p(g))u(Y-g) + (\tilde{\pi}-p(g))u(Y-g-D) + \theta f(g) \quad (19)$$

This leads to the following first order condition:

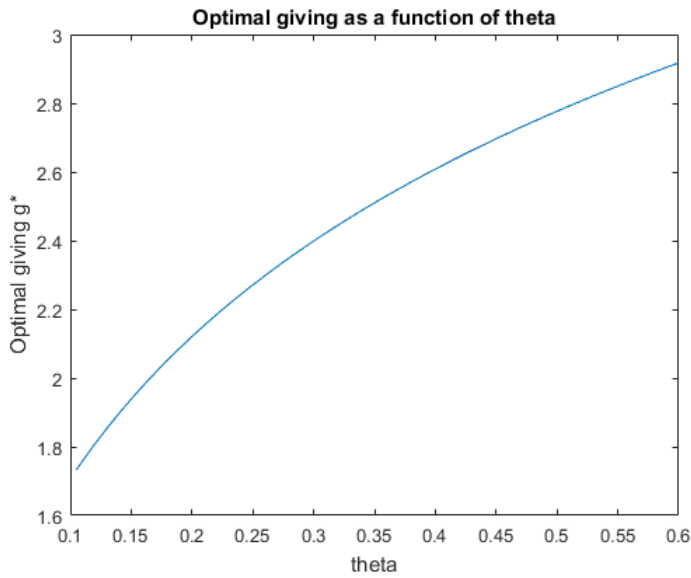$$p'(g)u(Y-g) - (1-\tilde{\pi}+p(g))u'(Y-g) - p'(g)u(Y-g-D) - (\tilde{\pi}-p(g))u'(Y-g-D) + \theta f'(g) = 0 \quad (20)$$

Figure 2: Community insurance - Numerical example: $Y = 10$, $D = 8$, $\pi = 0.4$, $u(.)$ CARA with $a = 0.1$, $f(.)$ CARA with $a = 1$, and $l(.)$ a logarithmic function with $s = 3.5$
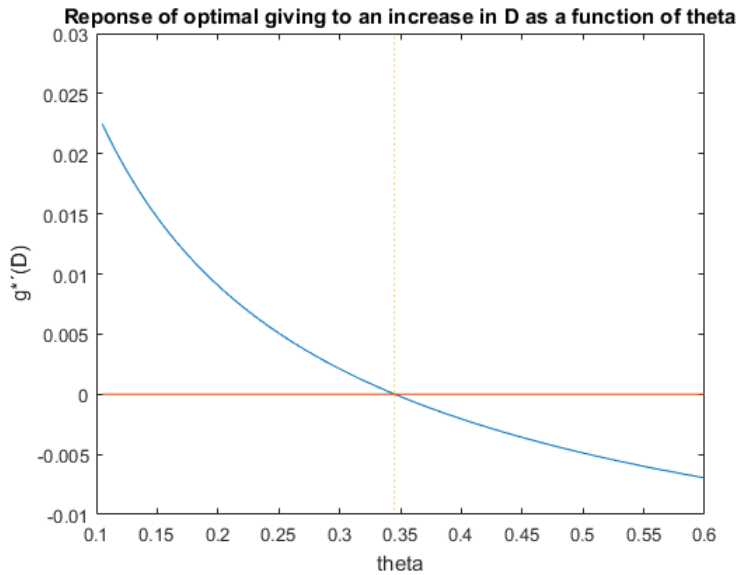

Figure 3: Community insurance - $g^{*'}(D)$ as a function of θ - numerical example marking the threshold $\tilde{\theta}$ where the sign of $g^{*'}(D)$ changes from positive to negative

Taking the second derivative of the objective function leads to:

$$p''(g)(u(Y-g) - u(Y-g-D)) + 2p'(g)(u'(Y-g-D) - u'(Y-g)) +$$

$$(1 - \tilde{\pi} + p(g))u''(Y-g) + (\tilde{\pi} - p(g))u''(Y-g-D) + \theta f''(g) \quad (21)$$

The first, third, fourth, and fifth terms are negative. The second term is positive. Intuitively, this expression is negative and the SOC is satisfied if the effect of the loss on the marginal utility of income not be too large. In other words, the income effect of the loss on the demand for insurance should not outweigh the substitution effect.

This condition is not too demanding. For example, it is satisfied in the numerical simulation shown below, where u is a CARA utility function: $u(c) = 1 - e^{-ac}$. Indeed, in this case,

$$p''(g)(u(Y-g) - u(Y-g-D)) + 2p'(g)(u'(Y-g-D) - u'(Y-g)) +$$

$$(1 - \tilde{\pi} + p(g))u''(Y-g) + (\tilde{\pi} - p(g))u''(Y-g-D) + \theta f''(g)$$

$$= [p''(g) + 2ap'(g)) - a^2(\tilde{\pi} - p(g))](e^{(-a(Y-g-D))} - e^{(-a(Y-g))}) - a^2 e^{(-a(Y-g))} + \theta f''(g) \quad (22)$$

A sufficient condition for this expression to be negative is thus given by

$$p''(g) + 2ap'(g) - a^2(\tilde{\pi} - p(g)) \leq 0$$

With $p(g) = k\log(1+g)$ as in the numerical example below, this is equivalent to

$$k \leq \frac{\tilde{\pi}}{\frac{2}{a(1+g)} - \frac{1}{a^2(1+g)^2} + \log(1+g)}$$

This condition holds for example in the simulation below, where $Y = 10$, $D = 8$, $\tilde{\pi} = 0.4$, $a = 0.1$ and $k = 0.09$.

In order to determine how optimal giving varies with D the size of the loss, we rewrite the FOC

in terms of $g^*(D, \theta)$,

$$p'(g^*(D,\theta))u(Y - g^*(D,\theta)) - (1 - \tilde{\pi} + p(g^*(D,\theta)))u'(Y - g^*(D,\theta)) -$$

$$p'(g^*(D,\theta))u(Y - g^*(D,\theta) - D) - (\tilde{\pi} - p(g^*(D,\theta)))u'(Y - g^*(D,\theta) - D) + \theta f'(g^*(D,\theta)) = 0 \quad (23)$$

Taking the derivative of the FOC with respect to D leads to the following equality:

$$g_D^{*'} * [p''(g^*)[u(Y - g^*) - u(Y - g^* - D)] + 2p'(g^*)[u'(Y - g^* - D) - u'(Y - g^*)]$$

$$+ (\tilde{\pi} - p(g^*))[u''(Y - g^* - D) - u''(Y - g^*)] + u''(Y - g^*) + f''(g)]$$

$$= -[p'(g^*)u'(Y - g * -D) + (\tilde{\pi} - p(g))u''(Y - g^* - D)] \quad (24)$$

Therefore, we have the following conditions:

$$g_D^{*'} > 0 \text{ when } - [p'(g^*)u'(Y - g * -D) + (\tilde{\pi} - p(g))u''(Y - g^* - D)] < 0 \quad (25)$$

$$g_D^{*'} < 0 \text{ when } - [p'(g^*)u'(Y - g * -D) + (\tilde{\pi} - p(g))u''(Y - g^* - D)] > 0 \quad (26)$$

Numerical illustration We simplify these conditions using a CARA utility function: $u(c) = 1 - e^{-ac}$, $u'(c) = ae^{-ac}$, $u''(c) = -a^2 e^{-ac}$ and the risk aversion $R(c) = -\dfrac{u''(c)}{u'(c)} = a$

$$-p'(g) - (\pi - p(g))\frac{u''(Y - g - D)}{u'(Y - g - D)} = -p'(g) + (\tilde{\pi} - p(g))a \quad (27)$$

Therefore:

$$g_D^{*'} > 0 \text{ when } - p'(g^*) + (\tilde{\pi} - p(g^*))a < 0 \quad (28)$$

$$g_D^{*'} < 0 \text{ when } - p'(g^*) + (\tilde{\pi} - p(g^*))a > 0 \quad (29)$$

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which can be rewritten as:

$$g_D^{*'} > 0 \text{ when } \frac{1}{a}p'(g^*) > (\tilde{\pi} - p(g^*)) \tag{30}$$

$$g_D^{*'} < 0 \text{ when } \frac{1}{a}p'(g^*) < (\tilde{\pi} - p(g^*)) \tag{31}$$

Therefore, we find that $g_D^{*'}$ is positive when the effectiveness of the spiritual insurance divided by the coefficient of absolute risk aversion at g^* is greater than the level of risk at g^*.

We can now also derive the conditions under which $g_D^{*'}$ is increasing until a certain level, and then decreasing. For this, we use the following reformulation of conditions (32) and (33):

$$g_D^{*'} > 0 \text{ when } p'(g^*) + ap(g^*) > a\tilde{\pi} \tag{32}$$

$$g_D^{*'} < 0 \text{ when } p'(g^*) + ap(g^*) < a\tilde{\pi} \tag{33}$$

Let us define $\Gamma(g) = p'(g) + ap(g)$. For $g_D^{*'}$ to be first positive and then negative we need $\Gamma(g)$ to be decreasing:

$$g_D^{*'} > 0 \text{ when } g^* < \Gamma^{-1}(a\pi) \tag{34}$$

$$g_D^{*'} < 0 \text{ when } g^* > \Gamma^{-1}(a\pi) \tag{35}$$

In order for Γ' to be decreasing, we need the following condition to be true:

$$\Gamma'(g) \leq 0 \Leftrightarrow p''(g) + ap'(g) \leq 0 \tag{36}$$

In the following, we will use a parametrization of $p(g)$ that is concave, and an a such that condition (36) hold in order to illustrate that with an increase in the level of giving, due to a higher θ for example, the sign of $g_D^{*'}$ can reverse.

We know that g^* is a function of θ, and we will now show a numerical example that illustrates the possibility of $g_D^{*'}|_{g^*(\theta)}$ to be positive until $g^*(\tilde{\theta})$ and negative afterwards. We will use the a simple

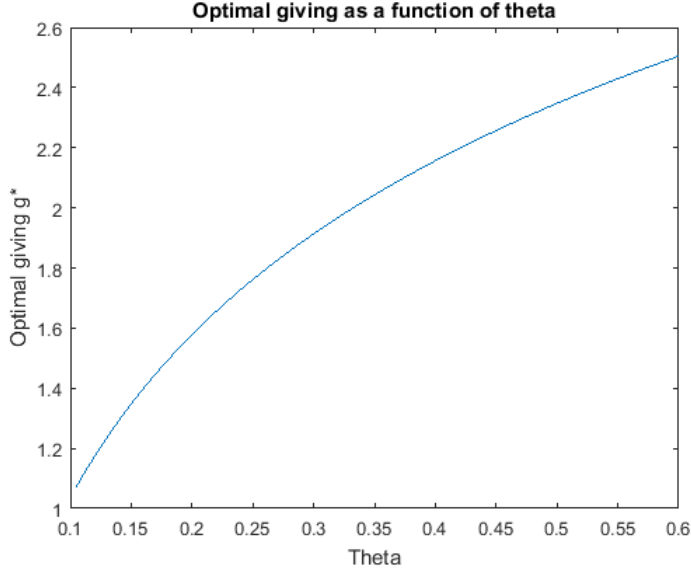Figure 4: Numerical example: $Y = 10$, $D = 8$, $\pi = 0.4$, $u(.)$ CARA with $a = 0.1$, $f(.)$ CARA with $a = 1$, and $p(.)$ a logarithmic function with $k = 0.09$

logarithmic function $p(g) = klog(g + 1)$ where $\tilde{\pi}$ and k are such that $0 < \tilde{\pi} - p(g) < 1$. If we insert this into equation (32), we get:

$$-\frac{k}{g^*(\theta) + 1} + (\tilde{\pi} - klog(g^*(\theta) + 1))a < 0 \tag{37}$$

Together with (33), we know that at a specific $\tilde{\theta}$, this equation is equal to zero:

$$-\frac{k}{g^*(\tilde{\theta}) + 1} + (\tilde{\pi} - klog(g^*(\tilde{\theta}) + 1))a = 0 \tag{38}$$

The following graphs illustrate a numerical example, in which we simulate the case of $g^*(\theta)$ being around the threshold in (38).
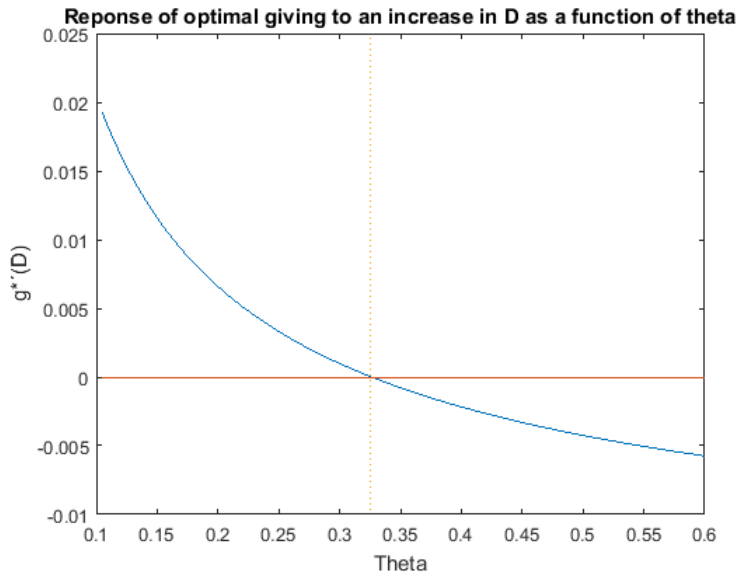
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Figure 5: $g^{*'}(D)$ as a function of θ - numerical example marking the threshold $\tilde{\theta}$ where the sign of $g^{*'}(D)$ changes from positive to negative

8.3   Questionnaire

1. How old are you?

   – number between 18 and 75

2. What is your gender?

   – Male
   – Female
   – prefer not to answer
   – do not know
   – not applicable

3. Where were you born?

   – Accra
   – Rural Ghana
   – Urban Ghana (not Accra)
   – Outside Ghana in Africa
   – Outside Africa
   – prefer not to answer
   – do not know
   – not applicable

4. How long have you lived in Accra?

   – Whole life
   – More than 10 years
   – 5 10 years
   – 2-5 years
   – Less than 2 years
   – prefer not to answer
   – do not know
   – not applicable

5. Are you married?

   – Yes
   – No
   – prefer not to answer
   – do not know
   – not applicable

6. What is the highest level of education you have completed?

   – No schooling
   – Primary
   – JHSS
   – SHS
   – Polytechnic
   – Professional degree
   – First degree
   – Advanced degree
   – prefer not to answer

   – do not know
   – not applicable

7. As an adult, have you ever left Ghana for more than 3 months for work or study?

   – Yes
     – Where did you go?
   – No
   – prefer not to answer
   – do not know
   – not applicable

8. What is your current work status?

   – Student
   – Unemployed or casual workers
   – Employed
   – Self-employed
   – Inactive(e.g. housewife)
   – Retired
   – prefer not to answer
   – do not know
   – not applicable

9. In which sector is your principal activity?

   – Unemployed
   – Student
   – Government
   – Agriculture
   – Services
   – Manufacturing or construction
   – Not-for-profit
   – prefer not to answer
   – do not know
   – not applicable

10. What is your principal source of income?

    – Salaried job
    – Entrepreneur
    – Family
    – Pension
    – Social support
    – prefer not to answer
    – do not know
    – not applicable

11. How many people live in your household?

    – number
    – prefer not to answer
    – do not know

– not applicable

12. Who usually makes the final financial decisions in your household?

    – Me
    – Spouse
    – Parent
    – Other senior relative
    – Joint decisions incl. me
    – Joint decisions not incl. me
    – prefer not to answer
    – do not know
    – not applicable

13. How much do you earn on average per month in Ghana cedis?

    – Less than 200
    – 200 500
    – 500-1000
    – 1000-1500
    – 1500-2000
    – 2500-3000
    – 3000-8000
    – More than 8000
    – prefer not to answer
    – do not know
    – not applicable

14. How much does your household earn on average per month in Ghana cedis?

    – Less than 200
    – 200 500
    – 500-1000
    – 1000-1500
    – 1500-2000
    – 2500-3000
    – 3000-8000
    – More than 8000
    – prefer not to answer
    – do not know
    – not applicable

15. Are you responsible for the daily financial needs (not including any salary payments) of any of the following people other than yourself?

    – Minor children
    – Adult children
    – Elderly parent
    – Other family

– Other community member
– prefer not to answer
– do not know
– not applicable

16. How many people in each of the categories are you financially responsible for?

17. Which of the following expenses in you and your dependents' lives do you face on a regular monthly basis?

    – Food
    – Sickness(including medication costs, etc.)
    – Transport
    – Insurance
    – Helping needy family members
    – Church contribution
    – Other social contribution (e.g. pledge to a school or charity)
    – Investment in own business
    – Investment in friend, relative, or business partner's business
    – prefer not to answer
    – do not know
    – not applicable

18. How much do you spend each month in cedis on the particular expenses?

19. In the last year, was there a substantial, unexpected increase in any of these aspects of you and your dependant's lives?

    – Food
    – Sickness(including medication costs, etc.)
    – Transport
    – Insurance
    – Helping needy family members
    – Church contribution
    – Other social contribution (e.g. pledge to a school or charity)
    – Investment in own business
    – Investment in friend, relative, or business partner's business
    – I faced no unexpected expenses
    – prefer not to answer
    – do not know
    – not applicable

20. How much did you spend to address the substantial increase?

21. What is your principal daily means of transport?

    – Privately owned car

- Privately owned motorcycle
- Trotro
- Taxi
- Bicycle
- Foot
- Train
- prefer not to answer
- do not know
- not applicable

22. How many cellphones do you own?

    - number
    - prefer not to answer
    - do not know
    - not applicable

23. How many hours a week do you spend browsing the internet?

    - Less than 30 minutes
    - 30 minutes to 2 hours
    - 2 to 5 hours
    - 5-10 hours
    - More than 10 hours
    - prefer not to answer
    - do not know
    - not applicable

24. Do you own a business?

    - Yes
    - No
    - prefer not to answer
    - do not know
    - not applicable

25. How many years have you owned your business?

    - Less than 1 year
    - 1 3 years
    - 3 10 years
    - More than 10 years
    - prefer not to answer
    - do not know
    - not applicable

26. How many employees do you have?

    - number
    - prefer not to answer
    - do not know
    - not applicable

27. Which religion do you belong to?

    - Pentecostal or charismatic Christian
    - Catholic Christian
    - Traditional
    - Protestant Christian
    - Muslim
    - No religion
    - prefer not to answer
    - do not know
    - not applicable

28. Were you born into this religion?

    - Yes
    - No
    - prefer not to answer
    - do not know
    - not applicable

29. Which denomination do you belong to? (Please specify a particular denomination, e.g. Action Chapel, ICGC, etc.)

    - name
    - prefer not to answer
    - do not know
    - not applicable

30. Do you belong to a different denomination than 5 years ago?

    - No
    - Yes,I changed within the last 5 years
    - Yes, I changed more than 5 years ago
    - prefer not to answer
    - do not know
    - not applicable

31. What are the main reasons you are with your current church?

    - The teaching about God corresponds to what I believe in
    - I go for the moral guidance to me and my family
    - I like the atmosphere of the services
    - Friends or relatives brought me there
    - Other members made an effort to welcome me
    - The congregation contains many interesting and successful people
    - I hope to meet a good marriage partner for me or my children
    - The building is close to my home

- The facilities are comfortable (e.g. airconditioning, comfortable seating, etc.)
- prefer not to answer
- do not know
- not applicable

32. Are you engaged in any of the following ministries of your church?

- Ushering or welcoming guests
- Children's ministry
- Worship team
- Prayer ministry
- Men or women's ministry
- Youth ministry
- Outreach
- Deacon or deaconess
- Protocol
- Pastoring
- prefer not to answer
- do not know
- not applicable

33. How many hours a week do you spend on each ministry? (preparation, participation, etc.)

34. Have you received financial assistance from your church in the last 5 years (incl. provisions)?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

35. How many times per week or per year do you attend your church?

- Less than once a year
- A few times per year
- A few times per month
- Weekly
- More than once per week
- prefer not to answer
- do not know
- not applicable

36. On average, how many hours do you spend each time you visit your church? (e.g duration of a service, prayer meeting, etc.)

- Less than 1 hour
- 1-2 hours

- 2-3 hours
- More than 3 hours
- prefer not to answer
- do not know
- not applicable

37. How many hours do you travel (going and coming) to attend your regular church?

- Less than 30minutes
- 30minutes 1 hour
- More than 1 hour
- prefer not to answer
- do not know
- not applicable

38. Have you moved your place of residence in order to be closer to your church?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

39. In the last 6 weeks, have you engaged in any of the following activities to bring others to your church?

- Preaching or teaching in the church
- Preaching or teaching outside the church
- Inviting friends or family to church
- Distributing church material in public
- Speaking or writing in public media (newspapers, radio, television, etc.)
- Prayer
- prefer not to answer
- do not know
- not applicable

40. How often do you pray to God?

- Multiple times per day
- Once per day
- A few times per week
- Occasionally
- prefer not to answer
- do not know
- not applicable

41. Are there any foods you do not eat for religious reasons?

- Yes
- No
- prefer not to answer

- do not know
- not applicable

42. Do you drink alcohol?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

43. Is this decision for religious reasons?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

44. Do you smoke tobacco?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

45. Is this decision for religious reasons?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

46. Do your religious beliefs affect the way you dress?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

47. Which of the following ceremonies have you done or would you do for your newborn child?

- Traditional naming
- Church blessing
- Baptism
- Outdooring party
- Nothing
- prefer not to answer
- do not know
- not applicable

48. What was the main cause of the most recent death in your extended family?

- Accident
- Illness
- Violence
- Old age
- prefer not to answer
- do not know
- not applicable

49. Do you think there was spiritual element involved?

- Yes
- No
- prefer not to answer
- do not know
- not applicable

50. How much on average do you give to the church per month?

- Less than 5 cedis
- 5 10 cedis
- 11 50 cedis
- 51 100 cedis
- 101 200cedis
- 201-500 cedis
- More than 501 cedis
- prefer not to answer
- do not know
- not applicable

51. Does giving to charity serve the same spiritual duty as giving directly to the church?

- No, charity is more important
- No, charity is less important
- Yes, they are equally important
- I do not think I have a duty to either.
- prefer not to answer
- do not know
- not applicable

52. How is God involved in your finances?

- God leaves me to run my own financial affairs
- God provides enough that I do not suffer
- God blesses me with financial abundance
- God is not interested in my finances
- prefer not to answer
- do not know
- not applicable

53. Is it important for you that your close friends come from the same church as you?

   – Yes, I try to only make friends with people from my church or mosque
   – Yes, I try to seek people from my church or mosque but it is not so important
   – No, it is not important at all
   – No, I prefer not to be friends with people from my church or mosque
   – prefer not to answer
   – do not know
   – not applicable

54. Is it important for you that your coworkers come from the same church as you?

   – Yes, I only work with people from my church or mosque
   – Yes, I try to seek people from my church or mosque but it is not so important
   – No, it is not important at all
   – No, I prefer not to work with people from my church or mosque
   – prefer not to answer
   – do not know
   – not applicable

55. Do you try to do business with people from the same church as you?

   – Yes, I only work with people from my church
   – Yes, I try to seek people from my church but it is not so important
   – No, it is not important at all
   – No, I prefer not to work with people from my church or mosque
   – prefer not to answer
   – do not know
   – not applicable

56. Who do you call when you need counselling about personal or family issues?

   – No one
   – Government or NGO social services
   – Friends
   – Family
   – Pastor
   – Imam
   – Church member
   – Work superior
   – Medical professional

   – prefer not to answer
   – do not know
   – not applicable

57. Who do you go to when you need financial help?

   – No one
   – Government or NGO social services
   – Friends
   – Family
   – Church community
   – Bank
   – Informal financial services (e.g susu group, moneylenders)
   – Work superior
   – prefer not to answer
   – do not know
   – not applicable

58. Who do you go to for medical support when you are sick?

   – No one
   – Government hospital
   – Private hospital
   – Traditional healer
   – Local clinic
   – Friends
   – Family
   – Pastor
   – Imam
   – Work superior
   – prefer not to answer
   – do not know
   – not applicable

59. Within the last 2 years, have you ever attended a prayer camp either for yourself or on behalf of a friend or family member?

   – Yes
   – No
   – prefer not to answer
   – do not know
   – not applicable

60. Which other clubs or associations are you an active member of?

   – name
   – prefer not to answer
   – do not know
   – not applicable

61. How did you meet your spouse if you are married? Where is the most likely place you will meet your spouse if you are not married?

  – Church
  – Through friends
  – Through family
  – Through work
  – Through school
  – Other social gathering
  – Internet
  – prefer not to answer
  – do not know
  – not applicable

62. Generally speaking, would you say other Ghanaians can be trusted?

  – People can almost always be trusted
  – People can usually be trusted
  – You usually cannot be too careful dealing with people
  – You always cannot be too careful dealing with people
  – prefer not to answer
  – do not know
  – not applicable

63. How much of the time do you trust the Ghanaian government?

  – I always trust the government
  – I mostly trust the government
  – I mostly mistrust the government
  – I always mistrust the government
  – prefer not to answer
  – do not know
  – not applicable

64. Are you registered for the National Health Insurance Scheme?

  – No
  – Yes
  – prefer not to answer
  – do not know
  – not applicable

65. Why not?

66. Do you hold any other sorts of insurance?

  – Yes
  – No
  – prefer not to answer
  – do not know
  – not applicable

67. Please specify which ones

  – name

  – prefer not to answer
  – do not know
  – not applicable

ADDITIONAL QUESTIONS FOR MARKET MEMBERS

68. Do you belong to the Kaneshie Markets Association?

  – Yes
  – No
  – prefer not to answer
  – do not know
  – not applicable

69. How many years have you belonged to the association?

  – number
  – prefer not to answer
  – do not know
  – not applicable

70. How many years have you paid your market dues?

  – number
  – prefer not to answer
  – do not know
  – not applicable

71. Have you ever met Auntie Eva, the market secretary?

  – Yes
  – No, but I know who she is
  – No, I have no idea who she is
  – prefer not to answer
  – do not know
  – not applicable

72. Have you ever received financial help from the market (loan, emergency money, help with stock, etc.)?

  – Yes, from the head of the market line
  – Yes, from the Kaneshie Market Association
  – Yes, from any other market members
  – No, I have received no help from the market
  – prefer not to answer
  – do not know
  – not applicable

73. Which market line do you belong to?

  – name
  – prefer not to answer
  – do not know
  – not applicable

8.4 Experimental protocol

Before participants arrive, enumerators prepare the room: they install chairs, tables, computers, and dividers. The session monitor prepares desks numbers to be given to participants, receipts, insurance forms, and envelopes for random draw. Enumerators sit and start the program while waiting for the participants.

When participants arrive, they are given an ID number and sit in front of a computer. The session monitor welcomes them and explains the experiment in English. One enumerator translates the explanations in the local language spoken by the participants (most often Twi).

Session monitor: *Welcome to our study, thank you for coming. We are a group of researcher from Toulouse in France and we are doing a study here in Ghana in collaboration with Central University College. The first part of the study consists in a questionnaire that contains demographic questions as well as questions about your religious practices. For completing the survey, you will receive 20GHS.The questionnaire is anonymous, no one will be able to associate you with the questionnaire. We will not record any private information with your answers. You are allowed to skip any question you do not want to answer. If you choose to stop the interview we will give you 5GHS for your effort to come here. In a second part, you will play a game on how to allocate 11GHS. You will be asked 10 questions; in each question you can choose you to allocate money between two different recipients. The list of the different recipients is written on the white board. First, in some occasions, you will have the opportunity to keep money for yourself. Another option will be to give money to the Streets Children Fund. This is an NGO active in Jamestown that helps children from the streets to access education. You will also be allowed to give to the National Thanksgiving Association, for a National Week of Prayer gathering as many Ghanaians as possible, from different religions, to pray for Ghana. This year the Week of prayer is expected to be held in March. You will also have the chance to make some donation to your own church privately, and in another option you can offer money to your church with your name. At the end of the game, we will pick one question randomly with equal probabilities. We will make payments according to your answers to this question. First, you will play a practice round, helped by your enumerator. You will play the real round privately. The session monitor is here to help you at any time. There are different types of sessions. The session we run with you is picked at random. We now ask you if you agree with us using the data from this session - the answers you give in the questionnaire and in the game which are anonymous - for research purpose.*

PAUSE, wait for objections. Continue if there are no objections. One participant draws an

envelope that contains the type of the session: 'INSURANCE, 'INSURANCE INFORMATION, or 'NO INSURANCE.

If the session is 'INSURANCE:

Session monitor: *The type of session we run with you is called 'INSURANCE. This means that we will offer you a funeral insurance policy. This insurance scheme is offered on the market by Enterprise Life and we will purchase it for you. From the day we enroll your name and for one year, if you or one of your family members (to be designated) dies, a recipient will get money to finance the funeral expenses (1000GHS). You can choose to enroll with you one family member. It can be of your parents, one of your minor children, your wife or husband. They should be younger than 74. To cover you and a family member, this insurance costs annually 12.50GHS. This group insurance is coordinated by your church. The coordinator is your Pastor (name). At the end of the year, you can collectively decide to continue or not the insurance contract. Any claim should be addressed to your Pastor, he will receive money for you if anything happens. If you do not wish to be benefit from the insurance policy, please inform us.*

If the session is 'INSURANCE INFORMATION:

Monitor: *The type of session we run with you is called 'INSURANCE. This means that we will give you information about an insurance that you can decide to purchase for yourself. The insurance we would like to discuss with you is a funeral insurance offered by Enterprise Life: if you or one of your family members (to be designated) dies, a recipient will get money to finance the funeral expenses (1000GHS). You can choose to enroll with you one of your parents, one of your minor children, or your wife or husband. They should be younger than 74. To cover you and one family member, this insurance costs annually 12.50GHS. At the end of the year, you can collectively decide to continue or not the insurance contract. The coordinator for this group insurance could be your Pastor (name). Any claim would be addressed to him, he would receive money for you if anything happens. If you are interested in buying this insurance, please contact Pastor (name).*

For all the sessions:

Monitor: *The experiment is now about to start. Please remember that the answers that you will give will be anonymous and be kept secret. The enumerators are here to guide you through the survey and translate it if necessary. You can leave the experiment at any time and you will be paid a show-up fee of 5GHS.*

The participants answer the questionnaire with the help of enumerators. After answering the

questionnaire, participants in 'INSURANCE sessions fill in the insurance form. Then they proceed to the game, first a practice round helped by the enumerators, and then the real round by themselves. Once they have entered their choices for the 10 money allocation questions, the participants randomly pick a letter that corresponds to one question. The session monitor enters the letter in the computer to record total payment. Participants leave the room and wait to be called for payment.