



Financial Services and the Informal Economy

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FINANCIAL SERVICES AND THE INFORMAL ECONOMY

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Abstract

This paper examines the impact of formality of employment on the utilisation of financial services, using data from the October 2000 Income and Expenditure Survey and the September 2000 Labour Force Survey. The presence of an employed member in the household is seen to be important for the utilisation of both bank accounts and funeral insurance, even after controlling for income. Furthermore there are strong links between the nature of this employment and utilisation of financial services. Employees are more likely to utilise financial services than the self-employed. Among employees, the probability of utilising financial services increases with the degree of formality of employment. These effects are stronger for formal banking services than for funeral insurance which includes informal burial societies.

1. Introduction

Recent literature shows an increasing recognition of the importance of risk and vulnerability in understanding poverty dynamics and the persistence of poverty over time (Morduch (1999), World Bank (2001), Holzmann and Jorgensen (1999), Dercon (2001)). Vulnerability refers to the inability to manage risk or cope with losses or costs resulting from the occurrence of a risky event (Brown and Churchill (1999)) and there is a mutually reinforcing relationship between risk, poverty and vulnerability. Vulnerability is a cause of poverty and poverty is in turn a source of vulnerability. To achieve sustainable poverty reduction, poor people need to be able to effectively manage risk. It is through such management that households are able to reduce and mitigate risk and lessen the impact of shocks. Lack of effective risk management instruments and assets limit the abilities of the poor to cope with shocks and often result in actions to cope in the short term that worsen deprivation in the long term, hence preventing any escape from poverty. Short term coping strategies such as taking children out of school, selling productive assets and borrowing from money lenders at high interest rates increase vulnerability to poverty. Actions to avoid risk can also perversely contribute to permanent deeper poverty. For example, a household may not utilize arable land for fear of crop loss or a rural person may stay at home where there is no chance of employment rather than risk the money required to move to an urban area to seek employment.

To manage risks people rely on both informal and formal strategies. Informal strategies include arrangements that involve individuals and households (self-insurance) or communities (informal group insurance). Formal strategies include market-based activities (formal credit, savings and insurance) and publicly provided mechanisms such as social pensions, disability grants and unemployment insurance. Households often face constraints to adopting efficient risk management strategies. These constraints include exclusion from or limited access to formal and/or informal savings, credit and insurance markets. Central to any vulnerability analysis is an understanding of households' access to and utilisation of these financial risk management instruments.

South Africa has a well-developed financial sector that supplies a sophisticated array of borrowing, lending and insurance products. This sector gives some South African households a range of options through which to smooth consumption and manage risk. However, as these options are supplied through the private sector market for financial services, it is largely only those households at the upper end of the income distribution who have had the resources to buy these services. A number of studies document the exclusion of the majority of South Africans from formal banking services (Van der Ruit (2002), MFRC(2001), Dallimore (2003), Dallimore and Mngimeti (2003), Porteous (2003a), Ardington (1999), Nigrini(2001)). Access to commercial banks is generally limited to salaried workers (most commercial banks require a payslip in order to open an account) excluding the poor, the unemployed, self-employed and informally employed. There has been rapid growth in micro-lending over the last decade. However, in contrast to other developing countries the South African micro-credit sector has been "dominated by consumer loans to salaried workers" with little evidence of a pro-poor focus (Porteous (2003b)). The collection technologies employed continue to rely heavily on access to a bank

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account or formal salaried employment¹. While rotating savings and credit groups (stokvels) and burial societies are important sources of informal insurance for low income households, evidence suggests that rather than being substitutes for formal financial products, these forms of insurance are complementary.

The South African government and financial sector have recognised the absence of basic financial services, particularly in rural areas, as a major obstacle to growth and poverty reduction. In October 2003 the South African financial sector committed itself to the Financial Sector Charter. The financial sector acknowledged that “access to first-order retail financial services is fundamental to black economic empowerment and to the development of the economy as a whole” (Banking Council of South Africa (2003:9)). Signatories to the charter committed to substantially increase effective access to retail financial services for the lower income groups by 2008. The Reserve Bank is currently drafting new legislation to simplify the regulatory framework for banks and other financial entities. The Dedicated Banks Bill aims to strengthen the country’s economic infrastructure in order to extend provision of affordable financial services to lower income groups (Morgan (2004)).

Aside from the usual data limitations, there are a number of challenges specific to measuring access to financial services. Firstly, access to financial services has a number of dimensions including affordability, terms and appropriateness of the product offering and physical access (Porteous (2003)). People with access to a service may also choose not to utilise that service. It is therefore very difficult in practice to measure access to financial services. Utilisation of financial services is the best available proxy for access to financial services and at the very least provides a lower bound. Secondly, although financial services are procured by individuals, from a vulnerability perspective the correct unit of analysis is “that group that has a shared responsibility for managing the consequences of an adverse event that befalls any of the individuals within the group” (Bester *et al* (2004)). Although some households may rely on broader family networks for support and in other households all members of a household may not necessarily support each other in the advent of an adverse event, the household does seem to be the most appropriate unit of analysis for empirical work. Using data from nationally representative surveys undertaken in 2000, this paper explores the utilisation of financial services by South African households at different positions in the distribution of income. By examining the impact of various predictors of utilisation of financial services we go some way towards understanding the factors that might be associated with a household's ability to access these services.

We are particularly interested in the impact of the employment status of individuals in the household on the vulnerability of the household in general, and access to financial services in particular. While formal secure employment of its members may be a great source of security to a household and may facilitate access to financial services, many people work in the informal economy² with very little security or benefits attached to their work. Indeed informal employment is a large and growing share of employment and income in many developing countries, with the informal sector accounting for over 30% of employment in South Africa³. There has been increasing informalisation of the formal labour market and a rapid expansion of the informal economy (Canagarajah and Sethuraman (2001), Beattie (2000), Chen *et al* (2001), Valodia (2002), Aliber (2001), Budlender *et al* (2002)). Globalisation and technological change have intensified competition pressurizing firms to minimize production costs, especially labour. Patterns of work are changing worldwide, with temporary workers, independent contract workers and casual or part time workers increasingly filling positions once held by permanent, regular workers. A feature of this informalisation is the increasing reliance upon labour brokers and sub-contractual relationships as firms attempt to reduce labour costs and avoid labour legislation (Del Conte (2000), Canagarajah and Sethuraman (2001: 8), Aliber (2001) and Valodia (2000)).

Although the informal economy is extremely diverse in the nature of work, type of enterprises and level of income, informal workers in the large part are poorly remunerated and vulnerable. Chen *et al*

¹ Until the late-1990s the two main collection technologies were payroll deductions for civil servants and employees of larger private sector companies and Card and PIN lending where the cash lenders retained a borrower’s card and PIN number. The Card and PIN collection methodology was outlawed in 1999 and in 2000 government withdrew payroll deduction facilities for civil servants. The micro-credit sector still relies heavily on the production of a payslip as proof of employment and the use of debit orders on formal bank accounts. (Porteous (2003b))

² The informal economy is comprised of self-employment and wage employment in informal enterprises and informal wage employment in formal enterprises. Informal work is “not recognised, regulated, or protected by existing legal or regulatory frameworks. International Labour Conference (2002: Chapter 1)”

³ This estimate does not include individuals working in informal jobs in the formal sector and is therefore a conservative estimate of the size of the informal economy in South Africa (Budlender *et al* (2002))

(2001:42) hold that “a characteristic of informal work is that it carries high risks, both economically and physically”. Informal workers are without secure contracts, worker benefits, income is generally inadequate and working conditions are hazardous. Informal workers are particularly vulnerable as they fall outside of formal safety nets and labour legislation and typically have limited access to financial services and risk management products. Del Conte (2000) views the absence of formal means to manage risk as a defining characteristic of workers in the informal economy.

Empirical studies in South Africa have found a strong link between poverty and the informal economy. “Quality of life is considerably worse for those who are employed or self-employed in the informal sector” (Aliber 2001: 19). Aliber (2001) and Budlender et al (2002) using the 1999 October Household Survey and the September 2000 Labour Force Survey show that informal workers are more likely to live in households experiencing hunger. Budlender et al (2002) calculate that 22% of domestic workers and 25% of other informal workers lived in a household reporting hunger over the last year, compared to only 9% of formal workers.

While the exclusion of the informally employed from formal financial services in South Africa is often cited in the literature there is little empirical evidence. Indeed empirical research that goes beyond examining the size and nature of the informal economy in South Africa is limited. Part of the problem is that there is no single criterion on which a job can be classified as formal or informal. The difficulties in identifying informal workers in South Africa are highlighted by Muller (2003), Budlender et al (2001), Aliber (2001) and Borat (1999). Lund and Srinivas (2001) and Canagarajah and Sethuraman (2001) are among the growing number of scholars who suggest moving away from viewing the economy as comprised of a ‘formal sector’ and an ‘informal sector’ towards viewing all economic activity on a continuum or spectrum from more formal at one end to more informal at the other, where jobs vary in their degree of informality in terms of a number of indicators.

Budlender et al (2001) go some way towards examining this continuum by constructing two indicators of the number of formal enterprise characteristics and the number of formal job characteristics. They show the level of heterogeneity within the formal and informal sectors, with formal sector jobs having informal characteristics and vice versa. In this paper we attempt to quantify this continuum by creating an index of formality where jobs are scored according to the number of formal attributes. The indicators considered by Budlender et al (2001) are combined and extended to include other measures of formality such as employer contributions to medical aid and pensions. Through the creation of such an index we are able to go further than merely identifying informal workers and can begin to analyse the impact of the formality of employment on various outcomes such as access to financial services.

The rest of this paper is organised as follows. Section 2 describes the data and methodology used. The variables used in the analysis are also defined in this section. Section 3 provides an overview of the utilisation of financial services by South African households with a particular focus on bank accounts and funeral insurance. The impact of work status on the utilisation of these financial services is then examined, with a presentation of the results in Section 4. These results are discussed in Section 5. Concluding comments are presented in Section 6.

2. Data and methods

This paper makes use of two Statistics South Africa (SSA) data sets, the October 2000 Income and Expenditure Survey (IES) and the September 2000 Labour Force Survey (LFS). By merging together key aspects of the IES and LFS we are able to examine both household income and expenditure and labour market status of household members. LFS and IES visited the same 26,000 households⁴. A stratified cluster sampling design was utilised with explicit stratification by province and area type (rural or urban). Initial weights were calculated to adjust for probability of selection and non-response. Post stratification weights were then applied to adjust for under-enumeration and to align survey estimates with independent population estimates. While the complex sample design is easily taken into account for the estimation of regression coefficients and standard errors (Stata Corporation (2003b)), assessing the fit of the model is problematic. According to Hosmer and Lemeshow (2000) there are no procedures readily available for assessing model calibration and discrimination when modelling data from complex sample surveys. One suggested approach is to use a 'model-based' analysis and assume that the data arose from a simple random sample when assessing the fit of the model. This approach has been adopted in this paper. Logistic regression coefficients and standard errors were first estimated using the `svylogit` command. Then the `logit` command was used to fit logistic regression models ignoring the weighting and complex sample design. Model calibration was then assessed using the Hosmer-Lemeshow goodness-of-fit test. Model discrimination was assessed by examining the area under the ROC curve. The area under the ROC curve measures the likelihood that the predicted probability will be higher for observations where the outcome of interest is observed than for observations where the outcome is not observed (Hosmer and Lemeshow (2000: 160-164)).

Table 1 presents descriptive statistics for the variables used in the analyses. Standard errors are presented in parenthesis alongside the estimates and the sample size on which the estimate is based is presented below the estimate. A range of variables measuring use of financial services, income, work status and other household characteristics were created. A dichotomous outcome variable, Bank, was generated representing whether a household had any bank account⁵. Similarly, the dichotomous variable Funeral represented whether a household had any funeral insurance. The work status of the primary income earner (PIE)⁶ was represented by two indicator variables, one indicating that the primary income earner was an employee and the other that they were self-employed. Households who had no working household members constituted the omitted category. Income was represented by the logarithm of per capita total household income in order to control for household size and to reduce skew. The household income variable included components that were collected at the household level from the outset as well as components that were aggregated from individual incomes within a household.⁷ Race was represented by three indicator variables for African, Coloured and Indian with White the omitted category. Demographic characteristics of the household head (age and sex), type of area (rural or urban), household levels of education (proxied by the level of education for the adult with the highest level of education in the household) and whether the household was receiving a social pension were also included in the analyses.

⁴ The LFS visited 26617 households and the IES visited 26265 households. A total of 26,000 households were included in both surveys. It is not clear where the minor discrepancies in the sample households arose. However, it is clear that LFS and IES households can be correctly matched.

⁵ Households were defined as having at least one bank account if they had deposited or withdrawn savings from a bank, paid bank charges, made bond or car payments, had credit card debt or an overdraft or had savings in a bank account.

⁶ The primary income earner was defined as the household member earning the highest income using LFS data. If more than one household member reported the same level of work income, the household member with the lowest person number (usually the household head) was selected.

⁷ For individual household members there is income information on salaries and wages, net profit from self-employment, rentals, royalties, interest payments, dividends, private pensions and annuities, state pensions, workmen's compensation and unemployment insurance, alimony, remittances from family members living elsewhere. The sum of these income sources generates the total regular income for each individual and, aggregating across individuals, for each household. Non-regular income was collected only at the household level. These data cover such categories as income from the sale of a vehicle or property, the value of food, clothing, housing, transport and medical aid goods and services received over the year, lump sum payments from maturing pension or life insurance policies, insurance claims, rotating credit associations and gifts. All of the documentation that Statistics South African releases on each of these questionnaires is available at: <http://web.uct.ac.za/depts/cssr/dfrusas.html#tus>

Table 1 Estimates of means and proportions for variables used in the analyses

Variable	All Households	Primary income earner employee
Bank account	0.444 (0.006) 26,000	0.559 (0.007) 15,065
Funeral insurance	0.233 (0.004) 26,000	0.261 (0.005) 15,065
African	0.783 (0.006) 25,957	0.745 (0.008) 15,036
Coloured	0.08 (0.004) 25,957	0.107 (0.005) 15,036
Indian	0.024 (0.003) 25,957	0.029 (0.003) 15,036
White	0.112 (0.005) 25,957	0.12 (0.006) 15,036
Log(per capita income)	8.681 (0.018) 25,926	9.058 (0.021) 14,970
Rural	0.339 (0.006) 26,000	0.232 (0.006) 15,065
Social pension	0.172 (0.004) 26,000	0.081 (0.003) 15,065
Female head	0.388 (0.004) 26,000	0.308 (0.006) 15,065
Age of head	46.225 (0.171) 25,997	42.995 (0.178) 15,062
Maximum education	10.629 (0.056) 25,283	11.390 (0.073) 14,885
Primary income earner self-employed	0.139 (0.003) 25,998	- -
Primary income earner employee	0.584 (0.005) 25,998	- -
No working household members	0.276 (0.004) 25,998	- -

Notes: Estimated means or proportions for variables used in the analysis. Standard errors are presented in parentheses alongside the estimates and the sample size on which the estimate is based is presented below the estimate.

An index of formality of employment was created using the range of enterprise characteristics, work related benefits and job characteristics presented in Table 2 below⁸. This index was only calculated for PIEs who were employees. The index is a simple summated scale where each job attribute is given equal weighting. The reliability of this index in measuring a unidimensional construct, namely formality of employment, was assessed by calculating Cronbach's alpha (Stata (2003a: 22-28)). A reliability coefficient of 0.70 or higher is generally considered "acceptable" (Stata (2003a)). Cronbach's alpha for the formality index was calculated as 0.8848 indicating acceptable reliability. The index was scaled to lie between 0 and 1 with 0 indicating a job with no formal attributes and scores to close to 1 indicating jobs with a number of formal attributes.

⁸ Formal business location was coded as formal (1) if the location was "inside a formal business premises such as factory or office" or "at a service outlet such as a shop, school, post office etc". Location of business was coded as informal (0) if the location was "in the owner's home/on the owner's farm", "in someone else's home", "at a market", "on a footpath, street or street corner, open space or field", "no fixed location". Permanent work was coded 1 for both permanent jobs and fixed period contracts. Permanent work was coded as 0 for temporary, seasonal or casual work. UIF was coded as 1 if UIF contributions are deducted or if "no – because his/her income is above the UIF limit".

Table 2 Formality index constituents

Enterprise characteristics	Benefits	Job characteristics
Registered company or close corporation	Paid leave	Permanent work
Business in the formal sector	Employer contributes to pension	Written contract
Five or more workers	Employer contributes to medical aid	Member of a trade union
Formal business location	UIF contributions deducted	

Table 3 below presents estimates of the proportion of PIEs with each number of formal attributes by gender with standard errors in parenthesis. The number of sample households with PIEs falling into each category is also given. For all PIEs, the proportions range from 0.044 to 0.188 and the distribution is skewed to the right with 65% of PIEs having six or more formal employment attributes. There are stark gender differences in the formality index.

According to Lund (2001), women are over-represented in the informal economy worldwide with the majority of economically active women in developing countries employed in the informal economy. Furthermore informal women workers also tend to earn lower incomes than informal male workers. Informal women workers “tend to occupy the most vulnerable and least lucrative strata, the so-called survivalist activities” (Valodia (2000:6)). The stark gender differences in Table 3 are consistent with these viewpoints. Twenty four percent of women have one or no formal attributes as opposed to only 9% of men. Almost half (48%) of the men have nine or more formal attributes as opposed to less than a third (32%) of the women.

Table 3 Estimated proportions of primary income earners with each level of formal employment attributes by gender (n=11,972)

Formality index	Females		Males		Total	
	Estimated proportion	n	Estimated proportion	n	Estimated proportion	n
0	0.106 (0.006)	470	0.048 (0.003)	371	0.068 (0.003)	841
1	0.132 (0.008)	545	0.038 (0.003)	274	0.071 (0.004)	819
2	0.071 (0.006)	274	0.029 (0.003)	233	0.044 (0.003)	507
3	0.054 (0.004)	240	0.046 (0.003)	398	0.048 (0.002)	638
4	0.056 (0.004)	253	0.056 (0.004)	514	0.056 (0.003)	767
5	0.058 (0.005)	238	0.062 (0.003)	541	0.06 (0.003)	779
6	0.049 (0.004)	219	0.06 (0.003)	537	0.056 (0.003)	756
7	0.076 (0.006)	290	0.074 (0.004)	590	0.075 (0.003)	880
8	0.083 (0.005)	354	0.107 (0.005)	795	0.098 (0.004)	1149
9	0.117 (0.006)	476	0.172 (0.006)	1261	0.152 (0.004)	1737
10	0.138 (0.007)	541	0.215 (0.007)	1557	0.188 (0.005)	2098
11	0.061 (0.005)	249	0.093 (0.004)	752	0.082 (0.003)	1001

Notes: Estimated proportions with standard errors presented in parentheses alongside the estimates and the sample size on which the estimate is based is presented below the estimate.

Permanent work is the most common (65%) formal attribute for workers who have only one formal attribute. For workers with roughly half (five) formal attributes the percentages with employer contributions to pensions (6%), belonging to trade unions (4%) and with employer contributions to medical aid (4%) are very low. Employer contributions to medical aid is the rarest formal attribute with only a quarter of all workers having this attribute. Indeed only 31% and 53% of those workers with nine and ten formal attributes respectively have employer contributions to medical aid.

Examining the occupations, industries and employers of workers across our formality index clear distinctions emerge. Ninety five percent of those with no formal attributes work for private business with 68% working in private households. In contrast 45% of workers with all eleven formal attributes work for private businesses. Almost as many (43%) percent work for central, provincial or local government. If parastatals such as Transnet and Telkom are included this rises to 53%. Turning to occupations, the majority (50%) of workers with no formal attributes are domestic workers. Other common occupational groups for these workers are skilled agriculture and fishery (18%) and craft and related trades (15%). The largest occupational categories for workers with all eleven formal attributes are technical and associate professionals (22%), craft and related trades (16%), plant and machine operators and assemblers (16%), clerks (12%) and service, shop and market sales (10%). The range of occupations increases with the number of formal attributes. There were 184 distinct occupations for

those with all eleven formal attributes as opposed to 61 distinct occupations for those with no formal attributes.

Workers with half the formal attributes (five or six) worked mostly in agriculture, hunting, forestry and fishing (31%), wholesale and retail trade (21%), manufacturing (14%) and community social and personal services (10%). The most common occupations were elementary occupations (35%), plant and machine operators and assemblers (16%), craft and related trades (15%) and service, shop and market sales (13%).

While there are distinct and predictable differences across the formality index, there is also clear evidence of heterogeneity in the informal economy. The inability to capture the security and quality of employment through simple occupation classifications is also highlighted.

Before we proceed to the analysis of data, it should be noted that both the LFS and the IES suffer from the fact that complete data are not available for every variable. For example, there were a total of 15,065 households where the PIE was an employee but complete data on all variables was only available for 11,972 of these households. In order to assess the impact of these missing data on the substantive findings of this paper, two of the models in the analysis below were compared to models estimated using imputed data. First, multiple imputations of missing values were performed using the Sequential Regression Imputation Method⁹ (Raghunathan et al (2001)). Second, logistic regression models taking into account weighting and the complex sample design were estimated for each of five imputed data sets. Finally, the results were combined with the uncertainty due to imputation taken into account¹⁰. The comparison of these models and the models estimated with the complete data are presented in Tables A1 and A2 in the appendix. While the standard errors for the imputed data are smaller and there are slight differences in the coefficients, the conclusions and substantive interpretations for both models are the same. As the aim of this paper is to examine the relationship between work status and utilisation of financial services rather than to obtain precise population parameter estimates, the analyses were restricted to subjects having complete data.

3. Descriptive Statistics

Figures 1 and 2 below present an overview of the utilisation of financial services by South African households. Figure 1 shows the proportion of households in each income decile with bank accounts, savings (including formal bank savings, informal rotating savings clubs (stokvels), investments and pension contributions), insurance and debt. The utilisation of financial services clearly increases with income. The percentage of households with bank accounts, savings and insurance rises from below 20% in the lowest income decile to over 80% in the highest income decile. While the proportion of households with debt also increases with income, the increase is less sharp rising from 28% of households in the lowest income decile to 71% of households in the 10th decile. In their analysis of the same data, Ardington et al (2003) find strong evidence of complementarities between the various financial services products even after controlling for income and other demographic variables.

⁹ IVEWARE's IMPUTE procedure was used to perform multiple imputations of the missing data (Raghunathan et al (2002: 11-30)).

¹⁰ IVEWARE's REGRESS procedure with link logistic was used to perform multiple imputation analyses of the regression models (Raghunathan et al (2002: 45-64)).

Figure 1 Proportion of households in each income decile with Bank Accounts, Savings, Insurance and Debt

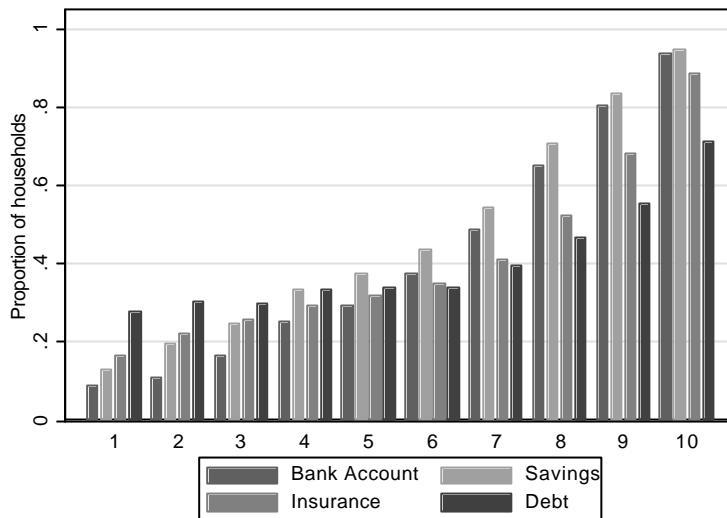


Figure 2 Proportion of households in each income decile with Funeral Insurance, Life Insurance, Medical Insurance and Property Insurance

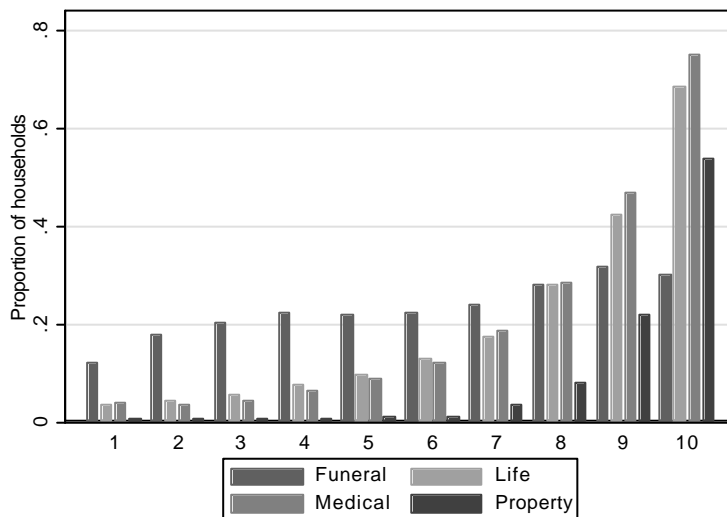


Figure 2 shows the proportion of households in each income decile with funeral insurance, life insurance, medical insurance and property insurance. For every type of insurance, the proportion of households with insurance increases with income, although the rate of increase for funeral insurance is modest. In the lowest deciles very few households have life insurance, medical insurance or property insurance and it is only in the 8th, 9th and 10th deciles that more than 20% of households have these forms of insurance. Funeral insurance is markedly different to the other types of insurance with a much flatter distribution across the income deciles. While the other forms of insurance would only be accessed through formal financial markets, funeral insurance includes both funeral policies with formal insurers and membership of informal burial societies. One might expect that life insurance would be a substitute for funeral insurance especially at the higher end of the income distribution. Interestingly, Ardington et al (2003) find that there are strong complementarities between funeral and life insurance after controlling for income and other demographic variables.

While utilisation of financial services clearly increases with income, patterns of utilisation differ across financial products. As we are concerned with the relationship between work status and utilisation of financial services and in the interests of brevity, the remainder of this study will focus on two financial products where these patterns differ considerably, namely bank accounts and funeral insurance. Access to a bank account is particularly important, not only for access to the savings, transmission and credit

facilities offered by the bank, but also for facilitating access to other financial services. Micro-lenders and insurance companies rely heavily on debit orders for collection of installments and premiums. Funeral insurance has some degree of penetration into the lowest income deciles and a much flatter distribution across the income deciles than bank accounts. Funeral insurance, which includes burial societies, may also be viewed as a less formal financial product than a bank account. Table 4 presents estimates of the proportion of households in each income decile with bank accounts and funeral insurance. Table 5 presents estimates of the proportion of households with bank accounts and funeral insurance for households with no working members, households where PIE is self-employed and households where the PIE is an employee. Standard errors are presented in parentheses alongside the estimates and the sample size on which each estimate is based is presented below the estimated proportion. An estimated 44% of South African households have at least one bank account while 23% have funeral insurance. Over a quarter (28%) of households had no-one working, 14% had PIEs who were self-employed and the remaining 8% had PIEs who were employees. The proportions of households with bank accounts and funeral insurance were lowest for those with no workers and highest for households where the PIEs were employees. Where the PIE was employed, 56% of households had bank accounts as opposed to only 37% of households where the PIE was self-employed and 24% of households where no-one was working. Although the differences were less marked, the proportion of households with funeral insurance was 26% for PIE employees, 22% for self-employed PIEs and 18% where no-one was working.

Table 4 Estimated proportion of households with bank accounts and funeral insurance by income deciles

	Bank Account	Funeral Insurance
Total	0.444 (0.006)	0.234 (0.004)
	25,730	25,730
Per capita income decile 1	0.089 (0.008)	0.121 (0.008)
	2,579	2,579
Per capita income decile 2	0.111 (0.007)	0.179 (0.010)
	2,574	2,574
Per capita income decile 3	0.169 (0.009)	0.202 (0.01)
	2,588	2,588
Per capita income decile 4	0.252 (0.012)	0.221 (0.01)
	2,570	2,570
Per capita income decile 5	0.294 (0.011)	0.219 (0.01)
	2,595	2,595
Per capita income decile 6	0.376 (0.014)	0.224 (0.01)
	2,606	2,606
Per capita income decile 7	0.485 (0.013)	0.239 (0.011)
	2,562	2,562
Per capita income decile 8	0.653 (0.014)	0.278 (0.011)
	2,558	2,558
Per capita income decile 9	0.805 (0.012)	0.316 (0.013)
	2,555	2,555
Per capita income decile 10	0.940 (0.007)	0.299 (0.012)
	2,543	2,543

Notes: Estimated proportions with standard errors presented in parentheses alongside the estimates and the sample size on which the estimate is based is presented below the estimate.

Table 5 Estimated proportion of households with bank accounts and funeral insurance by work status

	Bank Account	Funeral Insurance
No-one working	0.238 (0.008)	0.183 (0.006)
	7,471	7,471
PIE self-employed	0.371 (0.012)	0.215 (0.009)
	3,462	3,462
PIE employee	0.559 (0.007)	0.261 (0.005)
	15,065	15,065

Notes: Estimated proportions with standard errors presented in parentheses alongside the estimates and the sample size on which the estimate is based is presented below the estimate.

Utilisation of bank accounts and funeral insurance clearly increase with income and when the PIE is an employee. We now turn to examine the impact of the nature of the employment for the PIE. Restricting our analysis to households where the PIE is an employee, we examine the relationship between the formality of employment (as measured by the formality index) and utilisation of bank accounts and funeral insurance. Table 6 below presents estimates for the proportion of households with bank accounts and funeral insurance at each level of formal attributes. The proportion clearly increases with the formality of the job of the PIE. Only 13% of households where the PIE's job has no formal attributes have any bank account as opposed to 89% of households where the PIE's job has all eleven formal attributes. The proportion of households with funeral insurance increases from 12% of households where the PIE's job had no formal attributes to 49% for PIE with all the formal attributes.

Table 6 Estimated proportions of households with bank accounts and funeral insurance for each level of formal employment attributes

Number of formal attributes	Bank Account	Funeral Insurance
0	0.128 (0.015) 841	0.12 (0.013) 841
1	0.157 (0.017) 819	0.139 (0.015) 819
2	0.251 (0.03) 507	0.140 (0.017) 507
3	0.224 (0.021) 638	0.133 (0.017) 638
4	0.319 (0.023) 767	0.152 (0.017) 767
5	0.367 (0.023) 779	0.168 (0.017) 779
6	0.46 (0.022) 756	0.231 (0.018) 756
7	0.567 (0.024) 880	0.229 (0.016) 880
8	0.708 (0.016) 1,149	0.304 (0.016) 1,149
9	0.778 (0.014) 1,737	0.331 (0.014) 1,737
10	0.843 (0.011) 2,098	0.344 (0.014) 2,098
11	0.893 (0.012) 1,001	0.490 (0.02) 1,001

Notes: Estimated proportions with standard errors presented in parentheses alongside the estimates and the sample size on which the estimate is based is presented below the estimate.

In Table 4 the proportion of households with bank accounts increased sharply with income. As a preliminary investigation of whether the differences in Table 6 could merely be attributed to incomes increasing with the number of formal attributes we fit a number of non-parametric regression models. Smoothed prediction values were obtained for locally weighted regressions of having a bank account on income separately for various levels of formal attributes (Stata Corporation (2003c: 347-351)). Figure 3 below shows the smoothed proportion of households having bank accounts by per capita income decile and for various levels of formal attributes. The three lines represent households where the PIE has a job with zero to three, four to seven and eight to eleven formal attributes respectively. As evident in Table 4, the figure clearly shows the predicted proportion of households with bank accounts increasing with income. Taking income into account, the impact of the number of formal attributes is also striking. At each level of per capita income, the predicted proportion of households with bank accounts is lowest when the PIE has less than four formal attributes and highest when the PIE has more than seven formal attributes. The differences are most striking between the third and seventh income decile for PIEs with 4 to 7 formal attributes versus 8 to 11 formal attributes. From the figure it appears that a logistic regression model of the probability of having a bank account would be a reasonable fit.

Figure 3 Proportion of households having a bank account by per capita income and number of formal attributes

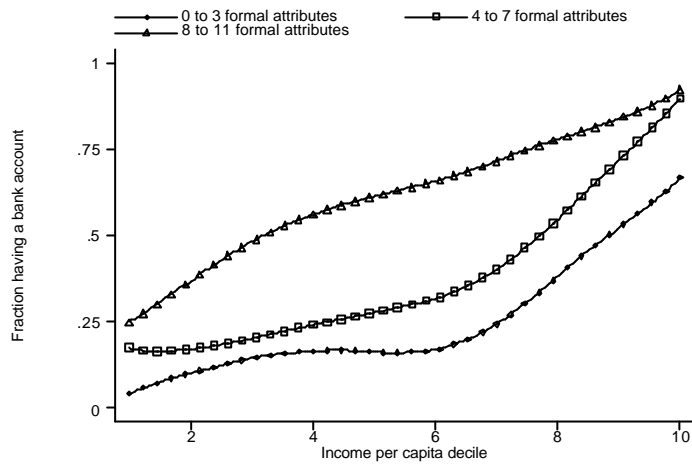
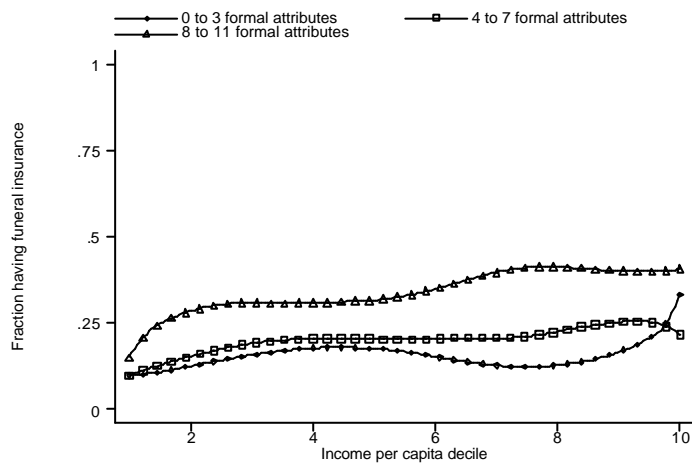


Figure 4 below presents the smoothed prediction values for locally weighted regressions of having funeral insurance on income. Although the predicted proportion of households having funeral insurance increases with income, this increase is much flatter than for having a bank account. While differences between households with 0 to 3 formal attributes and households with 4 to 7 formal attributes are not marked, the predicted proportion of households with funeral insurance is higher for PIEs with eight or more attributes. This finding is apparent at all levels of income. In the multivariate analysis that follows we will fit logistic regression models taking into account not only income and number of formal attributes but also a range of demographic characteristics of the household.

Figure 4 Proportion of households having funeral insurance by per capita income and number of formal attributes



4. Results

The descriptive analysis above has highlighted the importance of both PIE work status and formality of employment for PIE employees in households' utilisation of bank accounts and funeral insurance. In this section we use logistic regression analysis to sharpen our investigation of these relationships and to control for other household characteristics. Four logistic regression models were estimated. The first two models use the full sample to examine differences in utilisation of bank accounts and funeral insurance between households with no working members, households where the PIEs are self-employed and households where the PIEs are employees. The sample for the third and fourth models was restricted to households where the PIE was an employee. These models were estimated in order to assess the impact of the degree of formality of the PIE's job on utilisation of bank accounts and funeral insurance. The regression models controlled for income, race, rural/urban location, demographic characteristics of the household head (age and sex), household education levels and whether the household was receiving a social pension. The results from these regression analyses are presented in Tables 7 to 10. The tables present estimated odds ratios, standard errors, t-statistics, two-tailed p-values and 95% confidence intervals. Adjusted Wald tests for overall significance of the model, Hosmer-Lemeshow goodness-of-fit tests and the area under the ROC curve are also presented.

Table 7 presents the estimates for a logistic regression model with Bank as the dependent variable. The adjusted Wald test indicates that the overall model is highly significant. The area under the ROC curve is 0.8520, indicating excellent discrimination. The Hosmer-Lemeshow statistic is 80.57 with a corresponding p-value of less than 0.0001. Although this indicates that the model is a poor fit, with large sample sizes tests based on the chi square distribution have very high power and even small departures will result in rejections of the null hypothesis.

Table 7 Logistic regression model for the household having a bank account

Variable	Odds Ratio	Std. Err.	t	P> t	95% CI	
African	0.495	0.079	-4.39	0.000	0.361	0.677
Coloured	0.465	0.079	-4.48	0.000	0.333	0.650
Indian	0.516	0.107	-3.20	0.001	0.344	0.775
Log(per capita income)	2.578	0.081	29.98	0.000	2.423	2.742
Rural	0.935	0.054	-1.18	0.239	0.835	1.046
Social pension	0.720	0.050	-4.71	0.000	0.628	0.826
Female head	0.726	0.032	-7.34	0.000	0.666	0.791
Age of head	1.017	0.002	9.06	0.000	1.013	1.021
Maximum education	1.152	0.007	22.60	0.000	1.138	1.166
Primary income earner self-employed	1.337	0.103	3.77	0.000	1.150	1.556
Primary income earner employee	1.878	0.113	10.50	0.000	1.669	2.113

Adjusted Wald test $F(11,2924) = 275.26$ $p < 0.0001$

Hosmer-Lemeshow goodness-of-fit test $\text{Chi}^2(8) = 80.57$ $p < 0.0001$

Area under the ROC curve 0.8520

$n = 24,976$

Notes: Estimated odd ratios, standard errors, t-statistics, two-tailed p-values and 95% confidence intervals.

Examining the individual coefficients we see that apart from Rural, the associations between all the covariates and having a bank account are highly significant. African, Coloured and Indian households are all less likely than White households to have a bank account. For a given level of income and other household characteristics, African households have 51% lower odds of having a bank account than White households¹¹. Compared to White households, the odds of having a bank account are 54% lower for Coloured households and 48% lower for Indian households. Having a female head reduces the odds of a household having a bank account by 27%. Households receiving a state old age pension have 28% lower odds of having a bank account. For each year increase in age of the household head the odds of the household having a bank account increase by 1.7%. For each year increase in the education of the

¹¹ The percentage change in the odds is given by $100[\exp(\beta_k \times \delta) - 1]$ where $\exp(\beta_k)$ is the odds ratio (Hosmer and Lemeshow (2002: 81). For a unit change in x_k the percentage change in odds is $100[\text{odds ratio} - 1]$.

most highly educated adult in the household the odds of having a bank account increase by 15%. For each 10% percent increase in per capita income the odds of having a bank account increase by 9.5%¹².

Compared to households where there is no-one working, the odds of having a bank account are 34% higher for households where the PIE is self-employed and 88% higher for households where the PIE is an employee. Households where the PIE is an employee have 41% higher odds of having a bank account than households where the PIE is self-employed¹³. The effect of the work status of the PIE is highly significant, even when we control for income and other household characteristics.

Table 8 below presents the estimates for a logistic regression model with Funeral as the dependent variable. The adjusted Wald test indicates that the overall model is highly significant. The Hosmer-Lemeshow test indicates that the model is a good fit. The area under the ROC curve is 0.6906 indicating that the model has below adequate discrimination.

Table 8 Logistic regression model for the household having funeral insurance

Variable	Odds Ratio	Std. Err.	t	P> t	95% CI	
African	2.668	0.274	9.57	0.000	2.182	3.262
Coloured	5.417	0.636	14.39	0.000	4.303	6.819
Indian	0.718	0.139	-1.71	0.088	0.491	1.050
Log(per capita income)	1.416	0.033	14.85	0.000	1.353	1.483
Rural	1.532	0.082	7.95	0.000	1.379	1.702
Social pension	1.517	0.099	6.36	0.000	1.334	1.724
Female head	1.026	0.041	0.64	0.521	0.949	1.108
Age of head	1.021	0.002	11.34	0.000	1.017	1.024
Maximum education	1.052	0.005	11.05	0.000	1.042	1.061
Primary income earner self-employed	1.279	0.083	3.81	0.000	1.127	1.451
Primary income earner employee	1.570	0.085	8.35	0.000	1.413	1.746

Adjusted Wald test $F(11,2924) = 84.47$ $p < 0.0001$

Hosmer-Lemeshow goodness-of-fit test $\chi^2(8) = 13.41$ $p = 0.0985$

Area under the ROC curve 0.6906

$n = 24,976$

Notes: Estimated odd ratios, standard errors, t-statistics, two-tailed p-values and 95% confidence intervals.

Examining the individual coefficients we see that apart from Female and Indians, the associations between all the covariates and having funeral insurance are highly significant. In contrast to the previous model African and Coloured households are more likely to have funeral insurance than White households. Compared to White households, the odds of having funeral insurance are 166% greater for African households and 442% greater for Coloured households. Indians are less likely than Whites to have funeral insurance but this is only significant at the 10% level. Rural households have 53% higher odds than urban households of having funeral insurance. Households receiving a state old age pension have 52% higher odds of having funeral insurance. For each year increase in the age of the household head the odds of the household having funeral insurance increase by 2%. For each year increase in the education of the most highly educated adult in the household the odds of having funeral insurance increase by 3%. For each 10% increase in per capita income the odds of having funeral insurance increase by 3.56%. While the impacts of education and income are again positive (odds ratios greater than one), the magnitude of the coefficients is much lower than for bank accounts.

Compared to households where no-one is working, the odds of having funeral insurance are 30% higher for households where the PIE is self-employed and 57% higher for households where the PIE is an employee. Households where the PIE is an employee have 23% higher odds of having funeral insurance than households where the PIE is self-employed. The effect of the work status of the PIE is highly significant, even when we control for income and other household characteristics. Although the magnitudes of the coefficients are smaller than for bank accounts, the “work status” effect is still highly significant.

¹² Income is expressed in logarithm form so β_k is an elasticity coefficient. For every percentage increase in x_k the percentage change in odds is given by that β_k .

¹³ Odds ratio for PIE employee versus PIE self-employed = $\exp(\beta_{PIE\text{employee}} - \beta_{PIE\text{self-employed}})$.

Table 9 below presents the results for the logistic regression model with Bank as the dependent variable. The model was estimated for the subset of households where the PIE was an employee and the formality index was included as a predictor variable. The adjusted Wald test indicates that the overall model is highly significant. The area under the ROC curve is 0.8625, indicating excellent discrimination. As with the model for all households presented in Table 7, the Hosmer-Lemeshow test indicates poor fit.

Table 9 Logistic regression model for household where the primary income earner is an employee having a bank account

Variable	Odds Ratio	Std. Err.	t	P> t	95% CI	
African	0.585	0.156	-2.01	0.044	0.346	0.987
Coloured	0.456	0.126	-2.85	0.004	0.266	0.784
Indian	0.541	0.164	-2.03	0.043	0.299	0.980
Log(per capita income)	2.100	0.102	15.34	0.000	1.910	2.309
Rural	0.969	0.079	-0.39	0.700	0.825	1.138
Social pension	0.763	0.088	-2.34	0.019	0.609	0.957
Female head	0.946	0.068	-0.77	0.443	0.821	1.090
Age of head	1.017	0.003	5.80	0.000	1.011	1.023
Maximum education	1.132	0.012	11.97	0.000	1.109	1.156
Formality index	10.506	1.339	18.46	0.000	8.183	13.488

Adjusted Wald test $F(10,2736) = 168.91$ $p < 0.0001$

Hosmer-Lemeshow goodness-of-fit test $\chi^2(8) = 30.08$ $p = 0.0002$

Area under the ROC curve 0.8625

$n = 11,972$

Notes: Estimated odd ratios, standard errors, t-statistics, two-tailed p-values and 95% confidence intervals.

As the interpretation for most of the coefficients is very similar to that of the model for the full sample, only substantive differences between the two models will be highlighted. The coefficient for Female is no longer significant and although the odds ratio for income is highly significant and greater than one, the magnitude of this coefficient is lower than in the model for the full sample. The coefficient for the formality index is highly significant, indicating a strong association between the degree of formality of the PIE's job and the probability of having a bank account. Given levels of income and other household characteristics, the odds of having a bank account are 951% higher for a household where the PIE's job has all eleven formal attributes compared to a household where the PIE's job has no formal attributes. Alternatively for each additional formal attribute the odds increase by 24%.

Figure 5 Probability of having a bank account by per capita income and number of formal attributes

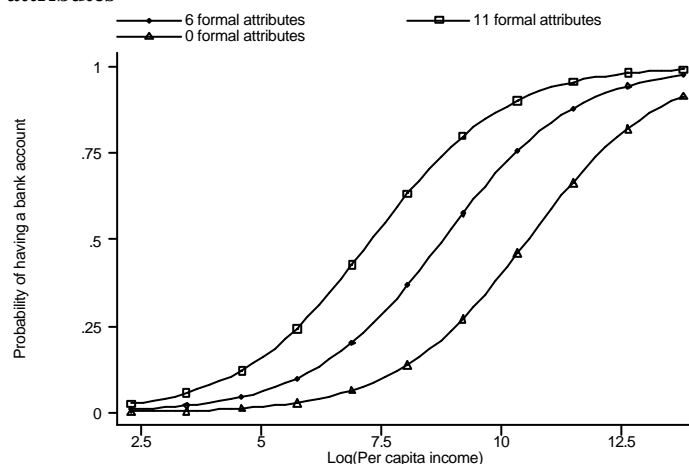


Figure 5 above shows the predicted probability of having a bank account for various levels of income and levels of formal attributes with all other variables at their mean. The three lines represent

households where the PIE has a job with no formal attributes, 6 formal attributes and 11 formal attributes. The figure clearly shows that the probability of having a bank account increases with income. Furthermore, at every income level the probability of having a bank account is higher for households where the PIE has a job with more formal attributes. The difference is most marked at the middle of the income distribution. For households with a log per capita income of 8.98 (R7,943) and all other variables at their mean the estimated probability of having a bank account is 0.24 for no formal attributes, 0.54 for 6 formal attributes and 0.77 for 11 formal attributes.

Table 10 below presents the results for the logistic regression model with Funeral as the dependent variable. The model was estimated for the subset of households where the PIE was an employee and the formality index was included as a predictor variable. The adjusted Wald test indicates that the overall model is highly significant. The area under the ROC curve is 0.7155, indicating acceptable discrimination. The Hosmer-Lemeshow test indicates that the model is a good fit.

Table 10 Logistic regression model for household where the primary income earner is an employee having funeral insurance

Variable	Odds Ratio	Std. Err.	T	P> t	95% CI	
African	2.690	0.328	8.11	0.000	2.118	3.417
Coloured	4.970	0.709	11.25	0.000	3.758	6.573
Indian	0.530	0.125	-2.70	0.007	0.335	0.841
Log(per capita income)	1.198	0.040	5.42	0.000	1.122	1.278
Rural	1.357	0.093	4.44	0.000	1.186	1.553
Social pension	1.023	0.118	0.19	0.847	0.815	1.283
Female head	1.051	0.064	0.81	0.417	0.932	1.185
Age of head	1.022	0.003	7.84	0.000	1.016	1.027
Maximum education	1.059	0.008	8.15	0.000	1.045	1.074
Formality index	4.708	0.605	12.05	0.000	3.659	6.059

Adjusted Wald test $F(10,2736) = 68.19$ $p < 0.0001$

Hosmer-Lemeshow goodness-of-fit test $\text{Chi}^2(8) = 4.90$ $p = 0.7686$

Area under the ROC curve 0.7155

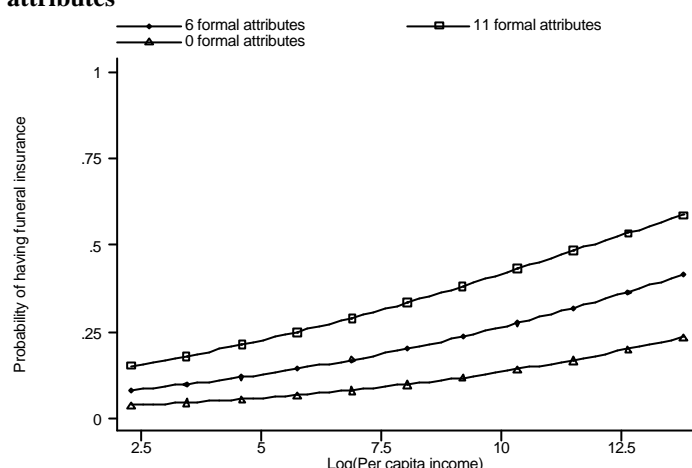
$n = 11,972$

Notes: Estimated odd ratios, standard errors, t-statistics, two-tailed p-values and 95% confidence intervals.

Comparing this model with the model for the full sample, we see that the coefficient for Social Pension is no longer significant. The income effect, while still significant, is also reduced. The coefficient for the formality index is highly significant although the magnitude is much smaller than for bank accounts. Compared to a household where the PIE's job has no formal attributes, the odds of having funeral insurance increase by 371% for households where the PIE's job has all eleven formal attributes. Alternatively each additional formal attribute increases the odds by 15%.

Figure 6 below shows the predicted probability of having funeral insurance for various levels of income and levels of formal attributes with all other variables at their mean. The three lines represent households where the PIE has a job with no formal attributes, 6 formal attributes and 11 formal attributes. The figure clearly shows that the probability of having funeral insurance increases with income, although the increase is more modest than with bank accounts. Furthermore, for every income level the probability of having funeral insurance is higher for households where the PIE has a job with more formal attributes. As with bank accounts, the difference is most marked at the middle of the income distribution. For households with a log per capita income of 8.98 (R7,943) and all other variables at their mean the estimated probability of having funeral insurance is 0.11 for no formal attributes, 0.23 for 6 formal attributes and 0.37 for 11 formal attributes.

Figure 6 Probability of having funeral insurance by per capita income and number of formal attributes



One third of the households where the primary income earner was an employee had more than one working household member. In order to assess the impact of the employment status of other working household members on the utilisation of financial services a number of additional models were fit. The results are shown in Tables 11 and 12 below. In the first column of both tables, the formality index for the primary income earner is replaced by the mean value of the formality index for all employees in the household. In the second column the formality index is replaced by the maximum formality index for the household. The maximum formality index was calculated by assigning each attribute a value of one if anyone in the household had employment with that attribute. The previous results appear to be robust to the change in specification of the index. In column 3 the number of other employees and the number of self-employed people in the household are added to the original models in Tables 9 and 10 above. The addition of these variables has no impact on the magnitude or significance of the coefficient on the formality index for either bank account or funeral insurances. For each self-employed person in the household the odds of the household having a bank account and funeral insurance increase by 23%. The presence of additional employees has no significant impact on the odds of having a bank account but increases the odds of having funeral insurance by about 10%.

Table 11 Logistic regression models for household where the primary income earner is an employee having a bank account

Variable	(1)	(2)	(3)
Household average formality index	11.498**		
Household maximum formality index		12.736**	
Formality index			10.540**
Number of other employees			1.041
Number of self-employed			1.232*

Notes: Estimated odd ratios, * significant at 5% level, ** significant at 0.1% level. Race, logarithm of per capita income, an indicator for rural households, age and sex of the household head, maximum education of adults in the household and an indicator for whether anyone in the household received a social pension were included in all regressions.

Table 12 Logistic regression models for household where the primary income earner is an employee having funeral insurance

Variable	(1)	(2)	(3)
Household average formality index	4.460**		
Household maximum formality index		4.942**	
Formality index			4.714**
Number of other employees			1.098*
Number of self-employed			1.239*

Notes: Estimated odd ratios, * significant at 5% level, ** significant at 0.1% level. Race, logarithm of per capita income, an indicator for rural households, age and sex of the household head, maximum education of adults in the household and an indicator for whether anyone in the household received a social pension were included in all regressions.

In order to examine whether the affect of the formality of employment on utilisation of financial services is driven by specific components of the formality index, separate regressions were run for each component in the index. The estimated odds ratios for each of these separate regressions are shown in columns (1) and (2) in Table 13 below. The presence of any of the formal attributes of the index significantly increased the odds that the household would have a bank account or funeral insurance. Columns (4) and (5) show the estimated odds ratios when all the components of the index are included in one regression. Primary income earners with written contracts, paid leave, employer contribution to medical aid, employer contributions to a pension and working in a formal business location were significantly more likely to have bank accounts. For funeral insurance, written contracts, permanent work, employer contribution to medical aid, membership of a trade union and employer contribution to a pension were significant. Interestingly once benefits and other conditions of employment are taken into account, employees in the formal sector are no more likely to have a bank account or funeral insurance than employees in the informal sector. These results highlight the heterogeneity within the formal and the informal sector and support the need for a multi-dimensional measure of formality of employment.

Table 13 Logistic regression models for each component of the formality index

Component of the formality index	(1)	(2)	(3)	(4)
	Bank Account Separate regression for each component	Funeral Insurance Separate regression for each component	Bank Account One regression including all components	Funeral Insurance One regression including all components
Contract	2.298**	1.648**	1.298**	1.196*
Leave	2.586**	1.641**	1.396**	0.955
Registered	2.342**	1.377**	1.136	0.991
UIF	2.270**	1.482**	1.124	0.987
Permanent	2.147**	1.836**	1.080	1.223*
Location	2.528**	1.472**	1.500**	1.039
Number of workers	2.333**	1.592**	1.144	1.089
Sector	2.657**	1.640**	1.028	1.026
Medical aid	2.469**	1.929**	1.650**	1.496**
Trade union	2.094**	2.230**	0.999	1.733**
Pension	2.890**	1.998**	1.531**	1.221*

Notes: Estimated odd ratios, * significant at 5% level, ** significant at 0.1% level. Race, logarithm of per capita income, an indicator for rural households, age and sex of the household head, maximum education of adults in the household and an indicator for whether anyone in the household received a social pension were included in all regressions.

5. Discussion and Conclusion

The evidence suggests the importance of the work status of the PIE in the utilisation of various financial services. Households where the PIE was working were significantly more likely to have bank accounts and funeral insurance than households where the PIE was not working. Furthermore households where the PIE was an employee had around 20% greater odds of having bank accounts and funeral insurance than households where the PIE was self-employed. The self-employed are a particularly vulnerable group with no work related benefits or social protection.

While employees are more likely to have bank accounts and funeral insurance, the results show that the nature of their employment is also important. Households where the PIE has very formal employment are significantly more likely to have bank accounts and funeral insurance than households where the PIE has more informal employment.

While income, work status and nature of employment were highly significant predictors of the probability of a household having a bank account and funeral insurance, there were distinct differences between these two financial products. Although they were still positive and highly significant, income, work status and "formality" effects were less strong for funeral insurance than for bank accounts. Funeral insurance includes both formal insurance policies and informal insurance through membership of burial societies. These findings suggest that income, work status and the nature of employment are the most important variables in determining the utilisation of formal financial services.

This paper set out to examine the factors that limit or promote households access to financial services, with a particular focus on households where the primary income earner was informally employed. Measures of access to financial services are unfortunately not readily available restricting the analysis to an observation of which households did and did not utilise various financial services. Using household level data from South Africa, the results clearly show the importance of work status even when controlling for household income and other household characteristics. Employees are significantly more likely to utilise bank accounts and funeral insurance than the self-employed. Households where the PIE was not working were the least likely to have bank accounts and funeral insurance.

Furthermore the nature of employment for employees was shown to be important. Through the creation of a formality index we were able to examine the relationship between formality of employment and utilisation of financial services. Households where the PIE is formally employed are significantly more likely to have bank accounts and funeral insurance than households where the PIE has informal employment.

References

- ALIBER, M. (2001) "Study on the incidence and nature of chronic poverty and development policy in South Africa : an overview", *Chronic Poverty Research Centre Background Paper No.3*, Institute for Development Policy and Management, University of Manchester.
- ARDINGTON, C., LAM, D., LEIBBRANDT, M. AND LEVINSOHN, J. (2003) "Savings, Insurance and Debt over the Post-Apartheid Period". Report for the Office of the Presidency.
- ARDINGTON, E. M. (1999) "Demand or Support: What counts in rural finance? A case-study based on Mbongolwana KwaZulu Natal", *Research Report No 26*, School of Development Studies, University of Natal-Durban.
- BANKING COUNCIL OF SOUTH AFRICA (2003) "Financial Sector Charter", see www.banking.org.za/Downloads/Charter_Final.pdf
- BEATTIE, R. (2000) "Social Protection for all: But how?" *International Labour Review*, 139(2), 129-148
- BESTER, H., CHAMBERLAIN, D., HAWTHORN, R., MALHERBE, S. AND WALKER, R. (2004) "Making insurance markets work for the poor in South Africa – scoping study" www.finmark.org.za
- BHORAT, H. (1999) "The October Household Survey, Unemployment and the Informal Sector: A note", *The South African Journal of Economics*, 67(2), 320-326.
- BROWN, W. AND CHURCHILL, C. (1999) "Providing Insurance to Low-Income Households Part I: A Primer on Insurance Principles and Products", Microenterprise Best Practices, Development Alternatives, Inc., Bethesda, Maryland, (<http://www.mip.org/pubs/mbp-def.htm>).
- BROWN, W. AND CHURCHILL, C. (2000) "Insurance Provision in Low Income Communities Part II: Initial Lessons from Micro-Insurance Experiments for the Poor", Microenterprise Best Practices, Development Alternatives, Inc., Bethesda, Maryland, (<http://www.mip.org/pubs/mbp-def.htm>).
- BUDLENDER, D., BUWEMBO, P. AND SHABALALA, N. (2002) "The Informal Economy: Statistical Data and Research Findings - Country case study: South Africa", Community Agency for Social Enquiry.
- CANAGARAJAH, S. AND SETHURAMAN, S.V. (2001) "Social Protection and the Informal Sector in Developing Countries: Challenges and Opportunities", *Social Protection Discussion Paper No. 0130*, World Bank.
- CHEN, M., JHABVALA, R. AND LUND, F. (2001) "Supporting Workers in the Informal Economy: A Policy Framework", Paper prepared for the ILO Task Force on the Informal Economy.
- DALLIMORE, A. (2003) "Savings versus Credit: Comparing Coping Strategies of Poor Households in Rural KwaZulu-Natal", Unpublished Report, Durban: Development Research Africa, February, 2003.
- DALLIMORE, A. AND MGIMETI, M. (2003) "Democratic Banking in the New South Africa: Challenging Contemporary Banking Practices at Grass Roots" Unpublished Report, Durban: Development Research Africa, February, 2003.
- DEL CONTE, A. (2000) "Roundtable on Microinsurance services in the informal economy: the role of microfinance institutions", Conference hosted by International Coalition on Women and Credit and Special Unit for Microfinance of UNCDF, The Ford Foundation, New York, 21 July 2000.
- DERCON, S. (2001) 'Assessing Vulnerability to Poverty', Paper prepared for DFID, (see www.economics.ox.ac.uk/members/stefan.dercon/).
- HOLZMANN, R. AND JORGENSEN, S. (1999) "Social Protection as Social Risk Management: Conceptual underpinnings for the Social Protection Sector Strategy Paper", *Journal of International Development*, 11, 1005-1027.

- HOMSER, D.W. AND LEMESHOW, S. (2002) Applied Logistic Regression Analysis, Wiley Inc., New York
- INTERNATIONAL LABOUR CONFERENCE 90TH SESSION (2002) “Women and men in the informal economy: a statistical picture”, International Labour Organisation, Geneva.
- LUND, F. AND SRINIVAS, S. (2000) “Learning from experience: a gendered approach to social protection for workers in the informal economy”, Geneva, International Labour Office.
- MFRC (2001) “Report on Impact of Credit and Indebtedness of Clients”, Micro-finance Regulatory Council, Johannesburg.
- MORDUCH, J. (1999) “Between the Market and the State: Can Informal Insurance Patch the Safety Net?”, *World Bank Research Observer*, 14(2), 187-207.
- MORGAN, P. (2004) “New law to bank the unbanked”, *Mail and Guardian* February 6 to 12 2004, 19
- MULLER, C. (2003) “Measuring South Africa's Informal Sector: An Analysis of National Household Surveys”, *Working paper 03/71*, Development Policy Research Unit, University of Cape Town
- NIGRINI, M (2001) “Empowering poor rural villages through the provision of financial services by means of financial service cooperatives: A preliminary investigation into Financial Service Cooperatives in South Africa”, International Jubilee Conference of the Economic Society of South Africa, 13-14 September 2001, Glenburn Lodge.
- PORTEOUS, D. (2003a) “The landscape of access to financial services in South Africa”, *Labour Markets and Social Frontiers No. 3*, South African Reserve Bank, Pretoria.
- PORTEOUS, D. (2003b) “Is Cinderella finally coming to the ball? SA Micro Finance in Broad Perspective” www.finmark.org.za
- RAGHUNATHAN, T.E., LEPKOWSKI, J., VAN HOEWYK, J. AND SOLENBERGER, P.W. (2001) “A multivariate technique for multiply imputing missing values using a sequence of regression models”, *Survey Methodology*, June
- RAGHUNATHAN, T.E., SOLENBERGER, P.W. AND VAN HOEWYK, J. (2002) “IVEware: Imputation and Variance Estimation Software. User Guide”, Survey Methodology Program, Survey Research Center, Institute for Social Research, University of Michigan
- STATA CORPORATION (2003a) Stata 8 Reference Manual A-F, Stata Press Publication, Texas
- STATA CORPORATION (2003b) Stata 8 Survey Data, Stata Press Publication, Texas
- STATA CORPORATION (2003c) Stata 8 Reference Manual G-M, Stata Press Publication, Texas
- VALODIA, I. (2000) “Economic Policy and Women's Work in South Africa: Overlooking Atypical Work?”, International Association for Feminist Economics, Istanbul, Turkey, 15-17 August 2000.
- VAN DER RUIT, C. (2002) “Micro-finance, Donor Roles and Influence and the Pro-poor Agenda. The Cases of South Africa and Mozambique”, *Research Report No 48*, School of Development Studies, University of Natal-Durban.
- WORLD BANK (2000) “World Development Report 2000/2001: Attacking poverty”, Oxford University Press, New York.

Appendix

Table A1 Comparison of estimates from logistic regression using complete data (Table 9) and using multiple imputation

Variable	Complete Data				Multiple Imputation			
	Coefficient	Std. Err.	t	P> t	Coefficient	Std. Err.	Wald test	Prob > Chi
African	-0.537	0.267	-2.01	0.044	-0.685	0.227	9.12	0.003
Coloured	-0.784	0.276	-2.85	0.004	-0.949	0.234	16.46	0.000
Indian	-0.614	0.303	-2.03	0.043	-0.747	0.274	7.44	0.006
Log(per capita income)	0.742	0.048	15.34	0.000	0.689	0.043	250.91	0.000
Rural	-0.032	0.082	-0.39	0.700	-0.068	0.077	0.78	0.377
Social pension	-0.270	0.115	-2.34	0.019	-0.234	0.101	5.39	0.020
Female head	-0.055	0.072	-0.77	0.443	-0.086	0.066	1.66	0.197
Age of head	0.017	0.003	5.80	0.000	0.013	0.003	26.55	0.000
Maximum education	0.124	0.010	11.97	0.000	0.125	0.009	179.77	0.000
Formality index	2.352	0.127	18.46	0.000	2.526	0.123	420.94	0.000

Notes: Estimated logits, standard errors, t-statistics and associated two-tailed p-values, Wald test statistics and associated p-values.

Table A2 Comparison of estimates from logistic regression using complete data (Table 10) and using multiple imputation

Variable	Complete Data				Multiple Imputation			
	Coefficient	Std. Err.	t	P> t	Coefficient	Std. Err.	Wald test	Prob > Chi
African	0.989	0.122	8.11	0.000	0.954	0.119	64.26	0.000
Coloured	1.603	0.143	11.25	0.000	1.595	0.136	138.13	0.000
Indian	-0.634	0.235	-2.70	0.007	-0.530	0.214	6.12	0.013
Log(per capita income)	0.180	0.033	5.42	0.000	0.170	0.036	22.15	0.000
Rural	0.305	0.069	4.44	0.000	0.288	0.065	19.67	0.000
Social pension	0.022	0.116	0.19	0.847	0.031	0.101	0.10	0.757
Female head	0.050	0.061	0.81	0.417	0.082	0.055	2.24	0.135
Age of head	0.021	0.003	7.84	0.000	0.022	0.003	76.52	0.000
Maximum education	0.058	0.007	8.15	0.000	0.059	0.006	83.12	0.000
Formality index	1.549	0.129	12.05	0.000	1.543	0.136	128.91	0.000

Notes: Estimated logits, standard errors, t-statistics and associated two-tailed p-values, Wald test statistics and associated p-values.