

Financial Inclusion and Welfare in Post-Apartheid South Africa

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Abstract

The socioeconomic transformation process in post-apartheid South Africa has generated research on a wide range of economic issues, in particular, inequality and poverty. Surprisingly, there is limited empirical analysis on financial inclusion. This paper fills this void in the literature by answering two questions: (i) Does financial inclusion improve welfare? (ii) Is the benefit from using formal financial services greater than from using non-formal financial services? The paper uses a unique cross-sectional dataset on use of financial products over the period 2006–2011. Two measures of welfare are constructed – a well-being index and a wealth index. The sample is divided into users of formal financial services and users of non-formal financial services. The focus is on the differences in the welfare of the two groups. This difference in welfare is then decomposed through the Recentered Influence Function (RIF) approach. Finally, an OLS regression of the recentered welfare is estimated across quantiles for each group. Results show that: (i) overall, using formal financial products is associated with higher welfare; (ii) regardless of the measure of welfare used, the results are qualitatively similar: the wealth index picks up differences in the top quantiles, while the well-being index picks the differences in the lower quantiles; (iii) welfare disparities are accounted for by the unexplained factors related to income and education; and (iv) there are welfare gains from using non-formal credit and insurance products for individuals in the lower quantiles. The results suggest that the pursuit of financial inclusion should be complemented with policies that improve education and incomes, especially for the marginalised.

Key words: *Financial Inclusion; Recentered Influence Function; South Africa; Welfare*

JEL codes: *G2, I3*

1. Introduction

Empirical work on the finance–welfare nexus has yielded mixed results. A growing body of research shows that broad-based access to financial services and products can lead to better livelihoods for households by promoting income equality and reducing poverty (Beck *et al*, 2007; Burges and Pande, 2005; Honohan, 2008; Khandker and Samad, 2013). In some cases, access to finance has led to increased incomes of the poor relative to the non-poor and improved self-reported well-being, as well as increased participation in entrepreneurial activities (Beck *et al*, 2007; Burges and Pande, 2005; Honohan, 2008; Karlan and Zinman, 2010; Khandker and Samad, 2013). In other instances, the effect has been to reduce the welfare of the included relative to periods prior to inclusion (see Diagne and Zeller, 2001). Emphasis has also been placed on formal financial mechanisms, yet the existence of non-formal financial products has implications for inclusion. For instance, uptake of formal products could be hampered and thus the scaling-up of financial inclusion, if non-formal products can compete favourably.

But the mechanisms through which this happens are not clear, given the varying definitions and measures of financial inclusion. A comprehensive definition of financial access relates to a situation whereby a full suite of quality financial services is provided at affordable prices to everyone who can use them, and the services are delivered by a range of providers in a stable and competitive market to financially capable clients.¹ Guided by this transmission mechanism, policy makers have adopted various initiatives to improve financial access by reducing the cost of operating a bank account or acquiring credit.² More direct interventions include “Banking the Poor” through “Government-to-People” (G2P) payment systems, whereby money transfers are made to specific groups of the population with a requirement that they receive their funds through a formal financial pay-point. G2P payments systems include Brazil’s Bolsa Familia, Columbia’s Familia en Accion, Mexico’s Oportunidades and South Africa’s Old Age Pension and Child Care support (Bold *et al*, 2012). This approach addresses the concerns raised by the World Bank that financial inclusion is out of reach for those living on less than \$2 a day. It is argued that households need means to transact, access credit, mitigate risks and plan for the future through savings.³ A key innovation in the transactions space is the M-Pesa technology in Kenya and Tanzania, which facilitates mobile-phone-based money transfers. This is relevant for the rural poor who are often excluded from mainstream banking (Kikulwe *et al*, 2014). But what are the welfare gains from increased access to and use of financial services and products? For whom is the gain most significant?

This paper investigates the welfare disparities between users and non-users of formal financial services in post-apartheid South Africa. Using FinScope surveys for the period 2006–2011 comprising a total of 18,694 individuals, two measures of individual welfare are constructed: a well-being index and a wealth index. Since participation in the formal sector is an individual choice, using the ordinary least squares method of analysis would not capture the potential self-selection bias. The paper thus mimics experimental literature by dividing the sample into users of formal financial services (the treatment group) and users of non-formal financial services (the control group). Welfare differences between these two groups are then decomposed by quantiles, using the Recentered Influence Function (RIF) approach from Firpo, Fortin and Lemieux (2007). The key finding of this paper is that, while users of formal financial products experience better welfare than users of non-formal financial products in general, there are welfare gains from using informal credit and insurance products for individuals at the bottom end of the welfare spectrum. Welfare gains are also non-linear across quantiles. Welfare disparities in lower quantiles are captured by the well-being index, and the wealth index captures disparities at the top. In both cases, the key determinants of the disparities are accounted for by education and income.

The rest of the paper is structured as follows: Section 2 provides an overview of South Africa's financial sector reforms in the light of financial inclusion. The literature review is provided in Section 3, followed by the theoretical framework and the methodological approach in Section 4 and Section 5, respectively. Results are provided and discussed in Section 6, while Section 7 concludes.

2. South Africa's financial system

The 1948 Apartheid legislation was characterized by unequal access to basic services on the basis of race. Only Whites had access to quality education and financial services, among other benefits. The rest of the population groups (Blacks, Asians and Coloureds) were confined to rural areas characterized by minimal financial and other infrastructural support. Subsequently, these marginalized groups devised alternative mechanisms to meet their financial demands in terms of credit, risk management, saving and investment. One such mechanism that gained prominence was the stokvels⁴ arrangements, a form of informal savings mechanism.⁵ Thus the country was characterized by a highly sophisticated financial sector, among the top 10 in the world (Ludwig, 2006), that served the interests of the elite few, alongside an equally vibrant informal sector that served the excluded majority.

The financial sector was governed by regulations that restricted access to and use of formal finance. Notable among these were the Usury Act of 1968 (hereafter “the Usury Act”) and the Credit Agreements Act 74 of 1980. The Usury Act covered money lending of up to R500,000 (roughly US\$40,000) and capped interest rates for these loans. This legislation had a discriminatory effect on the supply of loans in that, by imposing interest rate caps that were meant to protect lenders, it compromised access to credit by low-income individuals. For these people, financial institutions often rationed the supply of financial services to them, in fear of not covering their costs on small loans. To try and ease the credit rigidities, the Exemption Notice of 1992 was issued. It exempted loans under R6,000 (roughly US\$400) from the provisions of the Usury Act, and interest rate charges on such loans were uncapped (Kelly-Louw, 2012). However, this led to a rise in the already high cost of micro-credit, especially to poor and low-income consumers, who still could not gain access to formal credit.⁶

The Alienation of Land Act of 1981 inadvertently compromised the accumulation of assets by individuals. The government took sole ownership of the land, and if it required a piece of land that was inhabited by Blacks, Coloureds or Asians, these residents were evacuated and relocated to unproductive low-market areas with no financial infrastructure, often without adequate compensation. This had the long-term effect of curtailing the use of land as collateral to access formal credit.

With the advent of democracy in the early 1990s, the post-apartheid government undertook economic reforms to reverse the apartheid injustices. Under the Reconstruction and Development Programme (RDP), strategies were put in place to transform the economy from one that served the wealthy and excluded the poor, to one that harnessed the full potential of the country's people and resources (RDP, 1994). One key strategy

was Broad Based Black Economic Empowerment (B-BBEE), a precursor for the B-BBEE Act of 2003, which led to the development of the Financial Sector Charter of 2003. The “Charter” committed its participants (which included banks and insurance companies) to “actively promote a transformed, vibrant, and globally competitive financial sector that reflected the demographics of South Africa, and to contribute to the establishment of an equitable society. This was to be achieved by effectively providing accessible financial services to black people and by directing investment into targeted sectors of the economy”.⁷ As a result, affordable financial services and products were extended to the previously excluded, notably the low-cost transactional/Mzansi account.⁸ This boosted inclusion between 2003 and 2008 by six million, many of whom were first time users (see Table 1). In 2007, the National Treasury and the members of the Association for Savings and Investments in South Africa introduced a matched savings/investment product to assist parents in saving for their children’s tertiary education – the Fundisa fund.⁹ By 2012, all social grant recipients were required to receive their funds through a South African Social Security Account (SASSA),¹⁰ a form of G2P payment system to further include individuals at the lower end of the income spectrum. Money transfer mechanisms also became available through grocery and retail stores.

Table 1: Formal financial sector participation and inequality in South Africa, 2003–2013

(%)	2003	2006*	2009	2011	2013**
Currently banked	49	53	62	65	75
Previously banked	14	12	9	4	4
Never banked	37	35	28	31	21
Gini coefficient	57.7	67.4	70.0	65.4	67.8

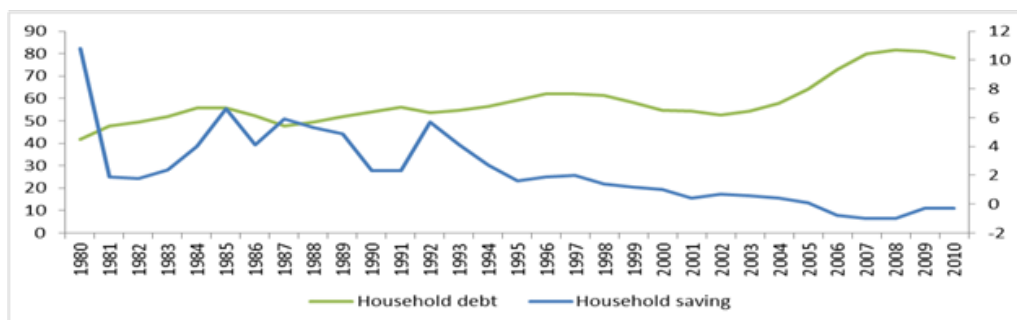
Source: FSSA (2003–2013), www.finscope.co.za and www.worldbank.org/PovcalNet/index.html

Note: Uptake boosted by: *Mzansi Account **SASSA Accounts. Informal sector: 12 million registered stokvel members pooling up to R44 billion per year.

In a series of reforms, the Usury Act was repealed and the National Credit Act of 2005 was adopted. There was provision for payments in instalments, which enabled many individuals to take up credit. Given the deprivation from the apartheid regime and the easy access to credit, accompanied by affirmative action as part of the transformation process,¹¹ there was a high potential for aspirational borrowing that could throw many consumers into indebtedness.¹²

But by 2004, the use of financial services in South Africa was closely associated with households at the higher end of the income distribution and more linked to formal employment (Ardington and Leibbrandt, 2004). Srinivasan (2006) also found that, even though more Black South African households gained access to formal credit between 1993 and 2004, the increase was not statistically significant. The FinScope survey of 2012 found that the extent of formal credit use was indeed as small as 26% of the population, and about 65% of South African adults did not borrow at all. Of those who borrowed from the formal financial institutions, 38% were heavily indebted,¹³ with household debt-to-disposable income reaching almost 80%, and household savings sinking to as low as -0.2%, as shown in Figure 1. This has implications for household welfare and inequality. Indeed, Table 1 shows that the country’s Gini coefficient has been relatively high by international standards.

Figure 1: The trend of household savings and household debt-to-disposable income



Source: South Africa Reserve Bank Quarterly publications for 1995–2012, and International Financial Statistics. Note: The figure shows that since the early 1990s, when the financial sector reforms were initiated, households have accumulated debt to unsustainable levels, while household savings dropped considerably.

The number of consumers outside the formal sector and the levels of indebtedness cause some concern. Notice that financial inclusion and access often focus on formal financial mechanisms as reflected in the definitions. But the existence of non-formal mechanisms could impede the take-up of formal products, resulting in a situation of voluntary exclusion. If the ultimate goal of financial inclusion is welfare improvement (as shown in Appendix A1), then it is worth investigating the benefits associated with both formal and non-formal financial mechanisms. Indeed, by 2012, 37% of the South African population was still outside the formal financial sector, with many using other sources of credit, including informal lenders, and saving through informal savings mechanisms (FinScope, 2012). Appendix A2 shows the range of financial products in the formal, semi-formal and informal financial sectors across product categories. Is it possible that there are welfare benefits from using non-formal financial mechanisms in South Africa? Answering this question would help guide future financial inclusion strategies for the country.

3. Literature review

Empirical evidence on the relationship between finance and welfare is mixed. The Indian social banking experiment showed that the expansion of credit and savings facilities to the rural poor can improve the head count poverty ratio (Burgess and Pande, 2005). The authors argue that even though they used wages for agricultural workers as a measure of welfare for the poorest group in the country, their results were robust at an aggregate poverty level. However, this measure might not be robust in economies without substantial employment in the agricultural sector, such as South Africa. In a cross-country analysis of 52 developed and developing countries, Beck, Demirgüç-Kunt and Levine (2007) find that financial development disproportionately improves income distribution in favour of the poor. In a panel analysis, Khandker and Samad (2013) followed micro-credit recipients in Bangladesh for a period of 20 years and found significant welfare gains (for example: increased income and consumption, accumulation of assets, investment in children's schooling) resulting from microcredit participation, with a gender bias in favour of women. They add that the benefits of borrowing outweigh accumulated debt, thus increasing households' net worth and reducing poverty and the debt-asset ratio. Their results, they argue, are robust after controlling for heterogeneity and participation or selection bias. But group dynamics in the microfinance model play a role in financial outcomes. This study is conducted at the individual level of financial access.

Estimates from about 160 countries of adults using formal financial services show that there is a positive association between access to finance and lower inequality, measured by the Gini coefficient (see Honohan, 2008). But a Malawi case study by Diagne and Zeller (2001) found that micro-credit to poor smallholder farmers, intended to raise their incomes through purchase of seeds, fertilizers and other inputs for maize and tobacco, had the effect of lowering net crop income for the participants compared to their non-participating counterparts. Diagne and Zeller argue that conditions surrounding access to financial services must be cognisant of the actual opportunities and constraints faced by the poor. Otherwise, the results may not be welfare enhancing.

A South African randomized experiment conducted by Karlan and Zinman (2010) found that marginal loans produced significant economic and subjective outcomes to borrowers, for example, job retention, increased income, food consumption in terms of quality and quantity, household decision making and mental outlook. This paper investigates whether such outcomes can also be attributable to other products such as insurance or savings and investment products.

The burgeoning research into the expansion of M-Pesa in Kenya shows that there are immediate gains to users of this transaction mechanism. For example, Kikulwe *et*

al (2014) find that smallholder farmers improve their cash-flow through remittances, which in turn enables them to purchase more farm inputs, and reduce risk and liquidity constraints, compared with farmers who do not use the mobile technology. Similar micro results have been found by Kirui et al (2013), Morawczynski (2009) and macro-level gains by Aker and Mbiti (2010).

In India, Gine et al (2010) find that if individuals believe that they might be worse off following the access to inappropriate financial services, they might resist take-up of formal financial products. This observation is corroborated by Garcia (2013), who argues that individuals will opt only for those financial services or products which address their needs and maximize their utility, based on their inherent preferences and risk profiles. Implicit in this is that welfare outcomes are not necessarily observable, given that preference satisfaction is individual-specific and not standard.

It is easy to see that welfare differences, following access to finance in the studies highlighted above, are related to the measure of welfare adopted and the setting. Furthermore, as in the case of the Indian social banking experiment (Burgess and Pande, 2005), the benefits might be greater in the short term and also product-specific. This raises questions as to whether the results would be consistent when we consider aggregate use of financial products or when usage is disaggregated to the product level. What is missing in the studies highlighted above is the explicit contribution of non-formal financial products, given that they exist in many social settings. This could have implications for the success of financial inclusion initiatives. For example, a financial inclusion project by the Ford Foundation and Proyecto Capital in Cusco, Peru, found that for every formal savings account held in a bank, women actively maintained their membership in their rotating informal savings clubs.¹⁴ This product holding across sectors can pose challenges to claiming causality from usage to welfare of formal products. While randomized experiments suffer from concerns about external validity, they hold more promise in addressing the causality deficient in most studies. There is consensus, however, about the non-linearity in the welfare benefits from use of formal financial services based on the individual's characteristics. What is the case for South Africa, a country with strong formal and informal financial sectors? The next section discusses the methodological approach adopted to investigate the South African case study.

4. Theoretical framework

This study fits within the theory of welfare economics, incorporating a consumer's utility, or units of happiness, which is crucial in assessing well-being, and, therefore, enters the social welfare function for policy recommendations. It is assumed that providing access to finance will cause consumers to reveal their preferences either in actions (such as affordability of housing, health care, education, and wealth accumulation) or in words, such as feelings of happiness and sense of worth (Knight and Gunatilaka, 2014). Unequal access to finance is therefore a potential source of inequality in the consumption of basic goods and services, with implications for society's welfare and overall poverty. This relationship can be represented by the following reduced form welfare function:

$$W = f(I(USE), X) \tag{1}$$

Where I is a measure of inequality (for example the Gini coefficient), USE is a measure of financial inclusion, and X is a vector of covariates. But use of financial services can be driven by one's welfare, or by unobserved elements of X , leading to an endogeneity problem. Several studies have found education and income to be important determinants of welfare (Blaauw and Pretorius, 2013; Bhorat *et al*, 2000), and also determinants of the use of financial services (Cole *et al*, 2011; Nanziri and Leibbrandt, forthcoming). This exacerbates the causality problem, and potential selection bias. Thus, to test the net effect of the use of financial services requires an econometric approach that controls for the choice to use, given an individual's initial characteristics. These issues are dealt with in the methodological approach adopted for the study, which is discussed in the next section.

5. Methodology

Welfare is a multi-dimensional concept (see Nussbaum and Sen, 1993) and one that can pose a challenge to measure. Evidence from the field experiments alluded to earlier, as well as literature on the subject, suggests that there are “softer” measures for well-being (see Ashraf *et al*, 2010) associated with an individual’s capability to be or to do things of intrinsic value. I, therefore, construct two measures of welfare: a well-being index (constructed from indicators of deprivation) and a wealth index, is meant to capture the ownership of durable goods by individuals. However, the assets therein are not corrected for net value (on account of data) given that it is possible to acquire them on credit.

The well-being index

In many poverty and inequality studies, the extent of deprivation has been used as an indication of welfare measured by a “multi-dimensional poverty index” (MPI).¹⁵ The MPI is constructed from two components: the multi-dimensional headcount ratio, and the average intensity of poverty ratio. An individual who is deprived in more than three of the indicators of these two components is deemed to be poorer (Finn *et al*, 2013). If being poor is synonymous with low well-being, then a measure of deprivation can be a proxy for one’s well-being.

In the FinScope surveys used by this study, respondents were asked on a scale of 1–5, where 1= “Often”; 2= “Sometimes”; 3= “Rarely”; 4= “Never”; and 5= “Don’t know”, to respond to a set of questions capturing a broad representation of one’s well-being. However, the structure of these questions in the dataset could not allow for the construction of the conventional subjective well-being index.¹⁶ A binary variable was constructed with “1= 1 or 2 or 3” and “0 = 4”. The question of interest was framed as follows: “In the last 12 months, how often have you or your family...”

- (i) gone without enough food to eat
- (ii) gone without medicine or medical treatment
- (iii) gone without cash income
- (iv) gone without shelter
- (v) gone without electricity in your home (apart from power cuts) or energy to heat your home or cook food?

These indicators compare relatively well with those identified in the MarkData Survey (1995) by Møller and Saris (2001), and they are aligned to the framework advanced by Noble et al (2000) and Finn *et al* (2013). According to these authors, responses to such questions have equal probability and they are subjective; that is to say, they are individual-specific. It is therefore safe to assume a linear and additive relationship between the variables and then to position the individuals between the lowest and the highest scores. This index assumes that all questions are weighted equally and is thus constructed according to the expression below:

$$WB_i = \sum_{k=1}^K x_k \quad (2)$$

where $i = 1, 2, \dots, N$; k is the number of deprivation questions asked, and x is the response or score for each respondent. The higher the score for an individual, the more “well-off” that person is.

The wealth index

This variable is constructed according to an individual’s possession of durable assets. This is based on the argument that assets might be better at capturing the long-term welfare of individuals or households, compared with income or expenditure that not only exhibit substantial measurement error, but are rarely recorded in many surveys. Assets as a measure of welfare are also widely used such as in the Demographic Household Surveys (Gwatkin *et al*, 2000; McKenzie, 2003).

A wealth index is constructed using a weighting method and individuals are ranked according to their scores. Simple summing across assets is often criticized on the basis of assuming equal weights for the items considered, while such items often differ in value as well as their distribution in the population. This difference is a function of the utility derived by individual consumers, thus, a weighting procedure such as factor analysis is preferred because it takes into account the underlying correlation between these items and their distribution in the population.¹⁷ A criticism often raised against the factor analysis approach is the negative weights attached to rare and unique items that are valued differently among individuals or across different geographical locations (for example, between urban and rural), with the result that individuals or households possessing such items often get a lower ranking or are considered worse-off than those who possess nothing at all.¹⁸

In recognition of this criticism, this study makes use of Banerjee’s (2010) uncentred Principal Component (PC) in which every variable is divided by its mean (in the binary variable case, p_i) and then extracting the first principal component of the cross-product matrix.¹⁹ Thus, the first principal component of this “uncentred PC” procedure is considered to be the wealth index. According to Banerjee (2010), this index is guaranteed to give a wealth index that obeys the principle of monotonicity. It gives non-negative scores with an absolute zero (hence no need to re-scale), and it can be used to calculate

Gini coefficients even when all variables are binary. Also, the Gini coefficient calculated in this way (using continuous variables) obeys all the standard inequality axioms such as showing a decrease in inequality if a correlation increasing transfer is effected. These advantages are crucial for this study, whose focus is on inequality. The individual's ranking according to welfare distribution is also crucial for the interpretation of results for policy, which is of interest to this study. The wealth index is constructed according to the following expression:

$$WLT(S) = [1 - \sum_{i=1}^n (2r_i - 1) / n^2] y_i \quad (3)$$

where WLT is the wealth index, S is an $n \times m$ matrix such that $A = A(S)$ is a scaled version of S obtained by dividing each member of S by the mean of the relevant column. $y_i = (Ax)_i$, $i = 1, 2, \dots, n$ where x is the first Eigen vector associated with the maximal Eigen value of the non-negative square matrix $A'A$ normalized so that its components sum to 1; r_i ($i = 1, 2, \dots, n$) is the rank of individual i in the re-arrangement of the vector $y = (y_1, y_2, \dots, y_n)$ in non-increasing order. The items used to construct this index were selected in line with the practice in the Demographic Household Surveys.

Measuring financial inclusion

In this study, financial inclusion is synonymous with financial products usage and it is constructed as a binary variable equal to one if an individual uses any one product in the categories of “transaction”, “credit and loan”, “short- and long-term insurance” and, “savings and investment” products from a formal financial institution.²⁰ The FinScope surveys asked individuals whether they had used a particular product in the past 12 months. Non-users or the financially excluded comprise users of products from the semi-formal and informal financial sectors.²¹ Disaggregating inclusion by products follows a similar categorization. Following Klapper and Singer (2014), formal is superior to semi-formal, which is in turn superior to informal. An individual who uses products across sectors is classified according to the higher sector. This breakdown at the product level is available in the data to the last detail of source and purpose. The next section delves into the estimation strategy employed in this study.

The empirical strategy

The welfare measures constructed above form the dependent variables of the study. The variables are first transformed using the Recentered Influence Function (RIF) approach, which is discussed in the next section. The difference in welfare is then decomposed to examine what explains the observed welfare differences between users (the financially included) and the non-users (the financially excluded) in the relevant models. The empirical approach is based on Firpo, Fortin and Lemieux (2007) – Firpo, Fortin and Lemieux hereafter – complemented by Fortin, Lemieux and Firpo (2009) – FLF hereafter – a version of which was used by Knight and Gunatilaka (2014).

Borrowing from the treatment effects literature (see Rosenbaum and Rubin, 1983; Heckman, 1979), the sample is divided into a treatment group (individuals who use at least one formal financial product) and a control group (individuals who use semi-formal or informal products). The focus is on the difference between the welfare of these two groups. Given that treatment is not random in this study, we first estimate the probability of using financial products. The conditional probability of an individual i being included given his/her characteristics $X = x$ is given by $p(x) = Pr [USE = 1|X = x]$. This is similar to the propensity score that is used to allocate individuals to the treatment and the control groups, and to form a counterfactual group. Welfare, however, is determined by observable characteristics X_i and unobservables ε_i , and this relationship can be represented as follows:

$$W_{ij} = g_j (X_i, \varepsilon_i) \quad (4)$$

for j =user, non-user, and the function $g_j(\dots)$ has an unknown value mapping. We assume that welfare (W), USE and the observed characteristics (X s) have a joint distribution (Firpo, Fortin and Lemieux, 2007). From the data on W , USE and X , we can non-parametrically identify the distributions of $(W_{use} | USE = 1) \sim F_{use}$ and that of $(W_{nonuse} | USE = 0) \sim F_{nonuse}$. To obtain the counterfactual distribution that we would have observed if non-users had the observed and unobserved characteristics of users, $(W_{nonuse} | USE = 1) \sim F_{counterfactual}$, we make two assumptions of “ignorability” and “common support”, and also invoke the “inverse probability weighting” technique to assign individuals to the groups.²² This is crucial for the decomposition of the welfare differences into the composition (explained) and welfare (unexplained) effects.

By the “ignorability” assumption, if (USE, X, ε) have a joint distribution such that ε is independent of financial inclusion for all $X=x$, then the distribution of unobserved factors in the determination of welfare is the same across groups once we condition on a vector of observable factors. According to Firpo, Fortin and Lemieux (2007), this rules out selection into either group based on unobservables. On the other hand, the “common support” assumes that there are no values for which everybody is treated or everybody is controlled. This implies that, for all x in X , $p(x) = Pr[USE = 1|X = x] < 1$ and $Pr[USE = 1] > 0$.

Given these assumptions, we follow a two-stage approach. First, we estimate the probability of using formal financial products and use the predicted values to assign individuals to treatment, control and counterfactual. We consider a function of the joint distribution of $(W_{use}, W_{nonuse})|USE$ such that the overall distributional changes can be decomposed into the “explained/composition” and the “unexplained/welfare” effects. Let $v(F_j)$ be a distributional statistic of interest (the quantile and Gini in this paper) of the welfare measure (y_j) 's distribution, F_j , where $j = 0, 1$ for non-users and users of financial services respectively. (y_j) is first re-weighted with the inverse of the probability of being in each group of “user”, “non-user” or “counterfactual”. The three weights that are required are $\widehat{w}_u = \frac{J}{\widehat{p}}$, $\widehat{w}_{mu} = \frac{1-J}{1-\widehat{p}}$ and $\left(\frac{\widehat{p}(X)}{1-\widehat{p}(X)}\right)$, which correspond to “users”, “non-users” and “counterfactual”, respectively, and \widehat{p} is the true probability of being a

“user” given X (covariates).²³ Subsequently, the estimation of the distribution statistics (\widehat{v}_u), (\widehat{v}_{nu}) and (\widehat{v}_c) follows a plug-in approach, wherein, replacing the cumulative distribution function by the empirical distribution produces the estimators of interest $\widehat{v}_j = v(\widehat{F}_j)$, $j = \text{users, non-users}$; $\widehat{v}_c = v(\widehat{F}_c)$, where; $\widehat{F}_j(y) = \sum_{i=1}^N \widehat{w}_j(J_i) * 1\{Y_i \leq y\}$, $j = \text{users, non-users}$ and $\widehat{F}_c(y) = \sum_{i=1}^N \widehat{w}_c(J_i) * 1\{Y_i \leq y\}$. \widehat{F}_c represents the distribution of welfare that individuals would have received as “non-users” if they had “user” characteristics. The welfare and composition effects are thus given as $\widehat{\Delta}_s^v = \widehat{v}_u - \widehat{v}_{nu}$ and $\widehat{\Delta}_x^v = \widehat{v}_c - \widehat{v}_{nu}$ respectively, and the overall change is given as in Equation 5, which is similar to the Oaxaca-Blinder decomposition.

$$\frac{v(\widehat{F}_u) - v(\widehat{F}_{nu})}{\text{overall effect}} = \frac{[v(\widehat{F}_u) - v(\widehat{F}_c)]}{\text{welfare effect}} + \frac{[v(\widehat{F}_c) - v(\widehat{F}_{nu})]}{\text{composition effect}} \quad (5)$$

It should be noted that the welfare variable used in this decomposition is a transformed one, and the decomposition is done on quantiles, which makes this approach different from the ordinary Oaxaca-Blinder decomposition. I now discuss the transformation exercise.

The Recentered Influence Function (RIF)

The RIF approach proposed by Firpo, Fortin and Lemieux (2007) allows us to investigate the impact of changing the distribution of covariates on the marginal quantiles of the welfare distributions $F_w(w)$ of the “user” and “non-user” groups as well as of the “counterfactual”. The influence function (IF) allows us to establish the influence of an individual observation on the distribution statistic. For each observation, I estimate the sample quantile q_τ , the density function $f_w(q_\tau)$ at the quantile using kernel methods,²⁴ and form a dummy variable $1\{W \leq q_\tau\}$, with one indicating that the value of the outcome variable is below q_τ and zero otherwise (second term of Equation 6). Adding back the statistic to the influence function yields the RIF given by Equation 6.

$$RIF(W; q_\tau, F_w) = q_\tau + \frac{\tau - 1\{W \leq q_\tau\}}{f_w(q_\tau)} \quad (6)$$

where the second term in Equation 6 represents the influence function for the case of quantiles. This expression thus represents the generalized form of the recentered welfare functional that is decomposed according to Equation 5.

The second stage is estimating an ordinary least squares (OLS) regression for the new dependent variables (Recentered WB and WLT indices) on the covariates by quantiles. To overcome the endogeneity problem alluded to earlier, education and income enter these regressions as predicted values. These two variables have been found to influence both welfare and use of financial services. Thus, two separate regressions are estimated for the determinants of education attainment as well as for income to obtain their respective

predicted values. The point estimates from the RIF regressions show the variation in the effect of each covariate across the different quantiles of the recentered WLT and WB distributions. Plotting these coefficients allows us to compare the within- and between-group variation in the welfare of users and non-users across quantiles. If use of formal financial services is welfare enhancing, then we expect a positive and significant welfare difference between the two groups in favour of the users. Furthermore, we should expect the difference to be greater at the lower end of the welfare distribution compared to the upper end,²⁵ where the marginal benefit of use of finance is greatest. These hypotheses will be tested in the context of the history and vibrancy of South Africa's informal financial sector.

The data

This study uses a detailed data set (the FinScope surveys) that focuses on financial access, needs and profiles of users of financial services/products and the financial institutions from which they get these products. The financial products are broken down into formal, semi-formal and informal. These surveys are repeated cross-sections conducted annually in South Africa (since 2003) and in 16 other developing countries. They also provide a considerable amount of detail on the characteristics of respondents such as age, level of education, sources of income, occupation, and indicators of well-being (income; housing quality and tenure; deprivation; statements on thoughts, feelings and experiences; asset possession). The unit of analysis is the individual.

Since the samples are drawn with independent probabilities, for the purpose of this study, I pooled data (by stacking/appending the individual surveys) only for the period 2006 to 2011 on account of inconsistencies in question framing. This provided a consistent and reasonable sample size of approximately 18,000 observations. The assumption was that different individuals were interviewed in each survey such that, on average, changes would reflect either the behaviour of the individuals (model effect) or changes in the make-up of the population over time (distribution effect). According to Wooldridge (2010), in such pooled cross-sections, the appearance of an observation in more than one cross-section is considered coincidental and does not affect the analysis.

The main limitations of the dataset are the inability to establish the initial usage status of the individual and the inconsistency of questions across surveys, hindering use of key variables in a pooled dataset. Consequently, the analysis for this paper is based on a shorter time period (2006–2011) and an extremely limited number of variables relating to well-being. Additionally, I construct two measures of welfare: the well-being index and the wealth index. It is, therefore, safe to assume that their combined effect can make a case for reliable inferences.

Highlights from the data

The data comprises 52% females and the racial composition is nationally representative at 80.3% Blacks, 7.4% Whites, 9.4% Coloureds and Asians at 2.9%. About 69% of the respondents have attained high school education, and up to 14.5% have post-secondary

school education. The largest age group is formed of youths (18–29 years) followed by the 30–44-year-olds who together make up 74% of the sample. There is a 50:50 rural-urban representation, and almost 90% of the sample reported a personal monthly income of less than R10,000 (roughly US\$600). The data are weighted with individual survey weights benchmarked to Statistics South Africa, which makes it nationally representative.

Table 2: Use of financial services in South Africa, 2006–2011

Panel A: Mean use of financial services and products					
	Variable	Mean	SD	Min	Max
Overall financial services use					
	Non-formal	0.366	0.482	0	1
	Formal	0.634	0.482	0	1
Use by financial sector					
	Non-users	0.168	0.374	0	1
	Informal	0.073	0.261	0	1
	Semi-formal	0.125	0.331	0	1
	Formal	0.633	0.482	0	1
Use by product category					
Transactional					
	Non-use	0.384	0.486	0	1
	Formal	0.616	0.486	0	1
Credit					
	Non-use	0.476	0.499	0	1
	Informal	0.052	0.222	0	1
	Semi-formal	0.331	0.47	0	1
	Formal	0.141	0.348	0	1
Insurance					
	Non-use	0.676	0.468	0	1
	Informal	0.118	0.322	0	1
	Semi-formal	0.045	0.206	0	1
	Formal	0.161	0.368	0	1
Savings & investment					
	Non-use	0.731	0.443	0	1
	Informal	0.112	0.315	0	1
	Formal	0.157	0.363	0	1
Panel B: Mean formal products use by racial group					
	N	Transactions	Credit & loan	Insu- rance	Savings
Blacks	12774	0.60	0.18	0.10	
Coloureds	3946	0.64	0.19	0.14	0.38
Asians	1538	0.77	0.23	0.15	0.58
Whites	3858	0.94	0.32	0.25	0.88

Source: FinScope surveys 2006–2011.

Note: The table shows mean use of financial services as categorised by product type and major financial sectors in South Africa. The data are weighted to be nationally representative using survey weights aligned to Statistics South Africa. These variables are used to construct an aggregate financial inclusion variable, which equals one if an individual uses any one of the formal products, and is equal to zero otherwise.

Table 2 shows that up to 63% of South Africans reported using at least one formal financial product, which is the measure of financial inclusion adopted for this study. This shows some evidence of increased access to finance following the financial inclusion policies, from just over 40% in 1994 (Srinivasan, 2006). Disaggregating this usage into product categories shows that the bulk of usage is for formal transactional products. This would include the Mzansi low-cost account that was embraced by many first-time formal financial services users. Indeed, for the rest of the categories there is a higher proportion

of non-users with marginal use of semi-formal credit products and informal insurance. These summary statistics make the decomposition exercise by products relevant, as aggregate analysis might conceal the effect of individual products and yield biased results (although the direction of the bias is not clear a priori). Further, breakdown of usage by race shows that almost the entire White population is banked, with usage spread across all the product categories in proportions greater than the rest of the racial groups. Blacks, who are also the majority, are the least financially included (Table 2: Panel B).

Distribution of welfare

The index for well-being (WB) has a mean of 4.11 out of 5, and a standard deviation of 1.29 (a higher score reflects better welfare). This average allows us to investigate the overall distribution, as shown in Table 3.

Table 3: Distribution of well-being by use of financial services in South Africa, 2006–2011

Use of financial services		Mean well-being	Relative well-being	Demographics		Mean well-being	Relative well-being	
Overall	Formal			Gender	Male	4.16	1.00	
	Non-use	3.57	1.00		Female	4.07	0.98	
	Formal Use	4.34	1.22					
Sector	Non-use	3.59	1.00	Race	Blacks	3.79	0.78	
	Informal	3.54	0.99		Coloureds	4.24	0.88	
	Semi-formal	3.57	0.99		Asians	4.66	0.96	
	Formal	4.35	1.21		Whites	4.84	1.00	
Products								
Transaction	Non-use	3.61	1.00	Education	No formal education	3.17	1.00	
	Use	4.11	1.14		Primary school	3.49	1.10	
Credit	Non-use	3.97	1.00		High school	4.11	1.30	
	Informal	3.53	0.89		Post-high school	4.71	1.49	
	Semi-formal	4.01	1.01	Income	Up to R999	3.65	1.00	
	Formal	4.74	1.19		R1000-5999	4.15	1.14	
Insurance	Non-use	3.99	1.00		R6000-9999	4.73	1.30	
	Informal	3.76	0.94		R10000-24999	4.86	1.33	
	Semi-formal	4.07	1.02	R25000+	4.93	1.35		
	Formal	4.65	1.17					
Savings	Non-use	3.98	1.00	Area	Urban formal	4.42	1.20	
	Informal	4.01	1.01		Urban informal	3.64	0.99	
	Formal	Traditional land	3.35		0.91	Rural formal	3.68	1.00
		30–44years	4.09		0.96	45–59years	4.13	0.97
		4.65	1.17		60+ years	4.26	1.00	

Source: Author's calculation from FinScope surveys 2006–2011.

Note: The table shows mean well-being by financial sector participation and by selected personal characteristics.

The index of well-being ranges from 1 to 5 with a national average of 4.11. A relative well-being of 1.00 indicates a base category. The data are weighted to be nationally representative.

We observe that the mean well-being of users of formal financial products is higher than that of non-users. While this pattern is, on average, replicated in product categories, we see an interesting pattern in the case of credit and insurance products. Credit and insurance non-users have a mean score that is comparable to that of semi-formal credit users and higher than that of informal-credit/insurance users. This result seems to suggest that semi-formal credit might not necessarily be welfare enhancing. Alternatively, non-users of these product categories might have other sources of fulfilment that might not necessarily be linked to access to financial services.²⁶ In terms of demographics, we notice in Table 3 that mean well-being increases with education and personal income levels. The regional distribution is as expected, with urban dwellers having a relatively higher mean compared to their rural counterparts. This result is similar to that obtained by Møller and Saris (2001).

The second measure of welfare, the wealth/asset index, shows that most South Africans were below the national average of 4.06, on a scale that ranges from 0 to 21.29 (see Table 4). A comparison between the users and non-users of financial services shows that more non-users have a score below the national average compared to users. Users of products from the formal sector have a comparatively higher score than non-users. A closer look at use by sector and by product category shows that in terms of only formal products, formal credit users have the best welfare overall, followed by formal insurance. Overall, users of formal products have a higher wealth score than users of semi-formal or informal products.

The distribution by demographics has a similar pattern to well-being in terms of income and education. Average wealth increases with increasing income and education levels, with above average scores for individuals earning at least R6,000, and for those with at least matric level of education. But the patterns of income and education seem to be interrelated. The intuition is that we expect individuals to get meaningful employment after matriculation, and the higher their earning, the greater their affordability of durables. Furthermore, having job tenure increases one's chances of qualifying for credit and accumulating wealth or assets. There is also a somewhat positive correlation between age and wealth, which might reflect the urgency of individuals to acquire assets once they reach their 30s, then building this asset base until retirement.²⁷

Table 4: Distribution of wealth by use of financial services in South Africa, 2006–2011

Use of financial services		Mean wealth	Relative wealth	Demographics		Mean wealth	Relative wealth
Overall	Formal			Gender			
	Non-use	1.64	1.00		Male	4.17	1.00
	Formal use	5.11	3.12		Female	3.97	0.95
Sector	Non-use	1.52	1.00	Race	Blacks	2.08	0.21
	Informal	1.34	0.88		Coloureds	3.68	0.37
	Semi-formal	1.97	1.30		Asians	6.60	0.66
	Formal	5.11	3.36		Whites	10.00	1.00

*continued next page***Table 4 Continued**

Use of financial services		Mean wealth	Relative wealth	Demographics		Mean wealth	Relative wealth
Products							
Transactions	Non-use	1.79	1.00	Education	No education	0.98	1.00
	Use	5.14	2.87		Primary school	1.45	1.48
Credit	Non- use	2.61	1.00	High school	3.64	3.71	
	Informal	1.80	0.69	Post-high school	8.15	8.32	
	Semi-formal	3.71	1.42	Income	Up to R999	2.11	1.00
	Formal	8.60	3.30		R1000–5999	3.27	1.55
Insurance	Non-use	3.60	1.00		R6000–9999	7.26	3.44
	Informal	1.85	0.51		R10000–24999	10.45	4.95
	Semi-formal	2.14	0.59	R25000+	13.93	6.60	
	Formal	6.87	1.91	Area	Urban formal	5.19	3.09
Savings	Non-use	3.22	1.00		Urban informal	1.38	0.82
	Informal	3.01	0.93		Traditional land	0.82	0.49
	Formal	7.64	2.37		Rural formal	1.68	1.00
	Age				18–29 years	3.21	0.63
				30–44 years	4.00	0.79	
				45–59 years	4.76	0.94	
				60+ years	5.08	1.00	

Source: Author's calculation from FinScope surveys 2006–2011.

Notes: The table shows the mean wealth by financial sector participation and for selected individual characteristics. The wealth index ranges between 0 and 21.09, with a national average of 4.06. A relative wealth of 1.00 indicates a base category. Results are weighted to be nationally representative.

It is worth noting that the difference in the distributions of these two measures can be linked to the fact that the wealth/asset index is a proxy of the tangible uses of access to finance whether in terms of credit (future incomes) or cash money (current income). The latter is commonly used as a measure of welfare in related studies, for example Honohan (2008) and Burges and Pande (2005). Well-being, on the other hand, is more qualitative and not observable, and it can be an outcome of several factors, access to finance being one of them. In this regard, these two measures can be considered to be complementary in that, while having wealth can improve one's well-being, it is not the only factor. Indeed, the correlation coefficient between the WB and the WLT indexes was extremely low and not significant.

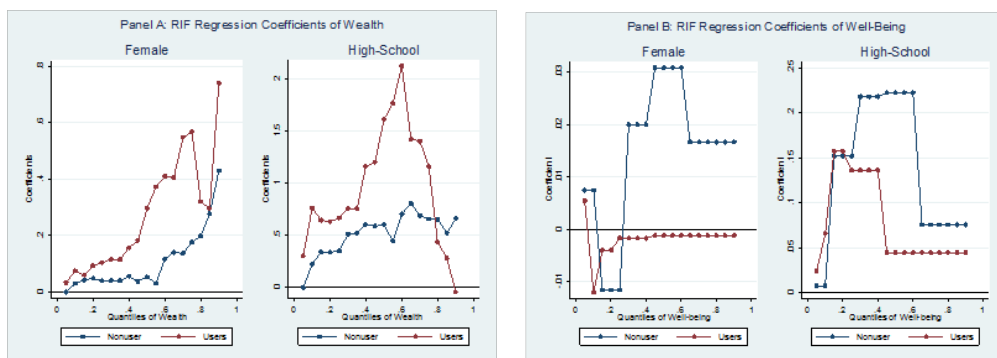
6. Empirical results

Before presenting the results of the decomposition exercise, let us examine how the welfare measures constructed relate to the financial services usage and the socioeconomic and demographic characteristics of South Africans. In what follows, the estimates from the RIF regressions by quantile for these two welfare measures are presented, followed by results from the decomposition exercise.

The RIF regression results

The influence function of each observation was computed using the second term in Equation 6. Survey weights aligned to Statistics South Africa were used in addition to the sample weights computed for the treatment, control and counterfactual sub-samples. Table 5 reports the RIF regression coefficients for the 10th, 50th and 90th quantiles for the users and non-users of financial services/products. The point to note from the RIF regression results is that covariates with a positive coefficient make a positive contribution to the welfare distribution, while those with a negative coefficient contribute negatively to the welfare distribution, (Firpo, Fortin and Lemieux, 2007). To complement the tabulated results, Figure 2 shows a plot of the RIF regression coefficients both on wealth and well-being. These plots show both the within and between-group effects (Fortin, Lemieux and Firpo, 2009) for users and non-users, as well as a combined effect (effect of covariates given that one uses or does not use financial services).

Figure 2: RIF regression coefficients on welfare across quantiles



Note: The graphs show plots of point estimates from regressing recentered wealth and well-being on a range of covariates. The base categories are Male, White, No formal education, 18–29 years, up to R999 monthly income, Urban. Users = “formal products” while Non-users = “semi-formal and informal products”. The data are weighted to be nationally representative.

Table 5: Unconditional quantile regression coefficients of welfare

	Non-users					Users						
	q10	(SE)	q50	(SE)	q90	(SE)	q10	(SE)	q50	(SE)	q90	(SE)
Female	0.03	0.002	0.05	0.015	0.38	0.011	0.07	0.004	0.52	0.000	0.71	0.001
Black	-0.02	0.072	-0.60	0.000	-8.82	0.000	-0.29	0.000	-4.96	0.000	-9.55	0.000
Coloured	0.03	0.004	-0.20	0.000	-7.80	0.000	0.18	0.000	-2.28	0.000	-8.83	0.000
Indian	0.03	0.007	0.00	0.941	-1.50	0.076	0.12	0.000	-0.02	0.915	-7.52	0.000
Primary school	0.10	0.001	0.09	0.019	-0.10	0.536	0.15	0.355	0.22	0.412	-0.12	0.675
High school	0.19	0.000	0.42	0.000	0.39	0.024	0.62	0.000	1.81	0.000	-0.30	0.308
Post-high	0.22	0.000	0.81	0.000	5.86	0.000	0.84	0.000	3.61	0.000	2.88	0.000
R1000-5999	0.05	0.000	0.14	0.000	0.01	0.974	0.24	0.000	0.40	0.000	-0.08	0.638
R6000-9999	0.07	0.102	0.05	0.688	1.93	0.360	0.32	0.000	2.52	0.000	2.57	0.000
R10000-24999	0.00	0.936	0.20	0.027	6.92	0.000	0.26	0.000	2.56	0.000	8.29	0.000
R25000+	0.00	0.000	0.00	0.000	0.00	0.000	0.25	0.000	2.53	0.000	15.18	0.000
Rural	-0.14	0.000	-0.71	0.000	-1.02	0.000	-1.11	0.000	-2.13	0.000	-0.16	0.349
Constant	0.10	0.002	1.50	0.000	12.34	0.000	0.01	0.936	3.68	0.000	16.45	0.000

continued next page

Table 5 Continued

	Non-users					Users						
	q10	(SE)	q50	(SE)	q90	(SE)	q10	(SE)	q50	(SE)	q90	(SE)
Female	0.01	0.312	0.02	0.069	-0.01	0.041	-0.01	0.245	-0.00	0.779	-0.00	0.779
Black	0.01	0.730	-0.20	0.000	-0.09	0.000	-0.01	0.000	-0.05	0.000	-0.05	0.000
Coloured	0.03	0.175	-0.13	0.000	-0.06	0.000	-0.01	0.477	-0.03	0.000	-0.03	0.000
Indian	0.04	0.036	0.01	0.717	0.03	0.129	0.00	0.972	-0.01	0.014	-0.01	0.014
Primary sch.	-0.00	0.755	0.06	0.005	0.02	0.009	-0.05	0.329	0.02	0.028	0.02	0.028
High sch.	0.01	0.295	0.17	0.000	0.06	0.000	0.02	0.723	0.05	0.000	0.05	0.000
Post-high	0.01	0.637	0.05	0.000	0.05	0.000	0.06	0.238	0.07	0.000	0.07	0.000
R1000-5999	0.02	0.024	0.07	0.000	0.03	0.000	0.05	0.000	0.02	0.000	0.02	0.000
R6000-9999	0.03	0.001	-0.01	0.918	-0.01	0.931	0.08	0.000	0.05	0.000	0.05	0.000
R10000-24999	0.03	0.010	0.15	0.023	0.08	0.056	0.05	0.000	0.05	0.000	0.05	0.000
R25000+	0.00	0.000	0.00	0.000	0.00	0.000	0.04	0.002	0.05	0.000	0.05	0.000
Rural	-0.01	0.197	-0.06	0.000	-0.03	0.000	-0.14	0.000	-0.03	0.000	-0.03	0.000
Constant	1.09	0.000	4.16	0.000	5.15	0.000	2.25	0.000	5.01	0.000	5.11	0.000

Robust standard errors (SE) reported.

Notes: The table reports the coefficients of the Recentered Influence Function regression for selected quantiles of the welfare of users and non-users of financial services on the individual's observable characteristics. The data are weighted to be nationally representative. Weights are aligned with Statistics South Africa.

A visual inspection of Figure 2 shows that there is a clear difference between the welfare distributions of users and non-users of financial services across the different quantiles. This is shown by the gap between the two plots in each category, where in some cases the gap is smaller at the lower quantiles and progressively widens at higher quantiles, while in other cases we see a convergence. Overall, the effect of being financially included is higher welfare. The distribution is also non-monotonic regardless of the welfare measure being used, falling above or below the distribution of the financially excluded. This difference is accentuated by the individuals' characteristics. For instance, from the top panel of both Table 5 and Figure 2, we notice that, compared with the base category (men), the effect of being financially included for women is higher wealth, rising across quantiles when compared with a somewhat stationary and lower effect for the non-users. Indeed, the within-group effect shows that the gap widens moving from lower quantiles for non-users {0.017 (q50-q10) versus 0.230 (q90-q50)}, but it narrows for the users {0.456 (50-10) versus 0.02 (90-50)}. Despite the oscillation at the top end of the distribution, it is clear that females who are financially included have higher welfare than their excluded counterparts. However, using the well-being measure, Figure 2's lower panel shows that the effect of being financially included for females is negative at lower quantiles and zero at higher quantiles compared to being financially excluded, although this effect is not statistically significant as shown in Table 5.

Overall, this result is consistent with experimental studies that have reported gender-related differences in the outcomes of financial inclusion programmes. For example, some financial inclusion interventions have reported an increase in women's entrepreneurship and empowerment in a manner that improves their welfare, with spillovers to the entire household.²⁸

Turning to the racial groups, the effect of financially included Blacks is negative and is statistically more significant for users than for non-users of financial products when compared to the base group of Whites. This pattern is similar for Coloureds and Asians, using both measures of welfare. Moreover, the within-group gap increases across quantiles for all three racial groups. These groups were previously excluded from the formal financial sector, and these results seem to suggest that despite the financial inclusion policies pursued by the post-apartheid government, it would appear that the use of formal products has not yet translated into significant welfare gains for these users compared to the use of semi-formal and informal products.

Education is one of the previously differentiated services offered in apartheid South Africa, yet it is linked to cognitive ability and the skills required to make effective use of financial services (Lusardi and Mitchell, 2014; Jappelli and Padula, 2013). We would therefore expect education to disproportionately improve welfare in favour of the financially included. Indeed, Figure 2 shows that the combined effect of financial inclusion and education is higher wealth, monotonically increasing from the 20th quantile for individuals with at least no high school level of education, to about the 60th quantile. Thereafter, it drops to negative territory for individuals with less than a matric (high school completion) level of education. A similar pattern is seen when we consider well-being, although the drop in the education effect occurs earlier in the distribution, at the 40th quantile. But Table 4 shows that this drop is not statistically significant.

Related to education is the income level of an individual, which represents the reward

to skills or education. Results in Figure 2 show that the welfare of financially included individuals earning at least R1,000 (US\$100) increases almost monotonically across quantiles. But the effect is more significant for earnings of more than R6,000 (roughly US\$400). This result is in line with empirical findings of a relatively higher welfare gain at the bottom of the income spectrum (Singer, 2014). On the other hand, the well-being measure shows that the effect of income for the financially included is only positive up to the 40th quantile. Notice from Table 4 that the contribution of income is significant for users relative to non-users, implying that the combined effect of higher levels of income and financial inclusion is relatively better welfare. To some extent, the education and income within-group effects seem to trend together.

Finally, the rural dummy shows a declining effect for both users and non-users of financial services compared with the base category of urban dwelling. The effect is worse for the financially included up to the 50th quantile, and it does not rise high enough to make a positive contribution to the welfare distribution, whether using wealth or well-being as measures. This result is not consistent with empirical findings such as in the rural banking project of India where there were welfare gains for rural users following a financial deepening policy, at least in the short run (Burges and Pande, 2005). However, in the case of South Africa, Singer (2014) argues that the structure of the banking sector with high costs makes access to finance by the poor unproductive, and could have negative implications for their welfare.

While these results so far point to a positive contribution of financial inclusion to welfare, the negative but significant contribution in some quantiles is perplexing, as is the positive and significant contribution of being financially excluded at some quantiles of the welfare distribution. This non-linearity in the distribution implies that the effect of financial inclusion cannot be generalized across individuals without due consideration of their initial position on the welfare spectrum. The flattening of the well-being distribution points to an optimal level of welfare that optimizes the treatment effect, such that beyond the median there is no significant variation in the well-being of individuals in both groups.

It should be noted that thus far the analysis has been based on a difference between use of formal financial services/products and non-use. But, as per the earlier discussion, South Africa has well developed semi-formal and informal financial sectors which, in some instances, offer similar services to those offered by the formal financial sector. Furthermore, the summary statistics in Table 2 show that there is a reasonable proportion of South Africans using non-formal products. Is it possible that there are welfare gains associated with participating in the non-formal financial sector such that there is not much difference between users of formal financial products and users of non-formal financial products? This argument is investigated in the next sub-section by undertaking the analysis at the product level between formal and informal credit and insurance. The choice of these products is based on their comparatively higher usage compared to other product categories.

Decomposition results

To capture the pattern of changes in the welfare distribution over the period 2006 to 2011, the welfare gap between users and non-users is decomposed across quantiles,

to allow for systematic tracking of the factors that could possibly account for differences in welfare. Table 6 shows the overall change in welfare at selected quantiles (Δ_{θ}^{τ}), decomposed into the composition effect or the explained effect (Δ_X^{τ}) and the welfare effect or the unexplained effect (Δ_S^{τ}) obtained using the re-weighting procedure. I focus on the lower (50–10) and the upper (90–50) gaps of the welfare distribution for illustration. The base category in this decomposition consists of Whites males with no formal education with up to R999 in personal income, 18–29 years of age and of urban residence. Overall, the unexplained factors appear to explain a substantial portion of the welfare disparities between the two groups.

Table 6: Decomposition results of welfare

Inequality measure	Panel A: Wealth			Panel B: Well-being		
	Overall inequality (90–10)	Lower gap (50–10)	Upper gap (90–50)	Overall inequality (90–10)	Lower gap (50–10)	Upper gap (90–50)
Total change	6.275	-0.868	5.407	-0.429	0.260	-0.689
Composition	2.626	0.367	2.259	0.050	0.166	-0.117
Welfare structure	3.650	0.502	3.148	-0.479	0.093	-0.572
Composition effects						
Demographics	6.347	0.258	6.088	0.121	0.181	-0.060
Education	2.641	0.381	2.260	0.102	0.199	-0.097
Personal income	2.022	-0.209	2.230	-0.161	-0.206	0.045
Rural dummy	1.129	0.469	0.659	0.035	0.130	-0.095
Residual	-9.513	-0.532	-8.978	-0.047	-0.138	-0.324
Welfare structure effects						
Demographics	2.269	-1.153	3.423	-0.003	-0.003	0.000
Education	2.289	4.871	-2.582	-0.050	-0.050	0.000
Personal income	1.437	1.430	0.007	-0.042	-0.042	0.000
Rural dummy	1.403	1.492	-0.089	-0.084	-0.084	0.000
Residual	-3.748	-5.875	2.382	0.300	0.272	-0.572

Note: Demographics include age, gender dummy and race. A positive value indicates greater inequality and a negative value indicates less inequality.

Using the wealth index, in Panel A we notice that the overall difference in the welfare of the two groups, the financially included and the financially excluded, is larger at the top end than at the bottom end of the welfare distribution. The difference is accounted for by the unexplained effect related to gender, race and age. Differences at the bottom end are accounted for by the unexplained effect related to income and education and, to some extent, region. It is therefore safe to say that the pursuit of financial inclusion policies should be complemented by policies that improve the education and incomes of individuals, in order for financial inclusion to contribute to the reduction of the welfare gap in South Africa. The intuition is consistent with empirical findings on the subject such as Cole *et al* (2011) and Lusardi and Mitchell (2014). If education, which facilitates the understanding of financial concepts, is lacking, then the use of financial services will be limited.²⁹ Recall that the descriptive statistics in Table 2 revealed that a big proportion of South Africans reported using more of the transaction products than

credit or insurance, and even fewer of the savings and investment products. Transactions products are mainly for consumption and contribute little to wealth accumulation. This pattern seems not to have changed since by 2004 empirical work by researchers such as Ardington and Leibbrandt (2004) and Srinivasan (2006) had found low use of formal products and even fewer credit products especially by Blacks despite the enactment of financial access policies. The positive value of the summary measure of inequality (the 90–10 gap) implies that, although there is greater inequality at the top end of the welfare distribution, overall inequality is greater among the financially excluded and is accounted for by the unexplained effect relating to the individual's characteristics.

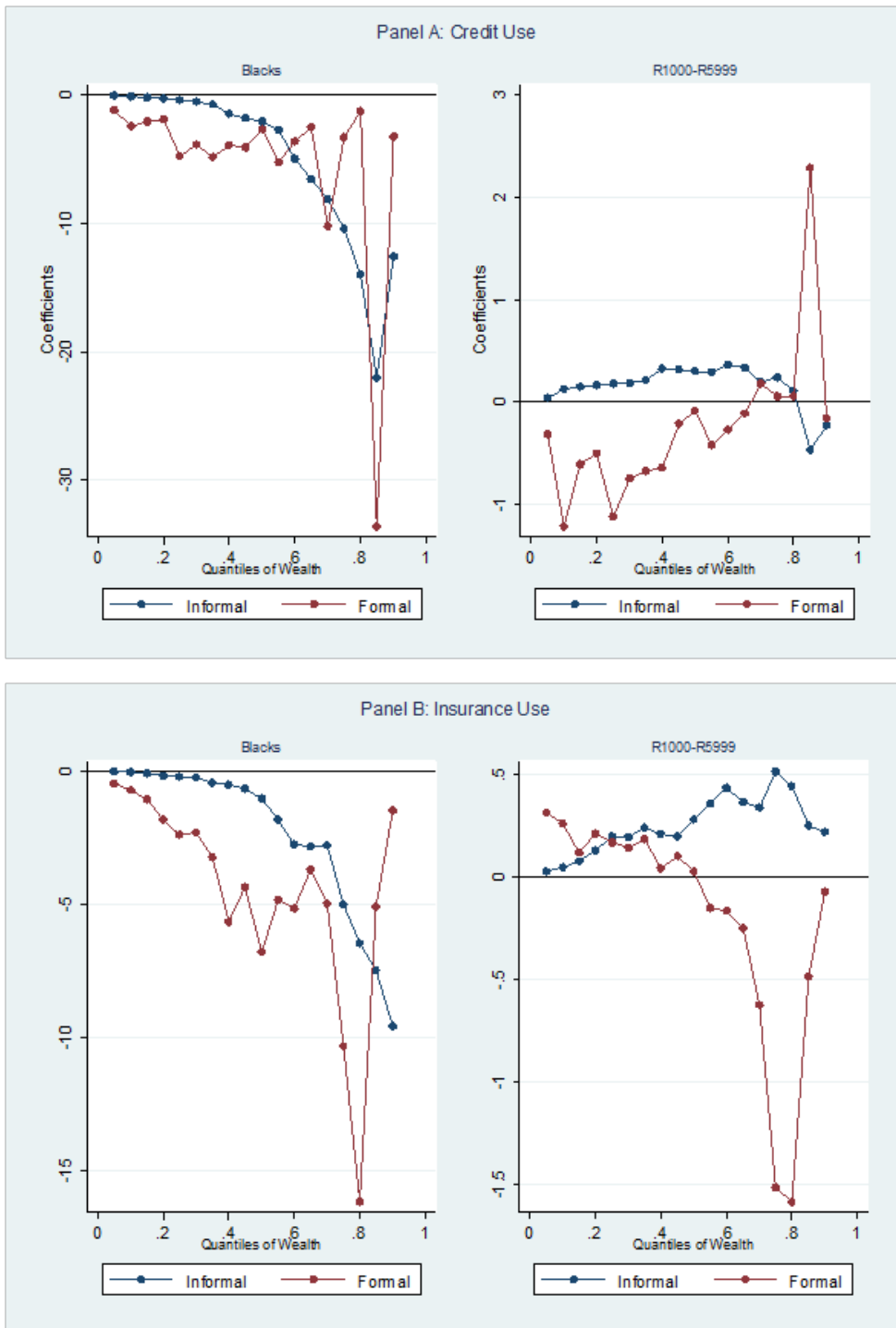
Turning to the well-being measure of welfare, Panel B of Table 6 shows that the summary measure of inequality (the 90–10 gap) is negative, implying that welfare disparity is greater at the bottom end than at the top end of the welfare distribution, and it is accounted for by the welfare effect. As was the case for the wealth index, the unexplained effect related to education, demographic and regional factors contribute more to this welfare disparity. On the other hand, there is no such effect of these factors at the top end of the distribution. The effect of personal income is to reduce the gap at the bottom end of the welfare distribution. It should be noted that at this part of the welfare distribution, the disparity attributed to personal income is greater among the financially excluded than the users of financial services. This result appears to be in line with findings by Lloyd and Leibbrandt (2013), who found that unemployed South Africans (especially the discouraged) were worse-off than the rest of the “not-economically-active” individuals in terms of subjective well-being as measured by self-reported level of happiness. In keeping with the objectives of the study, our results come close to those of Møller and Saris (2001) who found demographic characteristics to be significant in the determination of subjective well-being of South Africans.

Reconciling these two measures of welfare, it is clear that the wealth measure captures welfare disparities in the top quantiles, while the well-being index captures disparities in the lower quantiles of the welfare distribution. However, in both cases the unexplained effect is similar in explaining differences in the distribution, which provides some form of convergence of the two measures.

Product level analysis

The results analysed so far show that there is a positive contribution of financial inclusion to the welfare of individuals, when looking at financial services in aggregate terms. In this section, I investigate whether these results are consistent when inclusion is disaggregated to the product level. Figure 3 provides the RIF regression coefficients for formal credit and insurance products (as separate treatments) against semi-formal and informal credit, and insurance products as the control group. These two products are as diversified in the formal sector as in the semi-formal and informal financial sectors in South Africa. Given that the two measures of welfare are complementary as shown in the preceding section, the discussion below is restricted to the wealth index as a measure of welfare.

Figure 3: RIF regression coefficients for credit use and insurance



Note: The graphs show plots of point estimates across quantiles, from regressions of transformed wealth for users and non-users of formal credit (Panel A) and formal insurance (Panel B). The data is weighted to be nationally representative. The base categories are: male, Whites, No formal education, 18-29 years, Up to R999 in monthly income and urban dwelling.

In terms of credit products, the gender dummy shows that there is a marginal but significant contribution of formal credit to the welfare of female users compared with the welfare of non-users, for most of the distribution. Panel A in Figure 3 shows an overall negative contribution of both formal and informal credit for Black users (similar to Coloureds and Asians), compared with the base category of Whites. The welfare gap is insignificant except at higher quantiles. This result is consistent with findings by Srinivasan (2006) for an earlier period. In other words, use of formal credit during 2006–2011 did not significantly contribute to the welfare of the previously marginalized population groups. But we see a slightly different picture for the education, income and region (rural/urban) variables. While the distribution of users generally lies above that of non-users, it monotonically declines until it falls below that of non-users across education levels. Moreover, the gap widens at higher education levels. On the other hand, the welfare level marginally rises in the case of higher income levels. An outstanding result in Figure 3: Panel A shows a higher level of welfare for non-formal financial products users in the lower quantiles of the welfare distribution for earnings below R6,000 (roughly US\$400). Thus, the overall effect is that high incomes contribute to improved welfare of formal credit users at the top relative to the bottom of the welfare distribution.

Finally, the use of formal credit by rural dwellers has a negative effect on the welfare of users, but it monotonically improves across quantiles, while the contribution of non-formal credit causes a significant decline in welfare. This result seems to support concerns that informal credit mechanisms tend to harm borrowers.

A possible explanation of these results is the complexity of the formal credit market in terms of terminologies and credit contracts (that is, words used are too complicated). Inadequate understanding of these terms and conditions could easily lead to black-listings, resulting from failure to comply, or even repossession of accumulated wealth. The end result could be lower welfare. Nanziri and Leibbrandt (2016) find that education is a key determinant of financial literacy, and that, for South Africa, there was below average levels of financial literacy over the period of this study. Additionally, higher levels of income are associated with an increased use of formal products in South Africa (Nanziri and Leibbrandt, forthcoming). However, for this usage to translate into improved welfare, Jappelli and Padula (2013) argue that individuals at the higher end of the income

spectrum tend to invest in financial literacy to better manage their wealth. This might not be the case for individuals with low incomes, who use formal products, hence the lower welfare of such individuals.

For insurance products, there is a positive gender and age effect from using formal insurance across quantiles. Figure 3: Panel B shows a statistically significant decline in welfare pattern for Blacks (as well as for Coloureds and Asians) using formal insurance compared to those who use non-formal insurance products. The effect of higher education is positive but non-monotonic welfare for users of formal insurance up to the 60th quantile. The decline in welfare after this point is not statistically significant. The rural effect mimics the effect in the credit product category. Except for earnings below R6,000 (roughly US\$400) shown in Figure 3: Panel B, the income effect is a statistically significant increase in welfare for users of formal insurance.

Both these results suggest that there are welfare gains associated with using informal credit and insurance products in South Africa, especially at the bottom end of the welfare distribution. The results could suggest usage based on affordability and need. For example, the bulk of informal insurance is made up of burial and funeral policies, often used by low income earners (depicted by positive and higher welfare in Panel B of Figure 3). On the other hand, formal insurance is more sophisticated, ranging from vehicle cover and property insurance to medical and life assurance products, which are most often used by high-income earners. Currently, the South African insurance system requires consumers to have a stable and regular income in order to qualify for coverage. Thus the absence of micro-insurance excludes many contract workers and self-employed individuals.

7. Conclusion

This paper has investigated whether there are significant welfare disparities between users of formal financial products and users of non-formal financial products. The use of semi-formal and informal products is explicitly modelled, which is often excluded in empirical analysis on financial inclusion. The widespread pursuit of financial inclusion policies for the marginalized, the mixed empirical results, and the widespread use of informal financial mechanisms in South Africa make this exercise worthwhile.

The results provide evidence that significant disparities exist across quantiles along the welfare distribution, accounted for by the unexplained effect related mainly to income and education, and marginally to race and gender. These results are robust even at the product level and when using other methodological approaches such as “average treatment effect” estimation. The use of formal credit and formal insurance is associated with better welfare for individuals at the top of the welfare distribution. Interestingly, use of non-formal insurance has welfare benefits for individuals in lower quantiles. Overall, disparities at the bottom end of the welfare distribution are captured by the well-being index while disparities at the top end are captured by the wealth index.

Financial access policies in post-apartheid South Africa were mainly targeted towards the previously disadvantaged, that is, Blacks, Coloureds and Asians. Yet the results in this study show that during the period 2006–2011, use of formal financial products by these groups did not contribute to statistically significant welfare gains compared with use of informal products and compared with Whites. The results also show that most of the financial inclusion was concentrated in the transactions category, which might improve well-being but not necessarily wealth creation. Moreover, welfare gains associated with the use of informal products present evidence of the importance of the informal financial sector from where consumers can obtain alternative services and derive substantial utility.

The data did not allow for an investigation into the net value of assets used in the study, the initial position of individuals on the welfare spectrum, and the dynamics of the welfare disparities overtime. Hence, future research would benefit from the construction of a synthetic panel to address both causality and dynamic dimensions. Nonetheless, the results in this paper provide a starting point for conducting further research in economies where informal financial products are well established and can compete with formal financial products.

Notes

1. www.centerforfinancialinclusion.org
2. For instance, in India, Pakistan, Bangladesh, Vietnam, Thailand, Sri Lanka, etc. (Hannig and Jansen, 2010) and South Africa's Mzansi account.
3. See Appendix A1 for an illustration of the transmission mechanism.
4. The word comes from "stock fairs", which referred to rotating cattle auctions by English settlers in the Eastern Cape in the early 19th century, characterized by interacting and socialising. The practice was later adopted by black communities, but did not necessarily include trading. The term now refers to groups of people who meet regularly and contribute money to meet each other's financial needs in a rotating manner. While some stokvels are formal, guided by written rules (constitution), the majority are formed mainly on the basis of trust. The term is normally used to refer to all types of informal savings schemes, including: contributions-; basic-; family-; grocery-; purchasing-; investment-; party-; and borrowing stokvels; and burial societies (Townsend and Mosala, 2009).
5. See www.nasasa.co.za – the National Stokvel Association of South Africa.
6. The cost of credit was as high as 200 or even 360 per cent per year, which also led to high default rates, accompanied by unregulated debt collection mechanisms by lenders, including seizing borrowers' bank cards and personal identification numbers so as to make direct deductions from borrowers' bank accounts.
7. See Banking Association of South Africa, www.banking.org.za
8. This account was offered by all deposit taking banks as a low income transactions account. The required minimum balance was R325 (US\$30).
9. See www.asisa.co.za/fundisa
10. Receipts from social support were as low as R300.
11. The policy of Affirmative Action (AA) enabled the previously excluded (Blacks, Coloureds and Indians) to take up positions in the civil/public service, hence boosting their incomes and thus allowing them to use financial services.
12. Labour Force Surveys for this period show an increase in the labour force. Income is a requirement for access to credit. Figure 1 shows a surge in indebtedness over this period.

13. 7.9 million of the 19.8 million credit active consumers were over-indebted, that is, delinquent for over 90 days (NCR, 2012).
14. See www.proyectocapital.org
15. Motivated by the work of Nussbaum and Sen (1993), and used in studies such as Woolard and Leibbrandt (2009); Noble et al (2014); Noble et al (2000); Finn et al (2013).
16. See, for example, Nussbaum and Sen (1993); Diener (1994); Tinkler and Hicks (2011); and Lloyd and Leibbrandt (2013).
17. See Filmer and Pritchett (1998); Gwatkin et al (2000); Vyas and Kumaranayake (2006).
18. See Banerjee (2010) for a mathematical proof of this argument.
19. See Filmer and Pritchett (1998) for the conventional principal component approach to index construction.
20. This approach was used by Klapper and Singer (2013) during their investigation of the extent of financial inclusion using the Findex dataset.
21. Formal products are from institutions that are regulated by the monetary authorities (such as mainstream banks). Semi-formal relates to products from institutions that are primarily providers of non-financial services (such as retail stores and cell phone companies) but can offer some financial services, such as insurance and credit in line with their business; and informal products are not regulated at all but obtained in a private/individual arrangement such as from informal lenders (for example, mashonisas – a local word for informal rural lenders, funeral parlours or burial societies).
22. See Firpo et al (2007); Fortin, Lemieux and Firpo (2009); Frollich and Melly (2010).
23. \hat{p} is obtained by running a probit model of the form $\Pr(\text{USE}|X) = f(X, \varepsilon)$ and getting the predicted value.
24. It is desirable that the choice kernel has compact support (e.g. the Epanechnikov, tri-cubic) and a band-width that ensures consistent estimates.
25. See, for example, Khandker and Samad (2013), Ashraf et al (2010), and Cohen and Young (2007) for welfare-financial-use-related outcomes.
26. An example here could be inequality reduction initiatives of government such as rural electrification, housing and water and sanitation projects.
27. A study by Lusardi, Michaud and Mitchell (2011) showed that higher income earners will tend to acquire financial literacy to accumulate and better manage their wealth in preparation for retirement.
28. See, for example, Ashraf et al (2010) on savings accounts in Philippines; Neves et al (2009) on the use and effectiveness of the Old Age Social Grants in South Africa, and Proyecto capital projects in Peru (<http://fundacioncapital.org/inclusive-finance/proyecto-capital/>).
29. Nanziri and Leibbrandt (2016) found that over the period 2005–2009 South Africans had low levels of financial literacy and that education was a key determinant.

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Appendix A1: From financial access to welfare

Financial access	Financial use	Outcomes
<ul style="list-style-type: none"> • Intermediation • Low-cost products 	Contingency planning <ul style="list-style-type: none"> • Retirement • Buffer savings • Insurable contingencies Credit <ul style="list-style-type: none"> • Business livelihoods • Emergency loans • Housing loans • Consumption loans Wealth creation <ul style="list-style-type: none"> • Savings & investments 	Welfare improvement Economic growth & development

Note: Adopted from Narain (2007) and customized to the study. Financial inclusion conceptualizes that financial access lays the foundation for financial use to realize both micro- and macroeconomic outcomes in a country.

Appendix A2: Financial products classification over the period 2003–2012

Transactional	Credit	Insurance	Savings and investment	Retirement planning
Formal use				
<ul style="list-style-type: none"> • ATM card • Debit card • Current/cheque account • Garage card • Mzansi account • Transactions account • Postbank account 	<ul style="list-style-type: none"> • Credit card • Overdraft • Home loan or bond • Vehicle finance • Personal loan from bank (includes micro-lenders like African Bank) 	<ul style="list-style-type: none"> • Funeral policy company • Household contents • Life cover for debt • Disability cover • Cover for dreaded diseases • Medical insurance and hospital plans 	<ul style="list-style-type: none"> • Money market • Savings account • Fixed deposit account • Unit trusts • Postbank savings book 	<ul style="list-style-type: none"> • Pension fund • Retirement annuity • Provident fund • Life assurance • Endowment policies • Education policy
Semi-formal use				
<ul style="list-style-type: none"> • Store card cash back (e.g. Pick n Pay, Woolworths, Clicks, etc.) • Loyalty cash back (cellular phone companies, airlines) 	<ul style="list-style-type: none"> • Store cards • Government • Employer • Retail stores 	<ul style="list-style-type: none"> • Cellular phone companies • Funeral cover from employer • Disability cover from employer 	<ul style="list-style-type: none"> • n/a 	<ul style="list-style-type: none"> • Life cover from employer or trade union
Informal use				
<ul style="list-style-type: none"> • n/a 	<ul style="list-style-type: none"> • Vehicle loan, home loan, personal loan from family, mashonisa, friends, stokvels, local spaza 	<ul style="list-style-type: none"> • Funeral policy with an undertaker or burial society 	<ul style="list-style-type: none"> • Savings with stokvels or family and friends 	<ul style="list-style-type: none"> • n/a

Source: Author's compilation from FinScope surveys 2003–2012.

Source: FinScope surveys for South Africa (2003–2012).