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Investigating the relationship between financial inclusion and poverty in South Africa

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ABSTRACT

The literature on financial inclusion (FI) and poverty connections has received considerable attention, but there exists a scarcity of South African studies examining the relationship between FI and poverty. This study fills this research gap by analysing the 2011 and 2016 FinScope data. Principal Components Analysis was applied to consider indicators from four FI dimensions (access, usage, quality and welfare) to derive a financial inclusion index (FII), before the relative approach was used to distinguish the financially included and excluded individuals separately. The empirical findings indicated that lowly educated Africans residing in the rural areas of Eastern Cape, Free State and Limpopo provinces were associated with a greater likelihood of being financially excluded, whereas individuals coming from the lower FII quintiles suffered greater money-metric poverty likelihood. Lastly, the proportion of people who were both money-metric poor and financially excluded declined from 19.5% to 15.4% between 2011 and 2016.

KEYWORDS
Financial development; financial inclusion; poverty; FinScope South Africa

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G00; G21

1. Introduction

Financial systems facilitate and maintain economic growth, and financial development (FD) contributes towards economic growth, poverty alleviation and better living standards. Greater financial accessibility promotes savings (Aportela, 1999; Allen et al., 2013), decreases income inequality and poverty (Burgess & Pande, 2005), improves decision making and inclusive growth (Cyn-Yung & Mecardo, 2015).

Since access to financial services has been skewed towards the more privileged population, improving access to the poor and disadvantaged social strata is a global priority (Matsebula & Yu, 2020). As income distribution in many developing countries is also skewed towards the rich populace, not everyone benefits from improved FD (Beck et al., 2007).

There has been a remarkable development in both the depth and breadth of the financial system over the last century. A sound and well-functioning financial system offers multiple services to consumers, such as savings, payments and credit facilities. Moreover, an inclusive financial system is an engine towards benefiting the poor and other marginalised people. If the financial system is not inclusive, poor people and emerging small businesses

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must rely on their small savings and earnings to sustain their lives and businesses as well as invest in potential opportunities. This can widen income inequality further and lead to low economic advancement (Demirguc-Kunt & Levine, 2009).

Financial inclusion (FI) has emerged as a significant theme in the worldwide agenda for sustainable long-term economic growth. The expansion of financial outreach is based on the concept that lack of access to financial services (and sufficiently provided services) significantly affect the poor segments of the population and thus the initiative to extend levels of FI among the poor is considered a prominent solution (Imai et al., 2010, 2012). Internationally, numerous policies are initiated to improve FI amongst the low-income and disadvantaged groups, notably in developing countries (Arun & Kamath, 2015). For example, South Africa initiated a low-cost account called 'Mzansi' in 2004 by the South African Banking Association (Sarma & Pais, 2011), whereas microfinance institutions are set up in some parts of the world to extend financial outreach to the poor. However, financial development initiatives aimed at the improvement of livelihoods and inclusion of the poor do not always impact factors of economic development positively or even achieve its inclusion mandate (De Haan & Sturm, 2017; Bateman, 2019). In fact, the Mzansi account financial inclusion could only address the question of penetration (Kostov et al., 2015).

The structure of the financial system is also a key role player to ensure the objectives for initiatives of financial inclusion are successfully achieved. In South Africa, some financial inclusion initiatives, that are successful in other markets, were found not to have a positive outcome at times. For instance, the introduction of mobile money by MTN in Eswatini has had a significant increase in financial inclusion in the country. This initiative improved remittance and mobile payments affordability, efficiency and safety for users who were previously excluded from the mainstream banking system (Hlophe, 2018).

In South Africa, these services are constrained through regulation stipulated by the financial system; in particular, e-money can only be provided by a formal bank and there are limitations when issuing mobile payment without partnering with a bank. These structures thus create barriers to participation for non-bank players to render services, add cost participation in payment services and limit innovation (FinMark Trust, 2017).

With increasing recognition of the importance of FI, there is also more attention to the potential role FI plays in poverty alleviation in the economy. History on the linkage (if any) between FI and poverty reduction can be tracked to the Asian developing countries' past successes by alleviating millions of people out of deprivation. Nonetheless, high poverty still remains a persistent challenge in many developing countries (Cyn-Young, 2015).

FI helps increase poor people's access to financial services helps reduce poverty and income inequality. However, some past studies found that weak financial systems as well as FI and FD initiatives rather contributed negatively to economic growth and poverty alleviation, and even deteriorated the state of the poor (e.g. Greenwood & Jovanovic, 1990; Kostov et al., 2015; De Haan & Sturm, 2017).

This study addresses this key question: What is the relationship between FI and poverty reduction in South Africa? The objective is to use demand-side data (FinScope – which is surprisingly still a relatively under-utilised data source in South Africa) to establish the relationship between FI and poverty status in the country. The empirical findings provide implications for the poor, development finance, policymaking as well as future studies on FI in South Africa.

2. Literature review

2.1. Defining key concepts

FI is defined as an economic state from which individuals, households and firms have access to formal financial services. FI measures the extent to which individuals or households are incorporated into the formal financial sector (Aduda & Kalunda, 2012). Sarma (2008) and Allen et al. (2012) assert FI is a process to ensure the formal financial systems are available, accessible and easily used by all members of the economy.

Basic formal financial services comprise ownership of bank accounts, access to savings, credit and insurance products, easy usage of bank cards to make payments and withdrawals. By making these services accessible and imposing fewer restrictions (in terms of costs, proximity, required documentation and suitable laws that protect the interest of marginalised strata), the poor overcome their financial difficulties and be alleviated out of poverty (Arun & Kamath, 2015).

Camara & Tuesta (2014) distinguish an inclusive financial system as one that takes full advantage of access and usage of formal financial services while making involuntary financial exclusion minimal. Involuntary financial exclusion is assessed by barriers preventing people from having access to and using formal financial services, such as distance, trust, costs and documentation.

Financial exclusion (FE) is categorised into voluntary and involuntary exclusion (World Bank, 2014), as shown in Figure 1. The former represents people who can access financial services but decide not to use them due to various reasons (e.g. they do not need these services, cultural and religious reasons). Involuntary exclusion happens when access to financial services is denied due to the existence of numerous barriers, e.g. insufficient income, risk and cost-related issues, lack of information and required documentation, inappropriate financial products and discrimination.

Going back to FI, it usually comprises of three dimensions: access, usage and quality (Camara & Tuesta, 2014; Jabir, 2015). However, AFI (2010) suggested welfare to be included as the fourth dimension (see Figure 2). Access is concerned with the possibility of individuals and firms to use the available formal financial services and products. Understanding this dimension necessitates identification of possible barriers that prevent financial institutions from supplying their services/products, and factors that

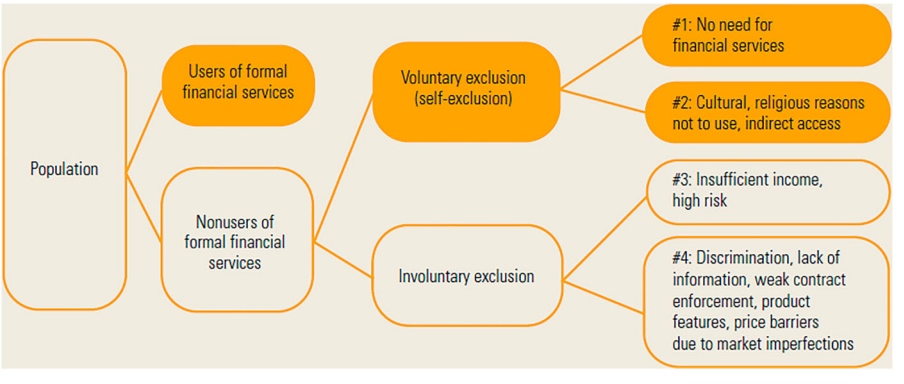

Figure 1. Main types of financial exclusion. Source: Adapted from World Bank (2014).

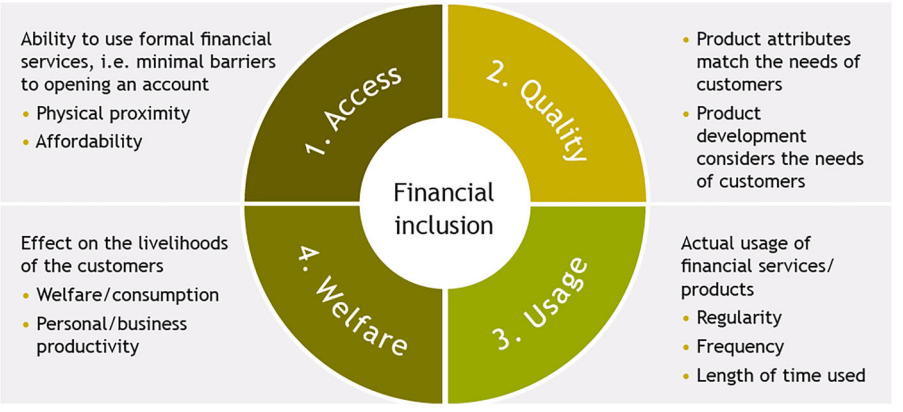

Figure 2. Dimensions of financial inclusion. Source: Alliance for Financial Inclusion (2010).

hinder clients from using the services (e.g. cost-related issues, physical proximity, documents required and trust of clients towards the financial institutions) (AFI, 2010). Having access does not imply actual usage.

The usage dimension deals with the extent to which formal finance is used. It concentrates on permanence and depth of use of financial services, including how often, how consistently and for how long formal finance has been used (AFI, 2010; Camara & Tuesta, 2014). The quality dimension measures relevance or compatibility of formal financial services to the needs of end-users. It includes the range of financial services options offered to clients, experience, as well as awareness of, understanding of and attitude towards available services. Indicators of quality portray whether the product is fit for the required purpose, user-friendly, safe to use, and offers protection to consumers (AFI, 2010; Jabir, 2015)

Welfare dimension examines the impact of financial services on the lives of clients, and variation in consumption and business activities and wellness. Evaluating the impact of these services is challenging since it needs more information beyond finance, and strategies need to be developed not only to depict relationships but also reflect causality. Developed strategies differentiate the impact of financial services from other concurrent factors that also have an impact, either direct impact, indirect or interactive effect with financial services on people's lives (AFI, 2010).

2.2. Core theories of financial inclusion

Most core theories are centred on capital market imperfection such as asymmetric information and transactional costs. Market imperfections are likely to be a disadvantage to the poor yet talented individuals and small business that do not have some form of collateral, credit histories, and connections. As a result, their opportunities are limited, thereby leading to worsening of poverty and inequality. Galor & Zeira (1993) allude that poor individuals fail to invest in their education (even with their high marginal productivity of investment) due to financial market frictions. Moreover, Banerjee & Newman (1993) indicate that initial endowments limit occupational choices for individuals, as the ability and extent to save and bear risk is determined

by one's structure of occupational choices. Alternatively, these theories indicate that lack of financial access plays a key role in causing persistent income inequality, poverty traps and slower growth.

Theories that emphasise capital accumulation stress that the extent to which the poor can borrow money for schooling and physical capital investment is determined by financial market imperfection. Regarding entrepreneurship, financial markets imperfections determine the extent that poor people with business ideas can source out funds for start-ups. Therefore, there is a close interrelation between the evolution of FD, growth and inter-generational income dynamics (World Bank, 2008).

Trickle-down theory refers to the economic state that taxes levied on both businesses and wealthy in society should be decreased to stimulate business investment in the short term, so that there will be a positive spill-over effect to the society at large, especially to the disadvantaged population in the long term (Aghion & Bolton, 1997). This theory is categorised into two broad understandings that favour the wealthy: supply-side arguments propose that tax cuts for the rich help increase output and create better employment opportunities, while demand-side arguments suggest the wealthy should be protected through provision of subsidies and tariffs to ensure they keep paying their employees and enable more investment (Arackal, 2016).

Both new-Keynesian and neoclassical theories can also be used to analyse FI or FE. The neoclassical theory posits that consumers and firms are the main economic agents who are competitive, self-interested and have all the necessary information to make rational decisions to improve their well-being. Based on these assumptions, inappropriate consumer choices and state policies can lead to FE. For example, consumers may voluntarily choose not to use the mainstream financial markets but rather use the informal financial services due to reasons such as lack of need for formal financial services as well as cultural reasons. On the other hand, government may set higher borrowing rates which in turn discourage consumers and result in the exclusion of disadvantaged groups.

According to the new-Keynesian theory, FE is involuntary. The constraints that prevail in the financial market system restrict other segments (especially risky borrowers) from accessing some financial services such as credit services. Stiglitz & Weiss (1981) argue that financial services providers supply the services if it is profitable to do so. Banks give credit to consumers who can repay. As consumers struggle to repay the loans, it is not easy to distinguish good from bad borrowers. Banks use interest rates as a screening strategy. To avoid losses from risky borrowers, creditors reduce interest rates and restrict credit.

2.3. Review of past empirical studies

2.3.1. International studies

While ample international studies on finance-growth-poverty nexus have been conducted, not much research has been conducted on the impact of FI on poverty alleviation. Imai & Annim (2010) investigated whether household access to microfinance reduced poverty in India. Access to microfinance institutions (MFIs) had positive contributions to both economic growth and poverty reduction. Jabir (2015) investigated the impact of FI on poverty reduction in Sub-Saharan Africa; females were less likely to be financially included than males, while highly educated people with additional income

sources were less likely to be poor. Moreover, access to formal financial services had a more significant impact on the poor than non-poor.

Donou-Adonsou & Sylwester (2016) incorporated banks in addition to MFI and adopted the instrumental variable (IV) econometric approach to examine the contribution of financial institutions on poverty reduction in 71 developing countries. The findings showed that banks reduced deprivation when the poverty headcount and poverty gap ratios were used to measure poverty. Most importantly, MFI made insignificant contributions to poverty reduction.

Park & Mercado (2015) investigated the impact of FI on poverty reduction and income inequality in 37 developing Asian countries. Three regression models were employed to examine the impact of various factors on FI, poverty reduction and income inequality. The findings indicated that rules of law, demographic characteristics and per capita income substantially influenced the level of FI. There was also a strong and significant relationship between high FI and lower levels of both income poverty and inequality.

Quartey (2005) employed time-series data in 1970–2001 to examine the relationship between FD and poverty reduction in Ghana with the aid of Granger-causality and Johansen cointegration tests. The study found that financial sector development contributed positively but insignificantly to poverty reduction. Dhrifi (2013) adopted similar econometric techniques to examine the connection between economic growth, poverty and inequality in 89 countries in 1990–2011. The findings showed that the indirect impact of FD on poverty was both unclear and insignificant. However, FD substantially impacted on poverty directly through insurance, access to credit facilities and savings.

Swamy (2014) employed the panel least squares method to investigate the impact of FI, gender dimensions and economic growth on poverty in India. The results showed that women's participation in economic activities increased household income. These results were supported by Park & Mercado (2015) on the role of FI on poverty reduction in that FI contributed positively to the poor in India. Gender played a significant role in FI programmes for the poor, and FI contributed positively to the poor households.

2.3.2. South African studies

There are few local studies examining the relationship between FI and poverty reduction. First, Odhiambo (2009) examined the causal link between FD, economic growth and poverty reduction in 1960–2006, by using the annual time-series data from various sources and employing the Trivariate Granger causality test technique. The author found that both FD and economic growth Granger-caused poverty reduction. Also, economic growth Granger-caused FD which in turn led to poverty reduction (aligning with the arguments of the trickle-down theory), in both short and long run.

With the aid of the instrumental variable (IV) regressions, Gondo (2009) examined the finance-growth link in 1970–99 by using data from the South African Reserve Bank, World Bank and Financial Structure Database. The findings suggested that the impact of FD was greater on the rich than poor. If pro-poor growth is the goal, the financial sector plays a significant and dual role to stimulate growth and decrease inequality. This is attained by widening access to credit and access to indexed securities, predominantly to the poor.

Kostov et al. (2015) examined factors affecting demand for financial services with concerning pre-entry Mzansi account mediation. The study analysed the 2007 FinScope data and employed logistic regression with a composite 'Octagonal shrinkage and clustering algorithm for regression' (OSCAR). Financial literacy was the main focus, and the authors found that to a small extent, financial education moved individuals into the financial access pool. Thus, the initiative of Mzansi's account to widen the level of financial access and move people out of poverty was not successful.

Matsebula & Yu (2020) investigated FI trends by analysing data from the first four waves of the National Income Dynamics Study (NIDS). Upon regressing the derived financial inclusion index (FII) on the personal- and household-level explanatory variables, the findings revealed the existence of positive connection between FI and poverty reduction. While the extent of financial inclusiveness increased, low-income households were less likely to be financially included than high-income households. One drawback of the study was that NIDS only captured information on usage.

3. Data and methods

3.1. Data

This study analyses the 2011 and 2016 South African FinScope data. FinScope is a FinMark Trust initiative established in 2002 and the most comprehensive national annual household survey on the financial services needs and usage across the population (FinMark Trust, 2016). FinScope captures information on the following: income and employment; asset ownership; use of financial services and products; financial household risk management and coping strategies; psychographics on banking and finance issues; language; and lastly communications.

Most importantly, FinScope data provides information on all four FI dimensions. With regard to access, the questionnaire captures information on barriers such as affordability and physical proximity. Finscope also asks questions about the actual use of financial services, including questions on frequency and duration of use of services over time. Information on the relevance and compatibility of the financial services to the lifestyle's needs of respondents (i.e. quality dimension) is captured, whilst for the welfare dimension, participants are asked about improvements in their wellbeing that can be attributed to the usage of financial services.

3.2. Methods

Descriptive and econometric analyses are conducted. With regard to the former, the demographic, geographic, education and labour market characteristics of survey participants are presented, before moving on to discuss the key descriptive statistical findings on the four FI dimensions.

Next, to distinguish the money-metric poor from the non-poor, the Statistics South Africa (2019) lowerbound poverty line of R810 per capita per month (2019 prices) is used. This line is derived based on the cost of basic needs approach introduced by Ravallion (1994), which estimates the cost of food needed for adequate nutrition and essential non-food items. One drawback of Finscope data is the high proportion of individuals with zero or unspecified household incomes (2011: 47%; 2016: 25%). Whilst the 2016

data has the after-imputation income variable available, this is not the case in 2011. Sequential regression multiple imputation (SMRI) is adopted to impute the missing household income values for 2011. Detailed explanation of the SRMI can be referred to Lacerda et al. (2008) and Yu (2016).

Moving on to the distinction between the financially included from the excluded individuals, there is a need to apply a statistical method to derive a multidimensional, composite index, before deciding on a threshold to distinguish the two groups of people. This study adopts the Principal Components Analysis (PCA) approach, which transforms a set of observations of potentially correlated factors into a set of estimate values of linearly uncorrelated factors (Karamizadeh et al., 2013). This tool reduces multidimensional data into lower dimensions while retaining the majority of the information. PCA achieves this reduction through identifying directions, known as principal components (PC) along which variation in the data is the greatest (Ringner, 2008). These PCs are linear combinations of the original variables, and they reproduce the information in the variables as closely as possible.

In the PCA approach, the j-th factor of FI is expressed as:

$$FII_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \ldots + W_{it}X_t$$

where W_i is the weight (individual weight); X represents an indicator in connection with a FI dimension; and t is the number of variables in the equation.

Eigenvalues are calculated through PCA. Components with the highest eigenvalues retain more standardised variance compared to others. Only eigenvalues higher than one are considered for the analysis. If the value holds more than one PC, more PCs can be taken into account in the financial analysis. The calculated weights using PCA are multiplied by the respective variables and thereafter sum the product to get a composite single value of the financial index.

To distinguish the financially included from excluded, relative approach is adopted. The 2011 FII value at the 40th percentile is used to distinguish the two groups (i.e. the bottom 40% are financially excluded), and this index value is again in 2016 to identify the two groups.

Regarding the econometric analysis, first of all, probit regressions on both money-metric poverty and FE probabilities are conducted. In the former regression, the dependent variable is binary that one and zero stand for poor and non-poor respectively; on the other hand, in the latter regression, the dependent variable is also binary (one: financially excluded; zero: financially included) (Gujarati, 2011). Marginal effects are derived by including the following independent variables (reference category of each variable is shown in brackets):

- Province (Western Cape)
- Geo-type (urban)
- Gender (male)
- Population group (white)
- Age cohort (55–64 years)
- Labour market status (employed)
- Educational attainment (tertiary)
- Marital status (married / lived together)

- Lifestyle satisfaction level (satisfied)
- Household size

In equation terms, the estimated probit models are specified as follows:

$$\begin{aligned} Prob(Financially\ excluded) &= \beta_0 + \beta_1 Province \\ &+ \beta_2 Geotype + \beta_3 Gender + \beta_4 Race + \beta_5 Age \\ &+ \beta_6 Employed + \beta_7 Education \\ &+ \beta_8 Marital + \beta_9 Lifestyle + \beta_{10} hhsize + \epsilon \end{aligned} \tag{1}$$

$$\begin{aligned} Prob(Poor) &= \beta_0 + \beta_1 Province \\ &+ \beta_2 Geotype + \beta_3 Gender + \beta_4 Race \\ &+ \beta_5 Age + \beta_6 Employed + \beta_7 Education \\ &+ \beta_8 Marital + \beta_9 Lifestyle + \beta_{10} hhsize + \epsilon \end{aligned} \tag{2}$$

As money-metric poverty and financial exclusion status are not independent of each other, bivariate probit model may be more appropriate because it considers the possible interdependence of outcomes (Chisadza, 2015:12). Thus, bivariate probit regression is also conducted to compare whether there are noticeable differences in the estimates between bivariate and probit regression models. The bivariate probit regression consists of two binary dependent variables (poverty status and financial exclusion status in this study). Two different equations, each with its own error term, are modelled jointly.

In equation terms, the bivariate probit model is as follows:

$$Poor_t = \beta X_t + \ \delta FI_t + \varepsilon_t$$

$$Financially\ excluded_t = \Upsilon H_t + \ \mu_t$$

$$E(\varepsilon_t) = E(\mu_t) \ = \ 0; \ \text{var}(\varepsilon_t) = \text{var}(\mu_t) \ = \ 1 \ ; \text{cov}(\varepsilon_t, \mu_t) = p, \ \text{where } p \ \neq \ 0.$$

FI measures indicators of financial inclusion, *X* and *H* represent the above-mentioned explanatory variables which help determine poverty status as well as financial exclusion status, respectively. Also, β and Υ are parameters of the equations, and lastly ε_t and μ_t are the error terms.

Whilst there may be a correlation between the errors terms of these two equations, both equations may have unobserved variables in common, which in turn impact both outcomes (Cotei & Farhat, 2011). If error terms in the two equations are correlated, the bivariate model yields more efficient coefficient estimates compared to univariate probit models. One limitation of the bivariate probit model is that it can only derive coefficients but not marginal effects (Chisadza, 2015). Lastly, all empirical findings are derived using the person weight variable, and only working-age population 15–64 years at the time of the survey are included.

4. Empirical findings

4.1. Profile of the weighted sample

Table 1 shows that Gauteng represented the greatest provincial share in both years (about a quarter), followed by KwaZulu-Natal, Western Cape and Eastern Cape (above 10%). About two-thirds resided in the urban areas. Moving on to racial composition, as

Table 1. Demographic characteristics of the final sample (%).

	2011	2016
Province of residence		
Western Cape	10.77	13.43
Eastern Cape	13.27	11.73
Northern Cape	2.07	2.64
Free State	5.39	5.93
KwaZulu-Natal	20.85	14.46
North West	6.53	7.33
Gauteng	23.86	27.19
Mpumalanga	7.44	7.56
Limpopo	9.82	9.72
	100.00	100.00
Geo-type of residence		
Urban	66.81	72.73
Rural / Tribal	33.19	27.27
	100.00	100.00
Gender		
Male	47.81	45.72
Female	52.19	54.28
	100.00	100.00
Population group		
African	77.99	74.52
Coloured	9.67	10.03
Indian / Asian	2.72	3.33
White	9.61	12.12
	100.00	100.00
Age cohort		
15–24 years	29.02	36.92
25–34 years	27.48	27.59
35–44 years	19.59	17.94
45–55 years	14.04	12.46
55–64 years	9.87	5.09
	100.00	100.00
Labour market status		
Employed	42.83	59.12
Unemployed	32.15	17.41
Economically inactive	25.02	23.47
	100.00	100.00
Educational attainment		
No formal education	2.84	1.58
Primary education	10.48	10.87
Secondary education	71.85	72.81
Vocational training / Special training / Other	2.61	1,99
Tertiary education	12.22	12.75
	100.00	100.00
Marital status		
Married / Living together	34.20	38.60
Divorced / Separated	3.59	4.42
Widowed	4.23	11.33
Single / Never married	57.90	45.58
Do not know	0.08	0.07
	100.00	100.00

expected, the share represented by the Africans was the highest at about three quarters. Youth aged 15–24 years represented the greatest age cohort share (rising from 29% to 37%), followed by people aged 25–34 years (about 27.5% in both years). The employed shared increased from 43% to 59%. Lastly, individuals who were single / never married accounted for the greatest share (2011: 58%; 2016: 46%).

4.2. Financial inclusion dimensions

Figure 3 presents the overall banking status of the working-age population. The results indicate an increase of proportion of people with bank accounts (2011: 62.79%; 2016: 77.13%). People whose answer was either 'never had' or 'used to have it in the past' were asked to proceed to answer questions on access and quality.

Table 2 shows the access dimension indicators of FI. The 'yes' proportion was the highest for the unemployment reason, but it declined sharply from 29.22% in 2011 to 9.02% in 2016. This result could be attributed largely to a substantial decline in unemployment in the weighted sample. The table also shows that the 'yes' proportion for the 'student' and 'prefer dealing with cash' reasons were also relatively high.

South Africa is a multilingual country with 11 official languages, but financial language may play a crucial role to determine access to financial services. Finance and accounting have its own language with distinct financial terminology. Financial literacy is also important as individuals manage their own finances. Similar to the findings of Nanziri & Leibbrandt (2018), a fairly high proportion of people found the language used in financial paperwork was confusing (2011: 41.81%; 2016: 55.40%).

Table 3 shows the descriptive statistics on usage dimension. The usage share was the highest for the bank account / card variable (2011: 60.20%; 2016: 63.83%). The

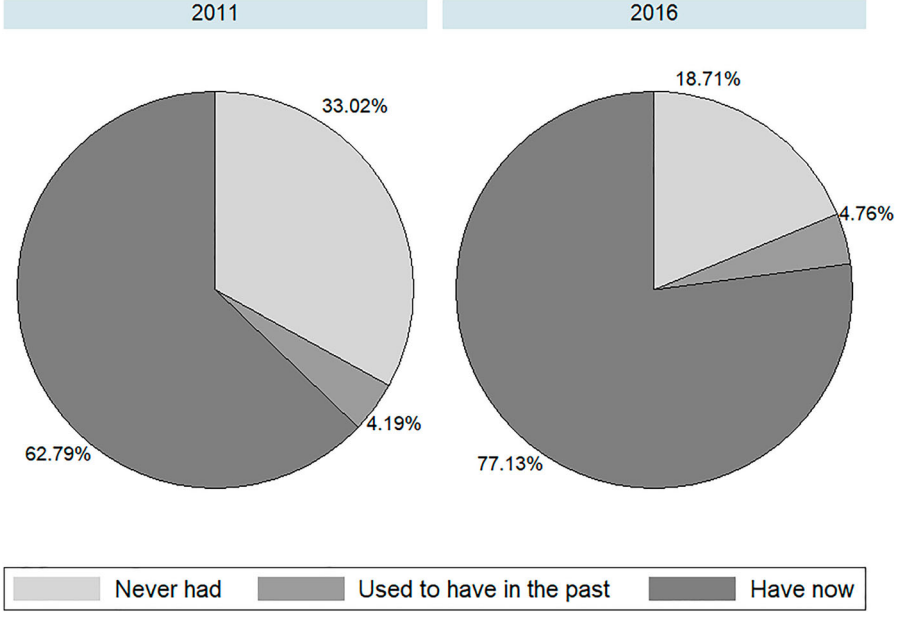

Figure 3. Bank account ownership status.

Table 2. Descriptive statistics on the access dimension of FI (%).

	2011	2016
Reason: never had or used to have a bank account/card: no proof of residence		
Yes	1.95	0.18
No	98.05	99.87
	100.00	100.00
Reason: never had or used to have a bank account/card: bank is too far		
Yes	1.54	0.12
No	98.46	99.88
	100.00	100.00
Reason: never had or used to have a bank account/card: no identity document		
Yes	2.27	0.68
No	97.33	99.32
	100.00	100.00
Reason: never had or used to have a bank account/card: expensive to have a bank account		
Yes	2.89	0.67
No	97.11	99.33
	100.00	100.00
Reason: never had or used to have a bank account/card: access other people's bank account		
Yes	2.13	0.20
No	97.87	99.80
	100.00	100.00
Reason: never had or used to have a bank account/card: unemployed		
Yes	29.22	9.02
No	70.78	90.98
	100.00	100.00
Reason: never had or used to have a bank account/card: student		
Yes	16.23	3.87
No	83.77	96.13
	100.00	100.00
Reason: never had or used to have a bank account/card: prefer dealing with cash		
Yes	15.77	1.00
No	84.23	99.00
	100.00	100.00
You find the language used in financial paperwork confusing		
Disagree	32.76	38.03
Neither agree nor disagree	25.43	6.57
Agree	41.81	55.40
	100.00	100.00

largest increase happened to the savings variable, as the proportion who claimed they saved or put money away more than doubled from 24.60% to 49.30%. Lastly, the proportion of individuals who borrowed in the past year dropped from 33.70% to 8.91%.

With regard to the quality dimension, Table 4 shows the 'yes' proportion for all three reasons was very low (below 2%). This result implies that all three quality inclusion variables played insignificant role to barrier the access and usage of formal financial services. The betterment in education attainment, as the share of the people with no formal education declined over time displayed in Table 1, may have played a crucial role to improve understanding of how banks operate and technology used.

Table 5 presents the welfare dimension results. The majority of people owned cellphone, computer and internet facilities (at least 85%). These devices and network facility not only reflect expenditure and possession of assets, but are linked to usage of online financial services. They are the convenient alternative means to physically visiting services providers' premises. A fairly high proportion (2011: 50%; 2016: 70%) experienced stress in dealing with their own finances, while there was a substantial fall (from 67.85% to 40.43%) in the percentage of people who liked to control their finance and money matters.

Table 3. Descriptive statistics on the usage dimension of FI (%).

	2011	2016
Use a bank account or bank card		
Yes	60.20	63.83
No	39.80	36.17
	100.00	100.00
Use a bank loan		
Yes	10.66	8.11
No	89.34	91.89
	100.00	100.00
Use savings book		
Yes	3.80	2.76
No	96.20	97.24
	100.00	100.00
Use overdraft facility		
Yes	2.95	3.67
No	97.05	96.33
	100.00	100.00
Use personal or garage card		
Yes	2.20	2.49
No	97.80	97.51
	100.00	100.00
Use funeral policy offered by the banks		
Yes	10.19	12.05
No	89.81	87.95
	100.00	100.00
Have you borrowed in the past 12 months?		
Yes	33.70	8.91
No	66.30	91.09
	100.00	100.00
Funeral cover usage		
Yes	28.73	27.33
No	71.27	72.67
	100.00	100.00
Terminal benefits		
Yes	16.21	14.47
No	83.79	85.53
	100.00	100.00
Having insurance policy		
Yes	18.86	19.41
No	81.14	80.59
	100.00	100.00
Do you currently save or put money away?		
Yes	24.60	49.30
No	75.40	50.70
	100.00	100.00

Table 4. Descriptive statistics on quality dimension of FI (%).

	2011	2016
Reason: never had or used to have a bank account/card: don't feel comfortable in a bank		
Yes	0.89	0.17
No	99.11	99.83
	100.00	100.00
Reason: never had or used to have a bank account/card: don't understand how banks work		
Yes	1.99	0.11
No	98.01	99.89
	100.00	100.00
Reason: never had or used to have a bank account/card: don't understand technology		
Yes	1.17	0.13
No	98.83	99.87
	100.00	100.00

Table 5. Descriptive statistics on welfare dimension of FI (%).

	2011	2016
Ownership of a cell phone		
Yes	96.14	85.60
No	3.86	14.40
	100.00	100.00
Ownership of a computer		
Yes	87.60	89.98
No	12.40	10.02
	100.00	100.00
Ownership of internet facility at home		
Yes	93.48	95.91
No	6.52	4.09
	100.00	100.00
Dealing with personal finances is stressful and a real burden		
Agree	52.39	70.90
Neither agree nor disagree	24.97	6.86
Disagree	22.64	22.24
	100.00	100.00
You like to be in control of your finances and money matters		
Agree	67.85	40.43
Neither agree nor disagree	20.49	36.17
Disagree	11.66	23.40
	100.00	100.00

4.3. Poverty and financial inclusion probabilities

Table A1 shows the first principal components for deriving the FII. The components have the correct sign, conforming to the theoretical arguments and earlier tables on the four FI dimension. The dummy variables with the greatest components values were 'having a bank account/card' (access) and 'used a bank account/card' (usage).

Table 6 presents the poverty headcount rates by demographic characteristics. Overall, this rate dropped from 31.69% to 20.15%. The ratio was relatively higher in Eastern Cape, Free State and Limpopo, rural areas, amongst the lowly educated, younger female Africans who were unemployed. People who self-reported they were dissatisfied with their lifestyle suffered greater poverty likelihood (nearly 42%), and individuals from the lower FII quintiles suffered greater money-metric poverty likelihood. The latter finding provides a preliminary indication that FE was associated with greater poverty probability.

Table 6 also shows FE likelihoods by the same characteristics. The excluded share dropped from 40.00% to 27.46%. The excluded were predominantly unemployed female Africans without tertiary education, living in rural areas of Eastern Cape, Free State, North West and Limpopo, and were dissatisfied with their lifestyle. To conclude the findings of Table 6, money-metric poor and financially excluded shared highly similar characteristics.

4.4. Relationship between financial inclusion and poverty

Tables 7 and 8 present the 2×2 matrices which further illustrate the possible relationship between financial inclusion/exclusion and poverty status. In 2011, for the money-metric poor, 62.65% of them were financially excluded. However, this share dropped to 58.10% in 2016. Focusing on the money-metric non-poor, the proportion of them being

Table 6. Poverty headcount rates and financial exclusion probabilities by demographic characteristics.

	Poverty headcount rate (%)		Financial exclusion probability (%)	
	2011	2016	2011	2016
All				
All	31.69	20.15	40.00	27.46
Province				
Western Cape	17.75	10.65	25.94	22.12
Eastern Cape	42.75	36.03	46.39	40.52
Northern Cape	27.30	19.88	37.77	36.99
Free State	36.67	31.91	47.61	40.47
KwaZulu-Natal	38.07	14.15	51.16	19.52
North West	34.36	28.28	46.40	41.87
Gauteng	17.31	11.14	25.94	18.63
Mpumalanga	32.25	24.09	51.09	33.47
Limpopo	49.42	31.95	51.35	40.28
Geo-type of residence				
Urban	21.33	14.01	32.03	22.08
Rural / Tribal	52.56	36.48	59.14	41.81
Gender				
Male	22.54	15.43	39.61	26.46
Female	40.08	24.12	42.33	28.30
Population group				
African	37.71	24.87	46.52	31.19
Coloured	22.88	12.39	35.23	28.53
Indian or Asian	0.62	06.20	28.81	23.25
White	0.50	01.40	5.72	4.80
Age cohort				
15–24 years	41.03	20.33	61.76	25.43
25–34 years	28.23	17.66	32.45	26.10
35–44 years	26.95	23.26	31.17	31.62
45–55 years	29.45	20.91	35.97	26.13
55–64 years	26.47	19.53	30.71	38.22
Labour market status				
Employed	9.94	8.28	16.42	16.30
Unemployed	54.31	52.82	59.99	55.41
Inactive	39.86	25.82	58.79	36.58
Educational attainment				
No formal education	66.31	38.39	68.49	53.91
Primary education	50.65	47.19	65.59	57.76
Secondary education	33.21	19.70	42.67	27.62
Tertiary education	4.22	0.58	9.02	1.09
Other	4.89	0.00	6.55	4.05
Marital status				
Married/ Living together	24.29	11.41	27.86	22.07
Divorced/ Separated	17.16	10.80	32.16	16.61
Widowed	42.01	28.25	36.83	33.39
Single/ Never married	36.11	26.48	49.72	31.65
Satisfaction with lifestyle				
Dissatisfied	41.97	41.94	50.02	47.15
Neither nor	34.94	20.52	47.30	27.33
Satisfied	25.28	9.36	33.84	17.11
Financial inclusion index quintile				
Quintile1	49.57	43.75	100.00	100.00
Quintile2	48.74	31.55	100.00	29.02
Quintile3	36.67	16.14	0.00	0.00
Quintile4	20.43	5.38	0.00	0.00
Quintile5	4.62	0.16	0.00	0.00

financially excluded decreased from 30.77% to 19.73%. These findings suggest that the financial exclusion rate declined between the two survey years, but money-metric poor individuals were still associated with much greater financial exclusion likelihood.

Table 7. Percentage share of working-age population by poverty and financial inclusion status (%), row totals.

	2011		
	Financially excluded	Financially included	
Money-metric poor	62.65	37.35	100.00
Money-metric non-poor	30.77	69.23	100.00
	40.00	60.00	100.00
2016			
	Financially excluded	Financially included	
Money-metric poor	58.10	41.90	100.00
Money-metric non-poor	19.73	80.27	100.00
	27.46	72.54	100.00

Table 8. Percentage share of working-age population by poverty and financial inclusion status (%), cell totals.

	2011		
	Financially excluded	Financially included	
Money-metric poor	19.53	12.12	31.65
Money-metric non-poor	21.33	47.02	68.35
	40.86	59.14	100.00
2016			
	Financially excluded	Financially included	
Money-metric poor	15.40	8.53	20.15
Money-metric non-poor	11.62	64.45	79.85
	27.02	72.98	100.00

Table 8 presents a similar 2×2 matrix but this time the cell totals are shown; the proportion of people who were both poor and financially excluded dropped from 19.53% to 15.40%, whereas the share of people who were both non-poor and financially included rose from 47.02% to 64.45%.

To conclude the descriptive statistics, the population are divided into these four groups:

- Group [I]: Money-metric poor; financially excluded
- Group [II]: Money-metric poor; financially included
- Group [III]: Money-metric non-poor; financially excluded
- Group [IV]: Money-metric non-poor; financially included

Table 9 shows that Limpopo was the most disadvantaged province, which was associated with the lowest proportion of people belonging to group [IV] (2011: 31.47%; 2016: 47.36%); Western Cape and Gauteng were the two best-performing provinces, with nearly two-thirds falling under group [IV] in 2011 and about three quarters in 2016. KwaZulu-Natal improved rapidly between the two survey periods as the group [IV] share of the individuals nearly doubled from 38.25% to 72.88%. Moreover, urban area was the most advantaged geographical location reporting the highest percentage share in Group [IV] (57.63% in 2016 and 72.73% in 2016).

The group [IV] share increased in both genders during the period under study, although this share was greater for males. Regarding race, a high proportion of white individuals (above 90% in both years) belonged to group [IV]. Also, the group [IV]

Table 9. Percentage share of working-age population by poverty and financial inclusion status by demographic characteristics (%), row totals.

	2011				2016			
	[I]	[II]	[III]	[IV]	[I]	[II]	[III]	[IV]
Province								
Western Cape	10.74	6.77	15.97	66.51	6.38	4.28	14.45	74.90
Eastern Cape	23.19	20.17	21.08	35.56	17.11	18.92	13.99	49.98
Northern Cape	13.58	12.72	23.83	49.87	12.20	7.69	25.20	54.92
Free State	20.47	18.99	27.36	33.19	20.51	11.40	18.09	50.00
KwaZulu-Natal	26.79	10.95	24.01	38.25	6.54	7.61	12.96	72.88
North West	20.59	12.71	24.64	42.06	17.91	10.37	22.80	48.91
Gauteng	8.57	7.82	18.23	65.38	7.88	3.25	10.91	77.95
Mpumalanga	26.30	9.75	24.89	39.07	12.63	11.45	20.59	55.32
Limpopo	30.31	17.58	20.65	31.47	19.11	12.84	20.69	47.36
Geo-type								
Urban	11.28	10.17	20.92	57.63	8.32	5.70	13.25	72.73
Rural / Tribal	36.12	16.05	22.16	25.67	20.40	16.08	21.15	42.37
Gender								
Male	16.02	7.31	23.92	52.74	11.26	4.17	13.88	70.69
Female	22.74	16.53	18.96	41.78	11.92	12.20	16.69	59.19
Population group								
Black African	23.11	14.38	22.87	39.63	14.40	10.47	16.60	58.54
Coloured	15.34	8.84	21.59	54.23	6.93	5.47	19.96	67.65
Indian or Asian	0.56	0.07	27.57	71.80	2.59	3.61	17.82	75.99
White	0.00	0.50	6.76	92.73	0.89	0.51	3.62	94.97
Age cohort								
15–24 years	31.88	10.91	31.69	25.52	11.18	9.15	14.06	65.61
25–34 years	13.00	13.23	18.74	55.03	11.08	6.58	15.10	67.24
35–44 years	15.43	12.53	13.89	58.15	16.38	6.88	15.88	60.86
45–55 years	16.50	11.67	18.87	52.96	7.90	13.01	15.56	63.53
55–64 years	13.81	12.44	16.35	57.40	9.90	9.54	24.72	55.76
Labour market status								
Employed	4.24	6.25	12.05	77.45	4.96	3.32	9.97	81.76
Unemployed	31.10	20.90	27.90	20.10	33.33	19.50	23.24	23.94
Inactive	30.81	10.90	28.77	29.52	12.29	13.53	23.27	50.91
Educational attainment								
No formal education	45.78	16.99	22.44	14.79	27.01	11.38	32.55	29.06
Primary education	34.92	15.30	29.44	20.34	31.40	15.78	26.77	26.05
Secondary education	20.13	13.23	22.53	44.10	10.68	9.01	16.15	64.16
Tertiary education	1.77	1.07	15.34	81.81	0.00	0.00	4.05	95.95
Other	0.47	4.12	8.32	87.09	0.00	0.58	1.10	98.32
Marital status								
Married/ Living together	12.53	11.41	14.20	61.86	6.10	2.31	15.54	73.06
Divorced/ Separated	7.38	10.65	21.69	60.28	6.04	4.77	7.86	81.34
Widowed	21.87	17.41	14.22	46.50	14.66	13.59	18.17	53.58
Single/ Never married	24.27	50.74	26.07	37.47	16.09	10.38	15.36	58.17

Notes: [I]: Money-metric poor; financially excluded. [II]: Money-metric poor; financially included. [III]: Money-metric non-poor; financially excluded. [IV]: Money-metric non-poor; financially included

share increased between 2011 and 2016 in all race groups, but the increase was the greatest (19 percentage points) for the Africans – 2011: 39.63%; 2016: 58.54%.

The employed became more privileged as their share in Group [IV] increased from 77.45% to 81.76%. The table also shows that the unemployed have been the most vulnerable group, as a high proportion of them (one-thirds in both years) fell under the most vulnerable group [I]. Hence, unemployment is associated with a greater probability of money-metric poverty and FE. Higher educational attainment categories enjoyed a greater group [IV] share but a lower group [I] share. Lastly, for people who were widowed or single/unmarried, a relatively greater proportion of them belonged to group [I] but a smaller share in group [IV].

4.5. Econometric analysis

Table 10 presents the results of probit regressions on poverty and FE probabilities. Whilst the results on the province dummy variables were somewhat mixed, rural African residents were associated with significantly greater poverty likelihood and greater FE probability. It is interesting that after controlling for differences in other characteristics, females were associated with significantly greater poverty likelihood only in 2010, but significantly lower FE probability in both years.

Table 10. Probit regressions on money-metric poverty and financial exclusion likelihoods, marginal effects.

	Poverty		Financial exclusion	
	2011	2016	2011	2016
Province: Eastern Cape	0.0276	0.0487	−0.0447	−0.0312
Province: Northern Cape	−0.0506	0.0129	−0.0138	0.0604
Province: Free State	0.0335	0.0772*	0.1007*	0.0593*
Province: KwaZulu-Natal	0.0019	−0.0433**	0.1200***	−0.0889***
Province: North West	−0.0517	0.0073	0.0125	0.0528
Province: Gauteng	−0.0644**	−0.0376*	0.0073	−0.0310
Province: Mpumalanga	−0.0486	−0.0256	0.0588	0.0091
Province: Limpopo	−0.0253	−0.0494**	−0.0379	−0.0306
Geo-type: rural / tribal	0.1297***	0.0674***	0.1478***	0.0729***
Gender: Female	0.0657***	−0.0150	−0.0840***	−0.0452***
Population group: African	0.3036***	0.0677**	0.2873***	0.1261***
Population group: Coloured	0.5535***	0.0324	0.3630***	0.1841***
Population group: Indian / Asian	−0.506	0.1862*	0.3159***	0.3452***
Age cohort: 15–24 years	0.0633	0.0827*	0.3060***	0.0934
Age cohort: 25–34 years	0.338	0.1008**	0.1478***	0.1352**
Age cohort: 35–44 years	0.0701	0.1625***	0.1297***	0.1879***
Age cohort: 45–54 years	0.0493	0.0556	0.1705***	−0.0513
Labour market status: unemployed	0.2952***	0.2945***	0.3715***	0.3375***
Labour market status: inactive	0.2845***	0.1582***	0.4329***	0.2674***
Educational attainment: none	0.4936***	0.5123***	0.5508***	0.6840***
Educational attainment: primary	0.4323***	0.5077***	0.5800***	0.6543***
Educational attainment: secondary	0.2008***	0.1350***	0.3095***	0.2619***
Educational attainment: other	−0.1446***	Omitted	0.1560*	0.1915
Marital status: single / never married	0.0017	0.1257***	0.1004***	0.0493**
Marital status: divorced / separated	−0.0263	0.0982	0.0077	−0.0631
Marital status: widowed	0.0050	0.0988***	−0.0501	−0.0174
Lifestyle: Dissatisfied	0.0178	0.1750***	0.0255	0.1635***
Lifestyle: Indifferent	0.0299	0.0591***	0.0534*	0.0416*
Household size	0.0496***	0.0391***	−0.0033	−0.0065
Sample size	3449	3220	3447	3292
Pseudo *R*-squared	0.3404	0.3898	0.2826	0.2437
Observed probability	0.3164	0.2062	0.4089	0.2710
Predicted probability	0.1853	0.0894	0.3460	0.1956
Chi-squared statistic	515.12	600.54	676.90	470.10
Prob. > Chi-squared statistic	0.0000	0.0000	0.0000	0.0000

***Significant at 1%, **Significant at 5%, *Significant at 10%.
Note: Reference categories
- Province: Western Cape
- Geo-type: urban
- Gender: male
- Population group: white
- Age cohort: 55–64 years
- Labour market status: employed
- Educational attainment: tertiary
- Marital status: married / lived together
- Lifestyle: satisfied

Unemployed and inactive as well as those without tertiary education suffered significantly greater poverty and FE probabilities. People who were single / unmarried suffered significantly greater poverty likelihood in both years and significantly greater FE likelihood only in 2016. Furthermore, survey participants who were dissatisfied or indifferent with their lifestyle suffered significantly greater poverty and FE likelihoods in 2016.

Whilst not shown in Table 10, upon adding the FII as an additional explanatory variable in the poverty probit regressions, this variable was associated with a statistically significant but negative marginal effects in both years. These results further suggest FI was associated with poverty alleviation. On the contrary, after adding the money-metric poor dummy as an additional independent variable in the FE probit regressions, this dummy explanatory variable had a statistically significant and positive marginal effects (again in both survey years). In other words, money-metric poverty was related to greater FE likelihood. To conclude, the abovementioned results indicate higher FII was associated with lower money-metric poverty likelihood, whereas money-metric poverty was associated with greater FE probability. These findings are in line with the theoretical framework that associates financial inclusion with poverty reduction (Demirgüç-Kun et al., 2008). Lastly, Table 11 shows the results of bivariate probit regressions, and in general the findings (in terms of the sign of parameter and statistical significance) are similar to what was found in Table 10.

5. Conclusion

As FI helps reduce poverty, understanding the relationship between FI and poverty in South Africa is highly important. This study found that money-metric poverty was associated with FE; nonetheless, the proportion of working-age population who were both poor and financially excluded declined between 2011 and 2016. In addition, the financially excluded remained predominantly lowly educated female Africans residing in rural areas of Eastern Cape, Free State and Limpopo provinces, who were unemployed or inactive in the labour market, and were dissatisfied with their lifestyle.

The policy implications from the findings are that FI, as measured in terms of bank account ownership does not create a key problem. However, the authorities in South Africa could improve formal account ownership by tackling barriers related to demographic characteristics all of which are impactful in the long-run. A study conducted by Fungacova & Weill (2015) in China showed that the utilisation of formal accounts has improved compared to other countries. Nevertheless, obstacles obstructing access to bank accounts existed.

Improving country-wide access to wireless internet, smartphones, and computers especially in the rural areas, as well as encouraging provision of secure online financial products and services could boast FI, which in turn can lower poverty. This may optimise the population's ability to understand internet-based financial services. The studies conducted by Evans (2018) on African countries, and Lenka & Barik (2018) on South Asian-Association of Regional Cooperation countries, showed that internet use and mobile phones impacted positively on FI such that high levels of internet and mobile phones were connected with increased FI. Hence, adequate provision of internet facilities nationwide that permit the end-users of financial services to be located in rural areas can be a promising potential to facilitate FI outside the main cities.

Table 11. Bivariate probit regressions on money-metric poverty and financial exclusion likelihoods.

	Poverty		Financial exclusion	
	2011	2016	2011	2016
Province: Eastern Cape	0.0981	0.2631*	−0.1222	−0.1159
Province: Northern Cape	−0.2101	0.0718	−0.0363	0.1966
Province: Free State	0.1153	0.3669**	0.2626*	0.1870
Province: KwaZulu-Natal	0.0074	−0.3082*	0.3172***	−0.3697***
Province: North West	−0.2088	0.0479	0.0350	0.1699
Province: Gauteng	−0.2584**	−0.2557	0.0200	−0.1214
Province: Mpumalanga	−0.1978	−0.1724	0.1571	0.0325
Province: Limpopo	−0.0975	−0.3806*	−0.1042	−0.1221
Geo-type: rural / tribal	0.4541***	0.3832***	0.3928***	0.2743***
Gender: Female	0.2469***	−0.0807***	−0.2284***	−0.1645**
Population group: African	1.8547***	0.4948***	0.9076***	0.5188***
Population group: Coloured	1.5731***	0.1882***	0.9430***	0.5754***
Population group: Indian / Asian	−0.2145	0.7724**	0.8131***	0.9806***
Age cohort: 15–24 years	0.2297	0.4706**	0.8090***	0.3239
Age cohort: 25–34 years	0.1261	0.5337**	0.3910***	0.5337**
Age cohort: 35–44 years	0.2469*	0.7424***	0.3395***	0.5931***
Age cohort: 45–54 years	0.1760	0.2898	0.4444***	−0.1913
Labour market status: unemployed	0.9814***	1.1951***	0.9933***	1.0127***
Labour market status: inactive	0.9107***	0.8148***	1.1543***	0.8404***
Educational attainment: no formal education	1.3692***	1.5427***	1.6136***	2.0023***
Educational attainment: primary education	1.24362***	1.6369***	1.6665***	1.8944***
Educational attainment: secondary education	0.9052***	1.1164***	0.9533***	1.2439***
Educational attainment: other	−0.8316	−6.3208***	0.4024*	0.5800
Marital status: single / never married	0.0056	0.7530***	0.2728***	0.1764***
Marital status: divorced / separated	−0.1025	0.4669**	0.0227	−0.2621
Marital status: widowed	0.0215	0.4806***	−0.1414	−0.0633
Marital status: don't know	0.9002	−3.6797***	−6.0228***	−5.0147***
Lifestyle: Dissatisfied	0.0653	0.8273***	0.0701	0.5306***
Lifestyle: Indifferent	0.1105	0.3371***	0.1435*	0.1486*
Household size	0.1855***	0.2414***	−0.0092	−0.0246
Constant	−5.0086***	−5.1401***	−3.4593***	−3.2491***
Sample size	3 449	3 293	3 449	3 293
F-statistic	3446.81	28.17	3446.81	28.17
Prob. > *F*-statistic	0.0000	0.0000	0.1106	0.0000

***Significant at 1%, **Significant at 5%, *Significant at 10%.
Note: Reference categories
- Province: Western Cape
- Geo-type: urban
- Gender: male
- Population group: white
- Age cohort: 55–64 years
- Labour market status: employed
- Educational attainment: tertiary
- Marital status: married / lived together
- Lifestyle: satisfied

Another option is making study loans accessible to the most disadvantaged people. Zins & Weill (2016) found that poor people in Africa were able to ask more for loans to pay for their education and medical expenses, while the richer proportion asked more loans to pursue businesses. Study loans could escalate higher learning enrolment to stimulate tertiary enrolment levels. This will not only assist the disadvantaged groups to further their studies but also improve their labour productivity to expand their job opportunities. This will also ensure that the individuals obtain the lowest level of knowledge needed to partake in the formal financial system. However, any attempt undertaken by the financial sector to fully finance the study loans should be motivated with consideration to lending rates.

Significant gains in South Africa's FI necessitate a collection of services, delivery channels and service providers. These providers and professional stakeholders in the financial sector must jointly map out and prioritise the necessary services and assess their contribution to FI. Proper banking models with suitable services and products should be designed. More financial services should be geared towards the lowly educated African rural residents to fight against poverty, given the empirical findings suggest that FE was associated with greater poverty probability.

Further research can be done to assess the influence of FI intermediations. Future study should analyse banking models applied so the finest ones can be used to achieve full FI. Further research can also incorporate mobile money and the rise of wireless internet access into the analysis to deepen understanding of how the use of wireless internet and communication influence FI in South Africa. Lastly, informal financial services should be more comprehensively examined as they continue to flourish regardless of FI initiatives.

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Appendix

Table A1. First principal components for deriving the financial inclusion index.

	2011	2016
Access		
Overall banking status: have a bank account/card	0.3961	0.3671
Overall banking status: used to have in the past	−0.1238	−0.2267
Never had/used a bank account: No proof of residence	−0.0580	−0.0442
Never had/used a bank account: Bank is too far	−0.0491	−0.0396
Never had/used a bank account: No identity document	−0.0556	−0.0539
Never had/used a bank account: Expensive to have a bank account	−0.0595	−0.0975
Never had/used a bank account: Unemployed	−0.2106	−0.2608

(*Continued*)

Table A1. Continued.

	2011	2016
Never had/used a bank account: Student	−0.1558	−0.0097
Never had/used a bank account: Prefer dealing with cash	−0.1396	−0.1032
Language used in financial paperwork is confusing: agree	0.1225	−0.0712
Language used in financial paperwork is confusing: indifferent	0.0019	0.1171
Usage		
Used a bank account/card	0.3969	0.3801
Used a bank loan	0.2769	0.2409
Used savings book	0.1659	0.1469
Used overdraft facilities	0.1583	0.1866
Used personal or garage card	0.1579	0.1664
Used funeral policy offered by banks	0.2541	0.2128
Have borrowed past 12 months	0.2112	0.0973
Have insurance policy	0.1373	0.3421
Used funeral cover	0.3056	0.2375
Terminal benefits	0.3134	0.3065
Currently saved or used money away	0.1659	0.1469
Quality		
Don't feel comfortable in a bank	−0.0373	−0.0518
Don't understand how banks work	−0.0536	−0.0372
Don't understand technology	−0.0422	−0.0387
Welfare		
Dealing with personal finance is stressful: agree	0.0107	0.1227
Dealing with personal finance is stressful: indifferent	0.0459	−0.0636
Would like to be in control of own finances and money matters: agree	−0.1293	0.0655
Would like to be in control of own finances and money matters: indifferent	0.1689	0.2027
Proportion of variation explained by the first principal components	14.02%	12.93%