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How can agency banking deepen financial inclusion in South Africa?

Lwanga Elizabeth Nanziri* and Paul Terna Gbahabo†

Abstract

This paper examines the potential of agency banking to deepen financial inclusion in South Africa. Using the three-stage least squares and logistic estimation techniques on three samples of adults drawn from the 2015 and 2023 FinScope surveys, and the 2021 Global Findex, our results show a positive and significant role played by agency banking in increasing the frequency of the use of credit, savings and bank transaction services. The associated demand for agency banking is driven by demographic, geographic and behavioural factors. Furthermore, our study identifies poverty, know-your-customer restrictions and a lack of trust in financial institutions as significant factors influencing the demand for agency banking services. However, the overall effect of agency banking on financial inclusion seems to be dissipating. Our nuanced analysis of demographic variations shows the need for a strategic approach to policy interventions that address specific barriers faced by different segments of South Africa's population in accessing financial services.

JEL classification

D0, G2, G5, O55

Keywords

Agency banking, financial inclusion, South Africa

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1. Introduction

Market failures and other supply constraints have restricted access to basic financial services (such as account ownership, savings, credit and insurance) for the unserved and underserved[1] population in several developing economies. One argument cited for this skewed distribution is that expanding the traditional banking model of brick-and-mortar branches to remote communities and diverse demographics is impractical and not cost-effective. Correspondent or agency banking has emerged as a viable alternative model for providing the unbanked and underbanked with access to financial services (Allen et al. 2016).

Agency banking involves partnerships between traditional financial institutions and non-financial commercial outlets, such as retail shops, supermarkets, lottery kiosks, post offices and mobile network operators, which serve as distribution channels for banking services to the underserved demography (Allen et al. 2016). Agency banking is essential for achieving the 'last mile'[2] of financial inclusion as it draws on the wider geographic spread of agent networks compared to bank branches. For example, the global density of agent networks averaged 228 active mobile money agents per 100 000 adults in 2019, seven times the density of automatic teller machines (ATMs) and 20 times that of bank branches (Obiko, Teyssier and Ilukwe 2022). In South Africa in 2021, retail stores providing agency banking services averaged 35% of the adult population. This is half the ATM penetration rate but double the bank branch and

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1 Due to geographic, economic or social barriers, unserved populations lack access to formal financial services. In contrast, underserved populations have some access to financial services but face limitations such as inadequate banking infrastructure or high costs. This concept is closely related to the notion of unbanked and underbanked, where unbanked denotes not having any accounts with traditional formal banks. These individuals rely primarily on cash or alternative financial services. Underbanked individuals have bank accounts but still rely on alternative financial services due to limited access to mainstream banking services (FinMark Trust 2016).

2 'Last mile' in the context of financial inclusion refers to policies designed to deliver financial services to individuals who are typically excluded or underserved. It encompasses three main aspects: access, usage and quality. Last-mile access involves reaching populations in remote or marginalised areas that have little or no access to traditional banking services. Last-mile usage ensures that individuals actively use and derive meaningful benefits from financial services beyond access to bank accounts, including savings, loans and insurance services. Last-mile quality refers to the effectiveness and efficiency of financial service delivery, including the cost of opening, maintaining and using a bank account and credit barriers such as collateral and know-your-customer requirements.

mobile banking penetration rate and seven times higher than the internet banking penetration rate (Genesis Analytics and Financial Sector Conduct Authority 2022).

The socioeconomic implications of extending access to financial services to underserved populations are enormous. The benefits of financial inclusion include reducing poverty, creating jobs, empowering women, and improving people's savings and investment behaviour. For instance, Karlan and Zinman (2010) reported that access to credit, irrespective of interest rates, improves food security and economic self-sufficiency among South African households. Van Biljon, von Fintel and Pasha (2018) showed that financial inclusion improves female empowerment in South Africa. Their study showed that the rollout of banking cards to female beneficiaries of government cash transfers improved their decision-making power in the household. Similarly, Ashraf, Karlan and Yin (2010) reported that access to commitment savings products in the Philippines increases women's empowerment by increasing their decision-making power within the household, especially for women below the median decision-making power balance. Aportela (1999) showed that expanding financial access to low-income households in Mexico increases the average household saving rate by more than 3–5%, with the poorest households receiving the most benefits. Dupas and Robinson (2013) reported that access to formal bank accounts improves savings and investment behaviour among self-employed female entrepreneurs in Kenya. However, the welfare effects of financial inclusion vary substantially across demographics. For instance, Nanziri (2016) found that South African women are more likely than men to adopt transaction accounts which do not facilitate asset accumulation, rather adopting than financial products and services that are better suited to asset accumulation.

In terms of the effect of agency banking on financial inclusion, using data of 124 000 individuals across 123 economies obtained from Global Findex data, Allen et al. (2016) showed that the promulgation of agency banking services is associated with increases in account and savings penetration but has no effect on the frequency of account use.

Although South Africa has relatively high account penetration, averaging 80% of the adult population (FinMark Trust 2023), about 9% of the population, or 3.9 million South

Africans, remains unbanked and underbanked due to a wide range of supply and demand constraints. Moreover, 33% of account holders use their accounts as mailboxes,[3] citing as reasons poverty, a preference for cash and the cost of using bank savings accounts. Therefore, effective financial inclusion remains a challenge in South Africa (FinMark Trust 2022).

In this study, we aim to fill a significant gap in the literature by investigating the potential of agency banking to deepen financial inclusion in South Africa. We pose the following questions. How can agency banking be used to overcome existing barriers and achieve effective financial inclusion in South Africa? What factors drive the demand for agency banking in South Africa? To our knowledge, no study except Allen et al. (2016) has explored the link between agency banking and financial inclusion. However, given that Allen et al. (2016) examined this relationship in a global context comprising 123 economies, the validity of this relationship in the context of a single country remains an open empirical question. Furthermore, there is a lack of studies that examine the predictors of demand for agency banking in South Africa. Using the three-stage least squares estimation technique while controlling for potential endogeneity in the data, our study is the first attempt to provide new empirical insights into why South Africans rely on agency banking to meet their basic financial services needs rather than directly using formal banking models.

Our main empirical findings indicate a significant increase in credit and savings penetration and bank transaction frequency associated with the growing demand for agency banking in South Africa via cash-in-cash-out services. The profile of a typical financially excluded South African relying on agency banking to meet their financial services needs is a black person with a matric level of education and a monthly income of between R6 000 and R10 000 (US$300–500). The data also show that this individual is more likely to be a single female aged between 25 and 51, living in the urban areas of Gauteng, North West, Mpumalanga, the Eastern Cape or KwaZulu-Natal. There is also evidence that the proximity to a commercial banking outlet, the

[3] This is the practice of consumers making a once-off withdrawal of all funds that are deposited into their bank accounts by family, friends, employers or government in the form of social support.

prevalence of shared accounts,[4] know-your-customer (KYC) requirements and a lack of trust in financial institutions are some of the major factors explaining the demand for agency banking among urban dwellers, individuals below the median income and youth between the ages of 15 and 24. Analysis of individual cross-sections shows that the effect of agency banking declines between 2015 and 2023.

The policy implications of this study are twofold. First, given that the observed significant effect of agency banking on deepening financial inclusion is accounted for by proximity, policymakers can encourage the expansion of licensed agents beyond regular retail shops and supermarkets. Second, policymakers can address the barriers to the demand for agency banking by absorbing these individuals operating at the fringe into the mainstream financial system. The disaggregated analysis of demographic disparities offers the basis for a targeted policy intervention.

The rest of the paper is organised as follows. Section 2 provides an overview of financial inclusion, agency banking and the policy environment in South Africa. Section 3 presents the conceptual definition, measurement and theoretical framework. Section 4 presents the empirical strategy, section 5 discusses the results and section 6 concludes.

2. An overview of the state of financial inclusion in South Africa

2.1 Regulatory frameworks for promoting financial inclusion

As part of the Reconstruction and Development Plan of post-apartheid South Africa, the financial sector was tasked with implementing policies that encouraged the participation of all economic agents in the country's economic activities. To this end, regulatory frameworks and acts of parliament, including the Financial Sector Code of 2003, the National Payment System Amendment Act 22 of 2004 and the Financial Sector Regulation Act 9 of 2017, were enacted to foster financial inclusion in the economy, among other objectives. The following subsections discuss these financial sector milestones and legal frameworks.

[4] A shared account is a bank account that is used by more than one person.

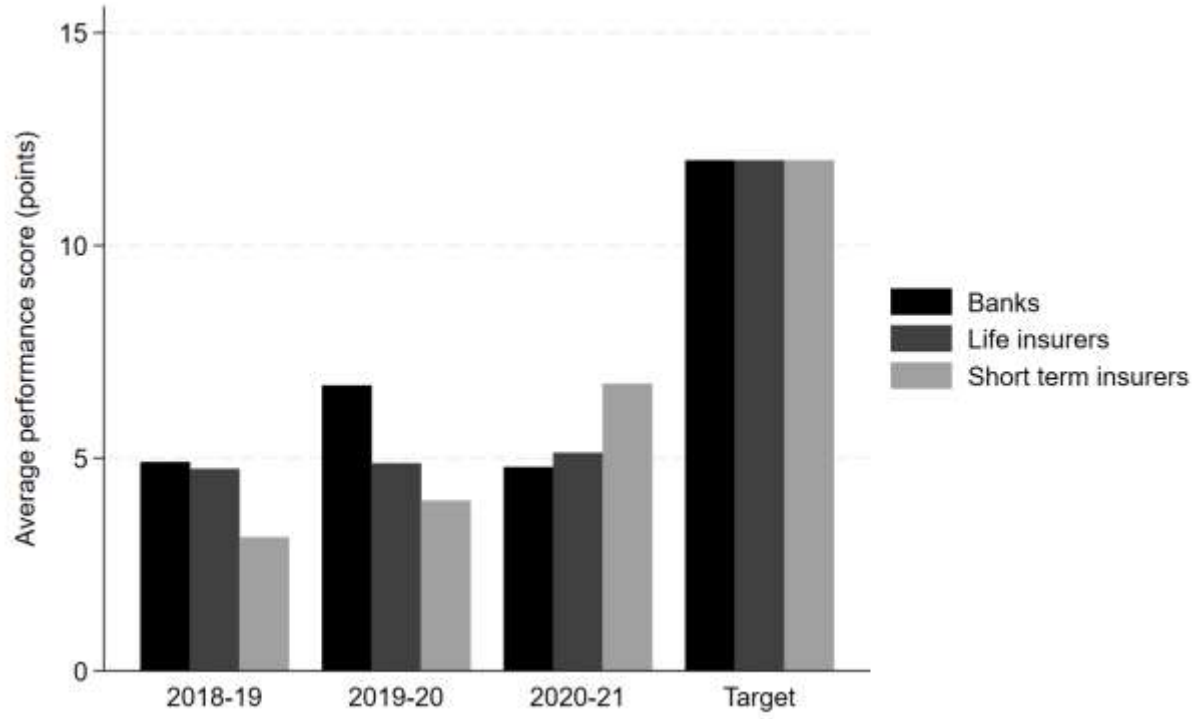
2.1.1 Financial Sector Code 2003

The Financial Sector Code, formerly the Financial Sector Charter, originated as a voluntary agreement between the South African government and the financial services industry to overcome marginalisation, foster transformation and redress apartheid-era injustices in the sector. Initially signed in October 2003, it has undergone multiple revisions to align with the Broad-Based Black Economic Empowerment Act 53 of 2003, reflecting a broader national transformation agenda. Regulated by the Financial Sector Transformation Council, the Code mandates all financial institutions to pursue transformation objectives outlined in publicly available annual reports. Companies must regularly report on their progress to a monitoring body established under the charter. Despite the Code's success in promoting inclusivity and diversity, ongoing efforts are needed to achieve these goals fully.

The Financial Sector Code covers key areas such as procurement, ownership, management representation, enterprise and human resource development, and access to financial services. Section 8 of the Code emphasises improving access to primary retail financial services, which is essential for black economic empowerment and economic development. It advocates for sustainable banking services, contractual savings schemes, credit for small enterprises and measures to combat discrimination in financial services.

Figure 1 benchmarks the average performance score of commercial banks, life insurers and short-term insurers against set targets of access to financial services between 2018 and 2021. The figure shows that all subsectors performed below the target benchmark over the period.

Figure 1: Access to financial services, South Africa, 2018–2021



Source: Financial Sector Transformation Council annual report, 2020–21

Specific commitments include increasing access to financial products for Living Standards Measure 1–5 demographics through physical and digital infrastructure by 2008. Financial institutions pledged to invest in consumer education and support community-based financial entities. They also committed to originating loans for low-income housing, agricultural development, and small- and medium-sized enterprises to meet targeted investment goals.

Furthermore, the 2020–21 annual report on the state of the industry by the Financial Sector Transformation Council indicated that inclusivity had been achieved in terms of Exercisable Voting Rights. The target of 25% black participation, at least 10% of which must constitute black female participation, had been surpassed in the 2020–21 fiscal year at 28.25% and 11.66%, respectively. The Financial Sector Code represents a significant framework for achieving economic empowerment and equitable access to financial services in South Africa, aligning with broader socioeconomic transformation imperatives.

2.1.2 National Payment System Amendment Act 22 of 2004

The National Payment System Amendment Act aims to enhance the regulatory framework governing payment systems in South Africa. Its objectives include establishing designated settlement systems, facilitating payments to third parties and granting the South African Reserve Bank (SARB) authority to issue directives and manage related matters.

Section 7 of the act specifies conditions under which a person can receive money or payment instructions to facilitate payments on behalf of others. This includes the SARB, commercial banks, mutual banks, foreign institution branches and designated settlement system operators. It emphasises adherence to directives issued by the SARB to ensure systemic stability, public interest and the integrity of the payment system.

The act's establishment of designated settlement systems and facilitation of payments are crucial for enhancing financial infrastructure and efficiency. However, given the increasing digitalisation of the economy, subsequent amendments to the act must prioritise cybersecurity and other innovative digital payment initiatives. The criteria for accepting payments on behalf of others seem comprehensive but could restrict market entry for new players in the payment sector. Moreover, although the act aims to safeguard financial stability, the interpretation and implementation of some concepts like 'systemic risk' and 'national financial stability' remain subjective, requiring clear guidelines to prevent misuse of regulatory powers.

2.1.3 Financial Sector Regulation Act 9 of 2017

The Financial Sector Regulation Act serves as South Africa's principal financial sector regulatory framework. The primary objective of section 7 is to establish a robust regulatory and supervisory framework that ensures a stable financial system. This system aims to protect the interests of financial customers, support balanced and sustainable economic growth, and promote various aspects, including financial stability, safety of financial institutions, fair treatment of customers, efficiency of the financial system and prevention of financial crime.

The act places significant emphasis on financial inclusion, which is defined as providing equitable access to appropriate, fair and affordable financial services to all individuals. Despite high levels of account penetration in South Africa, data from the FinScope surveys highlight persistent gaps in access to credit, savings and insurance among segments of the country's population. This indicates that the challenge in achieving financial inclusion lies not only in promoting access but also in enhancing the usage and quality of financial services (see Figures 4 and 5).

2.2 Financial inclusion developments in South Africa

Although South Africa enjoys some of the highest levels of account penetration in Africa, with about 91% of the adult population formally served as of 2021, a considerable number of its citizens remain unbanked. Figure 2 illustrates trends in account penetration from 2014 to 2021, revealing bank account ownership as the dominant form of account penetration until 2019. However, in 2021, account ownership with other formal non-bank financial institutions became dominant. Interestingly, account ownership at informal institutions declined between 2014 and 2016, and then increased from 2019 to 2021. The overall implication is that individuals are gaining confidence in the services of alternative financial institutions, ranging from non-bank to informal institutions.

Figure 2: Average account penetration (%), South Africa, 2014–2021

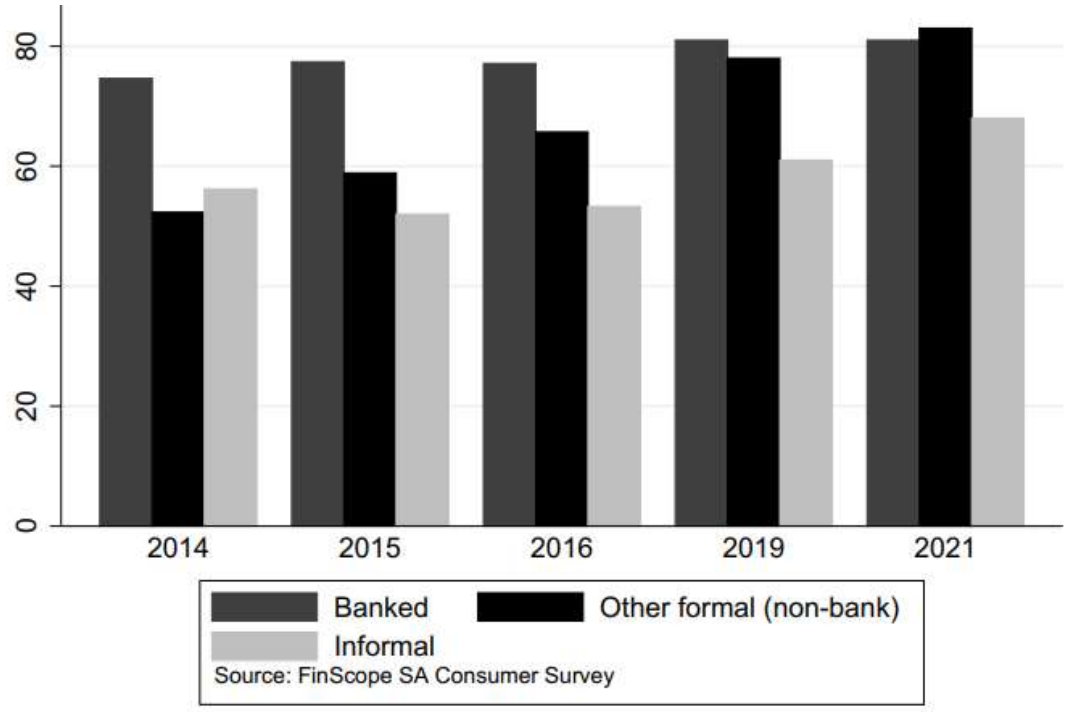


Figure 3 shows that savings through bank products rose from 10% in 2014 to 25% in 2021 but remained far behind informal savings, which constitutes all savings outside the financial system, including stokvels, umgalelo,[5] and other savings and investment clubs at home. The FinScope surveys show the marked difference between the incidence of informal savings and that of formal savings through bank products, especially since 2019 when informal savings penetration was twice that of bank savings (see Figure 3).

[5] FinMark Trust (2022) describes umgalelo as an alternative name for stokvel among certain demographic groups in South Africa.

Figure 3: Average savings penetration (%), South Africa, 2014–2021

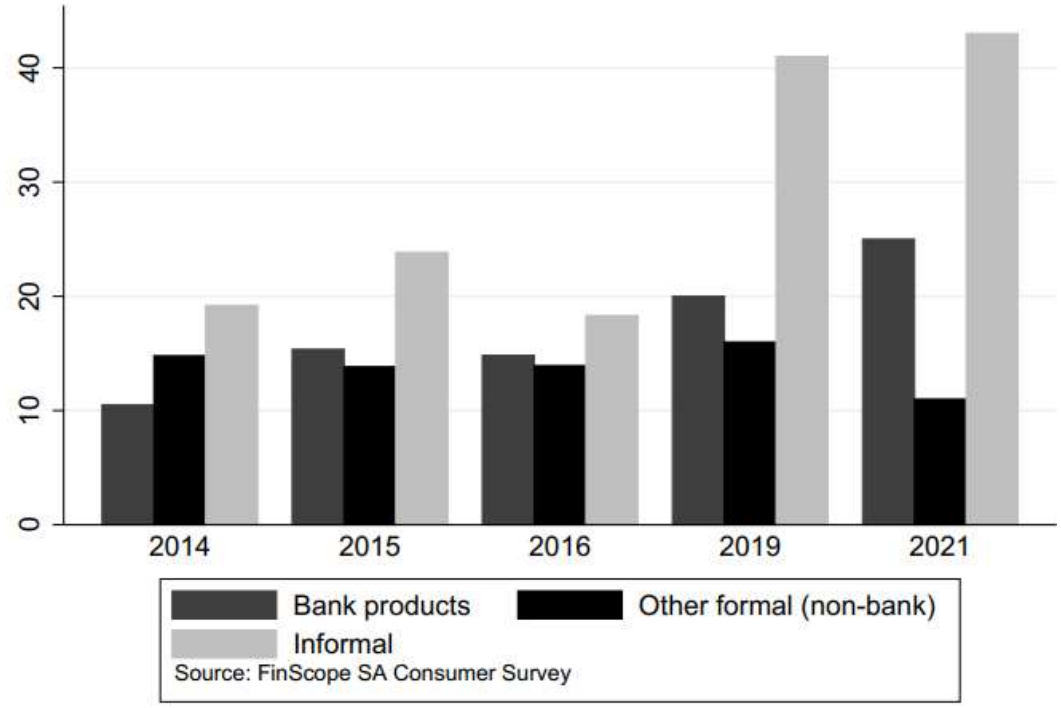
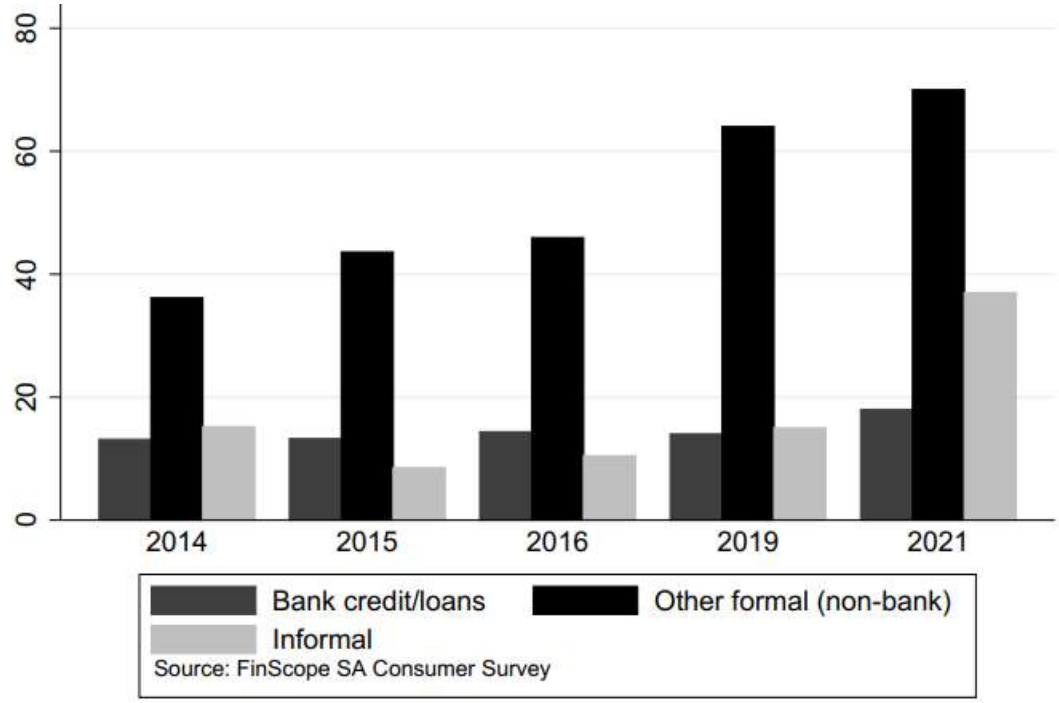


Figure 4 shows that credit provided by non-bank financial institutions rises from 36% in 2014 to 43% in 2016 before rising further to 70% in 2021, relative to 18% for bank credit. Although credit penetration in the informal sector declined from 15% in 2014 to 10% in 2016, it rose steadily to 37% in 2021. The implication is that the banking sector does not seem to be the preferred credit provider. This anomaly is likely linked to supply constraints, including regulatory and collateral requirements, as informal credit providers do not have to bear regulatory compliance costs. However, on the other hand, this situation can also lead to consumers paying significantly higher interest rates.

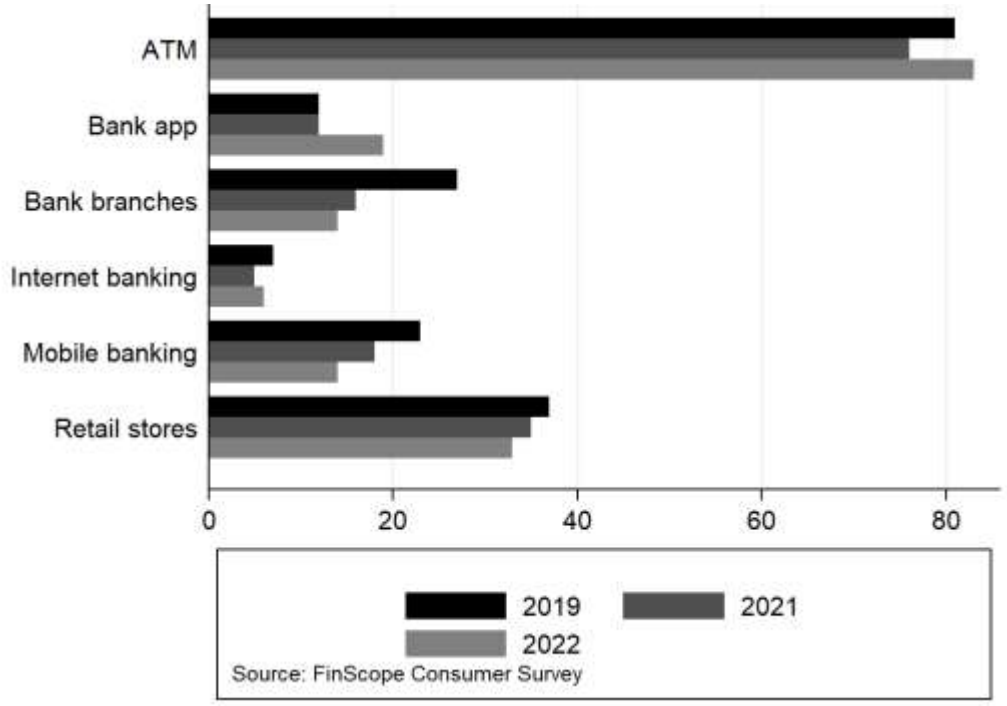
Figure 4: Average credit penetration (%), South Africa, 2014–2021



2.3 Agency banking developments in South Africa

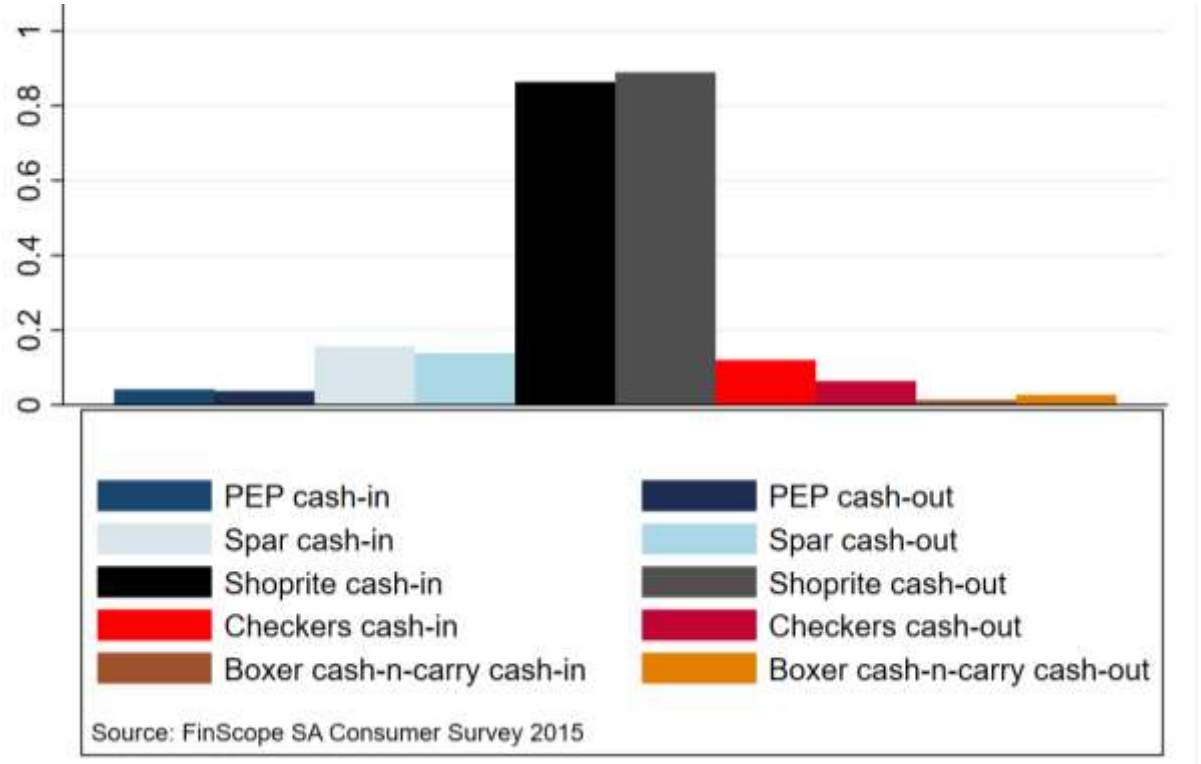
In South Africa, agency banking manifests via licensed third-party retail distribution channels such as retail stores and supermarket chains. South African banks are using the network of retail chains to expand their reach to underserved communities efficiently and affordably. Strategic alliances between banks and retailers – such as the partnership between Absa and PEP stores, TymeBank and Pick n Pay, and Boxer and The Foschini Group – have become a regular feature of South Africa's financial landscape (Genesis Analytics and Financial Sector Conduct Authority 2022). Agency banking via retail stores has become the preferred distribution channel for South Africans after ATMs, as illustrated in Figure 5. However, it is worth noting that the demand for agency banking at retail stores exhibited a within-channel decline between 2014 and 2021 (Figure 5).

Figure 5: Distribution of financial services channels, 2019–2022



The basic financial services facilitated through agency banking range from cash-in services (cash deposits, funds transfers and bill payments) and cash-out services (cash withdrawals and payment receipts) to opening new transaction accounts, such as Shoprite and Pick n Pay Money Market accounts. Figure 6 shows that cash-in services were preferred among customers of agency banking at retail stores in 2015, except at Shoprite and Boxer, where demand for cash-out services dominated.

Figure 6: Distribution of agency banking services in South Africa, 2015



3. Literature review

3.1 Conceptual definition and measurement

3.1.1 Agency banking

Agency banking has been variously defined. Barasa and Mwirigi (2013) refer to agency banking as a model through which regulated banks can offer some of their services through commercial outlets that serve as their agents. According to the Central Bank of Nigeria (2017), agency banking entails outsourcing basic financial services to a third party (retail agent) by licensed financial institutions. Bangladesh Bank (2013) defines agency banking as providing limited-scale banking and financial services to the unbanked population by engaging agents under a valid agency agreement instead of a teller/cashier.

Agents perform a broad range of financial services. These include account opening, cash-in (deposit) and cash-out (withdrawal) services, cash disbursement of bank-approved loans and repayment collection, payment and transfer services, international remittances and person-to-person domestic transfers, and even credit underwriting (Tarazi and Breloff 2011). However, the scope of financial services that agents are

permitted to provide depends on the jurisdiction and preferences of regulators. For example, in some jurisdictions, regulators classify agents into different categories depending on the sensitivity of services they offer – with less stringent eligibility criteria for agents providing only basic services such as cash-in and cash-out services.

While some writers on agency banking define the concept in terms of supply – that is, the number of agents per 10 000 people (Mani 2018) – others consider it in terms of demand – that is, the number of respondents using agents for basic financial transactions (Allen et al. 2016). This study follows the latter approach.

3.1.2 Financial inclusion

South Africa's National Treasury (2020) defines financial inclusion as the delivery of financial services at an affordable cost to large sections of the population that were historically excluded or underserved by the formal financial sector. However, the Financial Sector Regulation Act defines financial inclusion as "all persons having timely and fair access to appropriate, fair and affordable financial products and services".

Transaction costs are considered a major obstacle to financial inclusion. These costs include supply-side costs incurred by banks in servicing low-value accounts and extending banking infrastructure to underserved, low-income areas, and demand-side time and expense costs incurred by poor clients travelling to bank branches (Tarazi and Breloff 2011). Therefore, improving financial inclusion requires innovative business models that considerably reduce costs for all parties involved and thus allow profitable extension of financial services to the world's poor (Tarazi and Breloff 2011). One such model is agency banking, where banks delegate basic services, such as cash deposits and withdrawals, to retail agents to undertake on their behalf.

According to the Global Partnership for Financial Inclusion (2013), there are three dimensions to measure financial inclusion: access, usage and quality of financial products, and service delivery. Access to financial services relates to the prevalence of financial services in geographic locations or among the population, ranging from active accounts with a financial institution per square kilometre to the number of bank branches and points of sale per 100 000 adults. Financial services usage covers the

actual use of accounts by individuals, households and businesses for a wide range of services, such as deposits, credit, transfers, withdrawals and insurance, as well as the frequency of usage. Finally, the quality of financial services captures the usage cost, including the average cost of opening and maintaining a basic current account, funds transfer and credit barriers, including collateral requirements (GPFI 2013).

3.2 Theoretical underpinnings of agency banking

Agency banking uses two key theoretical frameworks – transaction cost theory and agency theory – to enhance financial inclusion.

3.2.1 Transaction cost theory

According to Coase (1937), in a frictionless world, transaction costs would not exist, and firms would choose between market transactions and internal operations solely based on efficiency. Transaction costs for financial transactions (fees, time, effort) can hinder traditional institutions from serving low-income and small business clients profitably. According to the theory, in a perfectly competitive market, firms exist to reduce transaction costs by selecting the optimal decision at any given time. At its core, the transaction cost theory provides an empirical understanding of vertical integration in making or buying decisions. Therefore, it underpins a wide range of managerial decisions, including whether a firm should outsource some of its services (Williamson 1979). The theory is essentially one of organisational efficiency that aims to minimise transaction costs and inefficiencies by identifying the best organisational arrangement for a given transaction (Jack and Suri 2014).

In the context of financial inclusion, financial institutions use retail agents to cut transaction costs for basic financial services by eliminating the need for extensive physical infrastructure. As a result, they can offer faster, cheaper and more accessible financial services, such as microloans and savings accounts, to underserved populations, thus increasing financial inclusion.

3.2.2 Agency theory

Through the principal-agent relationship, Jensen and Meckling (1976) describe how financial institutions delegate service provision (e.g. deposits, withdrawals, person-to-person transactions and account opening) to agents (e.g. retail stores). This delegation reduces the agency costs associated with managing multiple branches and staff, lowering operational expenses.

The implication for financial inclusion is that by using retail stores as agents, financial institutions extend their reach without the overhead costs of brick-and-mortar branches, making financial products more accessible and affordable, thereby promoting economic empowerment and stability among previously excluded groups.

4. Methodology

4.1 Empirical approach

To investigate the role of agency banking in deepening financial inclusion we follow a two-pronged approach: (i) modelling the financial inclusion effects of agency banking, and (ii) modelling the predictors of the demand for agency banking.

Examining the effects of agency banking on financial inclusion presents several methodological challenges. The first challenge relates to the difficulty of assigning agents as treatment in a randomised framework that generates causal inference. This challenge is a source of selection bias in many financial inclusion models because uptakers of agency banking may significantly differ from never-takers (those who do not use agency banking). The second challenge relates to endogeneity arising from the possibility that agency banking and financial inclusion could be simultaneously determined or jointly co-determined by some other unobserved variables. The third challenge is linked to possible omitted variable bias if some vital variables are not adequately controlled for in the estimation. We acknowledge these challenges and have taken some steps to address them.

To address the issue of individual selection bias that could confound estimates of agency banking on the use of financial services, we adopt the three-stage least

squares (3SLS) technique, which uses some form of partial randomisation of the users of agents (treatment) and non-users of agents (control group) to derive average treatment effects. The 3SLS technique, which is a kind of instrumental variable analysis, also controls for endogeneity issues by disentangling issues relating to reverse causality. The instrumental variables used in this model are insurance services provided by financial institutions, government transfers, and pensions provided to individuals through mobile money accounts. The intuition behind the choice of both instruments is simple. First, insurance and pension services offer risk-mitigating institutional savings that are inversely related to direct household precautionary savings, bank credit and bank transaction frequency. Like access to insurance and a pension, public transfer payments such as cash transfers[6] increase individuals' and households' financial resilience, particularly in times of crisis. This implies that the more individuals and households access institutional savings and public transfers, the less likely they are to tamper with their bank savings, take bank loans and frequently require bank transactions.

The econometric theory suggests that a valid instrument Z must satisfy two essential conditions. First, variation in the instrument must have a causal effect on the treatment variables: Cov (Zi, Xi) ≠ 0. This is also called the instrument relevance assumption. Second, the instruments must be exogenous, completely or partially randomly assigned, and unrelated to the unobserved omitted variables: Cov (Zi, ui) = 0. This is also known as the instrument exogeneity assumption (Stock and Watson 2020). Tables A2 and A3 in the annexure illustrate the results of the relevance assumption. Given that we only used exactly identified models with a single instrument per model, we cannot report Hansen-J statistics for the instrument exogeneity assumption, which is only relevant in cases with more than one instrument.

To address issues of omitted variable bias, we control for all possible observable characteristics of financial service users. We then control for unobservable idiosyncratic effects of individuals by interacting individual effects with geographic area to further capture individual-specific trends concerning local financial market effects

6 The South African Social Security Agency cash transfer grant.

and local ethnic and religious cleavage effects that could jointly affect the demand for agency banking.

To establish the predictors of agency banking, we use the Logit model because agency banking in this model takes a binary value of 1 if the individual uses agents and zero otherwise. The Logit model estimates the likelihood of an event occurring (use of agent banking) given a set of predictors, such as the individual's observable characteristics. However, given that in a Logit model the coefficients of demand for agency banking on the use of financial services only estimate the effect of a change in demand for agency banking, we employ the marginal effect approach. The marginal effect analysis of probabilistic models yields a more intuitive interpretation – in this case, the marginal effect of a change in the demand for agency banking on the probability that the dependent variable is a positive outcome (use of financial services).

4.2 Model specification

Following the literature, we specify the following econometric model to estimate the effect of agent banking on financial inclusion in South Africa:

$$FI_i = \alpha_i + \beta_i Agent_i + \delta_i X_i + \varepsilon_i \quad (1)$$

where for individual i, FI denotes the financial inclusion measure as a dummy equal to 1 if an individual uses credit services or savings services or frequently uses a transaction account, zero otherwise. We therefore estimate three models, one for each measure of financial inclusion. Agent denotes demand for agency banking services, which is also a dummy variable. X represents a vector of control variables comprising employment, gender, race, education, age, urban/rural, marital status of the head of the household and their monthly income, and ε_i is the idiosyncratic error term. Equation 1 is estimated using the 3SLS technique.

To estimate the predictors of agency banking, we specify the model in equation 2 and obtain the marginal effects using the logistic regression approach:

$$Agent_i = \gamma_i + \rho_i Factor_i + \sigma_i X_i + \epsilon_i \quad (2)$$

where *Agent* is as defined in equation 1. *Factor* is a vector of variables such as the distance to financial institution outlets, the prevalence of shared accounts, KYC requirements, trust in financial institutions, transaction costs (charges), the personal conviction that the use of financial services is not a necessity, self-exclusion due to religious belief and exclusion due to poverty. These factors are often cited in the literature as reasons for not using formal financial institutions (see Demirgüç-Kunt, Klapper and Singer 2015; Dupas and Robinson 2013). X is a vector of control variables as defined in equation 1 and ϵ_i is the idiosyncratic error term. All variables are entered into the models as binary variables.

4.3 Data

We use three sources of data: the 2015 and 2023 FinScope Consumer Survey for South Africa and the 2021 Global Findex. In the 2015 FinScope consumer survey, respondents were asked why they do not use banks and they responded that they use bank retail agents. They also reported that they use agents for cash-in or cash-out services. In the 2023 FinScope consumer survey, respondents listed retail shops and supermarket stores as their usual channel for sending and receiving money. We therefore combine the two responses additively to obtain a measure of agency banking, which is consumers' demand for banking services at retail shops and supermarkets, measured as the number of respondents who make cash deposits, payments and transfers (agent cash-in) or make withdrawals/receive payments (agent cash-out). However, the 2021 Global Findex dataset provides the agency banking response as an aggregate and alternative to mobile money accounts. We therefore use the two datasets separately as a way of enriching our analysis.

The dependent variable, financial inclusion, is measured from the usage dimension: credit and savings penetration and bank transaction frequency.[7] These data are

[7] We further estimated alternative models using the composite index of financial inclusion, combining credit and savings penetration as well as bank transaction frequency as subindices in Annexure A1.

available in both the FinScope and Global Findex datasets.[8] Finally, for the 2015 FinScope survey we used the insurance services provided by financial institutions as the instrumental variable for the 3SLS regression, while for the 2023 FinScope survey we used social grants and remittance data as the instrumental variable. Similarly, the data on government transfers and pensions to individuals via mobile money accounts, used as the instrumental variable of choice, are obtained from the Global Findex database. The detailed description and measurement of the variables are presented in Annexure Table B6.

The FinScope South Africa consumer survey and the 2021 Global Findex survey are nationally representative surveys focusing on consumers' demand for financial products and services. The sample sizes of these datasets are 5 000 (2015 FinScope survey), 3 478 (2023 FinScope survey) and 1 000 (2021 Global Findex survey).

5. Results and discussion

5.1 Descriptive statistics

A review of the main dataset used in the study, the 2015 FinScope consumer survey, shows that only 7% of the South African population used agency banking between 2014 and 2015. This translates into a sample of 388 respondents out of the 5 000 we reported in section 4.3. We thus report the summary statistics based on this subsample.

Table 1 presents the demographic distribution to enable us to develop an individual profile for a respondent who uses agency banking in South Africa. The Eastern Cape, Gauteng, KwaZulu-Natal and North West exhibit a higher average number of users than the Northern Cape. This geographical distribution reflects the country's business

[8] The FinScope consumer survey is the most comprehensive dataset on financial inclusion dynamics in South Africa, so it is naturally expected that all analyses would be drawn from the survey. However, we were constrained by data access beyond the 2015 rounds of consumer surveys. To address this data limitation, we introduced the 2021 Global Findex survey dataset to enable us to capture the post-2015 dynamics in the data. Nevertheless, we note that the Global Findex survey is not as comprehensive as the FinScope consumer survey. The use of the survey for South Africa is thus only relevant in the absence of the much more detailed FinScope consumer survey.

hubs and poor provinces. There is also variation across race, employment, marital status, education, age and income. We can tentatively construct a profile of the typical individual who relies on agency banking to meet their financial service needs. As of 2015, the demand for agency banking was mostly concentrated among black low-income wage earners earning above R6 000 (US$300) with a high-school level of education. This individual is also likely to be an unmarried female, aged between 25 and 51, living in an urban area of either the economic hubs of Gauteng or KwaZulu-Natal, or the relatively poor provinces of the Eastern Cape or North West. In the next section, we use this profile in the empirical investigation to establish the factors that significantly predict the demand for agency banking.

Table 1: Demographic distribution of demand for agency banking

Account usage			Monthly income		
Agency banking	**Yes (N=388)**	**No (N=4 612)**		**Yes**	**No**
Formal credit usage	0.56	0.49	Below R100	0.272	0.24
Formal savings usage	0.34	0.28	Below R2k	0.158	0.20
Bank transaction frequency	0.41	0.36	Below R3k	0.131	0.08
Account ownership	0.77	0.68	Below R6k	0.174	0.13
Employment			Below R8k	0.0973	0.05
Employed	0.65	0.64	Below R10k	0.047	0.03
Unemployed	0.35	0.36	Below R12k	0.010	0.02
Gender			Below R17k	0.030	0.04
Male	0.43	0.45	Below R25k	0.010	0.03
Female	0.57	0.55	Below R30k	0.003	0.01
Education			Below R40k	0.003	0.01
No schooling	0.010	0.018	**Province**		
Primary school	0.044	0.080	Eastern Cape	0.106	0.12
High school	0.384	0.428	Free State	0.085	0.09
Matric	0.466	0.379	Gauteng	0.255	0.18
Apprenticeship	0.018	0.023	KwaZulu-Natal	0.183	0.17
Diploma	0.072	0.087	Limpopo	0.078	0.08
Degree	0.046	0.063	Mpumalanga	0.083	0.08
Race			North West	0.101	0.08
Black	0.894	0.61	Northern Cape	0.018	0.06
Asian	0.0309	0.07	Western Cape	0.090	0.13
Coloured	0.0593	0.17	**Geographic area**		
White	0.0155	0.16	Urban	0.768	0.77
Marital status			Rural	0.232	0.23
Single	0.593	0.45	**Age**		
Married	0.296	0.42	16–29 yrs	0.302	0.29
Widow/widower	0.077	0.09	30–44 yrs	0.43	0.35
Divorced/separated	0.034	0.04	45–59 yrs	0.206	0.23
			60+ yrs	0.059	0.13

Source: Authors' compilation using the 2015 FinScope consumer survey

5.2 Agency banking and usage dimension of financial inclusion

In this section, we present the results for the estimated effect of agency banking (aggregated and disaggregated) on financial inclusion from the dimension of usage, disaggregated into credit use, savings use and transaction frequency.

Table 2 presents the results of the 3SLS model of agency banking on credit and savings penetration and bank transaction frequency. The aggregate results are

presented in columns 1 to 3, while the disaggregated results are presented in columns 4 to 9. The results of the aggregate model indicate a strong positive relationship between the demand for agency banking and financial inclusion. The effects are large, robust and statistically significant, emphasising the agency's role in increasing the use of financial services. Specifically, a 1% increase in agency banking increases credit access, formal savings products and bank transaction frequency by a large magnitude of 3.7 (se = 1.06), 3.7 (se = 1.01) and 2.9 (se = 0.85), respectively.

The disaggregated results of agency banking into agent cash-in and agent cash-out provide more insights, indicating that the positive significant effects primarily observed in the aggregate models are driven by agent cash-in services and only to a lesser extent by agent cash-out services. Specifically, the demand for agent cash-in services is positive and significantly associated with credit and savings penetration and bank transaction frequency with an even larger coefficient magnitude of 5.8 (se = 1.96), 5.9 (se = 1.90) and 4.58 (se = 1.57), respectively. These results imply that the demand for agent cash-in services increases credit, savings penetration and bank transaction frequency, with a robust statistical significance at the 1% level.

The results of agent cash-out services also positively affect financial inclusion outcomes. However, the results are less robust, with a relatively weaker level of statistical significance at 10%. Nonetheless, the disaggregated cash-out models produce larger effects of agency banking on the use of financial services, with magnitudes of 10.12 (se = 5.95) for credit penetration, 10.21 (se = 5.92) for savings penetration and 7.58 (se = 4.71) for bank transaction frequency.

Table 2: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa, 2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variable	**Credit**	**Savings**	**Transaction frequency**	**Credit**	**Savings**	**Transaction frequency**	**Credit**	**Savings**	**Transaction frequency**
Agent banking	3.658***	3.689***	2.880***						
	(1.056)	(1.009)	(0.848)						
Agent cash-in				5.820***	5.869***	4.583***			
				(1.958)	(1.904)	(1.571)			
Agent cash-out							10.12*	10.21*	7.972*
							(5.950)	(5.915)	(4.712)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.313	0.034	0.0888	0.457*	0.180	0.202	0.477	0.200	0.218
	(0.198)	(0.189)	(0.159)	(0.237)	(0.231)	(0.190)	(0.418)	(0.415)	(0.331)
N	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Covariates include employment status, age, gender, education, rural/urban, province and marital status. The data used are from the 2015 FinScope Consumer Survey for South Africa. The full set of results is presented in Annexure A2, while the results of the first stage of the 3SLS are provided in Annexure A3.

5.3 Robustness check

In this section, we repeat the econometric exercise using two recent datasets: the 2021 Global Findex survey and the 2023 FinScope consumer survey. Although the 2021 Global Findex survey dataset does not disaggregate the agent variable into cash-in/cash-out, the results presented in Table 3 are similar to those in Table 2, with a strong positive relationship between agency banking, credit and savings penetration and bank transaction frequency. We document significant effects in order of magnitude: 0.604 (se = 0.245), 0.723 (se = 0.360) and 1.16 (se = 0.44), respectively.

The results presented in Table 4, using the 2023 FinScope consumer survey, show a consistent effect in terms of the positive direction of causality, but the magnitude and degree of significance decline substantially. For instance, agency banking has a positive significant effect on credit and bank transaction frequency with a coefficient of 0.036 (se = 0.020) and 0.292 (se = 0.037), respectively, compared to 0.604 and 1.16 for credit and transaction frequency, respectively, in 2012. The corresponding magnitudes for 2015 are 3.7 for credit and 2.9 for transaction frequency. Thus, there is evidence of a decline in the effect of agent banking on financial inclusion between 2015 and 2023, a result that could indicate alternative channels of getting financial services such as open banking.[9]

The disaggregated results for agent cash-in and cash-out services exhibit similar patterns to the aggregated results but with slightly higher coefficient magnitudes. Three interesting points stand out. First, the results of the cash-in and cash-out agency are symmetrical in direction of causality, magnitude and statistical significance, averaging 0.062 (se = 0.034) for credit and 0.423 (se = 0.062) for bank transaction frequency. Second, contrary to the findings of the 2015 survey, which reported the magnitude of agency banking to be higher on credit and savings penetration than bank transaction frequency, like the results of the 2021 Global Findex, the results of the 2023 survey indicate that the magnitude of agency banking on bank transaction frequency is greater than its effect on credit penetration. Third, whereas the results of the 2015 and 2021

[9] Open banking is a banking practice that uses application programming interfaces for a third-party financial service provider to offer open access to client banking, transactions and other financial data from financial institutions (Frei 2023).

surveys showed that agency banking had a positive significant effect on savings penetration, the 2023 survey reported a consistent no statistical relationship across all categories.

These findings are consistent with the results of Allen et al. (2016), who reported a positive significant effect between agency banking and savings but found no effect between agency banking and frequency of account use (three or more times a month). The results of the first-stage regressions showing the strength of the instrumental variables are presented in Annexure A5.

Table 3: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa, 2021

	(1)	(2)	(3)
Variable	**Credit**	**Savings**	**Bank transaction frequency**
Agent banking	0.604**	0.723**	1.161***
	(0.245)	(0.360)	(0.437)
Income_q2	-0.043	-0.021	0.089
	(0.049)	(0.073)	(0.088)
Income_q3	-0.039	0.0735	0.247***
	(0.051)	(0.075)	(0.091)
Income_q4	-0.016	0.228***	0.245***
	(0.049)	(0.072)	(0.087)
Income_q5	0.019	0.307***	0.435***
	(0.045)	(0.066)	(0.080)
Female	-0.019	-0.065	-0.030
	(0.032)	(0.046)	(0.056)
Urban	-0.068	-0.213	-0.248
	(0.109)	(0.160)	(0.194)
Employed	0.063*	0.0956**	0.176***
	(0.033)	(0.047)	(0.059)
Age	0.003	0.006	0.010
	(0.006)	(0.008)	(0.010)
Age-sq	-7.41e-06	-3.92e-05	-7.25e-05
	(6.73e-05)	(9.87e-05)	(0.0001)
High school	-0.053	-0.188**	-0.174*
	(0.0506)	(0.074)	(0.090)
Constant	-0.064	0.088	-0.046
	(0.122)	(0.179)	(0.218)
Observations	576	576	576

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The data are from the 2021 Global Findex survey. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models. The full set of results is presented in Annexure A4, while the first-stage estimates are reported in Annexure A5.

Table 4: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa using the 2023 FinScope consumer survey

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**
Agent banking	0.036*	-0.001	0.292***						
	(0.020)	(0.024)	(0.037)						
Agent cash-in				0.061*	-0.004	0.424***			
				(0.033)	(0.038)	(0.059)			
Agent cash-out							0.063*	0.004	0.422***
							(0.034)	(0.039)	(0.064)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.009	0.032	0.648	-0.043	0.018	0.644	-0.010	0.032	0.644
	(0.237)	(0.274)	(0.430)	(0.237)	(0.273)	(0.428)	(0.237)	(0.274)	(0.443)
F-stat	54.79			34.200			26.570		
Hansen-Sargan overid	140.504	140.504	140.504	84.470	84.470	84.470	0.502	0.502	0.502
Observations	3 478	3 478	3 478	3 478	3 478	3 478	3 478	3 478	3 478
R-squared	0.081	0.039	-0.019	0.077	0.039	-0.013	0.076	0.039	-0.081

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Covariates include employment status, age, race, gender, education, household monthly income, number of adults in households, rural/urban, province and marital status. The full set of results is presented in Annexure A6. The data are from the 2023 FinScope survey. F-stat denotes the instrument relevance statistics, Hansen-Sargan overid statistics denotes the exclusion restrictions test. The diagnostics show that for both tests the statistics are within the acceptable range.

5.4 Extension of analysis

Following the positive results obtained in sections 5.2 and 5.3, we explicitly model the determinants of agency banking. If we can establish the drivers of agency banking, we can facilitate policy interventions that leverage agency banking to increase financial inclusion. Given ample literature on the supply-side constraints of the uptake of formal financial services through traditional banking platforms, we conduct our analysis from the demand side.

Table 5 presents the marginal effects of the Logit model using the 2021 Global Findex survey data. We note that the proximity to financial institutions' outlets, the prevalence of shared accounts, KYC restrictions and the trust deficit in financial institutions are the four major factors accounting for the demand for agency banking in South Africa. These factors exhibit robust statistical significance.

These marginal effects show significant differences across the population demographics, as shown in Annexures B2–B5. For example, the barriers associated with proximity predict the likelihood of demand for agency banking for all segments of the population except for the youth (ages 15–24), as they are more open to adopting financial innovations such as digital banking, while KYC restrictions predict the demand for agency banking in all segments of the population except for those below the median income. Similarly, while the prevalence of shared accounts predicts the demand across all demographics, the low trust in financial institutions only predicts the demand for agency banking among females and adults aged between 45 and 60. In contrast, transaction costs (bank charges) and poverty only predict agency banking among women and youth.

The latter results – bank charges and poverty among women and youth, respectively – reflect the situation in South Africa for these two groups of consumers. Like many developing countries, South Africa has high levels of youth unemployment, which has averaged 43% for the past 10 years. Similarly, women in South Africa account for a large share of the unemployed, and many are beneficiaries of social welfare support. Coupled with bank charges that average R40, it is not surprising that our results capture these factors as key predictors of agency banking.

Table 5: The marginal effects of demand for agency banking in South Africa, 2021

	Female		Urban		Below median income	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Distance	0.26**	0.10	0.18*	0.08	0.25**	0.08
Shared account	0.23*	0.09	0.21**	0.08	0.23*	0.09
KYC documents	0.33***	0.07	0.17**	0.07	0.14	0.11
Trust	0.27*	0.11	0.09	0.10	0.19*	0.11
Transaction cost	0.22*	0.10	0.09	0.09	0.12	0.10
Not a necessity	0.14	0.10	0.10	0.08	0.15	0.10
Religion	0.06	0.22	-0.04	0.21	0.08	0.22
Poverty	-0.02	0.11	-0.02	0.08	-0.09	0.11
	Age (15–24)		**Age (45–60)**			
	dy/dx	Std. Err.	dy/dx	Std. Err.		
Distance	0.20	0.14	0.41*	0.24		
Shared account	0.53**	0.12	0.21*	0.12		
KYC documents	0.322*	0.18	3.96**	1.40		
Trust	0.22	0.21	0.93*	0.55		
Transaction cost	0.06	0.07	0.27	0.23		
Not a necessity	0.06	0.13	0.14	0.10		
Religion	0.24	0.21	0.25	0.24		
Poverty	0.27*	0.14	-0.32*	0.14		

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The data are from the 2021 Global Findex database. The full logit regression models are presented in Annexure B1.

6. Conclusion

The main contribution of this paper is to test whether agency banking can deepen financial inclusion. This is a timely issue, given the limited empirical evidence of the relationship between agency banking and financial inclusion, the many possible agents in South Africa, and the growing use of agency banking globally. Insights into this relationship can inform policy interventions aimed at improving financial inclusion. We provide robust evidence that use of agents providing cash-in or cash-out services is associated with increased use of credit and savings services, as well as increased frequency of bank transactions in South Africa between 2015 and 2021. We find that the positive results are driven by cash-in services, where consumers use retail shops and supermarkets to transfer funds and deposit payments. We also document the key drivers of demand for agency banking, which are proximity to financial institutions' outlets, KYC documentation requirements, the prevalence of shared accounts, the lack of trust in financial institutions and self-exclusion from the formal financial sector.

Although these factors explain the demand for and adoption of agency banking, they can be viewed as barriers to financial inclusion, given that most individuals using agency banking are financially excluded. Therefore, policy instruments can be designed to tackle these issues to enhance financial inclusion. Finally, we have established that the profile of a typical individual who relies on agency banking to meet their financial services needs is a single (unmarried) black African woman with a high-school level of education, between the ages of 25 and 51, who earns more than R6 000 (US$300). This individual is likely to be an urban dweller in either the economic hubs of Gauteng and KwaZulu-Natal or the poorer provinces of the Eastern Cape and North West.

The policy implications of this study are twofold. First, given that we have established that there is a significant probability that the demand for agency banking indirectly induces deepening of financial inclusion, policymakers can expand the network of licensed agents beyond regular retail shops and supermarkets. Second, policymakers can alternatively address the barrier factors that contribute to the demand for and adoption of agency banking in order to absorb these individuals into the mainstream banking system. Knowing that the use of savings services increases through agency banking should incline the banking sector to incentivise these savers, whose funds can be used for financial intermediation, which is perhaps not the case under the agency banking model. This paper has provided evidence for targeted policy interventions to address specific barriers that prevent certain segments of South Africa’s population from accessing financial services.

Annexures

Annexure A

Table A1: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa using 2015 FinScope survey

	(1)	(2)	(3)
Variables	**Financial inclusion index**	**Financial inclusion index**	**Financial inclusion index**
Agent banking	3.409***		
	(0.930)		
Agent cash-in		5.424***	
		(1.756)	
Agent cash-out			9.435*
			(5.471)
Employed	0.211***	-0.035	0.602**
	(0.044)	(0.092)	(0.251)
Female	-0.013	0.016	-0.108
	(0.040)	(0.045)	(0.112)
Age	-0.003	-0.001	-0.007
	(0.002)	(0.002)	(0.005)
Adult per household	0.054**	0.046*	0.076
	(0.023)	(0.025)	(0.059)
Income	0.000**	0.000	0.000**
	(0.000)	(0.000)	(0.000)
No education	0.091	0.113	0.179
	(0.128)	(0.154)	(0.293)
Primary school	-0.023	0.047	-0.106
	(0.071)	(0.092)	(0.146)
Matric	0.021	0.021	-0.146
	(0.052)	(0.062)	(0.184)
Post-matric	0.222***	0.310***	0.045
	(0.073)	(0.087)	(0.200)
Black	-0.235**	-0.247*	-0.379

	(0.114)	(0.137)	(0.301)
Coloured	0.030	0.021	0.015
	(0.096)	(0.114)	(0.205)
White	0.267**	0.302**	0.245
	(0.118)	(0.145)	(0.245)
Single	-0.253**	-0.160	-0.495
	(0.118)	(0.130)	(0.335)
Married	-0.178	-0.212	-0.269
	(0.113)	(0.138)	(0.264)
Widow/widower	-0.206*	-0.070	-0.461
	(0.124)	(0.140)	(0.338)
MyID	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Urban	-0.004	-0.109	0.086
	(0.086)	(0.113)	(0.180)
c.MyID#c.urban	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
Constant	0.145	0.280	0.298
	(0.174)	(0.213)	(0.384)
Observations	2 779	2 779	2 779
R-squared	-7.047	-10.327	-35.350

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: 3SLS estimates of the effect of agency banking on financial inclusion (disaggregated) in South Africa using 2015 FinScope survey

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**
Agent banking	3.658***	3.689***	2.880***						
	(1.056)	(1.009)	(0.848)						
Agent cash-in				5.820***	5.869***	4.583***			
				(1.958)	(1.904)	(1.571)			
Agent cash-out							10.12*	10.21*	7.972*
							(5.950)	(5.915)	(4.712)
Employed	0.219***	0.164***	0.250***	-0.0447	-0.102	0.0423	0.638**	0.586**	0.580***
	(0.050)	(0.048)	(0.041)	(0.103)	(0.100)	(0.0827)	(0.273)	(0.272)	(0.216)
Female	0.016	-0.029	-0.026	0.0467	0.001	-0.00135	-0.086	-0.132	-0.106
	(0.045)	(0.043)	(0.036)	(0.0505)	(0.049)	(0.0405)	(0.122)	(0.121)	(0.097)
Age	-0.0016	-0.002	-0.004***	-0.000110	-0.000	-0.00311*	-0.007	-0.007	-0.008*
	(0.0019)	(0.002)	(0.001)	(0.00209)	(0.002)	(0.00168)	(0.005)	(0.005)	(0.004)
Adults per household	0.0573**	0.0635**	0.0425**	0.0479*	0.054**	0.0351	0.081	0.087	0.061
	(0.026)	(0.025)	(0.021)	(0.0282)	(0.028)	(0.0226)	(0.065)	(0.064)	(0.0511)
Income	5.84e-06	1.53e-05***	1.11e-05***	8.56e-07	1.03e-05	7.17e-06	1.46e-05	2.42e-05**	1.80e-05**
	(5.05e-06)	(4.83e-06)	(4.06e-06)	(6.57e-06)	(6.39e-06)	(5.27e-06)	(1.01e-05)	(1.00e-05)	(7.99e-06)
No education	0.100	0.115	0.058	0.123	0.138	0.0762	0.194	0.210	0.132
	(0.145)	(0.139)	(0.116)	(0.172)	(0.167)	(0.138)	(0.319)	(0.317)	(0.253)
Primary school	-0.024	-0.0301	-0.014	0.0510	0.046	0.0453	-0.113	-0.120	-0.0838
	(0.080)	(0.077)	(0.065)	(0.103)	(0.100)	(0.0827)	(0.158)	(0.158)	(0.126)
Matric	0.0204	-0.011	0.054	0.0203	-0.011	0.0542	-0.159	-0.192	-0.0873
	(0.059)	(0.057)	(0.048)	(0.0690)	(0.067)	(0.0553)	(0.200)	(0.199)	(0.158)
Post-matric	0.216***	0.239***	0.213***	0.310***	0.334***	0.287***	0.0249	0.046	0.0623
	(0.083)	(0.079)	(0.067)	(0.0967)	(0.094)	(0.0776)	(0.218)	(0.217)	(0.173)
Black	-0.317**	-0.213*	-0.176*	-0.329**	-0.225	-0.186	-0.472	-0.369	-0.298
	(0.129)	(0.124)	(0.104)	(0.153)	(0.149)	(0.123)	(0.328)	(0.326)	(0.260)

Coloured	-0.046	0.087	0.051	-0.0566	0.076	0.0423	-0.0626	0.070	0.0375
	(0.109)	(0.104)	(0.088)	(0.127)	(0.124)	(0.102)	(0.222)	(0.221)	(0.176)
White	0.194	0.340***	0.268**	0.231	0.377**	0.297**	0.170	0.315	0.248
	(0.134)	(0.128)	(0.108)	(0.162)	(0.158)	(0.130)	(0.266)	(0.265)	(0.211)
Single	-0.279**	-0.269**	-0.211**	-0.179	-0.168	-0.132	-0.539	-0.531	-0.416
	(0.134)	(0.128)	(0.107)	(0.145)	(0.141)	(0.116)	(0.365)	(0.363)	(0.289)
Married	-0.164	-0.191	-0.180*	-0.201	-0.228	-0.208*	-0.261	-0.289	-0.256
	(0.128)	(0.122)	(0.103)	(0.154)	(0.150)	(0.124)	(0.287)	(0.285)	(0.227)
Widow/widower	-0.233*	-0.218	-0.168	-0.086	-0.070	-0.0526	-0.507	-0.494	-0.384
	(0.140)	(0.134)	(0.113)	(0.156)	(0.152)	(0.125)	(0.368)	(0.366)	(0.291)
Urban	-0.038	-0.047	0.0722	-0.150	-0.160	-0.0164	0.059	0.051	0.148
	(0.097)	(0.093)	(0.078)	(0.126)	(0.123)	(0.101)	(0.196)	(0.194)	(0.155)
Constant	0.313	0.034	0.089	0.457*	0.180	0.202	0.477	0.200	0.218
	(0.198)	(0.189)	(0.159)	(0.237)	(0.231)	(0.190)	(0.418)	(0.415)	(0.331)
Observations	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Findex database.

Table A3: First-stage estimates of the 3SLS regression using 2015 FinScope survey

Panel A: Agent banking	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**	
Formal insurance	0.049	0.013	3.710	0.000	0.023	0.076
Employed	-0.014	0.013	-1.080	0.279	-0.040	0.011
Female	0.008	0.011	0.780	0.435	-0.013	0.030
Age	0.000	0.0002	0.660	0.508	-0.001	0.001
Adults in household	-0.018	0.004	-4.410	0.000	-0.027	-0.011
Monthly income	0.000	0.000	0.250	0.806	-0.000	0.000
No schooling	-0.040	0.035	-1.280	0.199	-0.112	0.023
Primary school	-0.018	0.019	-0.910	0.365	-0.056	0.021
Matric	0.027	0.0126	2.190	0.029	0.003	0.052
Post-matric	0.004	0.021	0.200	0.842	-0.037	0.045
Black	0.068	0.026	2.670	0.008	0.018	0.119
Coloured	-0.000	0.000	-0.000	0.788	-0.062	0.047
White	-0.000	0.000	-0.000	0.000	-0.000	-0.006
Single	0.061	0.030	1.990	0.047	0.001	0.122
Married	0.047	0.030	1.550	0.121	-0.012	0.107
Widow/widower	0.039	0.034	1.170	0.243	-0.027	0.107
Urban	0.013	0.024	0.550	0.583	-0.034	0.061
Constant	-0.000	0.050	-0.010	0.996	-0.099	0.098
Panel B: Agent cash-in	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**	
Formal insurance	0.031	0.010	3.100	0.002	0.0115	0.051
Employed	0.036	0.010	3.680	0.000	0.016	0.056
Female	0.000	0.008	0.020	0.985	-0.016	0.016
Age	-0.000	0.000	-0.190	0.850	-0.0007	0.001
Adults in household	-0.010	0.003	-3.180	0.001	-0.020	
Monthly income	10.000	0.000	1.100	0.270	-0.000	0.000
No schooling	-0.000	0.000	-0.000	0.000	-0.082	0.019
Primary school	-0.000	0.000	-0.000	0.000	-0.053	0.005
Matric	0.017	0.009	1.830	0.068	-0.001	0.035
Post-matric	-0.013	0.015	-0.860	0.389	-0.044	0.017
Black	0.000	0.000	0.000	0.000	0.007	0.083

Coloured	-0.000	0.000	-0.000	0.000	-0.044	0.038
White	-0.047	0.023	-2.080	0.038	-0.095	
Single	0.021	0.023	0.920	0.357	-0.024	0.067
Married	0.035	0.023	1.570	0.117	-0.009	0.081
Widow/widower	-0.000	0.026	0.000	0.998	-0.050	0.050
Urban	0.027	0.018	1.510	0.131	-0.008	0.064
Constant	-0.025	0.037	-0.660	0.511	-0.099	0.050
Panel C: Agent cash-out	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**	
Formal insurance	0.018	0.0106	1.720	0.085	-0.003	0.038
Employed	-0.046	0.010	-4.540	0.000	-0.066	-0.026
Female	0.013	0.008	1.540	0.125	-0.004	0.030
Age	0.001	0.000	1.720	0.085	-0.000	0.001
Adults in household	-0.009	0.003	-2.730	0.006	-0.016	-0.003
Monthly income	-0.000	0.000	-0.760	0.444	-0.000	0.000
No schooling	-0.025	0.026	-0.940	0.347	-0.078	0.027
Primary school	0.002	0.015	0.150	0.881	-0.027	0.032
Matric	0.027	0.009	2.830	0.005	0.008	0.046
Post-matric	0.020	0.016	1.240	0.214	-0.011	0.052
Black	0.040	0.020	0.002	0.046	0.001	0.079
Coloured	-0.001	0.021	-0.050	0.961	-0.043	0.041
White	-0.020	0.023	-0.900	0.369	-0.067	0.025
Single	0.047	0.028	1.990	0.047	0.001	0.095
Married	0.026	0.020	1.120	0.261	-0.020	0.073
Widow/widower	0.041	0.020	1.560	0.119	-0.010	0.093
Urban	-0.004	0.019	-0.250	0.804	-0.042	0.032
Constant	-0.016	0.039	-0.420	0.678	-0.093	0.060

Note: Robust standard errors are presented.

Table A4: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa (2021 Global Findex)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**
Agent banking	3.658***	3.689***	2.880***						
	(1.056)	(1.009)	(0.848)						
Agent cash-in				5.820***	5.869***	4.583***			
				(1.958)	(1.904)	(1.571)			
Agent cash-out							10.12*	10.21*	7.972*
							(5.950)	(5.915)	(4.712)
Employed	0.219***	0.164***	0.250***	-0.0447	-0.102	0.042	0.638**	0.586**	0.580***
	(0.0504)	(0.048)	(0.0405)	(0.103)	(0.100)	(0.083)	(0.273)	(0.272)	(0.216)
Female	0.0161	-0.0294	-0.0255	0.047	0.00149	-0.001	-0.0861	-0.132	-0.106
	(0.0448)	(0.0429)	(0.0360)	(0.051)	(0.0491)	(0.041)	(0.122)	(0.121)	(0.097)
Age	-0.00160	-0.002	-0.00429***	-0.000	-0.000389	-0.003*	-0.00673	-0.007	-0.008*
	(0.00186)	(0.002)	(0.00149)	(0.002)	(0.00203)	(0.002)	(0.00541)	(0.005)	(0.0042
Adults per household	0.0573**	0.064**	0.0425**	0.048*	0.0540**	0.035	0.0806	0.087	0.061
	(0.0262)	(0.025)	(0.0211)	(0.028)	(0.0275)	(0.023)	(0.0645)	(0.064)	(0.05)
Income	5.84e-06	1.53e-05***	1.11e-05***	8.56e-07	1.03e-05	7.17e-06	1.46e-05	2.42e-05**	1.80e-05**
	(5.05e-06)	(4.83e-06)	(4.06e-06)	(6.57e-06)	(6.39e-06)	(5.27e-06)	(1.01e-05)	(1.00e-05)	(7.99e-06)
No education	0.100	0.115	0.0579	0.123	0.138	0.076	0.194	0.210	0.132
	(0.145)	(0.139)	(0.116)	(0.172)	(0.167)	(0.138)	(0.319)	(0.317)	(0.253)
Primary school	-0.024	-0.030	-0.0137	0.051	0.0455	0.045	-0.113	-0.120	-0.084
	(0.080)	(0.077)	(0.0645)	(0.103)	(0.100)	(0.083)	(0.158)	(0.158)	(0.126)
Matric	0.0204	-0.011	0.0543	0.020	-0.0110	0.054	-0.159	-0.192	-0.087
	(0.059)	(0.057)	(0.0475)	(0.069)	(0.0671)	(0.055)	(0.200)	(0.199)	(0.158)
Post-matric	0.216***	0.239***	0.213***	0.310***	0.334***	0.287***	0.0249	0.046	0.062
	(0.083)	(0.079)	(0.0667)	(0.097)	(0.0940)	(0.078)	(0.218)	(0.217)	(0.173)
Black	-0.317**	-0.213*	-0.176*	-0.329**	-0.225	-0.186	-0.472	-0.369	-0.298
	(0.129)	(0.124)	(0.104)	(0.153)	(0.149)	(0.123)	(0.328)	(0.326)	(0.260)

Coloured	-0.0460	0.087	0.0507	-0.057	0.0760	0.042	-0.0626	0.070	0.038
	(0.109)	(0.104)	(0.0878)	(0.127)	(0.124)	(0.102)	(0.222)	(0.221)	(0.176)
White	0.194	0.340***	0.268**	0.231	0.377**	0.297**	0.170	0.315	0.248
	(0.134)	(0.128)	(0.108)	(0.162)	(0.158)	(0.130)	(0.266)	(0.265)	(0.211)
Single	-0.279**	-0.269**	-0.211**	-0.179	-0.168	-0.132	-0.539	-0.531	-0.416
	(0.134)	(0.128)	(0.107)	(0.145)	(0.141)	(0.116)	(0.365)	(0.363)	(0.289)
Married	-0.164	-0.191	-0.180*	-0.201	-0.228	-0.208*	-0.261	-0.289	-0.256
	(0.128)	(0.122)	(0.103)	(0.154)	(0.150)	(0.124)	(0.287)	(0.285)	(0.227)
Widow/widower	-0.233*	-0.218	-0.168	-0.086	-0.0701	-0.053	-0.507	-0.494	-0.384
	(0.140)	(0.134)	(0.113)	(0.156)	(0.152)	(0.125)	(0.368)	(0.366)	(0.291)
Urban	-0.038	-0.047	0.072	-0.150	-0.160	-0.016	0.059	0.0509	0.148
	(0.097)	(0.093)	(0.078)	(0.126)	(0.123)	(0.101)	(0.196)	(0.194)	(0.155)
Constant	0.313	0.034	0.089	0.457*	0.180	0.202	0.477	0.200	0.218
	(0.198)	(0.189)	(0.159)	(0.237)	(0.231)	(0.190)	(0.418)	(0.415)	(0.331)
Observations	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779	2 779

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: First-stage estimates of the effect of agency banking on financial inclusion in South Africa using 2021 Global Findex survey

Agent	Coef.	Std. Err.	t	P>t	[95% confidence interval]	
Public transfers and pensions to mobile accounts	0.240	0.063	3.770	0.000	0.115	0.365
Income quantile						
Second 20%	0.044	0.051	0.860	0.388	-0.056	0.145
Middle 20%	0.081	0.051	1.600	0.111	-0.018	0.181
Fourth 20%	0.033	0.052	0.640	0.520	-0.069	0.136
Richest	0.009	0.049	0.190	0.849	-0.086	0.105
Female	0.034	0.033	1.060	0.292	-0.029	0.098
Urban	0.1572	0.111	1.420	0.157	-0.061	0.377
Employment	-0.011	0.035	-0.320	0.747	-0.081	0.058
Age	0.005	0.006	0.750	0.452	-0.007	0.016
Age squared	-0.000	0.000	-0.960	0.337	-0.000	0.000
Education	0.069	0.051	1.350	0.178	-0.031	0.1703
Constant	-0.034	0.132	-0.260	0.797	-0.294	0.226

Note: Robust standard errors presented. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table A6: 3SLS estimates of the effect of agency banking on financial inclusion in South Africa using 2023 FinScope survey

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**	**Credit**	**Savings**	**Bank transaction frequency**
Agent banking	0.036*	-0.001	0.292***						
	(0.020)	(0.024)	(0.037)						
Agent cash-in				0.061*	-0.004	0.424***			
				(0.033)	(0.038)	(0.059)			
Agent cash-out							0.063*	0.004	0.422***
							(0.034)	(0.039)	(0.064)
Employment status	0.047***	0.026**	0.010	0.045***	0.026**	-0.008	0.050***	0.026**	0.027
	(0.010)	(0.012)	(0.018)	(0.010)	(0.012)	(0.019)	(0.010)	(0.012)	(0.019)
Adults in household	-0.001	0.003	0.003	-0.000	0.004	0.004	-0.001	0.003	0.003
	(0.003)	(0.004)	(0.006)	(0.003)	(0.004)	(0.006)	(0.003)	(0.004)	(0.006)
Age	0.000*	0.001*	0.002***	0.000*	0.001*	0.002***	0.000*	0.001*	0.002***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Gender	-0.019**	-0.041***	0.061***	-0.019**	-0.041***	0.063***	-0.020**	-0.041***	0.055***
	(0.008)	(0.010)	(0.015)	(0.008)	(0.010)	(0.015)	(0.008)	(0.010)	(0.016)
Married	0.000	-0.013	0.024	0.001	-0.012	0.020	-0.000	-0.013	0.020
	(0.016)	(0.019)	(0.029)	(0.016)	(0.019)	(0.029)	(0.016)	(0.019)	(0.030)
Single	-0.013	-0.027	0.042	-0.010	-0.026	0.054*	-0.015	-0.027	0.025
	(0.017)	(0.019)	(0.030)	(0.017)	(0.019)	(0.030)	(0.017)	(0.019)	(0.031)
Post-matric	0.143	0.170	-0.315	0.122	0.163	-0.310	0.143	0.169	-0.296
	(0.234)	(0.271)	(0.426)	(0.235)	(0.271)	(0.424)	(0.235)	(0.271)	(0.439)
Apprenticeship	0.062	0.096	-0.349	0.041	0.089	-0.355	0.061	0.095	-0.342
	(0.236)	(0.273)	(0.429)	(0.237)	(0.273)	(0.428)	(0.237)	(0.273)	(0.442)
Matric	0.054	0.114	-0.322	0.033	0.106	-0.317	0.055	0.113	-0.299
	(0.234)	(0.271)	(0.425)	(0.234)	(0.271)	(0.424)	(0.235)	(0.271)	(0.438)
High school	0.030	0.081	-0.410	0.012	0.074	-0.397	0.030	0.080	-0.393
	(0.234)	(0.271)	(0.425)	(0.234)	(0.271)	(0.424)	(0.235)	(0.271)	(0.438)
Primary school	0.029	0.103	-0.461	0.014	0.098	-0.451	0.029	0.102	-0.441

	(0.234)	(0.271)	(0.425)	(0.234)	(0.271)	(0.424)	(0.235)	(0.271)	(0.438)
No schooling	0.026	0.085	-0.496	0.013	0.078	-0.470	0.025	0.084	-0.490
	(0.235)	(0.272)	(0.427)	(0.235)	(0.272)	(0.426)	(0.236)	(0.272)	(0.440)
Black	0.014	-0.004	-0.048	0.015	-0.002	-0.062*	0.015	-0.004	-0.031
	(0.017)	(0.020)	(0.032)	(0.018)	(0.020)	(0.032)	(0.017)	(0.020)	(0.032)
White	0.040**	0.006	-0.058*	0.041**	0.005	-0.069**	0.041**	0.006	-0.052
	(0.018)	(0.021)	(0.033)	(0.018)	(0.021)	(0.033)	(0.018)	(0.021)	(0.034)
Coloured	0.039**	-0.000	-0.071**	0.040**	0.005	-0.077**	0.039**	-0.001	-0.062*
	(0.019)	(0.022)	(0.035)	(0.019)	(0.022)	(0.035)	(0.019)	(0.022)	(0.036)
Household monthly income	0.020***	0.014***	0.061***	0.020***	0.013***	0.060***	0.021***	0.014***	0.062***
	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)	(0.007)
c.QID#c.Province	-0.000*	-0.000	-0.000*				-0.000*	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
Urban	-0.029***	-0.007	-0.011				-0.029***	-0.007	-0.015
	(0.010)	(0.012)	(0.019)				(0.010)	(0.012)	(0.019)
c.QID#c.urban				-0.000	0.000	-0.000**			
				(0.000)	(0.000)	(0.000)			
Constant	-0.009	0.032	0.648	-0.043	0.018	0.644	-0.010	0.032	0.644
	(0.237)	(0.274)	(0.430)	(0.237)	(0.273)	(0.428)	(0.237)	(0.274)	(0.443)
F-stat	54.79			34.2			26.57		
Hansen-Sargan overid	140.504	140.504	140.504	84.470	84.470	84.470	0.502	0.502	0.502
Observations	3 478	3 478	3 478	3 478	3 478	3 478	3 478	3 478	3 478
R-squared	0.081	0.039	-0.019	0.077	0.039	-0.013	0.076	0.039	-0.081

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The data are from the 2023 FinScope survey. F-stat denotes the instrument relevance statistics, Hansen-Sargan overid statistics denotes the exclusion restrictions test. The diagnostics show that for both tests the statistics are within the acceptable range.

Annexure B

Table B1: Logit results on factors explaining female demand for agency banking in South Africa, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**
Distance	1.819**							
	(0.836)							
Shared account		1.539**						
		(0.659)						
KYC documents			2.543***					
			(0.773)					
Trust				1.828**				
				(0.885)				
Transaction cost					1.486*			
					(0.798)			
Not a necessity						0.875		
						(0.702)		
Religion							0.392	
							(1.358)	
Poverty								-0.121
								(0.685)
2.inc_q	0.254	0.279	0.443	0.457	0.064	0.0875	0.216	0.261
	(0.746)	(0.744)	(0.882)	(0.774)	(0.783)	(0.781)	(0.760)	(0.805)
3.inc_q	-1.360	-1.599	-1.845	-1.291	-1.757*	-1.475	-1.536	-1.507
	(1.114)	(1.184)	(1.181)	(1.139)	(0.998)	(1.180)	(1.126)	(1.110)
4.inc_q	1.650	1.332	0.568	1.054	0.892	0.652	0.910	0.905
	(1.123)	(1.138)	(0.817)	(1.035)	(1.077)	(1.094)	(1.126)	(1.144)
5.inc_q	-0.992	-0.530	-1.789	-0.943	-1.022	-0.712	-0.552	-0.492
	(1.684)	(1.377)	(1.581)	(1.770)	(1.568)	(1.416)	(1.303)	(1.233)
c.age#c.age	-0.000	-0.000	-1.38e-05	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employment	1.057	1.069	-0.191	0.591	0.463	0.638	0.540	0.552

	(0.721)	(0.683)	(0.767)	(0.700)	(0.689)	(0.676)	(0.672)	(0.661)
Primary school	17.94***	16.75***	15.84***	17.13***	16.55***	15.43***	15.95***	15.70***
	(2.052)	(1.723)	(1.646)	(1.747)	(1.836)	(1.540)	(1.870)	(1.520)
Matric	16.88***	15.72***	15.36***	16.19***	15.66***	14.69***	15.14***	14.92***
	(1.758)	(1.638)	(1.344)	(1.519)	(1.624)	(1.363)	(1.766)	(1.322)
Constant	-18.78***	-17.41***	-16.76***	-17.66***	-17.26***	-16.37***	-16.32***	-16.07***
	(2.327)	(2.110)	(1.810)	(1.966)	(2.167)	(1.962)	(2.107)	(1.733)
Observations	65	65	65	65	65	65	65	65

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table B2: Logit results on factors explaining urban demand for agency banking in South Africa, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**
Distance	1.508**							
	(0.744)							
Shared account		1.717**						
		(0.718)						
KYC documents			1.420**					
			(0.666)					
Trust				0.692				
				(0.770)				
Not a necessity					0.770			
					(0.637)			
Transaction cost						0.712		
						(0.676)		
Religion							-0.320	
							(1.599)	
Poverty								-0.141
								(0.612)
2.inc_q	0.763	1.046	0.992	0.867	0.744	0.797	0.793	0.793
	(0.719)	(0.762)	(0.765)	(0.750)	(0.759)	(0.730)	(0.802)	(0.776)
3.inc_q	-0.709	-0.751	-0.753	-0.649	-0.535	-0.858	-0.706	-0.729
	(1.173)	(1.454)	(1.124)	(1.142)	(1.198)	(1.090)	(1.175)	(1.134)
4.inc_q	0.574	0.738	0.104	0.259	0.160	0.175	0.170	0.202
	(1.058)	(1.031)	(0.896)	(0.987)	(0.950)	(0.959)	(1.004)	(1.009)
5.inc_q	0.193	0.395	0.216	0.315	0.320	0.314	0.358	0.337
	(1.337)	(1.142)	(1.144)	(1.140)	(1.153)	(1.125)	(1.088)	(1.047)
Primary school	16.12***	16.77***	15.54***	14.67***	14.42***	14.65***	14.39***	14.47***
	(1.555)	(1.419)	(1.116)	(0.901)	(0.867)	(0.859)	(0.746)	(0.763)
Matric	15.71***	16.25***	15.51***	14.30***	14.00***	14.32***	13.98***	14.06***
	(1.507)	(1.381)	(0.939)	(0.817)	(0.728)	(0.700)	(0.711)	(0.611)
Employed	0.715	0.843	0.0728	0.413	0.480	0.298	0.358	0.363

	(0.674)	(0.584)	(0.606)	(0.598)	(0.614)	(0.601)	(0.597)	(0.598)
Female	1.133	1.196	0.784	0.969	0.985	0.982	0.946	0.929
	(0.819)	(0.751)	(0.736)	(0.729)	(0.730)	(0.747)	(0.682)	(0.690)
Constant	-18.22***	-20.02***	-17.59***	-16.15***	-16.37***	-16.19***	-15.37***	-15.48***
	(3.321)	(3.741)	(2.497)	(2.407)	(2.299)	(2.221)	(2.172)	(1.955)
Observations	90	90	90	90	90	90	90	90

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table B3: Logit estimates of the determinants of the demand for agency banking by income in South Africa, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**
Distance	1.801***							
	(0.688)							
Shared account		1.639**						
		(0.709)						
KYC documents			0.923					
			(0.810)					
Trust				1.304*				
				(0.792)				
Not a necessity					1.010			
					(0.720)			
Transaction cost						0.775		
						(0.697)		
Religion							0.493	
							(1.409)	
Poverty								-0.602
								(0.690)
2.inc_q	0.530	0.566	0.524	0.581	0.315	0.391	0.394	0.552
	(0.649)	(0.656)	(0.624)	(0.647)	(0.652)	(0.636)	(0.640)	(0.672)
Female	1.520*	1.501*	1.249*	1.389*	1.463*	1.284*	1.262*	1.177
	(0.831)	(0.805)	(0.744)	(0.785)	(0.758)	(0.738)	(0.713)	(0.717)
Employed	0.681	0.738	0.0738	0.186	0.222	0.222	0.167	0.161
	(0.626)	(0.641)	(0.632)	(0.610)	(0.624)	(0.612)	(0.604)	(0.615)
Primary school	12.66***	12.80***	13.26***	13.29***	12.98***	14.42***	12.24***	12.15***
	(1.442)	(1.466)	(1.495)	(1.312)	(1.587)	(1.324)	(1.330)	(1.362)
Matric	12.50***	12.63***	13.37***	13.27***	13.00***	14.26***	12.07***	11.96***
	(1.447)	(1.335)	(1.309)	(1.248)	(1.480)	(1.232)	(1.276)	(1.267)
Constant	-15.93***	-15.74***	-15.95***	-15.98***	-16.13***	-16.86***	-14.53***	-14.13***
	(1.326)	(1.329)	(1.388)	(1.282)	(1.364)	(1.382)	(1.341)	(1.379)
Observations	67	67	67	67	67	67	67	67

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table B4: Logit results on factors explaining youth (15–24) demand for agency banking/perceived barriers to account ownership in South Africa, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**
Distance	1.324							
	(1.057)							
Shared account		4.448***						
		(1.232)						
KYC documents			2.204*					
			(1.309)					
Trust				1.470				
				(1.456)				
Not a necessity					0.383			
					(0.803)			
Transaction cost						0.433		
						(0.540)		
Religion							1.557	
							(1.425)	
Poverty								1.856**
								(0.841)
Income_q2	0.863	2.542*	1.510	1.349	1.226	0.486	1.176	0.298
	(1.193)	(1.490)	(1.186)	(1.057)	(1.137)	(0.615)	(1.161)	(1.268)
Income_q3	0.407	-0.909	0.900	0.478	0.566	0.181	0.290	-0.179
	(1.180)	(1.546)	(1.233)	(1.196)	(1.234)	(0.733)	(1.280)	(1.358)
Income_q4	-0.241	-0.818	-0.877	-0.267	-0.207	-0.187	-0.165	-0.157
	(1.514)	(1.376)	(1.625)	(1.577)	(1.426)	(0.868)	(1.454)	(1.847)
Income_q5	0.228	-1.613	0.225	-0.0646	0.498	-0.146	0.171	0.155
	(1.759)	(1.716)	(1.754)	(2.269)	(1.631)	(0.954)	(1.796)	(1.549)
Female	-0.323	-0.583	-0.885	-0.284	-0.303	0.868	-0.352	-0.238
	(0.956)	(1.039)	(0.897)	(0.991)	(0.918)	(0.556)	(0.924)	(1.133)
Employed	1.630*	1.976*	1.084	1.265	1.189	0.555	1.230	1.459
	(0.911)	(1.107)	(0.807)	(0.829)	(0.775)	(0.510)	(0.811)	(0.897)

Primary school	16.96***	20.815	14.30***	17.27***	15.71***	16.16***	15.04***	18.54***
	(2.319)	(2.623)	(3.135)	(2.299)	(2.391)	(0.834)	(2.249)	(1.940)
Matric	16.42***	18.66	13.90***	16.44***	14.97***	16.18***	14.28***	17.60***
	(2.037)	(2.05)	(1.798)	(1.919)	(1.732)	(0.817)	(1.717)	(1.756)
Constant	-19.22***	-4.058**	-16.27***	-19.15***	-17.68***	-18.64***	-16.77***	-20.96***
	(2.917)	(1.858)	(2.527)	(2.628)	(2.519)	(1.265)	(2.543)	(2.665)
Observations	41	40	41	41	41	126	41	41

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table B5: Logit results on factors explaining mid-age (45–60) demand for agency banking/perceived barriers to account ownership in South Africa, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**	**Agent**
Distance	1.065							
	(1.010)							
Shared account		1.744*						
		(0.968)						
KYC documents			3.229***					
			(1.172)					
Trust				1.832*				
				(1.054)				
Not a necessity					1.281			
					(0.890)			
Transaction cost						1.369		
						(0.967)		
Religion							0.802	
							(1.269)	
Poverty								-2.432*
								(1.441)
Employed	0.362	0.792	0.055	-0.227	0.317	0.258	0.243	0.336
	(0.952)	(0.799)	(1.018)	(1.296)	(0.930)	(0.952)	(0.975)	(1.020)
Primary school	15.92***	16.40***	16.53***	16.26***	14.98***	14.34***	15.80***	15.92***
	(1.566)	(1.861)	(0.838)	(1.974)	(1.296)	(1.200)	(1.202)	(1.277)
Matric	15.79***	16.16***	16.64***	15.89***	14.65***	14.22***	15.57***	15.85***
	(1.437)	(1.899)	(1.440)	(1.715)	(1.187)	(1.179)	(1.187)	(1.199)
Income_q2	-0.190		-0.692**	-0.188	-0.200	-0.244	-0.233	-0.351
	(0.316)		(0.289)	(0.417)	(0.333)	(0.353)	(0.327)	(0.369)
Income_q3		0.153						
		(1.156)						
Income_q4		0.124						
		(1.746)						
Constant	-17.60***	-18.81***	-17.25***	-18.05***	-17.07***	-15.88***	-17.09***	-15.84***
	(2.373)	(2.689)	(2.252)	(3.019)	(1.918)	(2.147)	(2.067)	(2.224)
Observations	43	38	43	43	43	43	43	43

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data: 2021 Global Findex database. The income variable ranges from quintile 1 to 5, where quintile 1 was used as the reference quantile in the regression models.

Table B6: Data description and measurement

Variables	Measurement
Dependent variables	
Savings	Binary
Credit	Binary
Bank transaction frequency	Binary
Policy variables	
Agent banking	Binary
Agent cash-in	Binary
Agent cash-out	Binary
Control variables	
Employment	Binary
Gender	Binary
Income	Quantiles 1–5
Age	Dummy
Adults per household	Dummy
Race	Dummy
Marriage	Dummy
Location	Binary
Instrumental variables	
Formal insurance	Binary
Public transfers and pensions to mobile accounts	Binary
Extension	
Distance	Binary
Shared account	Binary
KYC documents	Binary
Trust	Binary
Transaction cost	Binary
Not a necessity	Binary
Religion	Binary
Poverty	Binary

Note: Binary denotes dummies with two outcomes, 0 and 1, where 1 equals affirmative. Dummy denotes dummies with more than two outcomes, such as race, age, education and marriage. Income is measured in quantiles of 20.

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