

The impact of digital finance channels on saving and investment decisions in South Africa

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This paper examines how digital finance channels affect saving and investment decisions in South Africa with a representative sample of 21,839 individuals over 2019–23. We find that younger and more urban individuals are more likely to adopt digital financial behaviours and digital-only banks. Higher-income, more educated and white respondents tend to use traditional banks while adopting digital behaviours, whereas lower-income, less educated and black respondents are more likely to adopt digital-only banks. Digital behaviours such as mobile banking are linked to higher saving rates, larger budget allocations to savings, greater use of formal methods and higher financial resilience. By contrast, digital-only bank users do not show improved saving outcomes. These findings suggest that while digital-only banks expand access, the benefits remain concentrated among the well-served, reinforcing existing divides.

Keywords: digital finance, financial inclusion, financial deepening, financial development, limited asset market participation, savings, investment

JEL classification: D14, E22, G51, O16, O32

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1. Introduction

The lack of retail participation in saving and investment markets is a challenge in many places, but particularly in emerging market and developing economies (EMDEs). Insufficient retail savings and investment can result in limited opportunities for individuals to build wealth (Gomes and Michaelides (2005)). It can also weaken their ability to handle financial shocks (World Bank (2014)) and exacerbate wealth inequality (IMF (2021)). Beyond individual and household level outcomes, lower retail savings and investment translate into a narrower domestic investor base (BIS (2019)), greater reliance on foreign investors (BIS (2011)) and potential threats to financial stability (Federal Reserve (2024)). In this paper, we explore investment and savings behaviour of individuals in South Africa and examine if digital finance technologies can play a role in furthering participation.

South Africa is a highly relevant jurisdiction to study the investment and savings behaviour of individuals and the impact of digital finance. With an estimated gross domestic product (GDP) of USD 410 billion in 2025, it is the smallest economy in the G20, but the largest in Africa (IMF (2025)). The South African financial sector is one of the most developed in Africa, contributing 23.5% to the GDP in 2021, with total banking sector assets worth R6.8 trillion (USD 374.8 billion) as of March 2022 (National Treasury (2023)). Reflecting the size of its economy and the importance of its financial sector, the Johannesburg Stock Exchange (JSE) ranks among the world's top 20 largest exchanges.

Despite these strengths, South Africans face persistent financial challenges. While 97% of the population used a formal financial product or service in 2021 (National Treasury (2023)), savings rates remain low, and many individuals liquidate their earnings into cash shortly after receiving them (FinScope (2023)).² Only 26% of households are considered financially stable or financially well, defined as possessing sufficient resources to make a stable living or to achieve financial success in the short and long run (Momentum/Unisa (2023)). The country also struggles with high unemployment (32.8% in 2025) and severe income and wealth inequality (IMF (2025); World Bank (2025)). South Africa's established financial infrastructure and widespread access to mobile phones and the internet offer significant potential for digital and financial technologies to bridge some of the existing gaps. The primary objective of this paper is to explore the extent to which this potential has been fulfilled.

Financial technology (fintech) can offer several ways to overcome common barriers that individuals and households may face. In South Africa, many people avoid saving or investing because of the complexity of financial products, high costs or the lack of knowledge about where or how to start (Jacobs et al (2023)). In this context, fintech has transformed how people access banking, saving and investing, particularly in contexts where traditional financial systems exclude low-income and rural populations. Fintech can reduce costs and simplify financial processes, making saving and investing more accessible. Digital banks, for example, can provide financial services in remote areas, saving users time and transportation costs (World Bank (2015)). Features such as auto-saving tools and goal-based nudges can encourage individuals to save more (Gargano and Rossi (2024)). Even basic functionalities, such as securely storing money in a digital account and monitoring balances, can help to build trust in financial products, which in turn promotes saving (Dupas and Robinson (2012); Bachas et al (2019)).

² In our sample only roughly 34% of individuals are actively saving in any given survey year.

Fintech can offer tangible benefits in the investment space as well. In principle, tools like robo-advisors can help individuals make better financial decisions by reducing bias and offering low-cost, diversified solutions (D'Acunto et al (2019); Chak et al (2022)). Zero-commission trading platforms, offered by some fintech companies in many economies, can lower the barriers to investing and have been associated with greater diversification and higher net returns (Eventov et al (2020)). However, much of the existing research relies only on small samples from specific platforms, making it challenging to generalise the findings to other contexts. Moreover, most of the existing research focuses on isolated financial decisions rather than their overall impact on financial well-being of individuals. This study seeks to address these gaps by analysing how digital finance adoption influences household saving and investment behaviour across a representative sample in a key G20 and African economy.

For our analysis, we make use of the four latest waves of the FinMark Trust's FinScope survey, covering 21,839 South African individuals during the period 2019–23. The FinScope survey lends itself well to a study on digital adoption and savings and investment behaviour for several reasons. First, the sampling ensures that the data are representative of the South African population. This enables us to study the effect of digital finance channels at the population level. Second, the data include a variety of variables on digital adoption and savings. This allows us to track different types of digital behaviour (eg online banking, digital payments) and banking choices (digital-only banks and traditional banks) to explore which ones may be more effective. Additionally, the survey captures different types of savings decisions, from the decision on whether to save or not, to how much of the monthly budget is allocated to savings, to the quality of the savings (ie whether the individual saves with formal methods, diversifies and has long term objectives when it comes to savings). Another reason why the Finscope data are useful to answer our research questions is that they contain extensive information on demographic and socio-economic variables, including race, gender, income and geographic location. This not only allows us to control for these factors and isolate the effect of digital adoption but also allows us to conduct heterogeneity analysis across different groups.

We conduct our empirical analysis in two steps. First, we examine the determinants of adoption of digital behaviour and digital banking. Second, we examine how digital adoption shapes saving outcomes. The results reveal a clear divide between those who adopt digital financial behaviours (online banking and payments) and those who use digital-only banks. People engaging in digital behaviours are more educated, richer and predominantly white. Conversely, users of digital-only banks typically have lower incomes, are less educated and are predominantly black. Both groups, however, are younger on average, more likely to be male and more likely to live in urban areas.

We then examine how these two different adoption measures (digital behaviours and using digital-only banks) correlate with a variety of saving outcomes. We find that having an account with a digital-only bank does not significantly affect saving behaviour. However, engaging in digital behaviours is associated with better saving outcomes. While holding demographic and socioeconomic factors constant, individuals who engage in digital behaviours are 15.2% more likely to save some money each month. They also allocate a larger portion of their budgets to savings 12.8% allocate a larger proportion of their savings to formal methods (3.3%) and engage in a greater variety of saving methods. They are 5.8% more likely to maintain rainy-day funds and 10% more likely to engage in budgeting practices.

Our results show that while digital-only banks seem to be successful in attracting underserved minorities, their influence on saving or investing behaviours remains limited. On the other hand,

the benefits of digital behaviour are largest among individuals who are already well-served by the financial sector. This may imply that to achieve greater benefits from digital finance channels, products need to be better diffused to households and individuals who are not yet well served by traditional banks and financial intermediaries. Further research would be needed to assess which types of product design, and which policy interventions, can help to achieve this result.

The rest of the paper is structured as follows. Section 2 describes the data and empirical approach. Section 3 presents results on the determinants of adopting digital behaviours and digital banks. Section 4 analyses how adoption relates to saving and investment outcomes. Section 5 concludes.

2. Data and empirical approach

We use data from the FinScope South Africa National Survey conducted by FinMark Trust. FinMark Trust is a non-profit organisation focused on promoting financial inclusion in Africa. The survey has been conducted annually over 2011–24 (with a gap during the Covid-19 pandemic) and is designed to be demographically representative of the South African population. It has been widely used by local authorities such as the South African Reserve Bank (SARB) and the Financial Sector Conduct Authority (FSCA).

Data collection is carried out through face-to-face or telephone interviews. The survey captures a wide range of information, including demographic characteristics and financial behaviours such as bank selection, saving methods and goal, budget allocation and investment behaviour. It also distinguishes between formal and informal financial practices, as well as between face-to-face and digital channels.

As the survey is originally designed to provide annual snapshots rather than track individuals over time, there are limited overlapping years with comparable questionnaires. We therefore focus on the 2019, 2021, 2022 and 2023 waves, which include the questions on digital channels that are relevant to our analysis. Our final sample consists of 21,839 individual-year observations.

We also include several individual-level controls. *Age* is grouped into four categories: under 18, 18–34, 35–54 and over 55. Gender is measured by an indicator (*Male*) equal to one if the respondent is a man and zero if the respondent is a woman. *Education* is coded on a scale from 0 to 6, where 0 indicates no schooling and 6 indicates a university degree. *Urban* is an indicator equal to one if the respondent lives in a metropolitan area and zero otherwise. *Race* is classified into four categories: black, coloured (ie mixed-race), Asian or white.

Digital finance channels

While the survey does not directly measure the level of engagement with digital financial channels, it asks about the channels used for different financial activities. We infer digital channel use from these responses.

First, we measure digital financial behaviours. The primary indicator to capture this is *mobile banking*, which captures whether respondents report using their mobile phone or tablet for mobile banking or other financial activities. A second measure comes from a question that captures the channels through which individuals send or receive money from outside their household. We classify a respondent as using digital channels if they report the channel to be internet or mobile

banking, mobile money, Hello Pesa, MoMo or a virtual transaction account (eg WhatsApp, Telkom Pay, Nedbank). Respondents can select multiple channels; we code digital use as one if any digital method is reported.

This approach has two limitations. First, we cannot observe the frequency or intensity of use, so we cannot determine whether digital channels are the primary method. Second, the question on the channel is only asked to the 28.4% of respondents who sent or received money from outside their household. To address this, we create three separate indicators: mobile banking use, sending money digitally and receiving money digitally. We use mobile banking as the main measure of digital behaviour given its broader coverage, and report results for the other two indicators in the appendix.

In addition to digital behaviour, we measure digital banking choice. While most traditional banks offer online and mobile services, they may still exclude underserved populations due to higher fees or products tailored to wealthier clients (Marco, Suher and Xu (2022)). Digital-only banks may overcome these barriers by offering low-cost products that expand access to clients previously excluded from formal services. Based on survey responses, we construct an indicator for holding an account with a digital-only bank (Bank Zero, TymeBank or Discovery Bank). We further classify respondents into three groups, with: (i) accounts only at digital-only banks, (ii) accounts at both digital-only and traditional banks and (iii) accounts only at traditional banks.

Saving outcomes

To measure saving outcomes, we examine three categories: saving activity, quality of savings and financial resilience.

Saving activity includes (i) saving incidence, measured by a dummy variable (*saves*) equal to one if an individual has used at least one saving method, and (ii) saving quantity, measured by the share of income allocated to savings. The latter is derived from a Fintrust survey question in which respondents allocate 21 matchsticks across spending categories (eg food, electricity, transportation, savings, debt) to represent their monthly budget. We calculate the share allocated to savings by dividing the number of matchsticks assigned to savings by 21.

The second category of variables on savings quality captures: (i) diversification, measured by the number of distinct saving methods an individual uses; (ii) use of formal methods, measured as the percentage of saving methods that are formal relative to the total number of methods (formal and informal) and (iii) long-term orientation, measured by the variable *proportion long term*, which is the percentage of saving goals aimed at long-term objectives such as education, retirement, debt repayment and insurance.

Financial resilience is measured by two indicators. The first, *has rainy day fund*, equals one if the individual reports having set aside emergency funds sufficient to cover three months of expenses in case of sickness, job loss, economic downturn or other emergencies. The second, *has budget*, equals one if the individual reports using a personal budget, defined as a plan detailing how income will be allocated across expenses.

Summary statistics

Table 1, panel A provides summary statistics for our key variables in the full sample. The average respondent is 39 years old, has an intermediate level of education, earns a monthly income of

6,622 Rand (~USD 380) and reports a household income of 10,128 Rand (~USD 590). We have a slight majority of female respondents in the sample (57%), and a slight minority lives in an urban (metro) area (47%).

Summary statistics for full sample and mobile banking users

Table 1

Variable	A. Full sample			B. Uses mobile banking		
	Obs	Mean	Variable	Obs	Mean	Variable
Age (years)	21,836	39.17	14.59	2,669	37.69	12.25
Male	21,836	0.43	0.50	2,669	0.45	0.50
Education (0 = no schooling 6 = university degree)	21,736	2.85	1.34	2,654	4.00	1.40
Personal income adj. (rand)	13,682	6,622	13,343	1,424	17,227	23,728
Household income adj. (rand)	20,689	10,128	11,631	2,445	21,592	15,468
Urban (metro)	21,837	0.47	0.50	2,669	0.59	0.49
Black	21,841	0.47	0.50	2,669	0.30	0.46
Coloured	21,841	0.11	0.31	2,669	0.07	0.26
Asian	21,841	0.04	0.19	2,669	0.06	0.23
White	21,841	0.13	0.33	2,669	0.29	0.45

Sources: FinMark Trust

Individuals that exhibit digital behaviours (ie use mobile banking) make up about 12.2% of our sample (Table 1, panel B). Individuals that hold digital-only bank accounts make up only about 1.4% of the overall sample (Table 2, panel A). As such, the majority of people in South Africa still rely on traditional banks and non-digital methods to conduct banking.

The two groups – those with digital behaviours and those with digital-only bank accounts – have some characteristics in common. For instance, both are younger (37.7 years for the average mobile banking user and 36.2 years for the average respondent that has an account with a digital-only bank, compared to a sample average of 39.2 years). Both are more likely to live in urban areas (59% for mobile banking users and 53% for only fintech compared to a sample average of 47%).

But there are also striking differences. Mobile banking users have much higher education levels than the average (4 versus 2.85 sample average) while individuals that rely on digital-only banks have lower education levels than the sample average (2.71 versus 2.85). Moreover, mobile banking users have higher than average household incomes (21,592 Rand versus a sample average of 10,128 Rand), the digital-only bank group, on average, has much lower incomes (5,781 Rand). There are also important differences in terms of race. 29% of mobile banking users are white (compared to 13% white respondents in the full sample). On the other hand, just 11% of digital-only users are white.

Summary statistics for digital-only bank and unbanked users

Table 2

Variable	A. Digital-only			B. Unbanked		
	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Age (years)	297	36.24	12.54	4,285	33.28	12.19
Male	297	0.45	0.50	4,285	0.53	0.50
Education (0 = no schooling 6 = university degree)	296	2.71	1.10	4,285	2.31	0.97
Personal income adj. (rand)	166	2,851	5,535	4,285	2,101	3,200
Household income adj. (rand)	281	5,781	7,534	4,285	5,510	7,361
Urban (metro)	297	0.53	0.50	4,285	0.53	0.50
Black	297	0.35	0.48	4,285	0.55	0.50
Coloured	297	0.03	0.16	4,285	0.09	0.29
Asian	297	0.04	0.20	4,285	0.03	0.18
White	297	0.11	0.31	4,285	0.06	0.23

Sources: FinMark Trust

The socio-economic outcomes of digital-only bank respondents are similar to that of the unbanked population in the sample, who have lower than average income and education levels (Table 2, panel B). On the other hand, respondents that have both traditional bank accounts and digital-only bank accounts have incomes and education levels that are higher than the sample average. In effect, digital-only banks capture the population that would otherwise not be able to afford a traditional bank account.

From Table 3, panel A, we see that only 38% of the sample over 2019–23 saves. More than half of the reported saving methods are informal (52%), highlighting the dominance of informal sector and cash use. Moreover, saving goals are heavily tilted towards the short-term, with 66% of the sample saving only for short term goals. Only 31% of the sample reports having a rainy day fund. In contrast, many more people have a budget (59%).

In the group of respondents that use mobile banking (Table 3, panel B), more people save (61%). A majority of this group relies on formal saving methods (58%) and also has more savings methods than the sample average. On the other hand, the group of respondents that only use digital-only banks do not have better saving outcomes compared to the sample average (Table 4, panel A). The proportion of respondents in this group that save in formal channels is particularly low (25%).

Savings behaviour of full sample and mobile banking users

Table 3

<u>A. Full sample</u>				<u>B. Uses mobile banking</u>		
Variable	Obs	Mean	Std. dev.	Variable	Obs	Mean
Saves (yes =1, no=0)	21,839	0.38	0.49	Obs	Mean	Std. dev.
Number of saving methods	21,839	0.82	1.87	2,619	0.61	0.49
Proportion formal (%)	8,397	0.48	0.45	2,619	1.29	1.56
Proportion saving for long-term goals (%)	11,035	0.31	0.43	1,597	0.58	0.43
Number of saving methods with advice	21,839	0.11	0.46	1,570	0.40	0.45
Has rainy day funds (yes =1, no=0)	21,835	0.31	0.46	2,619	0.37	0.80
Has budget (yes =1, no=0)	21,835	0.59	0.49	2,619	0.53	0.50

Sources: FinMark Trust

Savings behaviour of full sample and mobile banking users

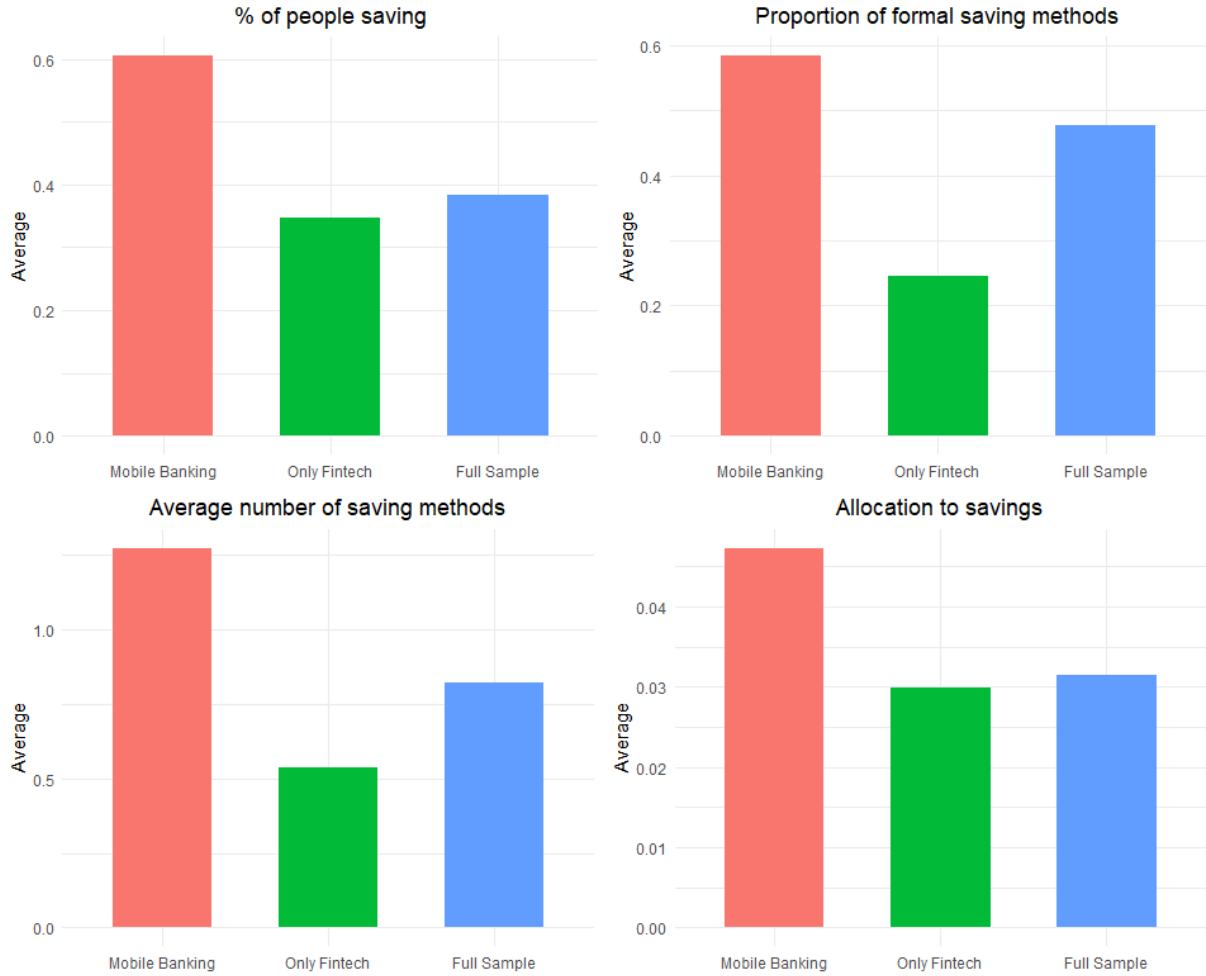
Table 4

<u>Only fintech</u>				<u>Unbanked</u>		
Variable	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Saves (yes =1, no=0)	297	0.35	0.48	4,287	0.23	0.42
Number of saving methods	297	0.54	1.22	4,287	0.41	1.35
Proportion formal (%)	103	0.25	0.41	997	0.31	0.45
Proportion saving for long-term goals (%)	158	0.31	0.44	1,520	0.28	0.42
Number of saving methods with advice	30	0.27	0.57	4,287	0.01	0.16
Has rainy day funds (yes =1, no=0)	297	0.30	0.46	4,285	0.19	0.39
Has budget (yes =1, no=0)	297	0.67	0.47	4,285	0.46	0.50

Sources: FinMark Trust

Figure 1 illustrates a few of these relationships graphically. Across the range of savings outcomes, it is clear that respondents using mobile banking (digital financial behaviours) have higher values of these outcome variables than those using digital-only banks, and indeed than the values in the full sample.

Figure 1: summary statistics for saving outcomes



Source: authors' calculations.

3. Adoption of digital finance behaviour and fintech only banks

We now turn to a regression approach to understand first the drivers of mobile banking and digital-only bank use. After this, we will look in the next section into the impact on saving and investment behaviour.

To understand the demographic factors associated with the adoption of mobile banking and use of fintech banks (only), we run the following econometric specifications:

$$Mobile\ Banking_i = probit(d_0 + d_\gamma \cdot X_i + \eta_t + \epsilon_i) \text{ and,}$$

$$Digital\ Only\ Bank_i = probit(d_0 + d_\gamma \cdot X_i + \eta_t + \epsilon_i)$$

Our main dependent variables are: i) whether or not the respondent (i) uses mobile banking ($Mobile\ Banking_i$), and ii) whether the respondent subscribes only to a digital-only bank ($Digital\ Only\ Bank_i$). Both of these are binary variables. The independent variables include a number of specific demographic characteristics and controls (X_i). We assume that the error term

(ϵ_i) is normally distributed. We include province (d_0) and year fixed effects (η_t), and use robust standard errors.

Table 5 reports the results of these probit regressions, in terms of the marginal effects of the dependent variables. In line with the summary statistics, we can clearly see that mobile banking rises with income and education, for lower age groups (18 – 34 and 35 – 54) and for those in urban areas (column 1). Digital-only bank use falls with income and is only slightly higher in urban areas (column 2).

Drivers of mobile banking and digital-only bank usage in the full sample		
Results in terms of average marginal effect		Table 5
	<u>Mobile banking</u>	<u>Digital-only bank</u>
	(1)	(2)
Log household income (adj)	0.062***	-0.002***
	(17.92)	(-2.70)
Age group 18 - 34	0.072***	-0.000
	(3.78)	(-0.01)
Age group 35 - 54	0.051***	0.000
	(2.72)	(0.03)
Age group > 55	0.016	-0.006
	(0.79)	(-1.19)
Male	-0.002	0.001
	(-0.38)	(0.37)
Education	0.035***	-0.001
	(14.65)	(-1.36)
Urban	0.022***	0.004*
	(2.82)	(1.79)
Coloured	0.021**	-0.005**
	(2.10)	(-2.49)
Asian	0.021*	0.006
	(1.65)	(1.14)
White	0.072***	0.003
	(7.73)	(1.06)
Province FE	Yes	Yes
Year FE	Yes	Yes
Pseudo R-Squared	0.198	0.088
N	11623	14642

Source: authors' calculations.

These results thus suggest three stylised facts. First, living in an urban area is a predictor of both digital behaviour (using mobile banking) and digital bank choice (being subscribed to a digital-only bank). This may be because urban areas offer better digital infrastructure. Second, digital behaviour is correlated with higher incomes and higher education levels. Third,

respondents subscribing only to fintech banks belong to more vulnerable groups, having lower incomes. All three stylised facts suggest that important digital divides exist in the population.

4. Digital finance channels and saving and investment outcomes

We now move on to regressions for saving and investment outcomes. In these estimations, the main dependent variable is either a dummy regarding whether an individual saves, or a continuous variable denoting the proportion that each respondent allocates to savings. We use the same set of control variables, province and year fixed effects. But our specification is now as follows:

$$Saving_i = probit(d_0 + d_\gamma \cdot X_i + \eta_t + \epsilon_i) \text{ and,}$$

$$Saving\ allocation_i = d_0 + d_\gamma \cdot X_i + \eta_t + \epsilon_i$$

where X_i is again a vector of relevant independent variables and controls. The error term is again assumed to be normally distributed.

For the decision whether or not to save results are reported in table 6. Clearly, respondents with digital financial behaviours (mobile banking) are more likely to save actively (column 2). We do not find a statistically significant relationship for those who use only a digital-only bank (column 3).

For saving allocation, the resulting OLS estimators are reported in table 7. Similar to the previous result, here too we find that even after controlling for socio-economic factors, the use of mobile banking is associated with a higher allocation of funds to savings. Respondents that use mobile banking allocate 12.8% more funds to savings than respondents that do not use mobile banking (column 2). However, we find no such relationship for respondents that are subscribed only to digital-only banks (column 3).

Regressions on saving activity

Results in terms of average marginal effect

Table 6

Probit	Saves		
	(1)	(2)	(3)
Mobile banking		0.143*** (10.49)	
Digital-only			-0.007 (-0.18)
Log household income (adj)	0.069*** (16.85)	0.057*** (12.04)	0.069*** (16.85)
Age group 18 - 34	0.031 (1.16)	0.041 (1.42)	0.031 (1.16)
Age group 35 - 54	0.073*** (2.74)	0.092*** (3.18)	0.073*** (2.74)
Age group > 55	0.044 (1.58)	0.070** (2.25)	0.044 (1.58)
Male	-0.025*** (-3.18)	-0.019** (-2.16)	-0.025*** (-3.18)
Education	0.051*** (14.46)	0.045*** (11.34)	0.051*** (14.46)
Urban	-0.027*** (-2.59)	-0.046*** (-3.85)	-0.027*** (-2.59)
Coloured	-0.023* (-1.86)	-0.021 (-1.50)	-0.023* (-1.87)
Asian	-0.097*** (-5.36)	-0.112*** (-5.59)	-0.097*** (-5.36)
White	-0.060*** (-5.06)	-0.088*** (-6.84)	-0.060*** (-5.06)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Pseudo R-Squared	0.052	0.058	0.052
N	14642	11623	14642

Source: authors' calculations.

Regressions on allocation to savings

Table 7

OLS	Allocation savings		
	(1)	(2)	(3)
Mobile banking		0.128*** (3.88)	
Only fintech			0.055 (0.65)
Log household income (adj)	0.139*** (15.27)	0.126*** (11.66)	0.139*** (15.27)
Age group 18 - 34	0.150** (2.54)	0.164** (2.58)	0.150** (2.54)
Age group 35 - 54	0.145** (2.50)	0.169*** (2.70)	0.145** (2.50)
Age group > 55	0.147** (2.43)	0.196*** (2.90)	0.148** (2.43)
Male	0.117*** (6.39)	0.126*** (5.91)	0.117*** (6.39)
Education	0.085*** (10.04)	0.080*** (8.15)	0.085*** (10.05)
Urban	0.014 (0.62)	0.010 (0.37)	0.014 (0.61)
Coloured	-0.076*** (-2.76)	-0.063* (-1.92)	-0.076*** (-2.75)
Asian	-0.142*** (-3.65)	-0.175*** (-4.16)	-0.142*** (-3.66)
White	-0.045 (-1.63)	-0.075** (-2.50)	-0.045 (-1.63)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R-squared	0.063	0.066	0.063
N	14641	11622	14641

Source: authors' calculations.

Saving quality

In addition to the decision to save and savings allocation, we also explore the relationship digital channels and the quality of savings. To measure the quality of savings, we focus on two dependent variables: i) the number of saving methods that the respondent uses and ii) proportion of the respondent's savings allocated to formal methods. The first measure captures the respondents' ability to diversify and benefit from absorbing unexpected shocks (Calvet, Campbell and Sodini (2007); Goetzmann and Kumar (2008); DeMiguel, Garlappi and Uppal (2009)). We use the following econometric specification:

$$\text{Number of Saving Methods}_i = d_0 + d_\gamma \cdot \text{Mobile Banking}_i + d \cdot \text{Controls}_i + \eta_t + \epsilon_i,$$

$$Proportion\ Formal_i = d_0 + d_\gamma \cdot Digital\ Only\ Bank_i + d \cdot Controls_i + \eta_t + \epsilon_i$$

The independent variables are the same as in previous regressions, and we assume that the errors are normally distributed. The least-square estimators of the two regressions (with two different measures of saving quality) are provided in tables 8 and 9.

Regressions on number of saving methods			Table 8
OLS	Number of saving methods		
	(1)	(2)	(3)
Mobile banking		0.344***	
		(7.07)	
Only fintech			-0.307***
			(-3.38)
Log household income (adj)	0.087***	0.035	0.086***
	(4.81)	(1.56)	(4.76)
Age group 18 - 34	0.134	0.180*	0.134
	(1.63)	(1.93)	(1.63)
Age group 35 - 54	0.303***	0.398***	0.303***
	(3.61)	(4.17)	(3.62)
Age group > 55	0.227**	0.367***	0.225**
	(2.47)	(3.22)	(2.45)
Male	0.051	0.079*	0.051
	(1.51)	(1.94)	(1.51)
Education	0.167***	0.145***	0.167***
	(11.14)	(8.21)	(11.12)
Urban	-0.427***	-0.584***	-0.425***
	(-8.56)	(-9.29)	(-8.54)
Coloured	0.227***	0.333***	0.226***
	(3.26)	(3.81)	(3.24)
Asian	-0.398***	-0.441***	-0.397***
	(-7.39)	(-7.04)	(-7.36)
White	-0.195***	-0.262***	-0.194***
	(-4.39)	(-5.27)	(-4.37)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R-squared	0.041	0.046	0.041
N	14642	11623	14642

Sources: authors' calculations

We find that respondents that use mobile banking use a greater number of saving methods and have a higher proportion of their savings allocated to formal channels. Moreover, respondents with higher incomes have a higher proportion of savings in formal channels. We do not find such an association between income and the number of saving methods.

On the other hand, respondents that only subscribe to digital-only banks have fewer savings methods and a lower proportion of their savings in formal channels. While digital-only banks capture the segment of the population that would otherwise be unbanked, having access to a digital-only bank account does not automatically translate into better saving outcomes. This underscores the fact that financial inclusion goes much beyond access to bank accounts.

Regressions on proportion saving formally			Table 9
OLS	Proportion formal		
	(1)	(2)	(3)
Mobile banking		0.033*** (2.62)	
Only fintech			-0.061 (-1.51)
Log household income (adj)	0.016*** (3.39)	0.016*** (3.03)	0.016*** (3.36)
Age group 18 - 34	0.018 (0.49)	-0.015 (-0.37)	0.019 (0.51)
Age group 35 - 54	0.047 (1.28)	0.019 (0.48)	0.048 (1.31)
Age group > 55	0.085** (2.21)	0.060 (1.45)	0.085** (2.23)
Male	0.033*** (3.41)	0.033*** (3.28)	0.033*** (3.41)
Education	0.033*** (8.60)	0.031*** (7.54)	0.033*** (8.59)
Urban	-0.042*** (-3.42)	-0.056*** (-4.34)	-0.042*** (-3.41)
Coloured	0.064*** (4.07)	0.084*** (5.05)	0.063*** (4.05)
Asian	-0.009 (-0.36)	-0.001 (-0.02)	-0.008 (-0.35)
White	0.102*** (7.24)	0.101*** (6.88)	0.102*** (7.24)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R-squared	0.369	0.381	0.369
N	5937	5131	5937

Source: authors' calculations.

Financial resilience

In the final part of the analysis, we explore the relationship between digital channels and financial resilience. We measure financial resilience through two measures: i) whether respondents have access to a rainy-day fund and ii) whether they have a budget. The first measure captures respondents' ability to absorb unexpected shocks, and the second measure captures the respondent's ability to engage in financial planning. We specify the following regressions:

$$Has\ Rainy\ Day\ Fund_i = probit(d_0 + d_\gamma \cdot Mobile\ Banking_i + d \cdot Controls_i + \eta_t + \epsilon_i)$$

$$Has\ Budget_i = probit(d_0 + d_\gamma \cdot Digital\ Only\ Bank_i + d \cdot Controls_i + \eta_t + \epsilon_i)$$

Our dependent variables are indicators for whether the respondent has a rainy-day fund and a budget. We use the same control variables as in the previous regressions and assume that the errors are normally distributed. Tables 10 and 11 report the marginal effects of the resulting probit regressions.

Our results show that respondents that use mobile banking have a 5.4% higher probability of having a rainy-day fund and a 10% higher probability of having a budget, given all control variables. We find no such association for respondents that subscribe to digital-only banks.

Regressions on rainy day fund availability

Results in terms of average marginal effect

Table 10

	Has rainy day fund		
	(1)	(2)	(3)
Mobile banking		0.054*** (4.37)	
Only fintech			0.030 (0.81)
Log household income (adj)	0.064*** (17.19)	0.060*** (13.76)	0.064*** (17.21)
Age group 18 - 34	0.048** (2.06)	0.052** (2.01)	0.048** (2.07)
Age group 35 - 54	0.093*** (4.03)	0.106*** (4.05)	0.093*** (4.03)
Age group > 55	0.129*** (5.30)	0.154*** (5.45)	0.130*** (5.31)
Male	0.017** (2.37)	0.014* (1.72)	0.017** (2.36)
Education	0.048*** (15.52)	0.046*** (12.80)	0.049*** (15.53)
Urban	-0.013 (-1.38)	-0.017 (-1.49)	-0.013 (-1.39)
Coloured	-0.031*** (-2.77)	-0.039*** (-3.00)	-0.031*** (-2.75)
Asian	-0.001 (-0.04)	-0.005 (-0.28)	-0.001 (-0.04)
White	0.057*** (5.01)	0.052*** (4.15)	0.057*** (5.00)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Pseudo R-Squared	0.085	0.081	0.085
N	14642	11623	14642

Source: authors' calculations.

Regressions on budget planning

Results in terms of average marginal effect

Table 11

	Has budget		
	(1)	(2)	(3)
Mobile banking		0.100*** (7.34)	
Only fintech			0.027 (0.67)
Log household income (adj)	0.057*** (14.50)	0.044*** (9.71)	0.057*** (14.51)
Age group 18 - 34	0.138*** (5.37)	0.132*** (4.70)	0.138*** (5.37)
Age group 35 - 54	0.189*** (7.39)	0.192*** (6.86)	0.189*** (7.40)
Age group > 55	0.185*** (6.94)	0.202*** (6.75)	0.185*** (6.95)
Male	-0.007 (-0.90)	-0.013 (-1.50)	-0.007 (-0.91)
Education	0.037*** (10.65)	0.034*** (8.57)	0.037*** (10.66)
Urban	0.017* (1.69)	0.017 (1.47)	0.017* (1.69)
Coloured	0.009 (0.76)	0.008 (0.62)	0.009 (0.77)
Asian	-0.018 (-0.93)	-0.029 (-1.39)	-0.018 (-0.95)
White	0.045*** (3.59)	0.032** (2.45)	0.044*** (3.58)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Pseudo R-Squared	0.121	0.113	0.121
N	14642	11623	14642

Source: authors' calculations.

Stylised facts based on empirical analysis

Our extensive empirical analysis leads to several stylised facts:

1. Mobile banking users and respondents that subscribe to digital-only banks are more likely to be situated in urban areas.
2. Mobile banking users have higher incomes and education levels.
3. Respondents that subscribe to digital-only banks only belong to more vulnerable groups with lower incomes.

4. Mobile banking users are more likely to save, have a higher allocation of their income to savings, save through several methods and allocate a larger proportion of their savings to formal channels.
5. Respondents that only subscribe to fintech banks have fewer savings methods and a lower proportion of their savings in formal channels.

These results are notably preliminary. Further work will be needed to assess the causal impact of digital finance channels on saving and investment outcomes. This work is ongoing.

5. Conclusion

Using rich, individual-level data for several thousand individuals over several years, we document the adoption of digital finance channels in South Africa, an important G20 economy and the largest economy in Africa. We also relate this adoption to savings outcomes.

We document several stylised facts that point to persistent digital divides in the country. First, use of mobile banking is prevalent among groups that have higher incomes, live in urban areas, have higher education levels and are white. Second, users of digital-only banks are notably lower-income, and more likely to be black. Third, there are discernible relationships between mobile banking and saving outcomes, but not digital-only banks and these same outcomes. Overall, this means that even though digital financial behaviour, like using mobile banking, is positively associated with desirable savings outcomes, the gains are limited to the part of the population that may already be well-served by financial services.

In ongoing work, we are exploring ways to lend a causal interpretation to our results to further understand whether digital finance improves economic outcomes or exacerbates existing inequalities. This remains an area of ongoing research.

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