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DETERMINANTS OF SAVINGS IN URBAN AND RURAL HOUSEHOLDS: CASE OF SOUTH AFRICA

Savings have been described as a significant financial and economic matter and represent an essential driving force of economic growth and development. Despite this, many studies investigating the determinants of savings in South Africa have looked predominantly at the drivers of savings only at a national level, without focusing on urban and rural differences. This is critical as these localities are structurally different, with different characteristics. It is, therefore, likely that the determinants of savings in these unique geographical localities would differ, given the negative impact of past policies of marginalisation. The purpose of this paper is to examine the urban-rural disparities in savings for South African households. We used data sourced from the five waves of the National Income Dynamics Study (NIDS) observed from 2008-2017. The novelty of this study is in its application of a novel two-stage least square estimation technique which addresses possible endogeneity problems which might have plagued previous studies in this field. It was concluded from the research that the determinants of savings are different across samples (urban and rural). We found that having access to land is an important predictor of savings in rural areas where the poor live (positive and significant), but the coefficient is not significant in the urban sample. Although there was a positive correlation between income and savings across samples, but the income impact on savings is higher in absolute values for households residing in rural areas, compared to household living in urban areas. We also found that, despite the coefficient of employment being similar in the direction of the impact (positive and significant) across the samples, the magnitude of the coefficient was stronger in the rural sample. Based on the higher magnitude of the coefficient, we found that household size has more effect in urban than rural areas. The study recommends that government should design and implement policies that foster job creation, even low-skilled jobs, which will generate more income and reduce unemployment.

Keywords: fixed-effects, random-effects, endogeneity, urban areas, rural areas, NIDS.

Description of the research problem. Although South Africa is classified as an upper-middle-income economy (also one of Africa's economic powerhouse), savings remain low by international standards. The country's gross domestic saving rate is well below that of its emerging market peers (Brazil, Russia, India and China). Savings rates in 2011 stood at 17.23 % for Brazil, 33.76 % for Russia, 34.98 % for India, 52.78 % for China, respectively, but South Africa recorded a mere 16.6 % (SARB, 2015; World Bank, 2018). Similar trends were observed in other African countries during the same period, with Botswana recording 26.15 % and Nigeria 24.41 % (OECD, 2017; World Bank, 2018).

Even more disturbing is the continual deterioration in household savings. Contrary to other developing countries, household savings are too low by South Africa's standards. Household saving rates in 2010 were in the region of 25 % for India and 28 % for China, whereas South Africa recorded a negligible -0.8 % (RBI, 2014; SARB, 2015). Comparatively, the net savings by households in South Africa was -0.63 % in 2009 before improving slightly to an average of -0.21 % in 2011 (SARB, 2012; Chipote & Tsegaye, 2014). There was a slight improvement from -0.50 % in the last quarter of 2016 to -0.30 % in the first quarter of 2017 (De Vos et al., 2020). These comparisons suggest that South Africa's declining savings compromise the country's ability to grow faster.

The literature is full of evidence suggesting that low savings leave individual households exposed to income shocks, limit them from building assets and add to the obligation of the state to provide retirement assistance (Chipote & Tsegaye, 2014; De Vos et al., 2020). Scholars such as De Vos et al. (2020) argue that a low savings rate impedes sustainable economic growth and development, which places more burden on the country current account balances. De Vos et al. (2020) contend that low savings in South Africa are a severe impediment for the country to reach the goal of realising increased economic growth and substantial poverty reduction in the absence of increased external inflows.

However, in the South African context, the temptation to begin any analysis on poverty, unemployment, inequality and savings from a historical perspective is factual, in the context of a history of past policies of disenfranchisement that championed the interests of a particular race at the expense of another (May & Norton, 1997; Zwane, 2020). According to May and Norton (1997), the institutionalised policies of apartheid left a large section of the population outside the mainstream economy, excluding them from conventional savings and saving instruments. As studies on South Africa have shown, using its institutionalised policies, the apartheid system meant that Africans, in particular, were restricted to low-income jobs and were most affected by unemployment and landlessness (May & Norton, 1997; De Vos et al., 2020). This was not a historical accident, but the result of deliberate policies that deprived black people of their productive assets, gave them a low-grade education, kept them out of skilled work and restricted them to Bantustans, which were densely po-

pulated, and had limited economic opportunities (May & Norton, 1997; De Vos et al., 2020). In a recent study, Zwane (2020) claims that the apartheid system forced the black population into homelands or rural areas where they were not permitted to obtain quality education which might lead them to aspire to positions in society that they would not be allowed to hold. The colonial and legislated oppressive regime of apartheid precluded opportunities and development in formerly black African areas (Von Fintel & Fourie, 2019).

In particular, years of segregation resulted in establishing a poor, primarily rural, black population that was reliant on the sale of its labour (ANC, 1994). In their work, Ashley and Maxwell (2001) argued that South Africa is one of the countries where poverty, unemployment, and inequality are prominent and seem to be worsening for the black African sections of society, particularly those living in rural areas. In their landmark statement, Ashley and Maxwell (2001: 395), cited in Zwane (2020), argued that: “[p]overty is not only widespread in rural areas [where Africans live], but most poverty is rural, at least for now”.

The aim of the study and innovation character. Despite the complications caused by apartheid in South Africa, savings have been described as a significant financial and economic matter and represent an essential driving force of economic growth and development as a whole (Mogale et al., 2013). Nonetheless, international research on the differences in savings determinants between urban and rural areas is very scarce due to data constraints. In the case of South Africa, although the literature is relatively rich in studies on the determinants of savings at a national level (Mogale et al., 2013; Chipote & Tsegaye, 2014; De Vos et al., 2020), they have significant drawbacks.

Firstly, the results from these studies are characterised by unusual levels of ambiguity relative to economic expectations. Such ambiguities are not helpful, given that the majority of these studies have mainly focused on macro-level analysis, leaving the microeconomic aspects as a fissure in the literature. Regrettably, macro-level analysis overlooks individual heterogeneity that explicitly reflects diverse influences of savings behaviour by individuals. Secondly, some of these studies have looked predominantly at the drivers of savings only at a national level, without considering the urban and rural divide. Previous studies on the determinants of savings have not estimated and compared results for samples split by geographical areas (urban and rural) separately. This is critical as these localities are structurally different, with different characteristics. It is, therefore, likely that the determinants of savings in these unique geographical localities would differ, given the negative impact of past policies of marginalisation. Thirdly, the statistical inference of many of the previous studies relied on cross-sectional data implementing a standard ordinary least-squares model, which, according to Posel (2016), fails to account for endogeneity and heterogeneity of cross-sectional units when compared to panel data. The reason for this might be due to the absence of long-running national representative micro-data with a

panel structure since the National Income Dynamics Study (NIDS) was commissioned in 2008 (SALDRU, 2016).

The purpose of the current study is to examine the urban-rural differences in savings for South African households. This paper contributes to and expands on the existing literature in three ways: (i) We endeavoured to correct the deficiencies linked to cross-sectional data by exploiting all five waves of the newly available large and rich first nationally representative panel survey, the National Income Dynamics Study observed between 2008-2017 in bi-annual waves (SALDRU, 2016). (ii) We employed appropriate panel data estimation techniques to address serious econometric concerns (heterogeneity and endogeneity), which cannot be accounted for easily in pure time-series and cross-sectional models. (iii) We investigated the urban-rural differences in savings for South African households.

To our best knowledge, there are no known empirical studies that have disaggregated data into urban and rural zones in South Africa, despite the critical role played saving in reverse the poverty curse. Disaggregating data in this way is novel, given that previous studies have only focused on these drivers at a national level. Different estimations are done on samples based on urban and rural areas, and this article identifies the main factors that correlate for regional savings differentials to contribute to specific policies targeting the poor. The rest of the paper is arranged as follows. Section 2 presents a brief review of the existing empirical literature on savings. Section 3 discusses the dataset and practical methods applied in this paper. The penultimate section discusses the results. Concluding remarks are presented in the final section.

Analysis of recent studies and publications. The empirical and theoretical literature on savings behaviour is well established (see for example, Wakabayashi & Mackellar, 1999; Horioka & Wan, 2007; Adewuyi et al., 2010; Mahlo, 2011; Mogale et al., 2013; Kudaisi, 2013; Chipote & Tsegaye, 2014; De Vos et al., 2020). The findings have repeatedly generated debate among researchers, with no clear empirical answer regarding the critical determinants of savings. The theoretical basis of savings behaviour can be sketched as far back as Friedman's (1957) permanent income theory to Ando and Modigliani's (1963) life-cycle theory. As observed by Adewuyi (2010) and Kudaisi (2013), economic theories on savings behaviour (permanent income theory and life-cycle theory) present insights into possible factors likely to influence savings. For example, both theoretical frameworks cited above consider the household disposable income to be the primary driver of savings since it is lack of income that mainly contributes to low savings.

According to the permanent income theory propounded by Friedman (1957), individual current consumption is directly associated with the measure of permanent or lifetime disposable income. This theory assumes that households are responsible for sustaining a constant consumption path by allocating

lifetime resources equitably in each period (Mbuthia, 2011). In each period, consumption is comparable to the permanent household income (Adewuyi et al., 2010). According to Mbuthia (2011), permanent income is often seen as the amount of compensation that presents individuals with the same current value of lifetime assets as implied by actual inter-temporal budget constraints.

On the contrary, the life-cycle theory advocated by Ando and Modigliani (1963) assumes that households distribute lifetime consumption across their lives by accruing savings during their working lives and sustaining consumption levels during retirement. Concerning consumption and savings, the life-cycle theory put more emphasis on the importance of the age structure of individuals (Modigliani, 2005). Based on this theory, individuals smooth consumption over time (Mbuthia, 2011), considering the projected changes in their assets influenced by education and age distribution (Modigliani, 2005; Modigliani & Brumberg, 1954). The theory views young people as non-savers in the early working stages of their life, and the aged are assumed to be net borrowers (Modigliani & Brumberg, 1954). In their study, Modigliani and Brumberg (1954) argue that people's disposable income is initially low, and consumption is often greater than income.

In the second phase of people's lifetime, the middle-aged accumulate human capital, thus improving their incomes beyond their consumption levels (Abu et al., 2013). According to Modigliani and Brumberg (1954), middle-aged individuals can often pay off debts they accrued in their earlier years, thus making saving for retirement imminent. The last phase is when individuals reach retirement age, income drops to zero and savings decline, creating the humped-shape of the life-cycle hypothesis (Abu et al., 2013). Therefore, people would fall back on their past savings to smooth consumption (Abu et al., 2013). The life-cycle theory assigns an essential function to household income and the age composition of the population as significant determinants of savings (Dirschmid & Glatzer, 2004).

However, researchers and policymakers alike have questioned the relevance of the life-cycle theory for emerging economies. Researchers suggest that such a model of savings behaviour might not be appropriate for economies with low-income levels, South Africa included. Individuals with low-incomes might find it difficult to save enough during their early years to support consumption in old age, as the model suggests and definitely not to the same extent as individuals with higher incomes or living in wealthier nations. Some scholars argue that the life-cycle theory showed serious deficiencies when tested empirically. For example, Carrol and Summers (1991) reported that, unlike the life-cycle theory predictions, the cross-sectional profile of consumption in various countries seems to be well-explained by the cross-section of current income in those countries relative to a cross-section of expected lifetime income.

In both developed and developing countries, a large number of studies are investigating the determinants of savings in both developed and developing

countries. However, the empirical results has been mixed and inconclusive. In fact, researchers hold different views regarding the real determinants of savings. Scholars holding these views can be grouped into two exclusive groups. The first group has found evidence of a positive causal nexus between household disposable income and savings, supporting the life-cycle theory. For instance, Wakabayashi and Mackellar (1999) applied the life-cycle theory as a basic model and used longitudinal data for China spanning 1993 to 1998. To validate the life-cycle theory, they reported that disposable household income was positively associated with savings. Similarly, Horioka and Wan (2007) used China's provinces as a test centre and applied a panel-data function using the 1995 to 2004 Chinese household survey. Horioka and Wan (2007) reported that the lagged household disposable income had a positive and statistically significant impact on savings. However, the performance of age structure had no significant effect in Chinese provinces.

Adewuyi et al. (2010) modified the household savings function to capture the different features of the Economic Community of West African States (ECOWAS) and reported similar findings. The panel-data estimation techniques were estimated using longitudinal data from 1980 to 2006. In agreement with the findings of Horioka and Wan (2007), Adewuyi et al. (2010) reported a positive relationship between savings and income for ECOWAS countries. Arriving at a similar conclusion, Mogale et al. (2013) used a co-integrating vector autoregressive framework and reported that income growth rate was positively associated with savings in South Africa. These results concur with the work of Mahlo (2011), who applied an ordinary least squares (OLS) regression technique to assess the savings behaviour of South African households. Using data drawn from 1990-2009, Mahlo (2011) also reported a positive relationship between household savings and income in South Africa. De Vos et al. (2020) investigated determinants of savings among non-Ricardian households (NRH) in South Africa using National Income Dynamics Study (NIDS) data from 2008 to 2017. Using pooled OLS, fixed and random effects methods, the authors reported that household grants contributed positively to savings. Furthermore, the authors found that the level of savings was still considerably low. The low-income households in South Africa represented true NRHs, as many have zero or negative savings (De Vos et al., 2020). The limitation of this study is that the authors did not conduct an endogeneity test to ascertain the result.

The second group consists of scholars who firmly reject the proposition that increased income exerts a positive impact on savings (see for instance, Chipote & Tsegaye, 2014; Simleit et al., 2011). In their paper, Chipote and Tsegaye (2014) used time series annual data covering 1990–2011 and applied the Johansen co-integration and the error correction mechanism for South Africa. Chipote and Tsegaye (2014) found a negative association between household income and savings in South Africa. The results from their study contradict the

life-cycle theory's postulation of a positive relationship between income and savings. However, they agree with those of Simleit (2011), who concluded that an increase in South Africa's GDP leads to a simultaneous increase in consumption due to optimism and a drop in the savings rate. These findings contradict the work of the studies discussed earlier.

It is evident from the literature review that scholars are still far from reaching consensus concerning the real determinants of savings. The differing results could be due to the econometric techniques used, the period of investigation and the research methodologies applied. Another reason might be that most studies are based on cross-sectional datasets, which cannot address serious issues of endogeneity bias and heterogeneity of cross-sectional units compared to panel data. Additional reasons could be that contemporary savings theories do not focus on low-income households, which are in the majority in developing nations. Hence, little is known about the real factors influencing saving in such countries. Despite the significant role played by savings in determining people's escape from poverty or alternatively, their plunge into poverty over time, there is to date no known empirical study in South Africa that have investigated the determinants of savings on samples split location (urban and rural). This is critical as these localities are structurally different, with different characteristics. It is, therefore, likely that the determinants of savings in these unique geographical localities would differ, given the negative impact of past policies of disenfranchisement. Our study's point of departure from the previous empirical work on South Africa is that we split our data into urban and rural localities to identify the factors that affect these two unique areas based on the magnitude of the coefficients. Segregating data in this way has never been done in South Africa. In addition, with data from all the existing five waves of the NIDS (which earlier scholars did not have the opportunity to use), our work is the most comprehensive in evaluating the determinants of household savings within these regions. We used powerful panel data models (fixed-effects, random effects and IV-2SLS), which have not often been used in South Africa. Hence, this study will fill up the gap in the South African literature.

Data and research methods. This study used data obtained from the NIDS from 2008 to 2017. The Wave One data set was administered in 2008, and the other waves were done in 2010, 2012, 2015 and 2017, respectively (SALDRU, 2016). The NIDS is South Africa's first nationally representative panel data that follows individuals over time (SALDRU, 2009). The University of Cape Town provides the NIDS data, and the South African Labour and Research Unit (SALDRU) is the executing agency (SALDRU, 2016). The NIDS is a panel survey of individuals of all ages across South Africa, which is conducted every two years (SALDRU, 2016). An all-inclusive description of the NIDS data set may be found at www.nids.uct.ac.za. The panel structure of NIDS, now extended to five waves, offer significant benefit for our analysis. The advantage of the NIDS data is that

it covers a comprehensive series of information on individual and household demographics, consumption, income, employment, health, well-being, fertility, mortality, migration, education, vulnerability and social capital (SALDRU, 2016). In addition to the dependent variables (household savings), we utilised numerous control factors in the empirical analysis. We employed numerous factors documented in the literature as independent variables and critical determinants. Some of these were employment status, gender, race and age of the household head, household size, provincial dummies and indicator variables for household location (rural or urban). The inquiry focused on the determinants of savings in various settlement types, and the data were differentiated into two unique samples (urban and rural). Table 1 presents a list of the variables used in this study.

Table 1. Description of variables used in the empirical analysis of savings

Dependent variable	
Household saving:	Difference between household income and expenditure
Variables description	
Income	Summation of earnings from all sources in a given period
Urban	Area type: urban dummy variable (1 = yes, 0 = no)
Rural	Area type: rural dummy variable (1 = yes, 0 = no)
Coloured	Race: coloured dummy variable (1 = yes, 0 = no)
Indian	Race: Indian dummy variable (1 = yes, 0 = no)
White	Race: white dummy variable (1 = yes, 0 = no)
Female	Gender: female dummy variable (1 = yes, 0 = no)
Age	Age in years of household
Age2	Age in years of household squared
Primary	Education: primary education dummy variable (1 = yes, 0 = no)
Secondary	Education: secondary education dummy variable (1 = yes, 0 = no)
Matric	Education: matric dummy variable (1 = yes, 0 = no)
Tertiary	Education: tertiary dummy variable (1 = yes, 0 = no)
Employed	Labour market status: employed dummy variable (1 = yes, 0 = no)
Family size	Total number of individuals in the household
WC	Province: Western Cape dummy variable (1 = yes, 0 = no)
EC	Province: Eastern Cape dummy variable (1 = yes, 0 = no)
NC	Province: Northern Cape dummy variable (1 = yes, 0 = no)
FS	Province: Free State dummy variable (1 = yes, 0 = no)
KZN	Province: Kwazulu-Natal dummy variable (1 = yes, 0 = no)
NW	Province: North West dummy variable (1 = yes, 0 = no)
GAU	Province: Gauteng dummy variable (1 = yes, 0 = no)
MPU	Province: Mpumalanga dummy variable (1 = yes, 0 = no)
LIM	Province: Limpopo dummy variable (1 = yes, 0 = no)

Source: Own computation.

Directed by the literature, particularly Horioka and Wan (2007), Kudaisi (2013), Abu et al. (2013) and De Vos et al. (2020), our study applied panel data models to investigate the determinants of urban and rural households saving behaviour in South Africa. We began by implementing a panel fixed and random effects model. The major attraction of the random effect technique is that it accounts for time-invariant factors (Baltagi, 2008; Angrist & Pischke, 2009). The model is used if specific individual effects are assumed to be uncorrelated with the error term (Baltagi, 2008). The fixed effects model relaxes this assumption and allows specific individual effects and the error term to be correlated (Angrist & Pischke, 2009). We performed the Hausman test to choose the most relevant and appropriate model, fixed effects or random effects, consistent with the literature (Baltagi, 2008; Angrist & Pischke, 2009). The following multivariate specifications were estimated:

Fixed effects specification

$$\text{LogSav}_{it} = \beta_0 + \beta_1 \text{LogIncome}_{it} + \beta_2 X_{it} + \eta_{it} + \mu_{it} \quad (1)$$

Random effect specification

$$\text{LogSav}_{it} = \beta_0 + \beta_1 \text{LogIncome}_{it} + \beta_2 X_{it} + \mu_{it} \quad (2)$$

Following the approach adopted by Horioka and Wan (2007), Balde (2011) and Abu et al. (2013), we implemented a 2SLS to mitigate the problem of endogeneity bias.

Two-stage least-square specification

$$\text{LogSav}_{it} = \beta_0 + \beta_1 \text{LogIncome}_{it-1} + \beta_2 X_{it} + \mu_{it} \quad (3)$$

where LogSav_{it} measures our dependant variable, thus savings for household i at time t ($t = 5$). Previous research states that the life-cycle theory (discussed further below) recommends that savings should be dependent on the growth rate of income (Ando & Modigliani, 1963; Adewuyi et al., 2010). Guided by the literature in this field (Horioka & Wan, 2007; Balde, 2011; Abu et al., 2013), we then used LogIncome_{it} indicating household disposable income. On the other hand, X_{it} indicates the vector of various socio-economic variables that has an impact on savings (see Table 1). The subscript β_2 defines the model's estimated coefficients; μ_{it} denotes the error term; η_{it} captures unobserved individual heterogeneity.

However, a significant setback commonly associated with the empirical models discussed thus far is that the techniques fail to account for the joint endogeneity resulting from the reverse relationship between the variables of interest. Practical work has found that disposable income is endogenous to savings, indicating that, while an increase in income results in increased savings, increasing savings might also lead to increased income growth (Balde 2011; Loayza et al., 1999). The causality that might exist between savings and income growth rate would result in a correlation between the control variables and disturbance term,

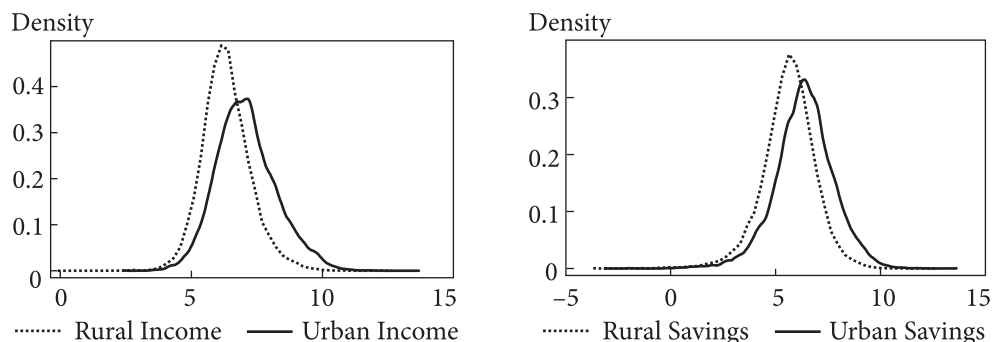


Fig. 1. Household income based on rural and urban regions in South Africa, 2008-2017

Source: Own presentation based on NIDS data.

Fig. 2. Household savings based on rural and urban regions in South Africa, 2008-2017

Source: Own presentation based on NIDS data.

therefore violating the linear regression model (Baldé 2011; Abu et al., 2013; De Vos et al., 2020). Besides, it is problematic to determine the influence of the explanatory variable on savings and estimate such an association results in potential endogeneity bias.

Although this paper hypothesises a direct impact resulting from household disposable income to savings, we would expect that reverse causality is also feasible. This suggests that the appropriate model in this study would be the one that addresses the endogeneity bias (Horioka & Wan, 2007; Balde, 2011). After conducting several tests, we concluded that our preferred choice of model to account for a possible endogeneity bias should be an instrumental variables approach in the form of a two-stage least square (IV-2SLS) model. Following previous studies, we attempted to address endogeneity concerns by using the lagged value of income as an instrument, consistent with the work of Horioka and Wan (2007), Balde (2011) and Abu et al. (2013).

The main findings of the study. Before presenting the empirical results obtained by implementing the empirical regressions, we began by analysing some descriptive statistics. Figure 1 displays the kernel density of household income for families living in rural and urban areas. This figure presents evidence of the variation in living standards between households residing in these two unique areas. From Figure 1, it can be seen that the rural population is worse off compared to their urban counterparts. This is because urban income distribution is positioned to the right-hand-side of the rural regions and its widespread. The results suggest that rural households earn less than their urban counterparts. The same scenario can be observed in Figure 2, which considers household savings distribution within these two unique geographical areas. In Figure 2, we see that the distribution bell is skewed to the right. The results seem to suggest that urban households save more than their rural counterparts. Figure 3 and 4 plot

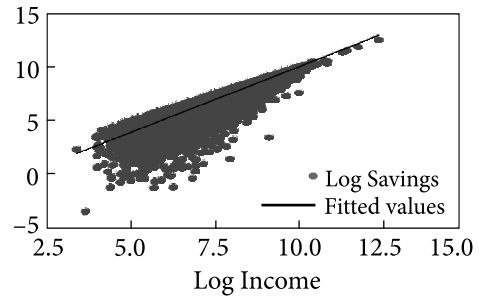
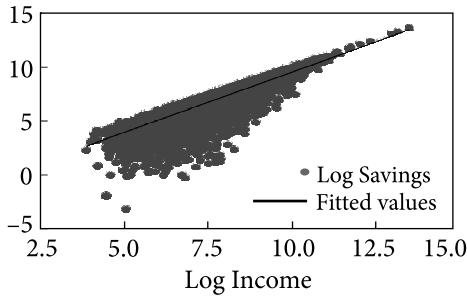


Fig. 3. Scatter plots of savings against household income for urban sample, 2008-2017
Source: Own presentation based on NIDS data.

Fig. 4. Scatter plots of savings and household income for the rural sample, 2008-2017
Source: Own presentation based on NIDS data.

the log of household income variable against the log of savings variable in the rural and urban areas using scatter plots. What emerges from these figures is a strong positive relationship between savings and income in both regions. The results suggest that, as household income rises, savings move in the same direction, reinforcing the predictions of the life-cycle theory.

Although the graphical analysis presented above offers remarkable insight, the analysis does not permit us to determine the statistical significance of various explanatory variables on savings. The panel data model results shown in Tables 2 and 3 below undertakes to bridge this gap. Before discussing the empirical results, we first applied the Hausman test to determine the most appropriate technique between the fixed effects and the random-effects models (Hausman, 1978). In our study, it is observed that the probability value of the Hausman test (1978) presented at the bottom of Table 2 is less than 0.05, rejecting the null hypothesis. Thus, concluding that the fixed-effects model is a more appropriate technique than the random-effects estimator (see the bottom of Table 2 below). Therefore, the results of the fixed-effects model are presented and discussed in this paper.

The analysis presented in Table 2 is displayed for the samples split into urban and rural localities (columns 2 and 3). Interestingly, the estimated coefficients of these samples are mostly different from one another (urban and rural). The differences are in terms of the magnitude, level of significance and the direction of the impact. These differences confirm the importance of segregating urban and rural samples in any inquiry. Segregating the determinants of savings in these two unique samples appears to present some nuances and valuable insights.

For instance, we find that having access to land is a strong predictor of savings (positive and significant) in rural areas, while the coefficient is not significant in the urban sample. Thus, the findings suggest that landholding is still a substantial component of diverse rural livelihoods and can help rural emerging farmers who want to be involved in large-scale farming. Moreover, the results

fit the theme of the continuing debates in the country concerning land reform and inclusive growth by potentially distributing state-owned land and expropriating land acquired during colonial and apartheid times (Von Fintel & Fourie, 2019). The other correlates of saving also prove interesting. We found that the employment status of the head of household matters a lot in explaining savings in rural areas. It is positive and significant at a 1 % level of significance, while the coefficient is not significant in the urban sample. These results are to be expected, given that people can only put aside a certain portion of their income if they are employed (see for example, Issahaku, 2011). These positive results concur with those of Issahaku (2011) for Nadowli, a deprived district capital in Ghana. Additionally, we found that household income is a strong predictor of savings in the rural sample, based on the higher magnitude of the coefficient. The positive results support the hypotheses that, as household disposable income rises, sa-

Table 2. Fixed effects estimates of the determinants of households savings

	Urban sample			Rural sample		
	Coeff	SE	T-stats	Coeff	SE	T-stats
Income	1.426005	(0.0106695)	***	1.452843	(0.0091039)	***
Landholdings	0.0021159	(0.0057858)		0.0348336	(0.0054165)	***
Household size	-0.2330367	(0.0037003)	***	-0.1925578	(0.0023068)	***
Employment	0.0116223	(0.015961)		0.0771176	(0.0135662)	***
Age	-0.0284759	(0.0022643)	***	-0.0150719	(0.0018866)	***
Married	0.0376341	(0.0068494)	***	0.0269021	(0.0057059)	***
Yrs of schooling	-0.0199254	(0.0172269)		0.0033691	(0.0146814)	
Eastern Cape	0.138608	(0.1643679)		-0.2115446	(0.1108249)	
Northern Cape	0.1726114	(0.1625131)		-0.3859466	(0.0824072)	***
Free State	0.286032.	(0.1680493)		-0.2233698	(0.1852211)	
Kwazulu-Natal	0.1531275	(0.1482949)		-0.1728985	(0.1407634)	
North West	0.2753644	(0.1603298)		-0.2137783	(0.0698748)	**
Gauteng	0.1505203	(0.1580106)		0.0248813	(0.1021641)	
Mpumalanga	0.3249584	(0.124507)	***	0.1510503	(0.0506125)	**
Limpopo	0.3374015	(0.1430233)	*	-0.0984269	(0.0790478)	
Hausman test		(0.000)			(0.000)	
Poolability		(0.000)			(0.000)	
Observations		(23 939)			(30 778)	

Source: Own calculation from NIDS data, 2008-2017 (***Significant at 1 %; **Significant at 5 %; *Significant at 10 %).

vings move in the same direction, a result first supported by Ando and Modigliani (1963) and Friedman (1957) in their seminal works. The results also support those reported in previous studies in developing countries, such as Iqbal et al. (2018) for urban and rural Pakistan. While many scholars arrived at a similar conclusion, this result and its theoretical foundations are not universal and still debated (Carrol & Summers, 1991).

Consistent with expectations, household size had a negative and statistically significant coefficient in both samples (urban and rural). In accordance with the life-cycle theory, an increase in the number of individuals in a household would increase the marginal propensity to consume, and the marginal propensity to save would be compromised (Nigus, 2015). These results align with those of Nigus (2015). Nigus (2015) pinned the negative association with the increased dependency ratio. Marital status is another significant predictor of savings and is positive and significantly related to savings in both samples. However, years of education do not appear to be important in explaining savings in both samples, a somewhat unexpected result. This scenario can be attributed to the consumerist culture adopted by the South African population, as many people reveal consumption behaviour not fit for their income levels. Generally, most provincial dummies appear to be insignificant across samples for South Africa, consistent with De Vos et al. (2020).

To ensure that the results presented in Table 2 are not biased due to endogeneity problems, the study estimated equation 3 with the lagged value of income, as suggested by Horioka and Wan (2007), Balde (2011) and Abu (2013). In addition, we executed other specification tests to ensure that the instrument used was relevant. As can be observed from the bottom of Table 3, the Lagrange multiplier (LM) test for under-identification reveals that the regressor is not under-identified (p -value = 0.000). Moreover, the Cragg-Donald Wald F statistic developed by Cragg and Donald (1993) is large (9316.572) compared to the Stock-Yogo weak ID test critical values. For these reasons, we concluded that there was no problem with weak instruments. We further conducted an endogeneity test to establish whether to implement the IV-2SLS estimator or whether the findings from the fixed effects technique would be adequate. The findings indicated that the IV-2SLS model is indeed a method to be pursued. Perhaps what is more insightful is a comparison of the fixed effects results presented earlier with the results of the IV-2SLS model. Again, there are some noticeable differences between the estimates derived from the fixed-effects model and those generated by the IV-2SLS estimator, confirming the significance of addressing endogeneity bias concerns. The estimates reported in Table 3 are different from each other, thus the rural and urban sample.

The results indicate that having access to land is still critical in explaining savings in rural areas (positive and statistically significant), while the coefficient is still insignificant in the urban sample. These results fit well with subsistence

farming characteristics and the likelihood of having adequate livestock that might anchor a rural household and potentially permit them to trade any surplus with other subsistence farmers and possibly generate additional income. Even though the estimated coefficient of income is positive and significantly related to saving, the magnitude is slightly smaller when the IV-2SLS is pursued. The smaller coefficient derived from the IV-2SLS estimator suggests that the fixed-effects model overstates the influence of household disposable income. Within the framework of the IV-2SLS, we also observed that the magnitude of the coefficient is slightly higher in the rural than the urban sample.

Table 3. IV-2SLS estimates of the determinants of households savings

	Urban sample		T-stats	Rural sample		T-stats
	Coeff	SE		Coeff	SE	
Income	1.028146	(0.0116854)	***	1.112948	(0.014522)	***
Landholdings	0.004149	(0.0053478)		0.0335078	(0.0049337)	***
Household size	-0.1885949	(0.0021133)	***	-0.156013	(0.0016764)	***
Employment	0.097929	(0.0112405)	***	0.2372709	(0.0112239)	***
Age	0.0056447	(0.0003657)	***	0.0041358	(0.0003268)	***
Gender	-0.0823807	(0.010292)	***	-0.092414	(0.0093258)	***
Married	0.0521135	(0.0034571)	***	0.0468106	(0.0032372)	***
Yrs of schooling	0.0062342	(0.0059715)		-0.0084475	(0.0055958)	
Coloured	-0.0810586	(0.0157553)	***	-0.2240568	(0.0345803)	***
Indian	-0.2181794	(0.0475089)	***	-0.463525	(0.0504402)	***
White	-0.0532403	(0.0276083)	*	-0.3315596	(0.0707278)	***
Eastern Cape	0.0218084	(0.0405778)		0.0744446	(0.0360886)	*
Northern Cape	-0.046326	(0.0409306)		-0.0098383	(0.0176721)	
Free State	0.0049653	(0.0414611)		0.0371059	(0.0291235)	
Kwazulu-Natal	-0.0604287	(0.0404396)		-0.0712562	(0.0402728)	
North West	-0.042589	(0.0412049)		0.02564	(0.0135548)	
Gauteng	0.0130473	(0.0442182)		-0.0044773	(0.0199833)	
Mpumalanga	-0.0339083	(0.0393524)		0.185402	(0.0234907)	***
Limpopo	0.0712029	(0.0417115)		0.0490589	(0.0203427)	*
Anderson canon. corr. LM statistic)						
Chi-sq(1) P-value	(0.000)			(0.0000)		
Cragg-Donald Wald F statistic	(9316.572)			(6335.668)		

Source: Own calculation from NIDS data, 2008-2017 (***Significant at 1 %; **Significant at 5 %; *Significant at 10 %).

After controlling for endogeneity, other differences emerged. We observed that employment status is positive and statistically significant across the sample, contrary to the results observed in Table 2. The IV-2SLS results confirm the long-standing argument that households can only save if they are unemployed. We also observed that the coefficient of the head of household's age is different from the fixed-effects estimates, which is positive and significant across the samples. This implies that household savings rise with the age of the household head, as was found by Rehman (2010). We also observed that, while the estimated coefficient of household size is still negative and significant, the magnitude of the coefficient is small in absolute values in the urban sample when the IV-2SLS model is pursued. The gender of the head of the household still matters in determining savings (enter with negative and significant coefficient across). We find that race dummies (Coloured; Indians; White) are in line with previous studies (Qabazi, 2018; De Vos et al., 2020).

Conclusion and policy implications. This paper's objective was to examine the urban-rural differences in household savings in South Africa. We used data sourced from the five waves of the National Income Dynamics Study (NIDS) observed between 2008-2017. The study applied a novel two-stage least square estimation technique to address possible endogeneity problems, which might have plagued previous studies in this field. It was concluded from the research that the determinants of savings are different across samples (urban and rural). For instance, we find that having access to land is an important predictor of savings in rural areas (positive and significant), while the coefficient is not significant in the urban sample. Although there is a positive correlation between income and savings across samples, income has more effect in rural areas based on the more significant magnitude of the coefficient. We also found that, despite the coefficient of employment being similar in the direction of the impact (positive and significant) across the samples, the magnitude of the coefficient was stronger in the rural sample. Remarkably, we found that the effect of household size had more impact in urban than rural areas based on the higher magnitude of the coefficient. The policy implication for this is that the South African government should design and implement policies that foster job creation and reduce unemployment. Thus, there is a need to introduce policies in rural areas that would help improve income level of the people. An improvement in household income would result improved saving ratio, and again need to teach individuals about saving and provide saving based schemes with incentives. Initiatives for promoting economic diversification and gainful employment creation should be intensified. Moreover, rural development strategies should emphasise the provision of agricultural infrastructure, promote productivity, growth by adopting improved technology and community development to exploit areas of competitive advantage by shared community resources. This would also increase household income, an essential ingredient for improved savings.

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ДЕТЕРМІНАНТИ ЗАОЩАДЖЕНЬ МІСЬКИХ ТА СІЛЬСЬКИХ ДОМОГОСПОДАРСТВ: ПРИКЛАД ПІВДЕННОЇ АФРИКИ

Заощадження мають суттєве фінансово-економічне значення та є важливою рушійною силою економічного зростання та розвитку. Попри на це, багато досліджень, що вивчають детермінанти заощаджень у Південній Африці, розглядають переважно рушії заощаджень лише на національному рівні, не акцентуючи увагу на міських та сільських відмінностях. Це критично важливо, оскільки ці населені пункти є структурно різними і мають різні характеристики. Тому цілком ймовірно, що детермінанти економії в цих унікальних географічних населених пунктах будуть відрізнятися, враховуючи негативний вплив минулої політики маргіналізації. Метою даної роботи є вивчення відмінностей у заощадженнях міських та сільських домогосподарств Південної Африки. Ми використовували дані, отримані з п'яти хвиль Національного дослідження динаміки доходів (NIDS), які здійснювались у 2008—2017 роках. Новизна цього дослідження полягає у застосуванні нової двоступеневої методики оцінки найменших квадратів для вирішення можливих проблем ендогенності, які могли перешкодити попереднім дослідженням у цій галузі. На основі дослідження було зроблено висновок, що детермінанти заощаджень різняться між вибірками (міські та сільські домогосподарства). Ми виявили, що доступ до землі є важливим предиктором заощаджень у

сільській місцевості, де проживають бідні (позитивний та значущий), натомість коефіцієнт не має істотного значення в міській вибірці. Хоча у вибірках існувала позитивна кореляція між доходами та заощадженнями, але вплив доходу на заощадження вищий за абсолютними значеннями для домогосподарств, які проживають у сільській місцевості, — порівняно з домогосподарствами у міських районах. Ми також виявили, що коефіцієнт зайнятості у вибірках був аналогічним за напрямком та силою впливу (позитивний та значущий), та важливість коефіцієнта була сильнішою у сільській вибірці. Виходячи з вищої величини коефіцієнта, було встановлено, що розмір домогосподарств має більший вплив у міських, аніж у сільських районах. Дослідження рекомендує уряду розробляти та впроваджувати політику, яка сприятиме створенню робочих місць (навіть низькокваліфікованих робочих місць), що призведе до збільшення доходу та зменшення безробіття.

Ключові слова: фіксовані ефекти, випадкові ефекти, ендогенність, міські райони, сільські райони, NIDS.