

Savings and Poverty: Is there really a link?

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Abstract

Poverty is one of the main concerns in developing economies. A potential factor linked to the reduction of poverty is savings. Although savings has been diagnosed as a factor that can move those that are in poverty out of poverty, it has been under-investigated due to the assumed role that it plays in South Africa. Investigating the link between savings and poverty in a developing economy such as South Africa is therefore the objective of this study. The study employs the methodology of the random effects Probit regression analysis as well as the mobility matrix to analyse the impact savings has on poverty. Results suggest that savings and poverty have a significant and negative relationship implying that those who save are more likely to move out of poverty while those who do not, remain in poverty.

Keywords: savings, poverty, poverty trap

JEL codes: C23, D91, I32, J60

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1. Background

Poverty is a concern in South Africa. The proportion of poor South Africans is illogical when reconciled with the increasing trends in South African per capita income (Posel 2013). On the other hand, savings is also a concern. The decline in savings raises potential issues in current and future levels of household consumption and debt (National Treasury 2012e). The impact of savings on poverty has seldom been investigated because of the fact that by itself, savings and poverty present many issues requiring an investigators full attention. Further, the savings behaviour of the poor has been the departure point of poverty and savings studies with limited empirically-based conclusions on the impact of savings on poverty.

Poverty and savings concepts have thus typically been investigated in separate studies where little empirical testing on the impact of savings on poverty measures were analysed. At most, in a poverty research study, a brief mention of the impact of savings on poverty is highlighted where savings – in its various forms – has been assumed to have a reducing impact on poverty (Woolard & Klasen 2004; Nga 2007). In savings studies, the conclusion that the poor illustrate savings capabilities is of increasing interest due to the assumption that the poor are ‘too poor’ to save (Esson 2003). The poor therefore display savings amounts that increase as income increases.

The assumed significant and reducing impact of savings on poverty is predominantly and explicitly highlighted in the abovementioned studies of Woolard and Klasen (2004) and Nga (2007). Other poverty studies focus more on the poverty statistics or the savings statistics without mention of the savings impact on poverty. This is not to say that poverty and savings measures have to be analysed in the same paper, however, the explanation that savings has a (significant) impact on poverty in South Africa in the abovementioned studies implies that such an investigation has been performed.

It is useful that the measures of both poverty and savings are commonly derived from the income and/or expenditure values from various household items (Ravallion 1998; Modigliani 2005). That is, the availability of household and individual income or expenditure data simplifies the determination of saving and poverty measures. For example, the (absolute) food poverty line or discretionary savings figures can be derived from these data points where the unit of measurement shared in both measures is in rand values over time e.g. rands per day or rands per month (Statistics South Africa 2008; 2009). The relative and subjective measures of savings and poverty, although they exist, are seldom utilised in the general comparison of poverty and savings over time due to the time-specific limitations i.e. the “deflatability” of these measures (Statistics South Africa 2008). These measures, however, are more able to capture the multi-dimensionality of poverty.

The poverty measures chosen are specific to the definition of poverty one is aiming to assess. For example, if the aim is to understand the general proportion of poor to non-poor individuals in a country, the absolute poverty line such as the headcount ratio or poverty gap ratio is sufficient.

These measures, otherwise known as poverty indices, are obviously simplistic and only satisfy weak poverty axioms [see Zheng (1997) for a detailed discussion on the poverty axioms]; however, because of the specific poverty definition one desires to assess, the poverty measure chosen – the absolute poverty line – is apt.

The definition of savings on the other hand is divided into various sub-group definitions. This is mainly due to the availability of data (Modigliani 2005). For instance, due to readily available income and expenditure data the type of savings typically analysed is the discretionary savings type where discretionary savings is the residual of income less expenditure. While on the other hand contractual savings; savings such as employee pensions and retirement annuities; are harder to obtain as reported incomes may exclude these types of savings because individuals perceive these as monthly expenditure amounts.

The measures of both poverty and saving are applied to both individuals and households, although in the case of the poverty line it is applied to the aggregate.

A topical issue when investigating poverty and savings is whether poverty and savings should be analysed in terms of the household or the individual level. The main concern is the neglect of different family sizes and compositions on the impact of poverty as well as savings (Deaton & Paxson 1999; Woolard & Leibbrandt 1999). The absolute poverty line, for example, measures income per capita (per person) implying that on average a household member, whether they are an adult or a child or whether the family consists of four or eight members, would need to earn below this line to be considered ‘poor’. In order to capture the impact of changes in family size, equivalence scales such as the adult equivalence scale [see Woolard & Klasen (2004)] can be included into the above measures. Savings measures on the other hand suffer less from changing household size; although the accuracy of individual data improves the understanding of savings behaviour [see Deaton & Paxson (1999) for a detailed discussion of individual compared to household data].

The most commonly employed measurements of poverty and savings has assessed both poverty and savings at the household level. This is because of the ease in interpretability and simplicity of using such common measures (Woolard & Leibbrandt 1999; Statistics South Africa 2008). Moreover, the tracking of the general proportion of poor to non-poor over time, as well as the assessment of savings behaviour over time, has also resulted in these straightforward measures to be chosen. In this study the poverty and savings measures therefore employed are the simple and straightforward measures described in Table 1 below.

Table 1: Poverty and Savings Measures

	Type of Measure	Poverty Measure	Equation	Type of Measure	Savings Measure	Equation
1	Poverty Indices	Headcount ratio ^a	H/N where $H < P$	Discretionary	Savings ^f	Income less Expenditure
2		Poverty Gap ^b	$\frac{1}{N} \sum_{j=1}^N \frac{P - y_j}{P}$			
3	Distribution-sensitive	Foster-Greer-Thorbecke (1984) ^c	$\frac{1}{N} \sum_{i=1}^q \left(\frac{g_i}{P}\right)^\alpha$			
4		Sen (1976) ^d	$H \left[1 - (1 - I) \left(1 - G \left(\frac{q}{q + 1} \right) \right) \right]$			
5		Poverty Squared ^e	$HxG_p + \text{Poverty Gap}(1 - G_p)$			

^aH represents all households below the poverty line and N is total population, ^bAll households earning below the poverty line, ^cGreater weights are given to those furthest away from the poverty line, ^dIncludes income gap ratio (I) and Gini coefficient (G_p) of the poor (q) and ^eSimilar to ^d, ^fIncome includes all types of incomes e.g. grants, wages, interest income, rental income, agriculture income, and expenditure includes total spending for the household per month. Figures used include imputations. See SALDRU user manual for details on the survey methodology and variable composition.

The equations above are all a function of the poverty line (P). The choice of the poverty line – the income threshold that divides the population into the poor and non-poor – is therefore crucial when investigating the poor compared to the non-poor. The poverty lines that are chosen for this study are taken from three different sources. The first source of Woolard and Leibbrandt (2010) established the poverty line at R502 per capita per month while the second and third sources from Statistics South Africa (2008, 2009) established two poverty lines. These two poverty lines consist of an upper bound of R614 per capita per month and a lower bound amount of R443 per capita per month. This was done in order to capture the various non-food expenditures a household incurs in addition to the base amount of only food expenditure.

Both Statistics South Africa (2008, 2009) and Woolard and Leibbrandt (2010) derive poverty lines from the spending on the minimum energy intake of an individual of a household.

It is expected that the relationship between the various poverty measures and discretionary savings is significant and negative i.e. savings reduces poverty.

Furthermore, previous savings is also of interest to the investigation and is assumed to have a significant and negative effect on savings in addition to the current savings of households. This is because previous savings increases the total savings amount overall. One of the aims of the study is to further compare the savings impact of those that move out of poverty versus those that move into poverty. This comparison is performed to show the potential long-run effect savings has on the probability of the household being poor.

The paper is structured as follows: the theoretical framework applied in the study is introduced in the next section followed by the methodology testing the savings-poverty relationship. Results and discussion are debated thereafter. Finally, conclusions on poverty and savings measures are drawn.

2. Theoretical Framework

The savings model employed for the analysis of savings and poverty is the Keynesian savings framework (Keynes 1936). The model was chosen because of the overlapping dependence on income for both the savings and poverty measures.

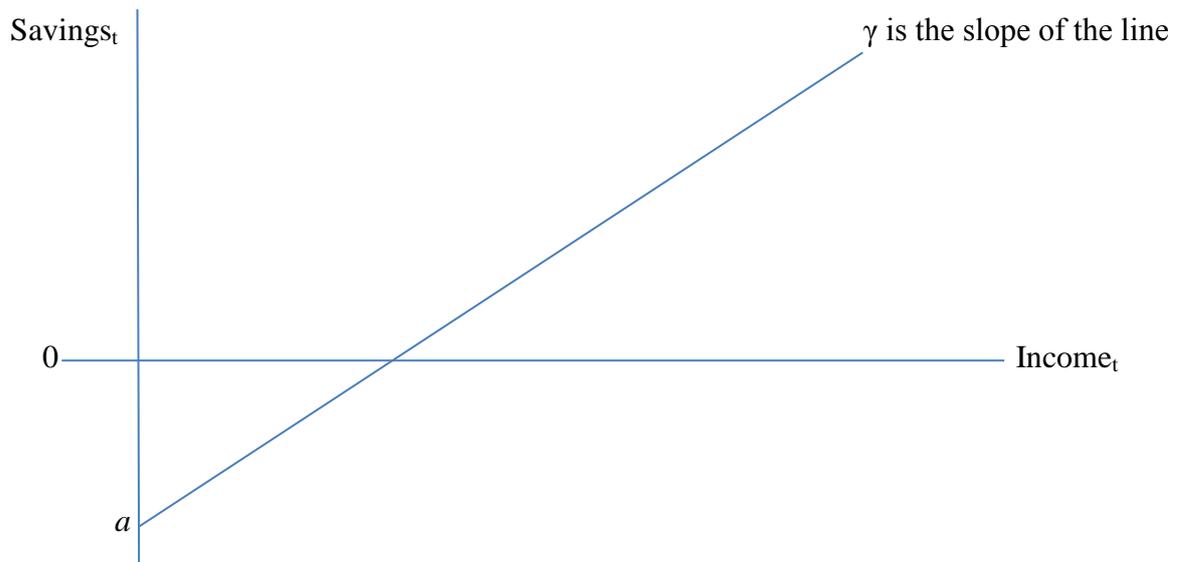
According to the Keynesian savings framework, savings increases as income increases (Figure 1). The poverty line, represented by the vertical line (PL) on the income-axis, illustrates the income threshold of the poor compared to the non-poor. Moreover, it segments the income group of the poor and the non-poor as well as the absolute savings amounts of the poor and the non-poor. Interestingly, the savings rate of the poor and the non-poor is constant under the Keynesian framework. (The application of the Keynesian savings framework is arguable, however, a preliminary analysis of the data points of the poor (see Data section) indicates that such a framework is apt in explaining the savings behavior of the poor for this study.)

Equation 1 below illustrates the relationship between savings and income under the Keynesian model:

$$\text{Savings}_t = -a + \gamma \text{Income}_t \quad (1)$$

where a denotes expenditure, $\gamma > 0$ denotes savings rate and income and savings denotes current income and savings amounts.

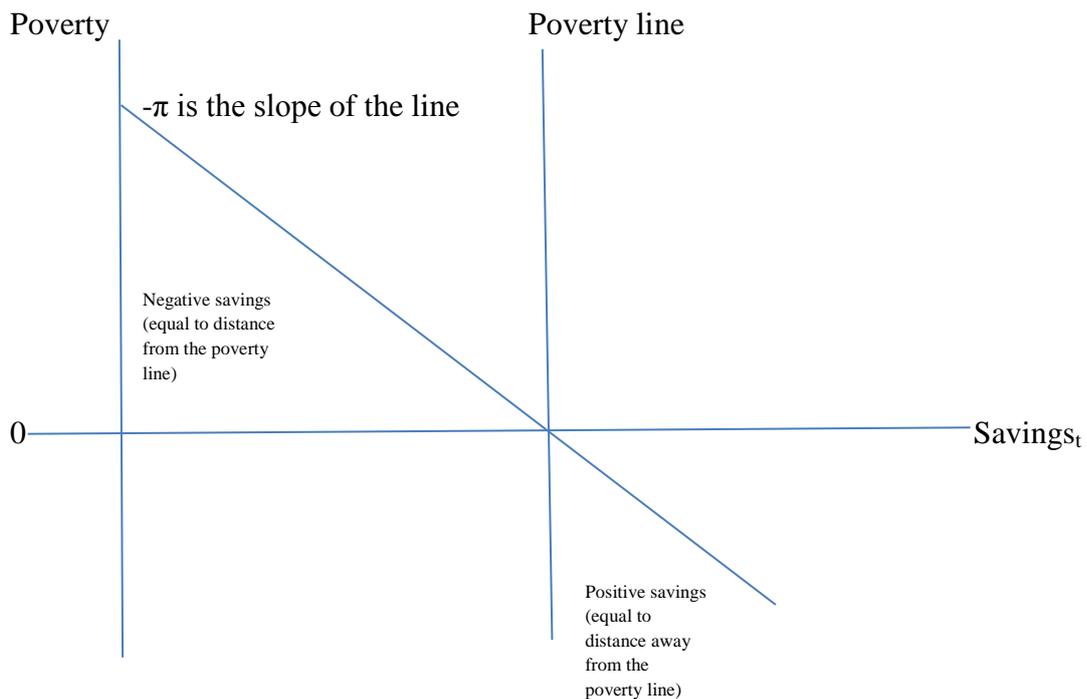
Figure 1: Income, Savings and the Poverty Line



Source: Author's own for illustrative purposes of Keynes (1936) Savings Framework

The relationship of poverty and savings is therefore as expected [according to Woolard and Klasen (2004) and Nga (2007)]. That is, as savings increases because of an increase in income, households are able to move over the poverty line (PL) shown in Figure 1. The relationship between poverty (or the distance from the poverty line) and savings is thus a negative one and can be observed in Figure 2 where savings is on the horizontal-axis and poverty is on the vertical-axis.

Figure 2: Savings and Poverty Relationship



Under this framework any endogeneity problems between poverty and savings is assumed away. In other words, the distance from the poverty line (PL) in Figure 1 of a poor household could also influence the amount of savings the household makes in order to move over this income threshold. This implies that the poverty position has an influence on the savings behaviour and the savings behaviour has an influence on the poverty position. Savings could potentially be a characteristic of being poor. Potential endogeneity problems between savings and poverty are, however, is not tackled in this paper.

A further assumption that is made of the impact of savings on poverty is that savings will automatically be used towards reducing poverty i.e. savings has an automatic transmission towards alleviating poverty, which may be presumptuous. In this latter case, the motive for saving is important. The motive for saving for a poor household is generally assumed to be that of the precautionary motive (Nga 2007) i.e. the savings amount made in the previous period is in anticipation of an income shortfall or in anticipation of anything unexpected that may cost more than the household has on hand.

This assumption implies that if the poor household experiences an income shortfall or an unexpected accident, for example, in the case of purchasing food items without having enough income to purchase these items or contracting a chronic illness, than the savings amount saved from the previous period will be used. The accumulation of savings, if not all utilised in such cases as mentioned above, over time could therefore augment the overall income of the poor household. The impact of these accumulated savings can therefore affect the poverty status of the household through the total income (including savings accumulated) of the household.

3. Methodology

The study utilises two probability methodologies. Probability methodologies were employed in order to assess a more long term outlook of a household's potential savings behaviour on their poverty status. Also, one is able to observe the probability of (*"how far off"*) households that save are from the poverty line in the current period. The first methodology is known as the random effects Probit regression analysis and the second methodology is known as the mobility matrix.

In the first methodology the regression equation utilised is described below where poverty is impacted by current savings, past savings and the demographic characteristics of the household.

$$\text{Poverty}_m = \alpha \text{Savings}_t + \beta \text{Savings}_{t-1} + \mu_{\text{demographics}} \mathbf{X}_{\text{demographics}} + U_{it} \quad (2)$$

The demographic characteristics include the age, gender, race group and highest education level achieved by the household head, and the family size (these characteristics follow from the study conducted by Esson (2003) on the savings behaviour of the poor, although other demographics such as employment status can also be included into the study).

Each poverty measure will be tested in this equation where significant and robust results are expected to be obtained. It is important to note here that although each regression model run will provide a best-fit-model measure these measures are not the focus of the study and are therefore not compared. The purpose of the study is to observe whether each of these models provides a significant and negative relationship between savings and poverty. That is, the relationship between poverty and savings is insensitive to the different definitions (measures) of poverty and savings. The poverty and savings link can therefore be robustly established.

The mobility matrix, specifically the transition mobility matrix, is an additional methodology employed to assess the long run implications of current (and previous) savings behaviour on future poverty statuses of households. It is also used to compare and confirm the probabilities obtained from the first methodology. For a detailed discussion of mobility matrices please refer to Formby, Smith and Zheng (2004). The mobility matrix requires that the savings of the poor is divided into smaller savings groups. Additionally, those that changed poverty statuses from one period to the next can also be tracked and the impact of their savings on the change in their poverty statuses further revealed.

To test whether these results are robust the following measures are used:

$$S(\tilde{P}) = \frac{q - \text{trace}(P)}{q} \quad (3)$$

where P is the transition matrix, $S(P)$ is the mobility index, $S(\tilde{P})$ is the maximum likelihood estimator of $S(P)$ and q is the number of savings classes.

The interpretation of the estimator ranks the mobility of similar-sized matrices where one is perfect mobility (household savings increases/decreases and impacts the probability of their poverty statuses in the future) and zero is immobility [households do not change savings and therefore poverty statuses also remain stagnant] (Shorrocks 1978a).

The estimator is also extended for the analysis of households changing poverty statuses over time: poor in period one and non-poor in period two, and likewise for the reverse case. It is important to note that this index only has meaning if it is compared to another matrix, and on its own cannot provide much sense unless it is significance tested.

It follows that to test the significance of this index, the constructed Z-values taken from both Schluter (1998) and Jappelli and Pistaferri (2000) are:

$$Z_2 = \frac{S(\widehat{P}_t) - S(\widehat{P}_v)}{\sqrt{s.e. (S(\widehat{P}_t))^2 + (S(\widehat{P}_v))^2}} \sim N(0, 1) \quad (4)$$

Equation 4 determines whether the savings mobility of the poor and non-poor has an impact on their poverty statuses over time, and also whether the savings of those with changing poverty statuses is significant over time. Z_2 is known as the difference-of-means test value, consists of $S(\widehat{P}_t)$ the estimator of a transition matrix across time, and $S(\widehat{P}_v)$ denoting the estimator of a transition matrix across different poverty categories: poor and non-poor.

4. Data

The National Income Dynamics Surveys (NIDS) wave one (2008) and wave two (2010) were employed in the testing of the possible impacts of savings on poverty. A comparison of the savings of the poor, non-poor and households changing poverty statuses such as those moving out of poverty and those moving into poverty was briefly analysed.

The demographic characteristics of the household also shed light on the sample composition of the data e.g. the proportion of poor and non-poor males to poor and non-poor female household heads were compared. All income and expenditure amounts were deflated to September 2010 prices.

Table 2a: Descriptive Statistics of Poverty Statuses (%) of Poverty Line R502

<To be inserted>

**Below is a rough template of the table*

	Poor	Non-poor		Poor to Non-poor	Non-poor to Poor
Savings Class**					
1					
2					
3					
4					
5					

Both years a denotes 2008 and b denotes 2010 will be compared against each other e.g. 53^a, 64^b

Table 2b: Descriptive Statistics of Poverty Statuses (%) of Poverty Line R443

**Template same as above*

Table 2c: Descriptive Statistics of Poverty Statuses (%) of Poverty Line R614

**Template same as above*

Table 3a: Demographic Characteristics and Savings of Poor versus Non-poor Households (%) of Poverty Line R502

<To be inserted>

**Below is a rough template of the table*

		Poor					Non-poor				
Demographics of the Household	Savings Class**	1	2	3	4	5	1	2	3	4	5
	Age										
	Gender										
	Race/Population Group										
	Highest Education Level										
	Family Size										

Both years a denotes 2008 and b denotes 2010 will be compared against each other e.g. 53^a, 64^b

**Savings classes are to be decided: either quintiles or based on exogenously set boundaries derived from income data

Table 3b: Demographic Characteristics and Savings of Poor versus Non-poor Households (% of Poverty Line R443

**Template same as above*

Table 3c: Demographic Characteristics and Savings of Poor versus Non-poor Households (% of Poverty Line R614

**Template same as above*

5. Preliminary Results and Discussion

To be discussed in presentation: xtprobit

6. Conclusion

To be finalized

7. References

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