



EDWRG Working Paper Series
January 2022

**ECONOMIC DEVELOPMENT
AND WELL-BEING
RESEARCH GROUP**

Determinants of Subjective Poverty in Rural and Urban Areas of South Africa

Working Paper Number 02-2022

Santos Bila and Mduduzi Biyase

Cite this paper: Bila, S., & Biyase, M. (2022). Determinants of Subjective Poverty in Rural and Urban Areas of South Africa. *EDWRG Working Paper Number 02-2022*.

Determinants of Subjective Poverty in Rural and Urban Areas of South Africa

SANTOS BILA[†] MDUDUZI BIYASE[‡]

Abstract

This paper extends the investigation from objective to subjective poverty, an issue that has received inadequate attention in South Africa. The empirical analysis based on the fixed effects two-stage least squares (FE-2SLS) and Living Condition Survey (LSC) reveal that household size, being male, being married or divorced, holding primary and tertiary education are strong predictors of subjective poverty across sub-samples. However, the determinants of rural subjective poverty are slightly different to the determinants of urban subjective poverty. For example, owning a piece of land appear to be important in explaining poverty in the rural sample, contrary to the urban sample. Moreover, we find that health and unemployment are strong predictors of urban sample, while they are not significant for the rural sample. The results have important implications for policy intervention. It suggests that land is still an important component of diverse livelihoods for rural people and can assist rural emerging farmers to be involved in large-scale farming.

Keywords: Determinants, location, fixed effect instrumental variable and Subjective poverty

JEL Classification: D63 · I32 · I38

[†] University of Johannesburg, Department of Economics and Econometrics

[‡] Director of the Economic Development and Well-being Research Group (EDWRG) and is a senior lecturer at the School of Economics, University of Johannesburg, mbiyase@uj.ac.za

1. Introduction

National poverty rate in South Africa has remained stubbornly high regardless of the commitment and efforts by the policy makers to combat it. According to the stats SA figures, the number of poor people in 2015, was 30.3 million, up from 27.3 million individuals in 2011. Poverty has been at the top of the agenda for a very long time (since 1994) and retains its apartheid features. Most of the poor (regardless of the measure used) live in rural areas, dominated the historically disadvantaged population groups (Black, Coloured and Indians). Recent estimates (by stats SA, 2017) suggest that rural areas exhibit high poverty headcount ratio in the region of about 81.3% compared to urban areas where it is hovering at 40.7%. Although the literature on poverty in South African has investigated trends in objective poverty by geo-type (and other related dimensions), the results derived from such descriptive analysis are only suggestive. Such comparative (and descriptive) analysis only tell us that rural dwellers experience higher poverty rate than urban dwellers, without shedding light on the factors underpinning these differences.

Moreover, literature on poverty in South Africa (with the exception of Meth, 2006; Vermaak, 2012; Posel and Rogan 2014) have relied heavily on objective poverty measures (income and expenditure), ignoring other alternative measures (such as subjective measures). Objective poverty is commonly conceptualized as percentage of the population whose incomes are not enough to meet subsistence minimum (see Baran and Sweezy, 1966; Reutlinger and Selowsky, 1976). Poverty is then measured by linking “expenditure or income, to a money-metric poverty threshold” (Posel and Rogan 2013:2). Objective measures have been criticized for not accounting for differences in the extent of poverty in different communities, race groups and for ignoring factors (such as tax and social grants) that may significantly alter a household income (Deaton, 1997; Posel and Rogan 2014, Ravallion and Lokshin, 2001, Citro & Michael 1995). Blank (1997) points out that poverty measures are predominantly time-invariant and therefore unreflective of policy and socio-economic changes (such as variations in the composition of the labor force participation—increase in female involvement). Posel and Rogan (2014:2) write “In the South African context, for example, state-subsidised housing and access to basic services such as electricity and water will not be reflected in income or expenditure rates of poverty, but these may influence subjective assessments of economic well-being”.

This paper contributes to the existing literature on the determinants of poverty in South Africa in two ways. First, it empirically investigates the determinants of rural and urban subjective poverty, an issue that has received less attention in South Africa. A better understanding of the determinants of rural and urban subjective poverty is crucial because it can facilitate interventions targeted at the most subjectively poor areas, rather than assuming a one size fit all policies.

The second contribution of this paper is that it considers alternative measures of objective poverty in rural and urban areas of South Africa. While it is not possible to construct a perfect measure of poverty, some scholars (e.g. Ravallion and Lokshin, 2001) have suggested alternative measures (such as subjective poverty) that can be used to supplement objective measures. Subjective poverty involves asking people to form an opinion about their poverty status— indicate if they think they are poor or not poor. A forceful proponent of this view, Ravallion, 2012, has provided some justifications as to why this approach might add value to the measurement of objective poverty and the literature in general. The crux of Ravallion, (2012) argument is that subjective poverty measures can ameliorate the problems associated with using the objective poverty measures.

The remainder of the paper is organised as follows: Section 2 provides an empirical review of the extant studies. Section 3 discusses the methodology and data to be used. Section 4 discusses the empirical findings of the study. Lastly, section 5 presents the conclusion.

2. Review of subjective poverty determinants

What are the determinants of subjective poverty? As noted earlier, the extant literature on the determinants of poverty has predominantly looked at the objective measures (Biyase and Zwane, 2018; Chiquito and Lozano, 2017; Leow and Tan, 2019; Heshmati, et al. 2019; John and Alexander, 2020) without paying attention to the subjective measures. This section will attempt to shed some light on this emerging literature. In its simplest form, subjective poverty is conceptualised by asking people to form an opinion about their poverty status— indicate if they think they are poor or not poor. A forceful proponent of this measure, Ravallion, 2012, has provided some justifications as to why this approach might add value to the measurement of objective poverty and the literature in general. The crux of Ravallion, (2012) argument is that subjective poverty measures ameliorate the problems associated with using the objective poverty measures. Specifically, subjective poverty measures are not underpinned by the assumption

derived from objective measures (such as correct for adult equivalent scales) (Ravallion, 2012, Posel and Rogan 2014). In driving this point home, Posel and Rogan (2014:2) write “In the South African context, for example, state-subsidised housing and access to basic services such as electricity and water will not be reflected in income or expenditure rates of poverty, but these may influence subjective assessments of economic well-being”.

Household characteristics (income, household size) and individual characteristics (age, marital status, education, health status as well as employment status) have been shown to be key predictors of subjective poverty in this literature. For example, Empirical investigations regarding the association between income and subjective poverty have not yielded consistently negative associations between the two variables as expected. For example, while some studies do identify a negative association between income and subjective poverty (Mahmood et al, 2018 and Wang et al, 2020), others find a positive relationship (Burchardt, 2003; Herrera, 2006; Dolan et al, 2007). The controversies with reference to different results can be attributed to the varied dataset used and the adopted measures of subjective poverty (Mahmood, 2018). For example, Mahmood et al (2018) used Pakistan panel household survey (2010) data and self-assessed poverty measure and found evidence suggesting a negative and statistically significant relationship between subjective poverty and income. Similarly, Wang et al (2020) followed the same path using a representative Chinese household survey and MIQ to investigate poverty and subjective poverty in rural China. On the other hand, Ravallion and Lokshin used SWL and their results suggest that income increases welfare.

Many subjective poverty related studies have established that household size influences poverty. In particular, larger families have a higher probability of being subjectively poor than smaller families (Gustafsson and Yue, 2006; Mahmood et al, 2018). For instance, Gustafsson and Yue (2006) used MIQ to investigate the rural perception of poverty in China and concluded that an increase in household size is positively correlated with subjective poverty. Specifically, the highest poverty was reported in the household with eight and more household members, consistent with many studies' findings in this field. Several empirical works in this field have also controlled for age in their subjective poverty function (Frey and Stutzer, 2002; Ferrer-i-Carbonell and Gowdy, 2007; Wang, et al, 2020). These studies mostly find a concave effect of age and age square on subjective poverty (Gustafsson and Yue, 2006; Posel and Rogan, 2014 and Mahmood, 2018). For example, Posel and Rogan (2014) used a probit regression to investigate the extent to which a certain individual might feel poor and found that as the person gets old, the probability of that person being poor increases.

There are consistent findings affirming the importance of gender in explaining subjective poverty rates. For example, Colasanto (1984); Mangahas (2001); Ravallion et al (2013) found female-headed households are less prone to subjective poverty compared to their counterparts. This on the other hand contradicts the finding by Gumede (2021) who confirms the feminization of poverty, this is suspected to be due to different measures used. Mangahas (2001) found that in Filipino households with women as the head or headed by an old person have small probability of being poor. Ravallion et al (2013) also found similar results in their studies in Tajikistan, Guatemala, and Tanzania. These results are not universal. In his study, Deeming (2013), using an SWL approach and logistic model in the UK found that gender does not really matter in terms of enhancing subjective well-being.

Most studies find that, highly educated people are less likely to be poor than those that are less educated (see Frey and Stutzer, 2002; Lokshin, 2004; Posel and Rogan, 2014; Wang et al, 2020). For instance, Lokshin (2004) using the Consumption Adequacy Question (CAQ) employed an ordered probit model to investigate subjective welfare in Madagascar and found that households headed by an individual with no education were among the poorest. Likewise, Wang et al, (2020) used a National Representative Survey of rural household in China to investigate poverty and subjective poverty and found that households with less subjective poverty rates were those with higher levels of education.

3. Methodology and data source

To investigate the determinants of subjective poverty, the analysis employs data from the Living Conditions Survey (LCS) for South Africa. It is collected by Statistics South Africa (the official statistical agency). The LCS data were collected between September 2008 and August 2009 and October 2014 and October 2015, respectively. The LCS is demographically representative, containing information on subjective poverty, household asset ownership, health status, race, employment status, marital status, gender of the household members, age, education, household size, access to services and income and expenditure. The survey uses diary and recall methods and a questionnaire of seven modules and four modules to collect the data for the period of 2008/9 and 2014/15, respectively. The appealing of the data is that different from other poverty related datasets, it contains variable that allow asking a subjective feeling of poverty. In other words, it asks whether people feel poor or not.. Since the analysis focuses on the determinants that affect subjective poverty in different settlement types, apart from the full sample, we also segregate the data into two different sub-samples: rural and urban areas.

3.1. Variable description

To explore the determinants of subjective poverty, the study accounts for the most relevant variables suggested by the existing literature (Ravallion and Lokshin, 2002; Frey and Stutzer, 2002; Herrera, 2006; Posel and Rogan, 2014; Wang, et al, 2020) on the household and demographic characteristics that explain subjective poverty. Our dependent variable of interest is subjective poverty (measured by self-assessed poverty). This is captured by the following question: “Would you say you and your household are at present: wealthy; very comfortable; reasonably comfortable; just getting along; poor; or very poor?” For robustness check, we used an economic ladder question (ELQ) a measure used by several important scholars in this field (Easterlin, 2001; Frey and Stutzer, 2002; Bardasi and Francesconi, 2003; Winkelmann, 2004; Ravallion, 2012). In the living condition survey this question is framed as follows: “Please imagine a 9-step ladder where on the bottom, the 1st step, stand the poorest people, and on the highest step, the 9th, stand the rich. On which step would you consider you and your household to be?”.

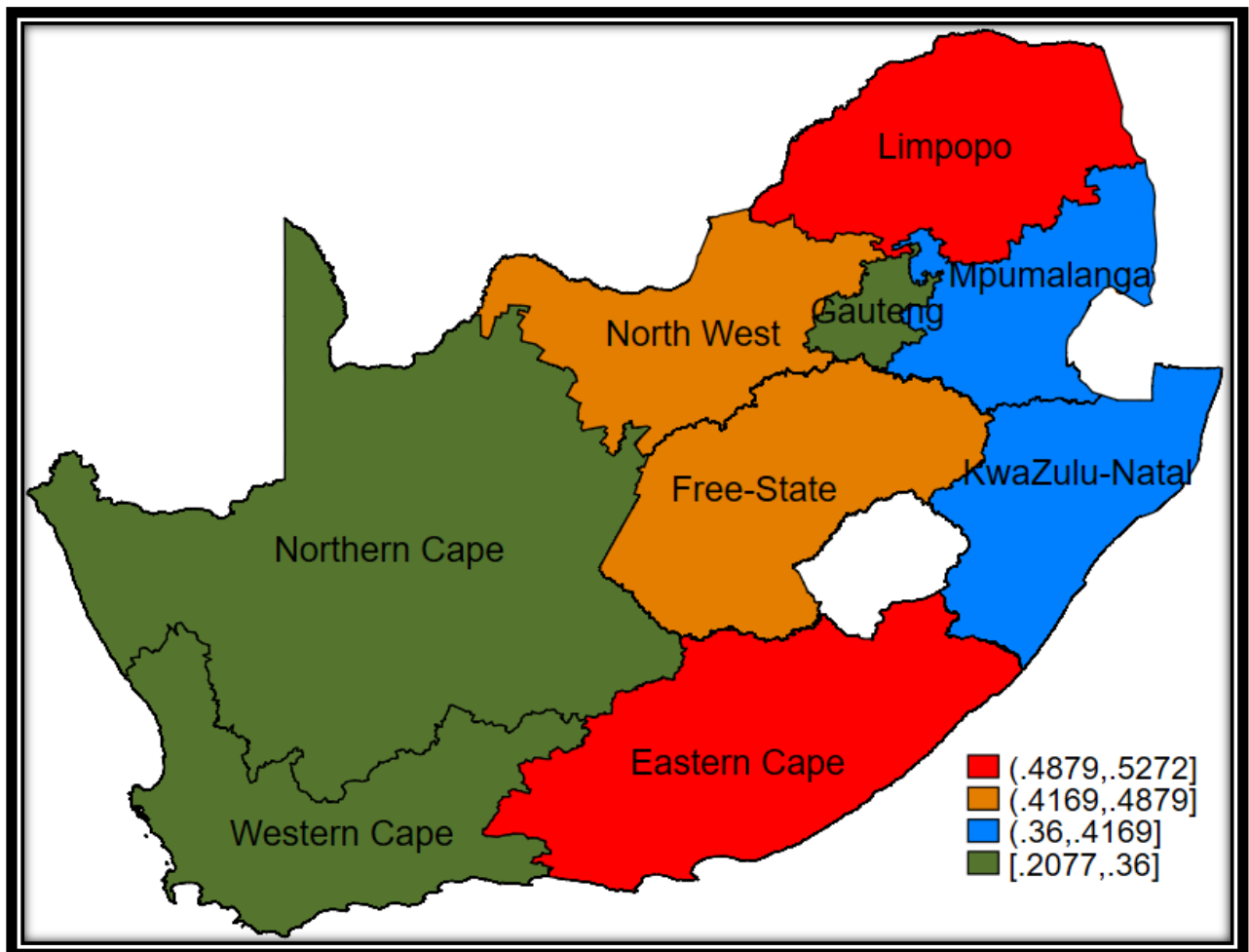
Although the above mentioned measures have been both used in the empirical analysis of subjective poverty, the former is a preferred formulation in this paper in so far as it is more direct compared to the latter one. As Posel and Rogan (2014:6) put it “The question does not require respondents to provide a relative assessment of their economic status and we also do not have to make assumptions about the association between ladder-rank and subjective poverty.”

The determinants included in the model are consistent with those used in the earlier studies on subjective poverty (Ravallion and Lokshin, 2002; Herrera, 2006; Posel and Rogan, 2014 and Wang, et al, 2020). They include: (1) economic factors (employment and income); (2) demographic and personality factors (age, household size, gender, race, marital status, assets, location, education, health, and province dummies), (see the Table 1 in the appendix). Figure 1 present the spatial distribution of subjective poverty for a pooled analysis. The results suggest that subjective poverty is relatively high in provinces such as Limpopo and Eastern Cape, varying from 49 per cent to 53 per cent.

On the other hand, Western Cape and Gauteng also appear to have lower levels of subjective poverty, with poverty ranging from 21 per cent to 36 per cent, respectively, consistent with the objective poverty measures. Table 2 shows the summary stats of the variables used in the analysis. As is clear from the table, respondents had to choose from seven answer options. The

percentage distributions of answers were as follows: ‘wealthy’ (0.32%); ‘very comfortable’ (3.00%) ; ‘reasonably comfortable’ (14%); ‘just getting along’ (44%); ‘poor’ (28%) ; or ‘very poor’ (9.8%). The economic ladder question and the responses categories are used for robustness check as noted earlier. The percentage distributions suggest that Poorest is (17.2%) ‘2sd’ (18.32%) ‘3rd’ (21.9%) ‘4th’ (21.17%) ‘5th’ (13.76%) ‘6th’ (4.45%) ‘7th’ (2.12%) ‘8th’ (0.5%) ‘Rich’ (0.54%). As regards the demographic factors, the table shows that gender composition is mostly in line with existing studies, with 54.4 % females compared to 45.6% males. Race dummies, comparing the largest population group Africans (81.6%) with smaller ones (minorities), such as Coloured (1.3%) indians (11%), Whites (5.4 %).

FIGURE 1: SUBJECTIVE POVERTY DISTRIBUTION ACROSS SA PROVINCES, 2008



Source: Author’s calculations based on the LCS dataset

TABLE 2: SUMMARY STATS

VARIABLES	Mean/%	Std	Min	Max					
<i>Household characteristics</i>									
Loginc	10.65	1.211	2.565	15.89					
Access to land	0.098	0.298	0	1					
Hhsize									
<i>Respondents characteristics</i>									
Age	4.115	0.692	1	28					
36-48	0.152	0.359	0	1					
49-59	0.086	0.281	0	1					
60+	0.083	0.276	0	1					
Agesq	1,175	1,452	0	10,609					
Male	0.456	0.498	0	1					
Female	0.544	0.489	0	1					
NMarried	0.474	0.499	0	1					
Married	0.157	0.364	0	1					
Divorced	0.023	0.146	0	1					
Widowed	0.053	0.224	0	1					
No.school	0.064	0.244	0	1					
Peduc	0.281	0.449	0	1					
Seduc	0.28	0.449	0	1					
Matric	0.1	0.3	0	1					
Teduc	0.022	0.147	0	1					
African	0.816	0.388	0	1					
Coloured	0.013	0.115	0	1					
Indian	0.117	0.322	0	1					
White	0.054	0.226	0	1					
Unemployed	0.052	0.222	0	1					
Health	0.205	0.404	0	1					
<i>Location</i>									
Rural	0.422	0.494	0	1					
Urban	0.578	0.494	0	1					
WC	0.116	0.32	0	1					
EC	0.138	0.345	0	1					
NC	0.057	0.231	0	1					
NW	0.08	0.272	0	1					
GP	0.139	0.346	0	1					
LP	0.125	0.331	0	1					
MP	0.099	0.299	0	1					
FS	0.085	0.279	0	1					
KZN	0.16	0.366	0	1					
<i>Instruments</i>									
SocG	0.2	0.4	0	1					
GoverG	0.036	0.186	0	1					
<i>Dependent variables</i>									
ELQ	Poorest	2sd	3rd	4th	5th	6th	7th	8th	Rich
Percentage	17.2	18.32	21.9	21.17	13.76	4.45	2.12	0.5	0.54

SAP	Wealthy	Very comfortable	Reasonably comfortable	Just getting along	Poor	very poor
Percentage	0.32	3.00	14.62	44.1	28.16	9.81

3.2 Model specification

This section will delve into the estimation of the determinants on subjective poverty in SA. Given the binary nature of our dependent variables in this study, we use a random effect probit framework to model the probability of a certain household falling into subjective poverty. Let the latent model of subjective poverty be specified as follows:

$$Y_{it}^* = \beta X_{it}' + \varepsilon_{it} \quad i = 1, 2, \dots, N; \quad t = 1, \dots, T, \quad (1)$$

$$\varepsilon_{it} = c_i + u_{it}, \quad (2)$$

Where Y_{it}^* is a latent dependent variable; Y_{it} is the observed binary outcome variable defined as

$$y_{it} = \begin{cases} 1 & \text{if } Y_{it}^* > 0; \\ 0, & \text{otherwise.} \end{cases} \quad (3)$$

In equation (1) the subscripts i and t show a certain household at time t . β is a vector of coefficients or variation given a vector of explanatory variables. ε_{it} is a composite error term (see equation 2) which can be decomposed into c_i , a term denoting unobserved individual heterogeneity effect and $u_{it} \sim IN(0, \sigma_c^2)$, a random error term. Furthermore, the likelihood function can be marginalised if that is conditional on the X_{it} , the unobserved individual heterogeneity term is also normally distributed with $c_i \sim IN(0, \sigma_c^2)$ and is independent of the X_{it} and u_{it} .

If we assume that the distribution of the latent variable Y^* , conditioned on c_i is independent normal (Heckman, 1981), the vector of parameters β s can be easily estimated. Hence,

$$\Pr(Y_{it} = 1 | c_i, X_{it}) = \Pr\left(\frac{u_{it}}{\sigma_u} > \frac{-\beta X_{it} - c_i}{\sigma_u}\right) = \Phi(v_{it}) \quad (4)$$

Where

$$v_{it} = -(\beta X_{it}' + c_i) / \sigma_u, \quad (5)$$

And Φ represents the distribution function of the standard normal variate. Therefore, the likelihood function to be maximised which was assumed to be with respect to c is given by

$$\Pi_i \left\{ \int_{-\infty}^{\infty} \prod_{t=1}^T \left[1 - \Phi(\beta^* X'_{it} + \sqrt{\frac{\gamma}{1-\gamma}} c^*) \right]^{1-Y_{it}} \right\} \times \left\{ \left[\Phi(\beta^* X'_{it} + \sqrt{\frac{\gamma}{1-\gamma}} c^*) \right]^{1-Y_{it}} \Phi(c^*) dc^* \right\},$$

(6)

Where $\beta^* = \beta/\sigma_u$ and $c_i = c_i/\sigma_u$.

3.3 Endogeneity issues

It is conceivable that some of the explanatory variables (e.g., income) might be endogenous. We attempt to take care of endogeneity of income arising from the causality bias using fixed effect instrumental variable, as suggested by Amemiya (1978) and Newey (1987). In the fixed effect instrumental variable model, the challenge is to identify the instruments that satisfy the validity conditions. In other words, if a certain instrument F_1 is available, for it to be valid it must meet two fundamental conditions, as follows: $E(T; Y) = 0$ and the $E(T; X) \neq 0$. On the one hand, this simply means that the covariance between the instrument and the dependent variable must be zero, implying that both are not correlated. On the other hand, the covariance between the instrument and the endogenous variable should be different from zero, which means they must be correlated. (Wooldridge, 2002; Murray, 2006). Nonetheless, in this study we use social benefits as an instrument for income as suggested by Andriopoulou and Tsakloglou (2011). Led by the availability of the data, we divide social benefits into two instruments, those that include social relief³ and government benefits.

Therefore, equation (1) can be written as shown below⁴.

$$X_{it} = \tau_k \sum_{j=1}^n F_{it} + \epsilon_{it} , \quad (1a)$$

$$Y_{2it} = \sum_{j=1}^n \Pi_k X_{1it} + v_{it} , \quad (1b)$$

Where, in equation (1a) X_{it} is the endogenous variable, F_{it} is a set of instrumental variables and other explanatory variables. In equation (1b) X_{1it} is a vector of the equation (1a) regression's residual and all the explanatory variables of equation (1) τ it's a vector of other structural parameters. $\Pi(k=1, \dots, m)$ are matrices of parameters, by assumption normally distributed.

³ The questions of these variables are asked in question 6.II and 4.2a in the LCS questionnaire, 2008/9 and 2014/15, respectively.

⁴ The explanatory variables are the same as in the random effect probit model.

4 Empirical Results

4.1 Stepwise regression estimates: random effect probit

Table 3 below reports the results of the random effect probit estimates of the determinants of subjective poverty. The estimates are first displayed for the entire sample and then split into subsamples (rural and urban). Initially model (1) of Table 3 reports the estimated coefficient of income and sequentially incorporating covariates into the model that are important in explaining subjective poverty.

The estimated coefficients of most variables (across the models: Model 1 to model 4) are broadly consistent and collaborate the findings of previous studies in this field in particular and literature on poverty using objective measures, see for example (Biyase and Zwane, 2017). Expectedly, we find that subjective poverty is determined by household income, household size, access to land, sex, education, race dummies, employment status, self-reported health status, location and provincial dummies. Model (1) of Table 3 reports the estimated coefficient of income. Consistent with previous work (Ravallion and Lokshin, and; Wang et al, 2020), we find that household income, is a negative and a significant predictor of subjective poverty ($\beta = -0.45$; $T = -152$). Model 2 of Table 3 is similar to model 1 except that it adds access to land and household size variables. We find that having access to land enters with a positive sign, while household size enters with the expected sign and significantly related to subjective poverty ($\beta = 0.07$; $T = 68$), echoing the findings obtained by Mahmood et al (2018) that household size increased subjective poverty in Russia. Interestingly, incorporating these variables does not seem to materially affect the income-subjective poverty nexus.

Model 3 incorporates the respondents' characteristics (i.e., age, gender, education, race, self-assessed health, and employment status). Most of these variables are significant and carry an expected sign, except for marital status (being married and divorced are not significant). Specifically, the coefficients of the other determinants of subjective poverty, such as age category: 36-48 and 49-59 ($\beta = 0.05$; $T=3.6$ and $\beta = 0.07$; $T=3.5$), being male ($\beta = 0.04$; $T=5.3$), and race dummies ($\beta = -0.42$, $T=-35.17$; $\beta = -0.58$, $T=-15.3$; $\beta = -0.66$, $T=-23.54$) are mostly in line existing studies (Ravallion and Lokshin (nd); Posel and Rogan, 2014 and Wang, et al, 2020).

TABLE3: RANDOM EFFECT PROBIT ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY IN SA

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Spoverty	Std.Err	Spoverty	Std.Err	Spoverty	Std.Err	Spoverty	Std.Err
<i>Household Characteristics</i>								
Loginc	-0.456***	(0.003)	-0.523***	(0.004)	-0.444***	(0.004)	-0.432***	(0.004)
Access to land			0.109***	(0.014)	0.066***	(0.014)	0.025*	(0.015)
Hhsize			0.068***	(0.001)	0.057***	(0.001)	0.056***	(0.001)
<i>Respondents Characteristics</i>								
Age								
36-48					0.046***	(0.013)	0.050***	(0.013)
49-59					0.074***	(0.021)	0.075***	(0.021)
60+					-0.078**	(0.033)	-0.091***	(0.033)
Agesq					0.000***	(0.000)	0.000***	(0.000)
Male					0.037***	(0.007)	0.039***	(0.007)
Lparter					0.038***	(0.011)	0.022**	(0.011)
Married					-0.257***	(0.014)	-0.288***	(0.014)
Widowed					-0.029	(0.018)	-0.061***	(0.018)
Divorced					0.024	(0.025)	-0.008	(0.025)
Peduc					0.109***	(0.010)	0.097***	(0.010)
Seduc					0.034***	(0.009)	0.030***	(0.009)
Matric					-0.160***	(0.013)	-0.146***	(0.013)
Teduc					-0.392***	(0.033)	-0.394***	(0.033)
Coloured					-0.422***	(0.012)	-0.453***	(0.016)
Indians					-0.583***	(0.038)	-0.452***	(0.038)
White					-0.659***	(0.028)	-0.666***	(0.029)
Health					-0.026***	(0.010)	-0.035***	(0.010)
Unemployed					0.136***	(0.013)	0.149***	(0.013)
<i>Settlement type</i>								
Rural							0.092***	(0.009)
<i>Location</i>								
EC							0.213***	(0.018)
NC							-0.006	(0.019)
FS							-0.066***	(0.019)
KZN							-0.209***	(0.018)
NW							0.014	(0.019)
GP							-0.085***	(0.018)
MP							-0.192***	(0.019)
LP							-0.042**	(0.019)
Constant	4.578***	(0.033)	4.986***	(0.040)	4.166***	(0.044)	4.074***	(0.049)
Observations	198,827		145,756		145,756		145,756	

Robust standard errors in parentheses. *

** p<0.01, ** p<0.05, * p<0.1.

Education coefficient is of interest, as it suggests that highly educated individuals are less likely to experience subjective poverty: primary education ($\beta = 0.11$, $T=10.9$), secondary education ($\beta = 0.03$, $T=3.78$), Matric ($\beta = -0.160$, $T=-12.31$), Tertiary education $\beta = -0.39$, $T=-11.88$). The last model (4) which controls for location, mostly presents negative and significant estimates on provincial dummies. In particular, we find that, compared to Western Cape (used as reference category), households living in other provinces such as Eastern Cape and Northern Cape are

more likely to suffer from subjective poverty, implying that these rural provinces should continue to be a major focus of poverty alleviation efforts in South Africa.

Are the determinants of subjective poverty shared in the rural and urban areas of South Africa? To answer this question, we split the sample into rural and urban sub-samples (rural and urban) and the results are presented in Tables 4 and 5 below. The estimates of these subsamples are somewhat different from each other (rural different from urban sample), confirming the importance of distinguishing between the two samples in South Africa. Distinguishing between the determinants of rural and urban areas seem to provide some nuances and useful insights.

TABLE 4: RANDOM EFFECT PROBIT ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (SAP) IN RURAL AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household Characteristics</i>								
Loginc	-0.385***	(0.005)	-0.485***	(0.007)	-0.446***	(0.007)	-0.440***	(0.007)
Access to land			0.025	(0.016)	0.023	(0.017)	0.020	(0.017)
Hhsize			0.055***	(0.002)	0.053***	(0.002)	0.055***	(0.002)
<i>Respondents Characteristics</i>								
Age								
36-48					0.058***	(0.020)	0.063***	(0.020)
49-59					0.102***	(0.030)	0.104***	(0.031)
60+					0.034	(0.047)	0.017	(0.047)
ages					0.000**	(0.000)	0.000***	(0.000)
Male					0.026**	(0.011)	0.023**	(0.011)
Lpartner					-0.027	(0.017)	-0.041**	(0.017)
Married					-0.340***	(0.022)	-0.386***	(0.022)
Widowed					-0.048*	(0.026)	-0.093***	(0.026)
Divorced					0.179***	(0.041)	0.120***	(0.042)
Peduc					0.064***	(0.013)	0.044***	(0.014)
Seduc					-0.008	(0.014)	-0.025*	(0.014)
Matric					-0.216***	(0.022)	-0.204***	(0.022)
Teduc					-0.382***	(0.059)	-0.399***	(0.060)
Coloured					-0.236***	(0.038)	-0.301***	(0.058)
Indian					-0.323*	(0.184)	-0.198	(0.185)
White					-0.592***	(0.089)	-0.629***	(0.090)
Health					-0.074***	(0.015)	-0.080***	(0.015)
Unemployed					0.134***	(0.020)	0.139***	(0.020)
<i>Location</i>								
EC							0.267***	(0.071)
NC							0.151**	(0.070)
FS							-0.018	(0.076)
KZN							-0.217***	(0.071)
NW							0.040	(0.071)
GP							-0.046	(0.089)
MP							-0.124*	(0.071)
LP							-0.015	(0.070)
Constant	3.969***	(0.053)	4.754***	(0.068)	4.360***	(0.072)	4.327***	(0.101)
Observations	85,794		60,457		60,457		60,457	

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1
 Note: The dependent variable is the self-assessed poverty (SAP)

As displayed in Models 1 to 4 of Table 4 and 5, for rural and urban samples, household income, is still a negative and a significant predictor of subjective poverty ($\beta = -0.39$; T=77) ($\beta = -0.46$, T=114), respectively, findings that are echoed in many previous studies. As for the rural and urban samples, the results in Model 1 to 4 of Table 5 prove yet again that household income is an important predictor of subjective poverty — negatively related to subjective poverty. However, having access to land does not seem to be related with subjective poverty for the rural sample, a somewhat surprising finding. Other remaining coefficients mostly resemble the ones obtained in the full sample and urban sample.

TABLE 5: RANDOM EFFECT PROBIT ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY IN URBAN AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household Characteristics</i>								
Loginc	-0.456***	(0.004)	-0.508***	(0.005)	-0.427***	(0.005)	-0.428***	(0.005)
Access to land			0.120***	(0.031)	0.065**	(0.031)	0.048	(0.031)
Hhsize			0.069***	(0.002)	0.058***	(0.002)	0.059***	(0.002)
<i>Respondents Characteristics</i>								
Age								
36-48					0.038**	(0.018)	0.035*	(0.018)
49-59					0.051*	(0.029)	0.044	(0.029)
60+					-0.187***	(0.047)	-0.193***	(0.047)
agesq					0.000***	(0.000)	0.000***	(0.000)
Male					0.049***	(0.010)	0.050***	(0.010)
Lparter					0.064***	(0.014)	0.064***	(0.014)
Married					-0.221***	(0.018)	-0.227***	(0.018)
Widowed					-0.057**	(0.025)	-0.058**	(0.025)
Divorced					-0.070**	(0.033)	-0.082**	(0.033)
Peduc					0.155***	(0.014)	0.153***	(0.014)
Seduc					0.084***	(0.013)	0.080***	(0.013)
Matric					-0.107***	(0.017)	-0.105***	(0.017)
Teduc					-0.374***	(0.040)	-0.374***	(0.040)
Coloured					-0.411***	(0.013)	-0.459***	(0.017)
Indians					-0.561***	(0.038)	-0.511***	(0.039)
White					-0.636***	(0.030)	-0.661***	(0.031)
Health					0.015**	(0.013)	0.000	(0.013)
Unemployed					0.154***	(0.017)	0.156***	(0.017)
<i>Location</i>								
EC							0.199***	(0.021)
NC							-0.039*	(0.021)
FS							-0.056***	(0.020)
KZN							-0.126***	(0.021)
NW							0.035	(0.024)
GP							-0.075***	(0.018)
MP							-0.242***	(0.025)
LP							0.044	(0.036)

Constant	4.470***	(0.043)	4.739***	(0.052)	3.854***	(0.058)	3.916***	(0.061)
Observations	113,033		85,299		85,299		85,299	

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

Surprisingly, we find a positive and significant association between having access to land and subjective poverty for the urban sample. But the level of significance changes once we control for all the other predictors (see Model 4), suggesting that estimated coefficient of this variable could have been biased (to a certain extent) by not controlling for the other variables in the analysis. The rest of the other urban estimated parameters are largely consistent with the full sample estimates. Similar to the full sample, subjective poverty is mostly influenced by household size, gender, education, race dummies, employment status, self-accessed health status and provincial dummies, across the models.

4.2 Stepwise regression estimates: FE-2SLS

To account for the potential feedback relationship between subjective poverty and income (endogeneity bias), we estimate the corresponding results of the determinants of subjective poverty using FE-2SLS estimator. We first performed different post-estimation specification tests, to check if the results are contaminated. These include the Anderson canon test (with the null hypotheses suggesting that the instruments are weak); the Sargan test of identification (with the null hypotheses of the model being exactly identified); and finally, the Hausman test of endogeneity of the regressors (with null hypothesis of no endogeneity).

The results reveal that the Hausman test chi square p-value is statistically significant across all the samples. Thus, we reject the null hypotheses that the income is exogenous, and therefore an IV technique was required. Furthermore, the Sargan test exhibits chi-square p-value statistically significant for the full and rural sample. This implies that we reject the null hypotheses of the exact identification of the model.

TABLE 6: FE-2SLS ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (SAP) IN SA

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household Characteristics</i>								
Loginc	0.066**	(0.031)	-0.375***	(0.028)	-0.498***	(0.032)	-0.520***	(0.031)
Access to land			-0.056***	(0.008)	-0.081***	(0.014)	-0.033***	(0.011)
Hhsize			0.037***	(0.005)	0.049***	(0.009)	0.054***	(0.009)
<i>Respondents Characteristics</i>								
Age								
36-48					0.070**	(0.030)	0.069**	(0.030)
49-59					0.060	(0.057)	0.058	(0.058)
60+					-0.072	(0.093)	-0.069	(0.096)
agesq					0.000**	(0.000)	0.000**	(0.000)
Male					0.059***	(0.022)	0.055***	(0.019)
Lparter					0.064***	(0.015)	0.079***	(0.018)
Married					0.140***	(0.026)	0.151***	(0.030)
Widowed					0.060***	(0.014)	0.075***	(0.015)
Divorced					0.053***	(0.007)	0.051***	(0.007)
Peduc					-0.106***	(0.025)	-0.106***	(0.026)
Seduc					-0.092***	(0.027)	-0.103***	(0.031)
Matric					0.015	(0.018)	0.005	(0.019)
Teduc					0.232***	(0.028)	0.230***	(0.023)
Coloured					0.050**	(0.021)	-0.018*	(0.011)
Indians					0.220***	(0.035)	0.213***	(0.028)
White					0.467***	(0.055)	0.429***	(0.051)
Health					0.035***	(0.003)	0.025***	(0.002)
Unemployed					-0.099***	(0.029)	-0.110***	(0.026)
<i>Settlement type</i>								
Rural							-0.132	(0.017)
<i>Location</i>								
EC							-0.008	(0.013)
NC							-0.140***	(0.013)
FS							-0.129***	(0.010)
KZN							-0.127***	(0.011)
NW							-0.048***	(0.005)
GP							0.001	(0.004)
MP							-0.086***	(0.017)
LP							-0.080***	(0.016)
Constant	-0.309	(0.329)	4.281***	(0.308)	5.416***	(0.297)	5.751***	(0.297)
Observations	198,827		145,756		145,756		145,756	
Anderson Canon	225.304	(0.000)						
Sargan Statistic	18.707	(0.000)						
Hausman (endogeneity)	137.519	(0.000)						

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the self-assessed poverty (SAP)

Moving from random effect probit to FE-2SLS affected the estimated coefficients of certain variables. For example, while the estimated coefficient of income remains negative and

significant, its magnitude is now smaller. Implying that the estimates derived from the random effect probit overstate the effect of income. Other determinants of subjective poverty also changed after controlling for endogeneity. For example, in model 3 Table 6, we observe that access to land, age (49-59 and 60+), marital status (widowed and divorced), education, belonging to any population group, and health status are different from the random effect estimates. Although age, being widowed or divorced and holding matric seem to have maintained their signs, their level of significance suggests that their important role in explaining subjective poverty in SA has changed.

Given that the determinants of subjective poverty vary by location, we also controlled for endogeneity in the rural and urban sub-samples. The results are summarised in Tables 8 and 9 below. The empirical analysis based on the FE-2SLS reveals that household size, being male, being married or divorced, having completed primary and tertiary education are still strong predictors of subjective poverty across sub-samples (rural and urban).

TABLE 7: FE-2SLS ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (SAP) IN RURAL AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household Characteristics</i>								
Loginc	0.016	(0.038)	-0.249***	(0.019)	-0.420***	(0.029)	-0.352***	(0.038)
Access to land			0.003	(0.008)	-0.027***	(0.009)	-0.015	(0.012)
Hhsize			0.027***	(0.004)	0.043***	(0.007)	0.038***	(0.007)
<i>Respondents Characteristics</i>								
Age								
36-48					0.078***	(0.018)	0.067***	(0.017)
49-59					0.074*	(0.040)	0.066*	(0.035)
60+					0.037	(0.063)	0.027	(0.053)
agesq					0.000***	(0.000)	0.000***	(0.000)
Male					0.042***	(0.016)	0.033**	(0.015)
Lparter					0.014	(0.021)	0.005	(0.019)
Married					0.011	(0.024)	-0.032	(0.026)
Widowed					0.025	(0.017)	0.006	(0.015)
Divorced					0.067***	(0.011)	0.047***	(0.011)
Peduc					-0.033**	(0.016)	-0.025	(0.018)
Seduc					-0.031	(0.020)	-0.029	(0.023)
Matric					-0.007	(0.013)	-0.022*	(0.012)
Teduc					0.156***	(0.041)	0.090**	(0.044)
Coloured					-0.002	(0.018)	-0.049**	(0.024)
Indians					0.195***	(0.031)	0.178***	(0.036)
White					0.361***	(0.030)	0.236***	(0.041)
Health					-0.009	(0.008)	-0.014	(0.010)
Unemployed					-0.021	(0.021)	-0.004	(0.019)
<i>Location</i>								
EC							0.062***	(0.015)
NC							0.035***	(0.011)
FS							-0.007	(0.026)
KZN							-0.092***	(0.010)
NW							0.017	(0.016)
GP							0.027	(0.029)

MP							-0.026	(0.025)
LP							-0.020	(0.019)
Constant	0.332	(0.389)	2.952***	(0.181)	4.588***	(0.259)	3.940***	(0.350)
Observations	85,794		60,457		60,457		60,457	
Anderson Canon	55.487	(0.000)						
Sargan Statistic	74.171	(0.000)						
Hausman (endogeneity)	8.441	(0.003)						

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the self-assessed poverty (SAP)

However, we find the determinants of rural subjective poverty to be slightly different to the determinants of urban subjective poverty. For example, contrary to the urban sample, owning a piece of land appears to be important in explaining poverty (statistically significant) in the rural sample. Moreover, we find that health and unemployment variables are strong predictors in the urban sample, while they are not significant for the rural sample.

TABLE 8: FE-2SLS ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (SAP) IN URBAN AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household Characteristics</i>								
Loginc	-0.378***	(0.045)	-0.285***	(0.022)	-0.399***	(0.030)	-0.403***	(0.027)
Acess to land			-0.006	(0.009)	-0.031	(0.019)	-0.022	(0.016)
Hhsize			0.030***	(0.003)	0.042***	(0.008)	0.043***	(0.008)
<i>Respondents Characteristics</i>								
Age								
36-48					0.047	(0.030)	0.048*	(0.029)
49-59					0.043	(0.051)	0.045	(0.050)
60+					-0.113	(0.082)	-0.107	(0.081)
agesq					0.000**	(0.000)	0.000**	(0.000)
Male					0.045***	(0.016)	0.044***	(0.015)
Lpartner					0.081***	(0.013)	0.084***	(0.013)
Married					0.122***	(0.025)	0.123***	(0.025)
Widowed					0.056***	(0.011)	0.065***	(0.012)
Divorced					0.031***	(0.008)	0.032***	(0.007)
Peduc					-0.086***	(0.024)	-0.084***	(0.025)
Seduc					-0.086***	(0.029)	-0.089***	(0.030)
Matric					-0.014	(0.017)	-0.016	(0.018)
Teduc					0.140***	(0.016)	0.138***	(0.013)
Coloured					-0.037***	(0.010)	-0.051***	(0.008)
Indians					0.082***	(0.020)	0.093***	(0.018)
White					0.280***	(0.038)	0.269***	(0.033)
Health					0.033***	(0.004)	0.028***	(0.003)
Unemployed					-0.092***	(0.025)	-0.088***	(0.022)
<i>Location</i>								
EC							0.022**	(0.010)
NC							-0.122***	(0.013)
FS							-0.103***	(0.008)
KZN							-0.072***	(0.007)
NW							-0.047***	(0.004)

GP							-0.006	(0.004)
MP							-0.104***	(0.013)
LP							-0.002	(0.027)
Constant	4.477***	(0.494)	3.353***	(0.240)	4.441***	(0.288)	4.521***	(0.262)
Observations	113,033		85,299		85,299		85,299	
Anderson Canon	239.188	(0.000)						
Sargan Statistic	2.233	(0.1351)						
Hausman (endogeneity)	87.00	(0.000)						

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the self-assessed poverty (SAP)

In summary, the empirical analysis based on the FE-2SLS and LCS reveal that household size, being male, being married or divorced, having completed primary and tertiary education are strong predictors of subjective poverty across sub-samples (rural and urban). However, we find the determinants of rural subjective poverty to be slightly different to the determinants of urban subjective poverty. For example, contrary to the urban sample, owning a piece of land appears to be important in explaining poverty (statistically significant) in the rural sample. Moreover, we find that health and unemployment variables are strong predictors in the urban sample, while they are not significant for the rural sample.

4.3 Robustness check

We performed some robustness check on the determinants of subjective poverty. Specifically, we replaced the subjective measure of poverty with an alternative measure, namely, economic ladder question, a measure used by several important scholars in this field (Easterlin, 2001; Frey and Stutzer, 2002; Bardasi and Francesconi, 2003; Winkelmann, 2004; Ravallion, 2012). The question is usually framed as follows: “Please imagine a 9-step ladder where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the rich. On which step consider you and your household to be?⁵” (Ravallion and Lokshin, 1998). Tables (9, 10 and 11) in the appendix, show the estimated results and again split the sample into rural and urban. Reassuringly, the robustness estimates of the determinants of subjective poverty for the full sample are mostly consistent with the earlier estimates and therefore not too sensitive to this alternative measure of subjective poverty. The estimates again do not alter in any significant way after splitting the sample, confirming our results concerning the suitability of the alternative variables used.

⁵ In this study it takes a value of 1 if the household belongs to the first and second ladder and 0 otherwise.

5 Concluding remarks

Although literature on poverty in South Africa has investigated trends in objective poverty by geo-type (and other related dimensions), the results derived from such descriptive analyses are only suggestive. This study extends the investigation from objective poverty to subjective poverty, an issue that has received inadequate attention in South Africa. This paper also deals with these discrepancies by investigating the determinants of rural and urban poverty using appropriate statistical analysis. These supreme objectives of this study are assessing the determinants of subjective poverty in South Africa based on the full sample and to evaluate the determinants of subjective poverty in rural and urban areas of South Africa.

The empirical analysis, based on the FE-2SLS and Living Condition Survey (LCS), reveals that household size, being male, being married or divorced, having completed primary and tertiary education, are strong predictors of subjective poverty across sub-samples (of rural and urban). However, we find the determinants of rural subjective poverty to be slightly different to the determinants of urban subjective poverty. For example, owning a piece of land appears to be important in explaining poverty (statistically significant) in the rural sample, in contrast to the urban sample. Moreover, we find that health and unemployment variables are strong predictors of in the urban sample, while they are not significant for in the rural sample. The results derived from this thesis have important and broader implications for policy intervention. It suggests that land is still an important component of diverse livelihoods for people living in rural areas and can assist rural emerging farmers who want to be involved in large-scale farming.

References

- Aliber, M. (2003). Chronic Poverty in South Africa: Incidence, Cause and Policies. *Word Development*. Vol. 31, No. 3, pp. 473-490.
- Amemiya, T. (1978). The estimation of a simultaneous equation generalised probit model. *Journal of the Econometrics Society*, Vol.46 no.5: 1193–1205.
- Arize, J. F and Retejec, A. (2020). Descomposicion y determinantes de la pobreza monetaria urbana en Colombia. Un estudio a nivel ciudades. *Estudios Gerenciales*, Vol. 36, N. 155. Pp 167-176.
- Biyase, M and Zwane, T. (2018). An Empirical Analysis of the determinants of poverty and household welfare in South Africa. *The Journal of Developing Areas*, vol. 52, pp 115-130.
- Borjas, G. (2009). *Labour Economics*. 5th edition. New York: McGraw-Hill Companies, Inc.
- Buttler, F. (2013). *What determines subjective poverty? An evaluation of the link between relative income poverty measures and subjective economic stress within the EU*. Preprints of the DFG Research Unit “Horizontal Europeanization”. Pp 28.
- Carletto, G. and Zezza, A. (2006). Being Poor, Feeling Poorer: Combining Objective and Subjective Measures of Welfare in Albania. *Journal of Development Studies* 42(5): 739-760.
- Chiquito, D. M and Lozano, C. (2017). Determinants of rural poverty in Ecuador 2007-2014: An estimate of probit models. *Revista Electronica de investigacion en ciencias economicas abriendo camino al conocimiento*, vol 50, pp 38-53.
- Colasanto, D., Kapteyn, A. J., and van der Gaag, J. (1983). Two Subjective Definitions of Poverty: Results From the Wisconsin Basic Needs Study. *The Journal of Human Resources*, vol.19, No.1. pp 127-138.
- De Lannoy, A; Leibbrandt, M and Frame, E. (2015). *A Focus on youth: An opportunity to disrupt the intergenerational transmission of poverty*. NDP, 2030. SALDRUS. Pp 22-33
- De Vos, K. and Garner, T. I. (1991). An evaluation of subjective poverty definitions: Comparing Results from the U.S. and the Netherlands. *Review of Income and Wealth Series*, 37(3): 267-285.
- Deeming, C. (2013). Addressing the social determinants of subjective wellbeing: The Latest challenge for social policy. *Journal of Social Policy*, 42(3), 541–565.
- Diener, E; Lucas, R.E and Oishi, S. (2018). *Advances and Open Questions in the Science of Subjective Well-Being*. University of California. Collabra, psychology, pp 1-78.
- Du, Toit, A. (2017). Explaining the Persistence of rural poverty in South Africa. Addis Ababa. Pp 1-10
- Easterlin, R. (2001). Income and Happiness: Towards a Unified Theory. *The Economic Journal*, 111 (July): 465-484.
- Filandri, M; Pasqua, S; Struolino, E. (2019). Being Working Poor or Feeling Working Poor? The Role of Work Intensity and Job Stability for Subjective Poverty. *Social Indicators Research*, , ISSN 1573-0921, Springer, Dordrecht, Vol. 147, pp 781-803. <https://doi.org/10.1007/s11205-019-02174-0>
- Fisher, M. (2005). On the Empirical Finding of a Higher Risk of Poverty in Rural Areas: Is Rural Residence Endogenous to Poverty?. *Journal of Agriculture and Resource Economics*, vol 30, pp 185 - 204.
- Fintel, D. V. and Fourie, J. (2019). The great divergence in South Africa: Population and wealth dynamics over two centuries. *Journal of Comparative Economics*, pp: 759-773.
- Frey, B. S., Stutzer, A. (2002). *Happiness & Economics; How the Economy and Institutions Affect Human Well-Being*. Princeton University Press NJ, US and the Netherlands , *Review of Income and Wealth*, Series 37 no. 3, September.

- Goedhart, T., Halberstadt, V., Kapteyn, A., and Van Praag, B. (1977). The Poverty Line: Concept and Measurement. *Journal of Human Resources* XII (4), pp. 503-520.
- Gordon, D.M. (1972). *Theories of Poverty and Underdevelopment: Orthodox, Radical, and Dual Labour Market Perspectives*. Lexington Books.
- Gumede, V. (2021). Revisiting Poverty, Human Development and Inequality in Democratic South Africa. *Indian Journal of Human Development*, pp 1-17. DOI: 10.1177/097370302//032961.
- Herrera, J., M. Razafindrakoto, and F. Roubaud (2006). *The Determinants of Subjective Poverty: A Comparative Analysis between Madagascar and Peru*. IRD Working Paper 2006-01. Paris: L'Institut de Recherche pour le Développement (IRD).
- Heshmati, A; Maasoumi, E and Wan, G. (2019). An analysis of the determinants of household consumption expenditure and poverty in India. *Economies*, vol 7, pp 1-27.
- Hill, J. L. (2008). *The Ambiguous Effects of Undergraduate Debt: Extending the Human Capital Model of Graduate School Enrollment*. North Carolina State University (Ed Thesis).
- Institute, S.P.I. (2007). *The Measurement of Poverty in South Africa Project: Key issues*. Johannesburg. Working paper no 1, pp 1-54.
- Leibbrandt, M., Lam, D., Branson, N. and Garlick, J. (2012). *Education and Inequality: The South African Case*. In: Southern Africa Labour and Development Research Unit Working Papers, 75, ISBN: 978-1-920517-16-8.
- Leibbrandt, M., Poswell, L., Naidoo, P., Welch, M. and Woolard, I. (2004). *Measuring Recent Changes in South African Inequality and Poverty Using 1996 and 2001 Census Data*. CSSR Working Paper No.84. Cape Town: Centre for Social Science Research, University of Cape Town, pp 95-142
- Leow, K.W and Tan, E. C. (2019). Determinants of poverty: A dynamic panel data analysis with controls for income level and inequality. *Malaysian Journal of Economics Studies*. Pp 227-242.
- Living Conditions Survey (2008/90). *Subjective Poverty in South Africa*. Report No. 03-10-01 (2008/2009)
- Lokshin, M., Umaphathi, N. and Paternostro, S. (2006). Robustness of subjective welfare analysing in a poor developing country: Madagascar 2001. *Journal of Development Studies*, 42(4), pp. 559-591
- Mahmood, T; Yu, X and Klasen, S. (2018). Do the Poor Really Feel Poor? Comparing Objective Poverty with Subjective Poverty in Pakistan. *Social Indicators Research*, Springer, vol. 142(2), pages 543-580.
- Mangahas, M. (1995). Self-rated poverty in the Philippines. *Philippine Review of Economics*, 7(1), pp. 40-55.
- Mbuli, B. N. (2008). *Poverty Reduction Strategies in South*. University of South Africa (Dissertation – Master's Degree).
- Meth, C. (2006). Income Poverty in 2004: A Second Engagement with the Van Der Berg et al. Figures'. School of Development Studies Working Paper, 47. Durban: School of Development Studies, University of KwaZulu-Natal, ISBN: 1-86840-619-9.
- Mesnard, L de (2007). *Poverty Reduction: The Paradox of the Endogenous Poverty Line*. University of Burgundy, France, pp 1-28.
- Murray, M. P. (2006). Avoiding Invalid Instruments and Coping with Weak Instruments. *Journal of Economic Perspectives*, 2006, vol. 20, issue 4, pages 111-132.
- Morawski, L. (2018). Using Subjective Equivalence Scales to Analyze Poverty in Poland. *Argumenta Oeconomica*. No. 2, pp 207-223.
- Newey, W. K. (1987). Efficient estimation of limited dependent variable models with endogenous explanatory variables. *Journal of Econometrics*, 36: pp 231–250.

- Okurut, F. N., Odwee, J.A.O. and Adebua, A. (2002). *Determinants of Regional Poverty in Uganda*. AERC Research Paper 122, Nairobi: African Economic Research Consortium. ISBN 9966-944-89-3.
- Posel, D; Rogan, M. (2014). Measured as poor versus feeling poor: Comparing objective and subjective poverty rates in South Africa. *Journal of human development and capabilities*, pp. 267-85.
- Pradhan, M; Ravallion, M. (1998). Measuring poverty using qualitative perceptions of welfare. *The Review of Economics and Statistics*, Vol. 82, No. 3 (Aug., 2000), pp. 462-471.
- Ravallion M., Lokshin M. (2000). Identifying welfare effects from subjective questions. *Economica Journal*, Vol. 68 Issue 271, 4, pp 335-357.
- Ravallion, M. (1998). *Poverty Lines in Theory and Practise*. Living Standards Measurement Study Working paper, 133. Washington D.C: World Bank, pp 1-53.
- Ravallion, M. (2012). *Poor, or Just Feeling Poor? On Using Subjective Data in Measuring Poverty* (Policy Research Working Paper No. 5968). Washington D.C.: World Development Bank.
- Ravallion, M; Himelein, K and Beegle, K. (2013). *Can Subjective Question on Economic Welfare be Trusted?*. Policy Research Working Paper, 6726.
- Riffault, H. (1991). *How poverty is perceived*. In K. Reif & R. Inglehart (Eds.), *Eurobarometer* (pp. 349– 354). London: Palgrave Macmillan SCOPE Paper 9. London: Department for International Development.
- Schiller, B.R. (1995). *The Economics of Poverty and Discrimination*, (6th Edition). Southern Africa Catholic Bishops' Conference. (2016). Intergenerational Poverty: the plight of South Africa's 'Born Frees'. Briefing paper: 411. Pp 4
- Statistics South Africa. (2008). *Measuring poverty in South Africa: poverty lines for statistical reporting* (Technical Report). Pretoria: Statistics South Africa.
- Statistics South Africa. (2012a). *Poverty Profile of South Africa: Application of the Poverty Lines on the LCS 2008/2009*. Pretoria: Statistics South Africa.
- Todaro, M. P. (1977). *Economics for a developing world: an introduction to principles, problems and policies for development*. London: Longman Press.
- Van Praag, B; Carbonell, A. F. (2005). *A Multi-dimensional Approach to Subjective Poverty*. Amsterdam. Pp32.
- Wang, H; Zhao, Q; Bai, Y; Zhang, L and Yu, X. (2020). Poverty and subjective poverty in rural China. *Social Indicators Research*, vol 150, pp 219–242.
- Winkelmann, R. (2005). Subjective well-being and the family: Results from an ordered probit model with multiple random effects. *Empirical Economics*, 30(3), 749–761.
- Wooldridge, J.M. (2001). Applications of Generalized Method Moments Estimation. *Journal of Economic Perspectives* 15:4, pp.87-100.
- World Bank Group. (2015). *Ending Poverty and Hunger by 2030*. An agenda for the global food system, 2nd edition, pp 32.
- Zdenek, R; Lososova, J. (2020). Objective and subjective poverty of households in Czech regions. *Demografie*, 61: 175–185.
- Zhou, S., & Yu, X. (2017). Regional heterogeneity of life satisfaction in urban China: Evidence from hierarchical ordered logit analysis. *Social Indicators Research*, Springer, vol. 132(1), pages 25-45.

Appendix

TABLE 1: EXPLANATORY VARIABLES USED IN THE EMPIRICAL ANALYSIS

Self-Assessed Poverty (SAP)	Dummy	1=poor and very poor, 0 otherwise
<i>Household Characteristics</i>		
Income	Continuous	Total income of the household
Access to land	Dummy	1=Owning or access to land, 0 otherwise
Hhsize	Continuous	Household size
<i>Respondents' Characteristics</i>		
18-35	Dummy	1= age between 18 and 35 years old, 0 otherwise
36-48	Dummy	1= age between 36 and 48 years old, 0 otherwise
49-59	Dummy	1= age between 49 and 59 years old, 0 otherwise
60+	Dummy	1= 60 +, 0 otherwise
ages	Continuous	
Never married	Dummy	1= never married, 0 otherwise
Living with partner	Dummy	1= living with a partner, 0 otherwise
Married	Dummy	1= married, 0 otherwise
Divorced	Dummy	1= divorced and separated, 0 otherwise
Widow/er	Dummy	1= widow/er, 0 otherwise
No schooling	Dummy	1= household member with no schooling, 0 otherwise
Primary education	Dummy	1= household member with primary educ., 0 otherwise
Secondary education	Dummy	1= household member with secondary educ., 0 otherwise
Matric	Dummy	1= household member with matric, 0 otherwise
Tertiary education	Dummy	1= household member with tertiary educ., 0 otherwise
Female	Dummy	1= female, 0 otherwise
Male	Dummy	1= male, 0 otherwise
African	Dummy	1= African, 0 otherwise
Indian	Dummy	1= Indian, 0 otherwise
White	Dummy	1= White, 0 otherwise
Coloured	Dummy	1= Coloured, 0 otherwise
Health	Dummy	1= less than adequate, 0 otherwise
Unemployed	Dummy	1= unemployed, 0 otherwise
<i>Location</i>		
Rural	Dummy	1= living in formal or informal rural, 0 otherwise
Urban	Dummy	1= living in formal or informal urban, 0 otherwise
WC	Dummy	1= living in Western Cape, 0 otherwise
NC	Dummy	1= living in Northern Cape, 0 otherwise
FS	Dummy	1= living in Free State, 0 otherwise
KZN	Dummy	1= living in KZN, 0 otherwise
NW	Dummy	1= living in North West, 0 otherwise
GP	Dummy	1= living in Gauteng, 0 otherwise
MP	Dummy	1= living in Mpumalanga, 0 otherwise
LP	Dummy	1= living in Limpopo, 0 otherwise

TABLE 9:FE-2SLS ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (ELQ) IN SA

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household characteristics</i>								
Loginc	-0.349***	(0.057)	-0.251***	(0.033)	-0.272***	(0.010)	-0.331***	(0.019)
Access to land			-0.008	(0.025)	-0.013	(0.021)	0.015	(0.014)
Hhsize			0.009***	(0.002)	0.014***	(0.004)	0.022***	(0.004)
<i>Respondents characteristics</i>								
Age								
36-48					0.043***	(0.013)	0.048***	(0.014)
49-59					0.013	(0.031)	0.016	(0.036)
60+					-0.097	(0.065)	-0.102	(0.074)
agesq					0.000**	(0.000)	0.000**	(0.000)
Male					0.025	(0.021)	0.026	(0.020)
LPartner					-0.147***	(0.022)	-0.130***	(0.020)
Married					-0.047***	(0.012)	-0.013	(0.012)
Widowed					-0.070***	(0.022)	-0.053***	(0.019)
Divorced					-0.054***	(0.015)	-0.048***	(0.014)
Peduc					-0.036***	(0.006)	-0.056***	(0.007)
Seduc					-0.058***	(0.012)	-0.081***	(0.015)
Metric					-0.009	(0.019)	-0.011	(0.021)
Teduc					0.102***	(0.011)	0.134***	(0.015)
Coloured					0.129***	(0.045)	0.153***	(0.048)
Indian					0.094***	(0.019)	0.057***	(0.020)
White					0.248***	(0.056)	0.278***	(0.070)
Health					-0.012	(0.009)	-0.012	(0.009)
Unemployed					-0.090***	(0.007)	-0.110***	(0.007)
<i>Location</i>								
Rural							-0.091***	(0.022)
EC							-0.033**	(0.015)
NC							-0.115***	(0.008)
FS							-0.124***	(0.007)
KZN							-0.092***	(0.009)
NW							-0.090***	(0.004)
GP							0.003	(0.011)
MP							-0.079***	(0.011)
LP							-0.095***	(0.012)
Constant	3.961***	(0.604)	2.869***	(0.369)	3.092***	(0.117)	3.782***	(0.205)
Observations	136,374		87,688		87,688		87,688	

***P<0.01; **P<0.05 and *P<0.1

Note: The dependent variable is the economic ladder question (ELQ)

TABLE 102:FE-2SLS (ELQ) ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY IN RURAL AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household characteristics</i>								
Loginc	-0.817***	(0.157)	-0.676***	(0.164)	-0.608***	(0.042)	-0.625***	(0.051)
Access to land			0.040	(0.022)	-0.008	(0.028)	-0.010*	(0.024)
Hhsize			0.063***	(0.007)	0.053***	(0.011)	0.055***	(0.011)
<i>Repondents characteristics</i>								
Age								
36-48					0.141***	(0.012)	0.142***	(0.011)
49-59					0.075*	(0.043)	0.075*	(0.043)
60+					-0.015	(0.091)	-0.017	(0.092)
agesq					0.000**	(0.000)	0.000**	(0.000)
Male					0.055**	(0.026)	0.056**	(0.026)
LPartner					-0.160**	(0.063)	-0.155**	(0.063)
Married					0.034	(0.059)	0.048	(0.060)
Widowed					-0.088	(0.054)	-0.083	(0.051)
Divorced					-0.093**	(0.041)	-0.089**	(0.040)
Peduc					-0.086***	(0.017)	-0.090***	(0.018)
Seduc					-0.089***	(0.028)	-0.092***	(0.029)
Metric					0.073*	(0.038)	0.073*	(0.039)
Teduc					0.441***	(0.055)	0.463***	(0.064)
Coloured					0.659***	(0.144)	0.675***	(0.158)
Indian					0.135**	(0.055)	0.137**	(0.056)
White					0.733***	(0.128)	0.753***	(0.138)
Health					0.001	(0.014)	0.002	(0.016)
Unemployed					-0.103***	(0.016)	-0.109***	(0.017)
<i>Location</i>								
EC							-0.002	(0.051)
NC							-0.017	(0.032)
FS							-0.068***	(0.024)
KZN							-0.009	(0.034)
NW							0.002	(0.027)
GP							0.183***	(0.024)
MP							0.025	(0.032)
LP							-0.036	(0.034)
Constant	8.660***	(1.603)	6.966***	(1.672)	6.269***	(0.390)	6.439***	(0.493)
Observations	57,884		34,428		34,428		34,428	

***P<0.01; **P<0.05 and *P<0.1

Note: The dependent variable is the economic ladder question (ELQ)

TABLE 11: FE-2SLS ESTIMATES OF DETERMINANTS OF SUBJECTIVE POVERTY (ELQ) IN URBAN AREAS

VARIABLES	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err	Coeff.	Std.Err
<i>Household characteristics</i>								
Loginc	-0.232***	(0.026)	-0.187***	(0.019)	-0.194***	(0.005)	-0.209***	(0.007)
Access to land			-0.026***	(0.005)	-0.041***	(0.004)	-0.027***	(0.004)
Hhsize			0.006***	(0.002)	0.010***	(0.003)	0.011***	(0.002)
<i>Respondents characteristics</i>								
Age								
36-48					0.017	(0.011)	0.020*	(0.011)
49-59					-0.002	(0.028)	0.002	(0.029)
60+					-0.108*	(0.056)	-0.104*	(0.059)
agesq					0.000**	(0.000)	0.000*	(0.000)
Male					0.018	(0.017)	0.018	(0.016)
LPartner					-0.131***	(0.014)	-0.128***	(0.012)
Married					-0.051***	(0.009)	-0.043***	(0.008)
Widowed					-0.068***	(0.010)	-0.060***	(0.008)
Divorced					-0.046***	(0.008)	-0.044***	(0.007)
Peduc					0.001	(0.009)	-0.005	(0.008)
Seduc					-0.026***	(0.005)	-0.034***	(0.006)
Metric					-0.021	(0.013)	-0.022	(0.014)
Teduc					0.040***	(0.009)	0.047***	(0.010)
Coloured					0.028	(0.029)	0.060**	(0.028)
Indian					0.032***	(0.010)	0.016	(0.012)
White					0.120***	(0.033)	0.124***	(0.039)
Health					-0.026***	(0.007)	-0.028***	(0.007)
Unemployed					-0.093***	(0.010)	-0.097***	(0.011)
<i>Location</i>								
EC							-0.007*	(0.004)
NC							-0.078***	(0.004)
FS							-0.075***	(0.007)
KZN							-0.092***	(0.008)
NW							-0.074***	(0.010)
GP							-0.007	(0.008)
MP							-0.067***	(0.002)
LP							-0.030**	(0.014)
Constant	2.744***	(0.286)	2.213***	(0.219)	2.309***	(0.057)	2.509***	(0.072)
Observations	78,490		53,260		53,260		53,260	

***P<0.01; **P<0.05 and *P<0.1

Note: The dependent variable is the economic ladder question (ELQ)