




The ugly truth about social welfare payments and households' subjective well-being



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Background: Implicitly, social welfare payments (SWPs) are a transfer from the wealthy (those in high-income quintiles) to the poor (in low-income quintiles) to reduce poverty and create a more equal distribution of income. Previous studies have shown that resources, such as income (including SWPs), are pooled within households creating positive externalities. Studies on the subjective well-being (SWB) effect of SWPs are scarce, and no previous study has investigated whether the expected positive relationship holds across all household income quintiles.

Aim: This study determines whether the expected positive relationship between SWB and SWPs holds across all household income quintiles.

Setting: The data for this study were obtained from the National Income Dynamics Study (NIDS), which is representative of the state of affairs in South Africa.

Methods: We use a pooled ordered probit and quasi-experimental models to investigate the relationship.

Results: Surprisingly, all forms of SWPs are accessed across all household income quintiles, and the trend over time shows an increase. As expected, the relationship between SWP and SWB is positive, except in those households in the highest income quintile receiving an SWP who experience a negative effect on well-being.

Conclusions: Our study explains the lack of progress in decreasing inequality and lower levels of SWB. Additionally, our findings are of interest to the ongoing broader debates around the effects of SWPs globally on poverty, inequality and SWB. Many checks and balances should be in place to ensure only the most vulnerable access SWPs.

Keywords: subjective well-being; social welfare payment; quasi-experiment; Propensity Score Matching; case study South Africa.

Introduction

In 2020, 9.2% of the world's population lived in extreme poverty. The World Bank predicted that an additional 88–115 million people would fall into this category in 2021 because of COVID-19 (World Bank 2020a). Therefore, it is no surprise that there is an increased uptake of social welfare payments (SWPs) worldwide, placing social welfare systems under significant pressure to ensure the survival of vulnerable households (Bassier et al. 2020). Additionally, an increase in extreme poverty, which may lead to higher levels of inequality, is of great concern because it is causally associated with decreased psychological well-being and increased mental stress. In unequal societies, stressed individuals with lower psychological well-being are poor decision-makers in crucial areas, such as long-term investments in education and health (Haushofer & Fehr 2014). In addition, higher levels of inequality increase social tension concerning social-capital problems, health-related problems and human-capital problems (eds. Helliwell, Layard & Sachs 2015; Wilkinson & Pickett 2009).

It is widely recognised that countries use SWPs because they are positively associated with better economic well-being outcomes for underprivileged and vulnerable people (Neves et al. 2009). However, human well-being is a multidimensional concept, and it is important to broaden our understanding of the impact of SWPs beyond merely economic well-being, to the wider concept of subjective well-being (SWB). Subjective well-being includes satisfaction with life (the cognitive dimension) and a positive mood or emotions (the affective dimension), overall referring to the hedonic perspective of well-being (Diener, Oishi & Lucas 2002). Even though SWB is now a well-established measure that complements traditional economic measures, such as the Gross Domestic Product, studies focusing on the effect of SWPs on SWB are scarce (see Literature review section).

Furthermore, studies investigating the effect of SWPs focused on only one specific type of SWP, while social welfare systems in most countries are typically made up of a collection of varied payments, and the payments are pooled into the household income (Knight, Hosegood & Timæus 2013; Whitworth & Wilkinson 2013). In addition, the recipient of an SWP is often not the main beneficiary. For example, a mother who receives a child support payment (CSP) is not the beneficiary but adds this income to the household budget to provide for the child's needs. These transfers thus create positive externalities. The South African General Household Survey states that individuals rely on their 'households for their physical, social and economic well-being' (Statistics South Africa 2018:4). The General Household Survey defines households as individuals living together under the same roof or in the same yard and sharing resources (Brophy et al. 2018; Statistics South Africa 2018).

South Africa, as a country, is our current case study and is known for its high levels of poverty and inequality. However, it also has one of the most extensive social welfare systems in the developing world, making it an excellent choice to test whether SWPs improve SWB, and determine whether it holds across all income quintiles (Goldblatt 2005). Traditional family structures are especially important in South Africa as large proportions of the population are subject to poverty and unemployment. Social welfare payments are often the primary income source of poor households (88% of the low-income households receive an SWP). Thus, although these payments are mostly made at an individual level, the money is pooled, and the household members share the effect of well-being. It is essential not only to consider the effect of a single payment on a specific individual's well-being (estimations would likely be upward biased, as it excludes the shared effect), but to take the effect of aggregated welfare payments on the household's mean SWB into consideration instead. Only once the influence on the entire household is considered, can we judge the effect of SWPs on well-being.

Considering the positive externalities for households from individually received SWPs, we contribute to the literature by being the first study to investigate the relationship between SWPs and people's SWB across household income quintiles. We use the National Income Dynamics Survey (NIDS) in our analysis. We introduce various estimation techniques to address possible endogeneity and limit the effects of confounding factors.

Our results show that all income quintiles access all types of SWPs in South Africa. Testing the hypothesis that a social welfare system should increase the SWB of people, as, among others, poverty and inequality decrease, we find the SWB assumption is true for the bottom income quintiles but not for the top income quintiles. Additionally, our finding shows that inequality most likely increases as the intention to transfer income from the wealthy to the poor is doubtful if the highest household income quintiles access SWPs.

The rest of the paper is structured as follows. In the next section the country in our case study, South Africa, is briefly discussed, as well as the relevant literature on SWPs. In the third section the methodology is outlined and the data described. The results follow in the fourth section, while the fifth section accommodates the conclusion.

Background and relevant literature review

Case study

Our case study, South Africa, is a developing country with approximately 60.7 million people. In 2019 the economy grew by only 0.15%. The estimated unemployment rate (as measured by the expanded definition) is 43.2% (Statistics South Africa 2021). In 2021, South Africa was noted as the country with the highest level of inequality, with a Gini coefficient of 0.66 (World Bank 2021). According to the Human Development Report (2020), 18.9% of the population, that is, approximately 11 million South Africans, live on less than R28 (\$1.90) a day, which is close to R800 (\$55) per month. South African NIDS researchers Zizzamia, Schotte and Leibbrandt (2019) estimate that about 52% of South Africans live in chronic poverty. However, an additional 11.4% can be classified as 'transient poor', and about 19% form part of the 'vulnerable middle class'.

Since the enactment of the *Social Assistance Act* of 1992:

[A] policy priority has been the direct transfer of revenue to vulnerable groups outside the labour force, particularly children and older adults living in poverty, adults and children with disabilities, and children needing care due to parental illness, death, abuse or neglect. (Godfrey et al. 2016:775)

The major share of the social welfare system comprises five categories (two targeted at adults and three at children): the old-age payment (OAP), the disability payment (DP), the CSP (introduced in April 1998 when it replaced the child maintenance payment), the foster-care payment (FCP), and the care-dependency payment (CDP). Three lesser-known SWPs, also applied for, include grant-in-aid, social relief of distress, and war veterans' payment.¹ According to the South African Social Security Agency (SASSA 2020a), by the end of December 2020, more than 18 million SWPs were paid to more than 11 million beneficiaries. Of the SWPs listed above, most of those paid in 2020 was in the CSP category, namely 12 945 457, while the OAP was awarded 3 729 103 times (SASSA 2020a).

Literature review

In the literature, most studies investigating the effect of SWPs² focus on 'child support payments'. There is a near-uniform belief that CSPs have a positive effect on the 'material well-being' of the child (Cooper, Mokomane & Fadji 2020; Patel &

1. See Table 2B for exact grants per year with any associated changes.

2. Please note that it falls outside the scope of the current study to discuss literature that focused on the relationship between social grants and poverty alleviation.

Ross 2020) and the caregiver (Granlund & Hocheld 2020; Patel & Ross 2020), but 'negative effects' are noted on the spouses or partners with increased feelings of shame (Granlund & Hocheld 2020). Cooper et al. (2020) found that the 'SWB' effects of the CSP were low and that recipients experienced a decrease in their level of dignity since they faced negative attitudes and prejudice from their own communities. Cooper et al.'s (2020) study was in direct contradiction to those of Attah et al. (2016) and Diener, Oishi and Tay (2018). They argued that socio-economic policies, such as income security and social protection programmes, are related to increased psychosocial well-being. Additionally, Oyenubi and Kollamparambil (2022) found that beneficiaries of the CSP had more birth attempts than non-beneficiaries, distorting incentives and likely increasing inequality and poverty issues.

The effect of 'old age payments'³ on SWB is clearer than CSPs. Consistent and significant positive effects of the OAP on the elderly have been found, although there is still a debate regarding gender differences. Kollamparambil and Etinzock (2019) and Grogan and Summerfield (2019) found positive relationships between SWB and OAPs, although they argued that this only applied to elderly females. Bando, Galiani and Gertler (2017) and Galiani, Gertler and Bando (2016) confirmed that OAPs decreased depression among the elderly, thereby increasing their mental well-being. Studies that contradict the above state no significant relationship (Schatz et al. 2012; Shin 2018). However, it should be noted that these studies have limitations. For example, Shin (2018) did not investigate causal relationships, or consider gender differences.

Using qualitative methods, Knight et al. (2013) focused on 10 households receiving DPs in KwaZulu-Natal, South Africa. They concluded that positive health outcomes were associated with households where individuals received the DP while undergoing antiretroviral therapy.

Very few studies 'combined different categories of SWPs' to determine the impact on the recipients. Using the first four waves of NIDS data, Waidler and Devereux (2019) investigated the impacts of child support and OAPs and remittances on one set of well-being outcomes: food security and nutrition. They found that the CSPs had no significant impact on the dietary diversity index used in the study. Thus, the positive and significant impacts are limited to the OAPs and remittances.

The OAPs' significance was confirmed in a Mackett (2020) study. Using the first five waves of the NIDS data and transition matrices, Mackett (2020) studied poverty and labour market outcomes due to receiving SWPs. Mackett (2020) compared those that receive and do not receive SWPs. Against expectation, she found that non-SWP recipients had a more favourable market outcome than SWP recipients. Additionally, Mackett (2020) concluded that OAPs had a better impact on labour outcomes and poverty than CSPs.

3. Old age payments are a non-contributory means-tested income transfer to persons aged 60 and above.

Given the above literature review, to the authors' knowledge and as stated in the introduction, no other study has compared the SWB relationship to receiving SWPs at a household level across income quintile groups.

Methodology and data

Methodology

We use descriptive analysis to answer the following questions: (1) which household income quintiles access SWPs, (2) what type of SWPs are accessed by different income quintiles, and (3) the temporal trend in accessed SWPs. Due to confounding factors and possible endogeneity due to possible omitted variables, we estimate various models to address the main question regarding the relationship between SWPs and SWB across the household and income quintiles. We use a pooled ordered probit model due to the dependent variable's ordered nature and test the robustness of the results using a Pooled Ordinary Least Squares (see Table A1). Lastly, we use a quasi-experimental model, namely Propensity Score Matching. All estimations are reported for the whole sample, and as the results are similar for income quintiles one to four, but differ for quintile five, we report only the results of quintiles one and five in the main text.

To estimate the Pooled Ordered Probit model, we use the following specification:

$$Pr(\text{subjective well} - \text{Being} = i) = \beta_0 + \beta_1 D + \beta_2 X + W + \mu \quad [\text{Eqn 1}]$$

Here $i = 1, 2, 3, \dots, 10$ represents the 10 categories of the SWB variable. D refers to our treatment variable, which takes a value of 1 if a household receives an SWP and 0 if it does not. X represents a vector of controls for household characteristics, and W refers to wave (time) fixed effects. Finally, μ represents the stochastic error term.

Equation (1) estimates a score as a function of the independent variables and a set of 'cut points'. The probability of observing outcome i corresponds to the probability that this score, plus the error term μ , is within the range of the cut points estimated in the model. The estimates from these models give us an idea of our treatment's general association with the outcome variable.

We run all diagnostic tests and find an absence of multicollinearity and autocorrelation. We use clustered (at the household level) robust standard error estimations to address heteroscedasticity.

As our data comes from non-random observational studies, we admit that traditional econometric methods may bias the effect of the 'treatment' (in our case, this is the receipt of an SWP) due to the presence of confounding factors. Following the seminal work of Rosenbaum and Rubin (1983), matching techniques, which 'match' the treated and the untreated in a range of observable characteristics, are now often used in impact evaluation.

Therefore, we use a matching technique based on propensity scores to test the relationship between the treatment and the outcome. Propensity Score Matching essentially estimates each household's propensity to receive a binary treatment (with a probit or logit model) as a function of observables and matches households with similar propensities (Caliendo & Kopeinig 2008). Our quasi-experimental design identifies a control group that does not receive an SWP, but is like the treatment group (households who receive an SWP). We match the treated and the untreated in a range of characteristics. The control group captures what would have been the outcomes if the policy of SWPs had not been implemented.

The starting point of our analysis is to estimate the 'propensity score'. We use a probit model for the estimation of our scores. In doing so, we follow Caliendo and Kopeinig (2008), who states:

In principle, any discrete choice model can be used. Preference for logit or probit models (*compared to linear probability models*) derives from the well-known shortcomings of the linear probability model. (p. 37)

We were largely guided by theory, and the framework Garrido et al. (2014) outlined to select the covariates to match the data. In particular, we are careful only to include relatively unaffected variables by the treatment. After choosing the variables and estimating the probability of receiving the treatment, we ensure that the propensity score is calculated and balances covariates across treatment and control households. In other words, given the control, there is no significant difference in being selected into the treatment group. We report diagnostic tests for the same in the results section.

After the initial balance tests, we match the sample to perform our propensity score analysis. There are several ways to do this (e.g. kernel weighting, nearest-neighbour, caliper matching, local linear regression). We choose the nearest-neighbour weighting as it retains the sample size, while leading to the best post-weighting balance (Garrido et al. 2014). Additionally, we also provide estimates from other matching techniques as robustness tests.

Our parameter of interest is the Average Treatment Effect on the treated (ATT) which focuses on those households receiving SWPs. The Propensity Score Matching estimator for the ATT can be represented by:

$$ATT = E_{P(x)|D=1} = \{E[Y(1)|D=1, P(x)] - E[Y(0)|D=0, P(x)]\}$$

[Eqn 2]

Here $Y(D)$ refers to the outcome based on the value of the treatment D . $P(x)$ refers to the probability for a household to receive the treatment (receive SWP) given the household's observed covariates X . Therefore, the ATT in our case is the mean difference in SWB, between those households who receive an SWP and those who don't, weighted by individual household propensity scores.

We acknowledge the critique against propensity-score matching, as King and Nielsen (2019) argued. The authors argue that propensity-score matching:

[A]s it is commonly used in practice or with many of the refinements that have been proposed, can and usually does increase imbalance, inefficiency, model dependence, research discretion, and bias at some point in both real data and in data generated to meet the requirements of Propensity Score Matching theory. (King & Nielsen 2019:1)

A propensity score method is, thus, a trade-off between sample size, generalisation, and balance. This has implications for the internal and external validity of the estimations.

To address King and Nielsen's critique, we apply several diagnostic tests to verify the balancing property of our covariates. We estimate our models with different sets of covariates to address the selection bias. Next, in addition to using a caliper method for matching, we also use the nearest-neighbour matching, so choosing a narrow caliper does not taint our estimations. Lastly, given the justifiable critiques of the propensity-score matching model, we want to flag to the reader that our intention is not to make any causal claims but to consider the robustness of our baseline models.

Data

The data used in this paper come from five waves of the NIDS. The first wave was conducted from 2008 to 2009, and wave five in 2017. We choose this dataset as it is a rich dataset, providing information on respondents' and households' different well-being domains. The National Income Dynamics Survey is a face-to-face longitudinal survey, following the same individuals (NIDS 2016). However, NIDS does not follow households over waves and allocates different household identifiers in each wave. For this reason, we pool the data and include a time-fixed effect to control for the different waves. The number of households is approximately 42 700, and after controlling for successful interviews, it decreases to approximately 42 400.

Selection of variables

We are led by the literature and data availability to select the variables included in the models. In the next section the dependent variable is discussed, followed by the derived variables and the covariates included in the estimations.

Household subjective well-being: To measure our dependent variable, household SWB, we use the mean level of satisfaction of the adults in the household. Within the adult questionnaire of the NIDS dataset, individuals 15 years and above are asked to rate the current level of general life satisfaction on a scale from 1 to 10, where 1 represents 'very dissatisfied', and 10 represents 'very satisfied'. Following the standard procedure of deriving life satisfaction at an aggregated level (see the World Happiness Report by Helliwell et al. [eds. 2021] and the UK Office for National Statistics [2021]), we derive the mean household life satisfaction. Additionally, we create a categorical variable in

line with the SWB literature and use this in pooled ordered probit estimations. The categorical variable measures life satisfaction on a level from 1 being not happy to 10 being very happy and approximates the distribution of the continuous variable. We believe using the SWB of adults in a household can represent the mean SWB of the entire household. Evidence from data collected in the World Values Survey (Inglehart et al. 2014) confirms that among six aspects of life – family, religion, politics, leisure time, work, and friends – family is rated the most important in over 60 analysed countries; followed by work and friends. Clair (2012) and Casas et al. (2008) argue that it is logical that parents' SWB would influence the SWB of their children. There are three primary explanations for this – genetic influences, environmental factors and common stressors (Bookwalter, Fuller & Dalenberg 2006; Clair 2012; Larsen & Eid 2008; Powdthavee & Vignoles 2008). Further, Clair (2012), using data from the British Household Panel Surveys, finds a significant and positive relationship between a parent's life satisfaction and the life satisfaction of their children.

Covariates and other derived variables: Our treatment variable is a binary variable that depicts whether the household receives an SWP. Our dataset also includes a variable that captures the amounts received by households; however, the missingness on this variable is 38.4% (even after imputation). Furthermore, the missingness is not random, with higher income quintiles' missingness being higher than lower household income quintiles. As our main research question is specifically targeted at analysing receiving SWPs across quintiles, we opted to use the binary variable. However, as a robustness test, we estimate all models using the amount variable and still find a negative relationship between SWPs received and SWB.

Variables related to age (Frijters & Beaton 2012), gender (Becchetti & Conzo 2013; Joshanloo & Jovanović 2020), employment (Ngoo, Tan & Tey 2021; Schröder 2020), relative income (Clark, Frijters & Shields 2008; Rossouw & Greyling 2021) and race (Rossouw & Greyling 2021; Van der Berg 2011) are that of the household head. Additionally, we control for other characteristics of household members related to self-reported health status (Rossouw & Greyling 2021; Kollamparambil & Etinzock 2019) and education (Dittmann & Goebel 2010; Ngoo et al. 2021), which are computed to be average levels over the household, as well as the size of the house (Kollamparambil & Etinzock 2019; Reyes-García et al. 2016). Aside from this, we also control for characteristics related to the location and services available to the household members, namely, type of dwelling (Rossouw & Greyling 2018; Zakerhaghighi, Khanian & Gheitarani, 2015), access to water (Bookwalter & Dalenburg 2002; Rossouw & Greyling 2021) and location of the household dwelling unit (Bhuiyan & Ivlevs 2019; Greyling & Rossouw 2019).

Our analysis is performed across income quintiles. We use the NIDS dataset's imputed household income variable to determine the income quintiles, which include all income

sources (wages, rent, interest, profit share, remittances, and SWPs received [Brophy et al. 2018]). To derive a household income variable at constant 2014 prices, we deflate household income for 2017 and inflate household income for 2009 and 2011 with the applicable price index (Brophy et al. 2018). Since we need household income excluding any SWPs when deriving income quintiles, we deduct household SWPs at constant prices from household income at constant prices. We divide the income into quintiles using the net household income (household income minus SWPs at constant prices). First, we run all models using the whole sample and then for the different income quintiles.

Table A2 summarises the data (see Methodology section), where we report the statistics for the full sample and those that receive (treated group) and do not receive (control group) SWPs. The full summary of our variables by income quintiles and SWPs can be found in Table A3.

Table A2 shows that households that receive an SWP record lower SWB than their counterparts. However, if we control for other factors, specifically years of education and level of employment, the group that receives SWPs experiences higher levels of satisfaction than their counterparts. Households receiving SWPs are less healthy, less likely to stay in formal housing and less inclined to have piped water. The older population, female gender, people of African descent, and traditional and urban areas are over-represented in terms of demographics.

Results and analysis

Descriptive analysis

We find that, against expectations, households in all income quintiles claim SWPs, though the percentage of households decreases as the income quintile increases. In the lowest household income quintile, 88% of the households receive an SWP, while 37% of households (Table 1) in the highest quintile (even the top decile [28%]) receive SWPs. This finding contradicts the theory that SWPs transfer from higher-income earners (households) to lower-income earners (households) to increase equality and likely have the opposite effect.

A possible reason for these results could lie in qualifying for an SWP. An individual or married couple must pass a means test. Given that the means test is based on a certain level of income or assets, it is possible that an individual (even one that is married) could earn an income below the means test, which legally gives them the right to access a particular SWP. To provide some perspective, let us consider the highest income quintile. Here, we notice that the income band is very wide, from R6941 (\$486) to almost R900 000 (\$62 993), highlighting that South Africa's income distribution is extremely skewed. This implies that the lowest cut-off point in the highest income quintile is still relatively low, making it possible for individuals in these households (although they are higher-income households) to earn an income below the means test and, therefore, likely have access to SWPs. Table

TABLE 1: Social welfare payments per income quintile.

Variable	Income quintiles				
	1 (bottom 20%)	2 (bottom 40%)	3	4	5 (top 20%)
% of HH receiving an SWP	88.37	70.07	65.59	59.34	37.27
HH Size	5.1	5.1	5.5	5.7	5.3
Income band (with SWP)	29.19–988.19	988.21–1647.35	1647.49–2712.67	2712.85–5235.02	5236.99–884636.4
Mean income (with SWP)	653.71	1301.48	2121.99	3739.67	115368.20
Income band (less SWP)	-20601.30–520.89	520.59–1501.75	1501.80–3666.36	3666.65–6694.27	6941.27–884636.40
Mean income (less SWP)	570.59	972.73	22514.82	4706.62	19764.74
Median (less SWP)	216.62	956.14	2214.17	4537.39	12605.85
% of HH receiving a CSP	30.11	25.77	23.85	19.67	7.77
% of HH receiving a DP	8.01	4.45	3.39	2.19	1.14
% of HH receiving an FCP	2.44	1.79	1.91	1.33	0.94
% of HH receiving a CDP	0.89	0.58	0.50	0.30	0.22
% of HH receiving an OAP	38.73	21.48	18.12	14.12	9.23
% of HH receiving a WVP	0.02	0.02	0.12	0.00	0.04
% of HH receiving grant-in-aid	0.10	0.07	0.04	0.12	0.06

SWP, Social welfare payments; HH, household; OAP, old age payment; DP, disability payment; CSP, child support payment; FCP, foster care payment; WVP, war veterans' payment; CDP, care dependency payment.

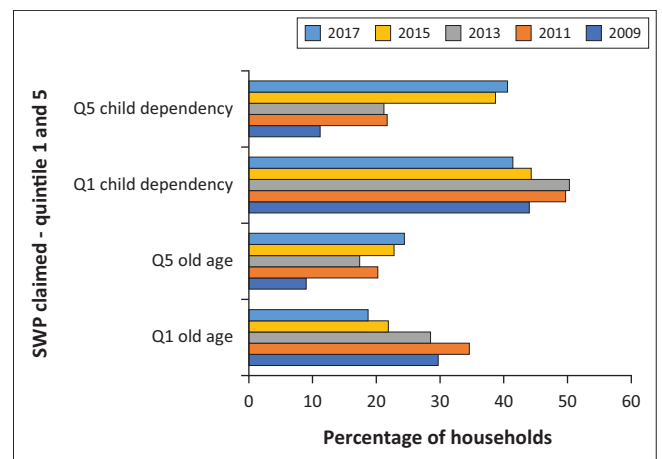
B1 provides the exact cut-offs for each welfare payment. We see that all the cut-offs for all payments (except FCPs, which are not means-tested) lie in the highest quintile of income.

Nonetheless, something is still amiss. If we consider households in the top quintile, their median income is 66 times more than the median in the lowest quintile. Thus, a ratio of 1:66 means that for every R1 earned by the lowest quintile, the top quintile earns R66. If SWPs were introduced to decrease poverty and inequality, it might have the opposite effect on inequality than originally intended and, as shown in the literature, inequality negatively influences SWB (Ding, Salinas-Jiménez & Salinas-Jiménez 2021; Margaux et al. 2021).

Additional reasons for households in the highest quintile claiming SWPs could be the FCP, which is not subject to a means test and is accessible to all (see Table B1 for a summary of SWPs). Table 1 provides further evidence that the type of grants claimed by households in the top income quintile predominantly comprises old age pension and CSPs. The policy structure makes it possible that grant recipients in an individual capacity may be eligible for these grants even though they are a part of a household in the wealthiest quintile.

Another major concern from the SASSA (2020b) revealed various fraudulent activities related to claiming SWPs in cases where people are not entitled to claim. According to the report (SASSA 2020b), fraudulent behaviour increased over time. They mention that people use fraudulent personal identification documents (IDs) or use the IDs of people who have passed away.

When we consider the different types of SWPs (Table 1), we notice that all income quintiles access all types of SWPs. Again, we notice that as the income quintile increases, the percentage of SWPs claimed by households decreases. For example, in the lowest quintile, 30% of the households claim CSPs, while households in the highest quintile claim 7.7%. Similar trends are seen with all types of SWPs claimed.



SWP, Social welfare payments.

FIGURE 1: Trend in child support and old age payments for quintiles 1 and 5.

Considering the trend over time (Table A4), approximately all categories of SWPs claimed by households increased in both the lowest and highest quintiles. The increases in the CSPs within the highest and lowest quintiles are remarkable, as is the increase in the OAPs in the highest quintile (see Figure 1 and Table A4).

Table A4 shows that the percentage of households claiming a CSP almost doubled in the lowest quintile, whereas for those households in the highest quintile, CSPs were a surprising 23 times higher from 2009 to 2017. For the lowest quintile, the households that claim foster care and CDPs increased by 74% and 115% over the time period. In the highest quintile, the percentage of households that claim SWPs (except for CSPs) increased by between 2% and 4%.

Considering the increasing debt burden South Africa has (nearly 70% of gross domestic product), these trends are not sustainable. We extended our study to include the top decile and the top 1% of households and found similar results; some of these households still access SWPs. Our results warrant further investigation.

TABLE 2: Pooled ordered probit with household subjective well-being as the dependent variable.

Variable	All		Lowest quintile		Highest quintile	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
HH SWP (No = 0)	0.0227*	(0.0138)	0.2016***	(0.0439)	-0.0873***	(0.0305)
HH size	0.0291***	(0.0021)	0.0185***	(0.0046)	0.0211***	(0.0059)
HH education	0.0205***	(0.0020)	0.0045	(0.0042)	0.0228***	(0.0051)
HH health	0.1132***	(0.0066)	0.1454***	(0.0132)	0.0844***	(0.0169)
Dwelling type	0.1198***	(0.0135)	0.0880***	(0.0245)	0.1158**	(0.0520)
Water dummy (no piped water = 0)	0.0851***	(0.0143)	0.0805***	(0.0271)	0.0209	(0.0489)
Geotype (Traditional = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Urban	0.0186	(0.0143)	-0.0362	(0.0299)	-0.0071	(0.0395)
Farm	0.0382*	(0.0229)	-0.0041	(0.0519)	0.0544	(0.0653)
Age (HH head)	0.0055***	(0.0004)	-0.0054	(0.0036)	0.0037	(0.0053)
Age ² (HH head)	0.000214	(0.000183)	0.0001***	(0.0000)	0.0000	(0.0001)
Gender (Female = 0)	0.0397***	(0.0112)	0.0801***	(0.0246)	0.0886***	(0.0257)
Relative Income (Below the neighbour = 0)†						
Relative Income Category (Average)	0.4399***	(0.0115)	0.4030***	(0.0258)	0.4183***	(0.0335)
Relative Income Category (Above)	0.1507***	(0.0191)	-0.1677***	(0.0460)	0.4255***	(0.0413)
Employment status (not economically active = 0)						
Unemployed	0.0129	(0.0192)	-0.0289	(0.0337)	-0.0241	(0.0668)
Employed	0.1337***	(0.0132)	-0.0202	(0.0363)	0.0670*	(0.0357)
Race (Black people = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Mixed race people	0.5172***	(0.0169)	0.5104***	(0.0477)	0.4131***	(0.0371)
Indian people	0.4969***	(0.0489)	0.4944***	(0.1709)	0.3740***	(0.0732)
White people	0.6545***	(0.0248)	0.3950**	(0.1587)	0.5026***	(0.0361)
/						
N	39 667		7772		7500	
Adj. R ²	0.040		0.030		0.027	
Wald (chi ²)	6789.83		831.88		849.96	

HH, household; SWP, Social welfare payments; SE, Standard errors.

Time-fixed effects used.

Standard errors in parentheses.

†, Base Category is below that of the neighbour.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.

Pooled ordered probit analysis

We now focus on answering our main question regarding the relationship between SWPs and SWB across household and income quintiles. We report the pooled ordered probit results followed by the propensity-score matching model and remind the reader that the Propensity Score Matching model is not used to make any causal claims but as a robustness test of our baseline models. Our analysis runs all models with and without design weights⁴ and compares the results. As mentioned in Methodology section, we test the robustness of our results using different estimation techniques. Our analyses are for the whole sample and subsequent household income quintiles. For brevity, we only report the results on quintiles one and five in the text (see Table 2). The complete set of results is reported in Table A5. As the primary purpose of Table 2 is to analyse associations, we report the coefficients from the Pooled Ordered Probit model and not the marginal effects.

As was expected, variables that have been established in the SWB literature, such as self-reported health, dwelling type and access to piped water, all behaved as expected (Table 2). Therefore, we shall limit our discussion to those covariates that significantly contribute to the existing literature.

4. Design weights are used to adjust for household non-response.

Table 2 shows that our variable of interest, the SWP, is positive and significantly related to the mean household SWB for quintile 1 (as well as quintiles two to four). In other words, a person who receives an SWP has a higher probability of having a higher household SWB, than those who do not receive an SWP. Quintile five is the exception. Here, the sign is negative and significant, not supporting the hypothesis that SWPs increase household SWB. We performed the same analysis using the amount of the SWP rather than the binary variables as explained in the methodology section. We find the same negative results for quintile five (see Table A6).

To test the robustness of this finding, we also used household income (without excluding SWPs) and expenditure at constant 2014 prices to divide the sample into quintiles. This is not ideal, as SWPs are implicitly included in these measures. Nonetheless, we find the negative relationship in quintile five holds, though when household expenditure is used, the relationship is negative but not significant.

A possible explanation for this negative relationship can be drawn from the literature (see literature review section). Whereas studies find positive effects of OAPs on well-being, the debate regarding CSPs is inconclusive. It could be that those households in the top 20% of income earners experience a significant and continuing decrease in their level of dignity since they, the so-called 'non-poor', are applying for SWPs,

whether legitimately or fraudulently. We note that in South Africa, people prefer to queue for SWPs rather than incur banking fees for the direct payment into a bank account (SA News 2021). Therefore, communities would likely know who receives SWPs, and these households may face negative attitudes and prejudice from their communities, which might consider them not poor enough to access SWPs.

The household's size is positive and significant across all samples, which is in line with the work done by Reyes-García et al. (2016) and Kollamparambil and Etinzock (2019).

Three interesting findings pertain to years of education, age squared and employment status. Education is not regarded as significant in those households in the lowest income quintile; thus, the number of years of education does not matter in these households' SWB. Normally, education is a pathway to employment and a way to escape poverty. With very high unemployment rates among households receiving SWPs, the hope of being employed is small. Seeing that 88% of this cohort depends on SWPs, it simply could be that long-term investments in education are not within their reach.

We do not find the usual U-shaped relationship between age and SWB. Instead, an inverted U-shaped relationship is identified in those households that receive SWPs and find themselves in the lowest income quintile. This indicates relatively low levels of well-being reported for young people, higher for the middle-aged respondents and lower again during people's later years. This low level of well-being among the youth is easily defended since South Africa is battling a youth unemployment rate of approximately 70% (Statistics South Africa 2021). Concerning employment status, we find that employed households have a higher SWB than those who are not economically active, except for households in the lowest quintile. Here employment is not of any significance. Again, considering the remarkable number of households accessing SWPs, an SWP could be seen as a disincentive to work, because of lower wages in the labour market and the effect of generous welfare benefits. This is in line with the work done by Gamson and Lasch (2013), which states that social welfare systems provide a disincentive for people to work since they end up being financially better off remaining on a benefit.

Regarding gender, households headed by males enjoy higher SWB than those headed by females, which is in line with Stoop, Leibbrandt and Zizzamia's (2019) argument that individuals living in households with a female head may face higher poverty risks and decrease SWB.

Over the years, relative income has become a more important indicator of well-being than absolute income (see Clark et al. 2008; Rossouw & Greyling 2021). A household's well-being is not influenced by absolute income levels, but rather by perceived relative income levels. Subjective well-being is predicted to be diminished by the higher income of others through feelings of relative deprivation or reduced status (Posel & Casale 2015). For the whole sample and those

households in the highest income quintile, we find that if the household head believes that they have an average or above-average income compared to their neighbour, their SWB is higher. This confirms studies, such as Kollamparambil and Etinzock (2019) and Posel and Casale (2015). In contradiction with previous findings is the relationship identified within those households in the lowest income quintile. Here we find that if the household head feels that the household's income is above that of his neighbour, the household's SWB is lower. Perhaps this indicates a sense of belonging to a community, or it could be that their higher income is conspicuous, and therefore neighbours approach them when a need arises.

In line with the findings of Stoop et al. (2019), Kollamparambil and Etinzock (2019) and Ebrahim et al. (2011), we also find that those of African descent experience the lowest household SWB compared to all other races across all quintiles.

We find geography only significant in the sample as a whole, in that people living on farmlands have a higher SWB than those in traditional and urban regions. With an urbanisation rate of 66.86% in 2019, poor households in urban centres may experience increased competition for already scarce amenities, thereby decreasing their SWB. On the other hand, households that choose to stay on farmlands have better health, more freedom and a constant food source, thereby increasing their SWB (see Bhuiyan & Ivlevs 2019; Greyling & Rossouw 2019).

As an additional robustness test, the results in Table 2 are replicated, but this time by creating income quintiles by per capita household income. This accounts for the possibility that higher-income households may be larger, skewing the household income variable. The results, however, are qualitatively the same and can be found in Table B2.

Propensity-score matching

Motivated by the pooled ordinary least squares results and the pooled ordered probit model (Table 2), we further estimate the impact of receiving an SWP using propensity-score matching. We match our estimates on health status, dwelling type and gender. The choice of these variables is driven by theory and model fit. The sample's Average Treatment Effect is given in Table 3, column 1. We find that the average SWB of the treated households (households that receive SWPs) is lower than that of the untreated households (households that do not receive SWPs). This is in line with the estimates reported in Table 2. However, this difference is not significant at the usual levels of significance and warrants further investigation.

Figure 2 plots the treatment and control group observations by propensity score. We can see an overlap of treatment and control observations at all levels of propensity scores. The results of the balancing tests are provided in Table 4 to verify whether our matching exercise has sufficiently met the balancing assumption. Again, we find no significant difference between the mean characteristics of the treated

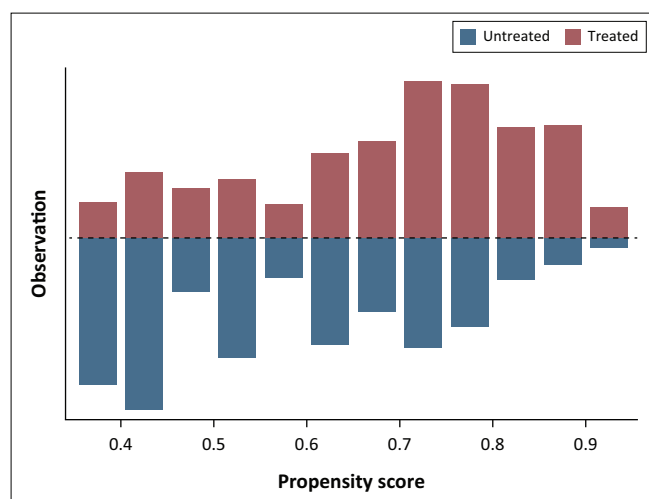
TABLE 3: Average treatment effect by income quintiles.

TABLE 3. Average treatment effect by income quintiles												
Variable	Full sample				Bottom 20%				Top 20%			
	Unmatched		Matched†		Unmatched		Matched		Unmatched		Matched	
	Treated	Control	Treated	Control	Treated	Control	Treated	Control	Treated	Control	Treated	Control
Ave SWB	5.354	5.708	5.353	5.422	4.758	4.223	4.758	4.055	6.086	6.675	6.086	6.515
	-0.353*** (0.02)		-0.068 (0.185)		-0.534*** (0.02)		0.702*** (0.202)		-0.589*** (0.044)		-0.428*** (0.156)	
N	40 671				7784				7667			

SWB, subjective well-being.

Standard errors in parentheses.

†, Matching is performed on dwelling type, gender, and average household health.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.**FIGURE 2:** Treated and untreated observation by propensity-score level.**TABLE 4:** Summary statistics of matched and unmatched sample characteristics.

Mean	Unmatched sample		p	Matched sample		p
	Treated	Untreated		Treated	Untreated	
Average household health	3.59	3.89	< 0.00	3.62	3.61	0.132
Dwelling type	0.74	0.81	< 0.00	0.744	0.742	0.555
Gender	0.31	0.51	< 0.00	0.338	0.342	0.317

and untreated households in all the variables for which observations were matched.

Next, we estimate the Average Treatment Effect for the five income quintiles to assess the extent of heterogeneity in the treatment effect. We can now see a pattern explaining the difference being not significant for the full sample. The ATT at the bottom 20% is estimated to be positive and significant at the 1% level. This means that for households in the sub-sample, the SWPs of those treated are significantly higher than those who do not receive the treatment (SWP). This is in line with the effect in the pooled ordered probit estimates provided in Table 2 for the lowest quintile. However, the effect is reversed considering the highest income quintile. For this income quintile, the difference in the ATT is -0.390 , significant at the 1% level. Thus, for this group of households, the SWB of those who receive an SWP is lower than those who do not. Again, this is in line with the pooled ordered probit estimates provided in Table 2.

Table 5 provides more robustness checks for the ATT. We experiment with using different methods to compute the

TABLE 5: Robustness.

Variable	Nearest neighbour	Local linear regression	Model II†	Model III‡
Average treatment effect on treated	-0.068 (0.185)	-0.137 (0.399)	-0.118 (0.117)	-0.135 (0.192)

Standard errors in parentheses.

†, Matching is performed on health, gender, and water source.

‡, Matching is performed on health, gender, and ownership of durable goods.

standard errors and different covariates based on the matching observations. We get qualitatively the same results.

Conclusion

There are positive externalities to a household when an individual receives an SWP. Social welfare payments are mostly pooled, and the well-being effect is shared among the household members. This study was the first to consider the relationship between SWPs and households' mean SWB across income quintiles. Theoretically, receiving SWPs should increase the SWB of recipient households. Therefore, it is important to determine which household quintiles receive SWPs and whether SWPs increase SWB across the quintiles.

We found that all income quintiles access all types of SWPs in South Africa using pooled ordinary least squares, pooled ordered probit and a quasi-experimental method. Testing the hypothesis that a social welfare system should increase the SWB of people, as, among others, poverty and inequality decrease, we find the SWB assumption is true for the bottom 20% (40, 60 and 80) income quintiles but not for the top 20% (and the top 10%) income quintile. Additionally, our findings show that inequality most likely increases as the intention to transfer income from the wealthy to the poor is doubtful when the highest household income quintile access SWPs while earning 66 times more than the lowest income quintile.

Our study explains the lack of progress in decreasing inequality and lower levels of SWB. Since households in the top 20% income group, that access SWPs, experience a negative effect on their well-being, the SWP system most likely has the opposite effect than initially intended, decreasing well-being in some groups and increasing inequality.

We provide further evidence that the type of grants claimed by households in the top income quintile predominantly comprises old age pension and CSPs. The policy structure makes it possible that grant recipients in an individual capacity may be eligible for these grants even though they are part of a household in the wealthiest quintile. These

findings are of interest to the ongoing broader debates around the effects of SWPs globally on poverty, inequality and SWB. Many checks and balances should be in place to ensure only the most vulnerable access SWPs.

This study has limitations; as in the analysis, we could only use pooled data and not a panel dataset. A panel dataset would likely clarify possible endogeneity arising from confounding factors. Nonetheless, using the combined interpretation of our different models' estimation results, we believe the negative relationship between SWPs and SWB in higher income quintiles is robust. Future studies should investigate our findings further as this can be a significant concern to the SWP system in South Africa.

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Competing interests

The authors have declared that no competing interest exists.

Authors' contributions

All the authors contributed equally in conceptualisation, methodology, analysis and writing.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

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Data availability

The data that support the findings of this study are available on request from the corresponding author.

Disclaimer

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Appendices starts on the next page →

Appendix 1

TABLE 1-A1: Pooled ordinary least squares with household subjective well-being as the dependent variable.

Variable	All		Lowest quintile		Highest quintile	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
HH SWP	0.0327*	(0.0276)	0.3451***	(0.0860)	-0.1726***	(0.0574)
HH size	0.0584***	(0.0043)	0.0332***	(0.0094)	0.0425***	(0.0113)
HH education	0.0408***	(0.0039)	0.0080	(0.0084)	0.0429***	(0.0097)
HH health	0.2247***	(0.0130)	0.2897***	(0.0264)	0.1540***	(0.0315)
Dwelling type	0.2428***	(0.0269)	0.1759***	(0.0494)	0.2366**	(0.0989)
Water dummy (no piped water = 0)	0.1737***	(0.0286)	0.1693***	(0.0546)	0.0459	(0.0936)
Geotype (Traditional = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Urban	0.0368	(0.0287)	-0.0719	(0.0600)	-0.0120	(0.0757)
Farm	0.0776*	(0.0458)	-0.0215	(0.1048)	0.1147	(0.1219)
Age (HH head)	0.0069*	(0.0037)	0.0125*	(0.0073)	0.0076	(0.0100)
Age ² (HH head)	0.0000	(0.0000)	0.0002***	(0.0001)	0.0000	(0.0001)
Gender (Female = 0)	0.0805***	(0.0225)	0.1581***	(0.0497)	0.1650***	(0.0480)
Relative income Category (Medium)†	0.8815***	(0.0230)	0.8100***	(0.0527)	0.8063***	(0.0642)
Relative income Category (High)	0.3147***	(0.0381)	-0.3211***	(0.0904)	0.8053***	(0.0785)
Employment status (economically inactive = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Unemployed	0.0273	(0.0386)	-0.0741	(0.0674)	-0.0469	(0.1278)
Employed	0.2733***	(0.0273)	-0.0408	(0.0724)	0.1254*	(0.0672)
Race (Black people = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Mixed race people	1.0541***	(0.0337)	1.0712***	(0.0992)	0.7756***	(0.0681)
Indian people	1.0133***	(0.0982)	0.9380***	(0.3636)	0.6889***	(0.1330)
White people	1.3448***	(0.0495)	0.8132**	(0.3448)	0.9441***	(0.0658)
1. wave	0.0000	(.)	0.0000	(.)	0.0000	(.)
2. wave	-0.6443***	(0.0375)	-0.6255***	(0.0670)	-0.4180***	(0.1130)
3. wave	-0.4009***	(0.0341)	-0.5197***	(0.0643)	-0.2590***	(0.0940)
4. wave	0.0917***	(0.0330)	0.0393	(0.0713)	0.0089	(0.0855)
5. wave	0.0282	(0.0329)	-0.0782	(0.0829)	-0.1978**	(0.0802)
_cons	2.6491***	(0.1114)	3.0426***	(0.2358)	3.7243***	(0.3219)
N	38 201		8361		7016	
Adj. R ²	0.161		0.098		0.105	

SWP, Social welfare payments; HH, household; SE, Standard errors.

Standard errors in parentheses.

†, Base category if low relative income.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.

TABLE 2-A1: Descriptives of the variables included in the pooled ordered probit.

Variable	Full sample			No SWP				Receive SWP			
	Obs	Mean/ Frequencies	Std. Dev.	Mean/ Frequencies	Std. Dev.	Min	Max	Mean/ Frequencies	Std. Dev.	Min	Max
SWB_cate-gorical	41 631	5.47	2.23	5.70	2.32	1	10	5.55	-	1	10
Household head	42 717	-	-	-	-	-	-	-	-	-	-
Household income – SWP (constant 2014 prices)*	40 160	5364.66	18790.49	9633.55	30169.56	0	884636.40	3067.03	6177.54	-20604.34	310265.90
Household income	40 130	6032.83	18737.22	9635.61	30182.64	0	884636.40	4094.00	6257.00	0	310439.60
Household expenditure	40 130	4426.80	9477.20	7145.79	14159.99	29.19	464227.20	2964.09	4915.29	72.99	177926.80
SWP (0 = no SWP)	42 717	0.65	0.48	-	-	0	1	-	-	0	1
HH_education	42 717	8.15	3.53	10.12	3.65	0	18	6.99	2.88	0	18
HH_health	41 305	3.72	0.91	3.90	0.92	1	5	3.62	0.89	1	5
HH_size	42 717	3.99	2.76	2.53	1.73	1	23	4.78	2.88	1	41
Dwelling type (0 = informal)	42 205	0.77	0.42	0.82	0.38	0	1	0.74	0.43	0	1
Water (0 = no piped water)	42 321	0.70	0.46	0.81	0.40	0	1	0.64	0.48	0	1
Age	42 717	47.09	16.44	42.11	14.18	11	111	50.43	16.99	11	110
Gender (0 = female)	41 614	0.44	0.19	0.63	0.48	0	1	0.34	0.47	0	1
Relative Income											
Below	20 077	0.47	-	0.37	-	-	-	0.53	-	-	-
Average	17 941	0.42	-	0.48	-	-	-	0.38	-	-	-
Above	4969	0.11	-	0.15	-	-	-	0.09	-	-	-
Race											
Black people	35 339	0.78	-	0.70	-	-	-	0.84	-	-	-
Mixed race people	5997	0.13	-	0.14	-	-	-	0.13	-	-	-
Asian/Indian people	661	0.01	-	0.02	-	-	-	0.01	-	-	-
White people	3053	0.07	-	0.14	-	-	-	0.01	-	-	-
Geotype											
Traditional	15 595	0.36	-	0.19	-	-	-	0.46	-	-	-
Urban	24 964	0.57	-	0.72	-	-	-	0.48	-	-	-
Farm	3264	0.07	-	0.09	-	-	-	0.06	-	-	-
Employment											
Not economically active	16 451	41.20	-	19.39	-	-	-	52.70	-	-	-
Unemployed	4150	10.29	-	8.43	-	-	-	11.43	-	-	-
Employed	19 332	48.41	-	72.18	-	-	-	35.88	-	-	-

SWP, Social welfare payments; SWB, subjective well-being; Obs, observations; Std. Dev., standard deviation; HH, household.

*, For reference, the mean South African Rand to US dollar exchange rate in 2014 was R1 = 0.0923 USD.

TABLE 3-A1: Summary statistics by quintile.

Variable	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	No SWP	SWP	No SWP	SWP	No SWP	SWP	No SWP	SWP	No SWP	SWP
SWB_categorical	4.52	4.81	4.86	5.23	5.33	5.53	5.88	5.87	6.66	6.27
Household income – SWP (constant 2014 prices)*	165	229	990	965	2276	2241	4739	4687	23181	14166
HH_education	3.65	3.47	3.81	3.62	3.88	3.69	3.96	3.78	3.96	3.78
HH_health	8.32	7.50	8.78	8.40	9.89	9.06	10.84	9.71	11.98	10.49
HH_size	3.5	5.46	3.3	5.9	3.5	6.4	3.7	6.9	3.8	7.3
Dwelling type (0 = informal)	18	82	28	72	31	69	33	67	38	62
Water (0 = no piped water)	15	85	26	74	24	76	26	74	32	68
Age	36	40	35	37	34	37	35	36	38	37
Race										
Black people	18	82	28	72	31	69	35	65	49	51
Mixed race people	16	84	31	69	34	66	35	65	52.5	47
Asian/Indian people	7	92	28	72	35	65	52	48	63.48	36
White people	31	69	49	51	59	41	72	28	86.06	14
Geotype										
Traditional	14	86	22	78	21	79	23	77	33	67
Urban	26	74	33	67	38	61	43	57	64	36
Farm	23	77	46	54	41	58	35	65	45	55
Employment										
Not economically active	15	85	22	78	28	72	28	72	46	54
Unemployed	19	81	28	72	31	69	31	69	43	55
Employed	40	60	41	59	45	55	45	55	63	37

SWP, Social welfare payments; SWB, subjective well-being; HH, household.

*, For reference, the mean South African Rand to US dollar exchange rate in 2014 was R1 = 0.0923 USD.

TABLE 4-A1: Trend for households receiving social welfare payments in the lowest and the highest income quintile.

Variable	Quintile 1					Quintile 5				
	Wave 1 (%)	Wave 2 (%)	Wave 3 (%)	Wave 4 (%)	Wave 5 (%)	Wave 1 (%)	Wave 2 (%)	Wave 3 (%)	Wave 4 (%)	Wave 5 (%)
Child support	23.15	27.78	34.67	31.15	41.43	0.41	3.85	4.85	8.75	10.03
Disability	10.34	7.05	6.70	7.27	7.84	0.41	0.64	1.19	1.23	1.27
Foster care	1.69	1.92	2.58	3.99	2.94	0.19	0.92	0.88	1.10	1.00
Old age	37.14	38.89	37.74	42.88	38.20	2.89	7.87	8.31	9.43	10.67
Care	0.55	0.75	1.32	0.93	1.18	0.21	0.00	0.10	0.21	0.32
War veteran	0.00	0.05	0.05	0.00	0.00	0.00	0.16	0.00	0.05	0.03
Aid	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.06

In 2017 prices R10 367.

TABLE 5-A1: Pooled ordered probit with household subjective well-being as the dependent variable.

Dependent variable: Categorical SWB	(1)		(2)		(3)		(4)		(5)	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
HH SWP	0.2016***	(0.0439)	0.1327***	(0.0281)	0.1197***	(0.0280)	0.0898***	(0.0292)	-0.0873***	(0.0305)
HH size	0.0185***	(0.0046)	0.0255***	(0.0049)	0.0119**	(0.0047)	-0.0048	(0.0049)	0.0211***	(0.0059)
HH education	0.0045	(0.0042)	0.0077*	(0.0042)	0.0066	(0.0050)	0.0096	(0.0062)	0.0228***	(0.0051)
HH health	0.1454***	(0.0132)	0.1085***	(0.0140)	0.0955***	(0.0149)	0.0924***	(0.0159)	0.0844***	(0.0169)
Dwelling type	0.0880***	(0.0245)	0.0805***	(0.0265)	0.0921***	(0.0294)	0.0559	(0.0354)	0.1158**	(0.0520)
Water dummy (no piped water = 0)	0.0805***	(0.0271)	0.0503*	(0.0281)	0.0486	(0.0309)	0.0619*	(0.0358)	0.0209	(0.0489)
Geotype (Traditional = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Urban	-0.0362	(0.0299)	0.0194	(0.0298)	-0.0099	(0.0314)	0.0423	(0.0336)	-0.0071	(0.0395)
Farm	-0.0041	(0.0519)	0.0779*	(0.0461)	0.0256	(0.0493)	0.1098**	(0.0536)	0.0544	(0.0653)
Age (HH head)	-0.0054	(0.0036)	0.0003	(0.0038)	-0.0053	(0.0042)	0.0075	(0.0048)	0.0037	(0.0053)
Age ² (HH head)	0.0001***	(0.0000)	0.0000	(0.0000)	0.0001**	(0.0000)	-0.0000	(0.0000)	0.0000	(0.0001)
Gender (Female = 0)	0.0801***	(0.0246)	0.0035	(0.0250)	0.0081	(0.0252)	0.0132	(0.0261)	0.0886***	(0.0257)
Relative income (Below the neighbour = 0)	-	-	0.0000	(.)	0.0000	(.)	0.0000	(.)	-	-
Relative income Category (Medium)†	0.4030***	(0.0258)	0.4030***	(0.0250)	0.3678***	(0.0246)	0.4438***	(0.0263)	0.4183***	(0.0335)
Relative income Category (High)	-0.1677***	(0.0460)	-0.0627	(0.0481)	-0.0635	(0.0462)	0.0809*	(0.0443)	0.4255***	(0.0413)
Employment status (economically inactive = 0)	-	-	0.0000	(.)	0.0000	(.)	0.0000	(.)	-	-
Unemployed	-0.0289	(0.0337)	0.0467	(0.0389)	0.0140	(0.0439)	0.0983*	(0.0527)	-0.0241	(0.0668)
Employed	-0.0202	(0.0363)	0.0227	(0.0296)	0.0985***	(0.0307)	0.0930***	(0.0334)	0.0670*	(0.0357)
Race (Black people = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Mixed race people	0.5104***	(0.0477)	0.5754***	(0.0411)	0.5067***	(0.0362)	0.4664***	(0.0336)	0.4131***	(0.0371)
Indian people	0.4944***	(0.1709)	0.3417	(0.2433)	0.4590***	(0.1389)	0.3736***	(0.1002)	0.3740***	(0.0732)
White people	0.3950**	(0.1587)	0.5800***	(0.1883)	0.6561***	(0.1007)	0.4083***	(0.0715)	0.5026***	(0.0361)
1. Wave	-	-	0.0000	(.)	0.0000	(.)	0.0000	(.)	-	-
2. Wave	-0.3343***	(0.0339)	-0.4330***	(0.0368)	-0.4564***	(0.0440)	-0.3702***	(0.0546)	-0.1951***	(0.0605)
3. Wave	-0.2655***	(0.0323)	-0.2842***	(0.0344)	-0.4111***	(0.0400)	-0.3139***	(0.0502)	-0.1172**	(0.0503)
4. Wave	0.0150	(0.0347)	-0.0156	(0.0346)	-0.1937***	(0.0392)	-0.1737***	(0.0478)	0.0212	(0.0461)
5. Wave	-0.0535	(0.0408)	-0.0745*	(0.0392)	-0.2199***	(0.0408)	-0.2214***	(0.0480)	-0.0863**	(0.0433)
Cut 1	-	-	-0.8468***	(0.1227)	-1.2792***	(0.1370)	-1.1232***	(0.1638)	-	-
Cut 2	-0.7083***	(0.1198)	-0.3092**	(0.1217)	-0.7582***	(0.1367)	-0.6043***	(0.1633)	-0.9501***	(0.1746)
Cut 3	-0.2089*	(0.1185)	0.1967	(0.1217)	-0.2528*	(0.1364)	-0.0796	(0.1634)	-0.4888***	(0.1719)
Cut 4	0.3273***	(0.1183)	0.6764***	(0.1218)	0.2390*	(0.1366)	0.4028**	(0.1633)	-0.0392	(0.1712)
Cut 5	0.8224***	(0.1183)	1.2531***	(0.1222)	0.7601***	(0.1369)	0.9446***	(0.1636)	0.4101**	(0.1714)
Cut 6	1.3929***	(0.1188)	1.6970***	(0.1226)	1.2252***	(0.1373)	1.4175***	(0.1639)	0.9403***	(0.1718)
Cut 7	1.8329***	(0.1195)	2.1269***	(0.1235)	1.6407***	(0.1378)	1.8867***	(0.1644)	1.4252***	(0.1720)
Cut 8	2.1891***	(0.1201)	2.5111***	(0.1245)	2.1113***	(0.1385)	2.3674***	(0.1654)	1.9448***	(0.1724)
Cut 9	2.5339***	(0.1213)	2.8015***	(0.1265)	2.4262***	(0.1400)	2.7810***	(0.1667)	2.5335***	(0.1729)
N	2.7639***	(0.1222)	7913		7671		7093		3.0086***	(0.1737)

SWP, Social welfare payments; SWB, subjective well-being; HH, household; SE, Standard errors; Coeff., coefficient.

Standard errors in parentheses.

†, Base Category if low relative Income.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.

TABLE 6-A1: Robustness check, using social welfare payments size instead of binary social welfare payments variable by quintile.

Dependent variable: Categorical SWB	(1)		(2)		(3)		(4)		(5)	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
HH SWP	0.0381***	(0.0105)	0.0623***	(0.0219)	0.0880***	(0.0247)	0.0307	(0.0264)	-0.0281	(0.0317)
HH size	0.0177***	(0.0027)	0.0138**	(0.0062)	0.0087	(0.0063)	-0.0117*	(0.0067)	0.0097	(0.0077)
HH education	0.0132***	(0.0027)	0.0015	(0.0056)	-0.0028	(0.0070)	-0.0003	(0.0089)	0.0247*	(0.0138)
HH health	0.1149***	(0.0090)	0.1054***	(0.0187)	0.1068***	(0.0213)	0.1016***	(0.0235)	0.0791**	(0.0323)
Dwelling type	0.1181***	(0.0168)	0.0676**	(0.0343)	0.1418***	(0.0397)	0.0512	(0.0486)	0.1044	(0.0776)
Water dummy (no piped water = 0)	0.0949***	(0.0177)	0.0772**	(0.0355)	0.0696*	(0.0412)	0.0534	(0.0485)	0.0774	(0.0726)
Geotype (Traditional = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Urban	0.0229	(0.0180)	0.0180	(0.0381)	0.0015	(0.0411)	0.0696	(0.0448)	-0.0325	(0.0572)
Farm	0.0885***	(0.0310)	0.1281*	(0.0671)	0.0484	(0.0702)	0.0894	(0.0723)	0.0992	(0.1036)
Age (HH head)	0.0042*	(0.0024)	0.0075	(0.0049)	-0.0043	(0.0056)	0.0150**	(0.0068)	0.0176**	(0.0087)
Age ² (HH head)	0.0000	(0.0000)	-0.0000	(0.0000)	0.0001	(0.0001)	-0.0001	(0.0001)	-0.0001	(0.0001)
Gender (Female = 0)	0.0814***	(0.0150)	0.0576*	(0.0325)	0.0484	(0.0342)	0.0222	(0.0370)	0.1298***	(0.0462)
Relative income Category (Medium) [†]	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Relative income Category (High)	0.4063***	(0.0147)	0.3486***	(0.0307)	0.3547***	(0.0329)	0.4651***	(0.0360)	0.4268***	(0.0516)
Employment status (economically inactive = 0)	-0.0399	(0.0267)	-0.0636	(0.0612)	-0.2073***	(0.0635)	-0.0770	(0.0632)	0.3063***	(0.0727)
Unemployed	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Employed	0.0370	(0.0244)	0.1610***	(0.0507)	0.0404	(0.0609)	0.0778	(0.0682)	0.0544	(0.1027)
Race (Black people = 0)	0.1296***	(0.0178)	0.0384	(0.0370)	0.1016**	(0.0412)	0.0990**	(0.0442)	0.0514	(0.0578)
Mixed race people	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Indian people	0.4895***	(0.0225)	0.4784***	(0.0521)	0.4869***	(0.0481)	0.3970***	(0.0466)	0.5523***	(0.0624)
White people	0.4193***	(0.0736)	0.1917	(0.2495)	0.2426	(0.1651)	0.1776	(0.1316)	0.5907***	(0.1584)
1. Wave	0.5620***	(0.0570)	0.5639**	(0.2410)	0.8864***	(0.1622)	0.2272*	(0.1171)	0.5045***	(0.0961)
2. Wave	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
3. Wave	-0.3200***	(0.0257)	-0.3857***	(0.0506)	-0.3965***	(0.0636)	-0.3167***	(0.0907)	-0.3730**	(0.1590)
4. Wave	-0.1756***	(0.0235)	-0.2182***	(0.0468)	-0.3014***	(0.0574)	-0.1115	(0.0853)	-0.0558	(0.1269)
5. Wave	0.0534**	(0.0227)	-0.0218	(0.0470)	-0.1522***	(0.0550)	-0.0025	(0.0807)	0.1324	(0.1162)
_cons	0.0338	(0.0234)	-0.0576	(0.0508)	-0.1492**	(0.0581)	-0.0492	(0.0818)	0.0274	(0.1150)
Urban	3.3667***	(0.1063)	3.2248***	(0.2147)	3.0428***	(0.2528)	3.1877***	(0.2937)	3.3788***	(0.4052)
N	7163		4956		4279		3635		2239	

SWP, Social welfare payments; SWB, subjective well-being; SE, Standard errors; Coeff., coefficient; HH, household.

Standard errors in parentheses.

[†], Base category if low relative income.*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.

Appendix 2

TABLE 1-A2: Social welfare payments for the period 2009–2017.

Type of SWP	Year	Means test	Means test is done per individual or per couple/family	Allowed to receive another grant as well
Child support payment (Child must be younger than 15 years of age)	2009	Income < R55 200 – couples Income < R27 600 – individual	Both	Yes
Age of child changed to 18 years and younger	2017	Income < R96 000 – couples Income < R48 000 – individual	Both	Yes
Disability payment	2009	Income < R18 000 – individual	Individual	No
	2017	Assets < R2 230 800 – couples Assets < R1 115 400 – individual Income < R156 240 – couples Income < R78 120 – individual	Both	No
Foster child payment	2009	No means test	Neither	Yes
	2017	No means test	Neither	Yes
Care-dependency payment	2009	Income < R242 400 – couples Income < R121 200 – individual	Both	Yes
	2017	Income < R405 600 – couples Income < R202 800 – individual	Both	Yes
Old-age payment	2009	Assets < R1 504 800 – couples Assets < R752 400 – individual	Both	No
	2017	Income < R89 760 – couples Income < R44 880 – individual Assets < R2 230 800 – couples Assets < R1 115 400 – individual Income < R156 240 – couples Income < R78 120 – individuals	Both	No
Grant-in-aid	2009	No means test – though you already need to receive another social grant	Neither	Yes. You must be living on a social grant to qualify for this grant.
	2017	No means test	Neither	Yes. You must be living on a social grant to qualify for this grant.
War veteran's payment	2017	Assets < R2 230 800 – couples Assets < R1 115 400 – individuals Income < R156 240 – couples Income < R78 120 – individuals	Both	No

Source: Adapted from SASSA, 2020a, *Ninth statistical report: Payment system*, viewed 16 April 2020, from <https://www.sassa.gov.za/statistical-reports/Documents/Social%20Grant%20Payments%20Report%20-%20December%202020.pdf>

SWP, Social welfare payments.

TABLE 2-A2: Robustness check, dividing quintiles by household income per capita instead of total household income.

Dependent variable: Categorical SWB	(1)		(2)		(3)		(4)		(5)	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
HH SWP	0.1370***	(0.0378)	0.1119***	(0.0334)	0.1497***	(0.0294)	0.1453***	(0.0274)	-0.0449	(0.0281)
HH Education	0.0162***	(0.0045)	0.0050	(0.0047)	0.0169***	(0.0049)	0.0227***	(0.0050)	0.0309***	(0.0056)
HH Health	0.1461***	(0.0156)	0.1645***	(0.0159)	0.1109***	(0.0157)	0.1025***	(0.0147)	0.0908***	(0.0129)
Dwelling type	0.0920***	(0.0268)	0.1202***	(0.0299)	0.0506	(0.0310)	0.1164***	(0.0321)	0.0905**	(0.0360)
Water dummy (no piped water = 0)	0.0635**	(0.0302)	0.0368	(0.0306)	0.1099***	(0.0315)	0.0605*	(0.0331)	0.0931**	(0.0376)
Geotype (Traditional = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Urban	-0.0186	(0.0341)	-0.0167	(0.0323)	-0.0376	(0.0313)	0.0111	(0.0311)	-0.0205	(0.0336)
Farm	0.0718	(0.0555)	0.0829	(0.0556)	0.0592	(0.0522)	-0.0133	(0.0477)	0.0242	(0.0523)
Age (HH head)	-0.0039	(0.0041)	0.0072*	(0.0043)	0.0116***	(0.0042)	0.0012	(0.0043)	0.0128***	(0.0042)
Age ² (HH head)	0.0001**	(0.0000)	-0.0000	(0.0000)	-0.0001	(0.0000)	0.0001	(0.0000)	-0.0001	(0.0000)
Gender (Female = 0)	0.1149***	(0.0277)	0.0365	(0.0282)	0.0020	(0.0267)	0.0132	(0.0241)	0.0420*	(0.0218)
Relative income Category (Medium)†	0.3704***	(0.0285)	0.3843***	(0.0272)	0.4279***	(0.0262)	0.4879***	(0.0249)	0.4496***	(0.0257)
Relative income Category (High)	-0.2019***	(0.0491)	-0.1433***	(0.0552)	-0.0552	(0.0493)	0.1743***	(0.0421)	0.4010***	(0.0341)
Unemployed	-0.0278	(0.0373)	0.0353	(0.0434)	-0.0172	(0.0420)	0.0951**	(0.0454)	-0.0592	(0.0588)
Employed	0.0284	(0.0418)	0.0297	(0.0321)	0.0786**	(0.0309)	0.1119***	(0.0309)	0.0650**	(0.0319)
Race (African = 0)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)	0.0000	(.)
Mixed race people	0.5153***	(0.0570)	0.5454***	(0.0442)	0.5668***	(0.0381)	0.5156***	(0.0326)	0.4389***	(0.0323)
Indian people	0.4120**	(0.1882)	0.5920***	(0.1985)	0.5095***	(0.1809)	0.4703***	(0.0981)	0.3682***	(0.0657)
White people	0.2741	(0.2004)	0.4488	(0.3548)	0.4170***	(0.1535)	0.5760***	(0.0960)	0.5100***	(0.0318)

SWP, Social welfare payments; SWB, subjective well-being; HH, household; SE, Standard errors; Coeff., coefficient.

Standard errors in parentheses.

†, Base Category if low relative Income.

*, $p < 0.10$; **, $p < 0.05$; ***, $p < 0.01$.