Migration Letters
November 2021
Volume: 18, No: 6, pp. 761 – 774
ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
journals.tplondon.com/ml

TRANSNATIONAL PRESS® LONDON

Received: 30 January 2020 Accepted: 3 November 2021
DOI: https://doi.org/10.33182/ml.v18i6.917

Remittances and subjective well-being: A static versus dynamic panel approach to happiness

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Abstract

Using all five waves of the National Income Dynamics Study (NIDS) panel dataset, we examine the effect of domestic remittances on the static and dynamic subjective well-being (SWB) of recipient individuals in South Africa, by using a random effects ordered probit model that accounts for individual heterogeneity. Moreover, we check the robustness of our static model results by making use of an instrumental variable for migrants' remittances. Two major empirical findings emerge from this paper: firstly, domestic remittances are consistently found to have a positive and statistically significant impact on the happiness of recipient individuals. Moreover, this finding persists in both the static and dynamic panel models. Secondly, the coefficient on lagged SWB (derived from the dynamic model) is found to be positive and statistically significant, confirming that SWB today is significantly influenced by SWB in the past.

Keywords: *East Central Europe; welfare state; welfare regime; hierarchical cluster analysis*

Introduction

In many developing countries like South Africa, domestic remittances[4] are a major source of income for poor households (Posel & Casale, 2006). Given that remittances often constitute a large share of the earned income of remittance-receiving households (StatsSA, 2019), it is expected that the subjective well-being[5] (SWB) of the remittance-receiving individuals is substantially affected by remittances. This is important as it suggests that the outcome of receiving remittances extends well-beyond its' monetary worth, by encompassing non-pecuniary gains. A number of studies have shown that these remittances not only increase the disposable income and consumption levels of recipient households, but also help reduce poverty, increase long-run economic development and improve overall standards of living by enabling these poor households to invest in better quality healthcare and education (Khan & Valatheeswaran, 2020; Munoz & Collazo, 2019; Nicoli, Kachingwe & Kaput, 2018; Biyase, 2012; Lu & Treiman, 2007; Rapoport & Docquier, 2006). Despite the known importance of domestic remittances in South Africa, very few studies have examined their impact on the SWB of recipient individuals (see one South African study which focuses on remittances and a static component of SWB by Kruger, 2017).

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[4] Domestic remittances constitute the remittances received by South Africans from other family members living in South Africa.
[5] Consistent with other studies, we use the words 'subjective well-being', 'life satisfaction' and 'happiness' interchangeably.sss

The main objective of this paper is to examine the effect of domestic remittances on the static as well as dynamic SWB of recipient individuals in South Africa using all five waves of the National Income Dynamics Study (NIDS) panel dataset. Currently, there exists a vast amount of international literature exploring the effect of remittances on the SWB of recipient individuals (see for example Joarder, Harris & Dockery, 2017; Borraz, Pozo & Rossi, 2010; Semyonov & Gorodzeisky, 2008), however, these studies have limitations. Firstly, they simply explore the relationship between total remittances and a static component of SWB. They, therefore, make the strong assumption that happiness is stationary and cannot change over time. Secondly, some studies provide misleading results by not accounting for potential endogeneity bias between remittances and SWB. This study contributes to domestic and international literature in the following three ways: i) We incorporate the dynamic nature of SWB into the empirical analysis to account for the complexities of human behaviour. In doing so, we observe how the SWB of recipient individuals may influence itself or, put differently, how SWB today might be influenced by SWB in the past. ii) We attempt to address some of the deficiencies associated with cross-sectional data by employing the nationally representative household panel dataset NIDS. iii) We make use of an instrumental variable for migrants' remittances to account for potential endogeneity.

The rest of this paper is structured as follows: Section 2 offers a comprehensive review of the literature on the topic. Section 3 presents the methodology. Section 4 describes the dataset and presents descriptive statistics. Section 5 provides the empirical results, and, lastly, Section 6 concludes.

Literature Review

The literature on SWB and remittances will be discussed first and thereafter literature on dynamic SWB. Studies on the relationship between SWB and remittances are mainly divided into the analysis of the SWB of migrants themselves (see for example Akay, Guilietti, Robalino & Zimmerman, 2014) or the households that are left behind (see for example Borraz et al., 2010, and Semyonov & Gorodzeisky, 2008). Only one study includes both migrants and their households when investigating SWB and remittances (Joarder et al., 2017). This study focuses on remittance-receiving individuals and therefore the literature discussed will focus on the SWB of these individuals.

Borraz et al. (2010) investigated the SWB of family members of migrants who get left behind in their home city, Cuenca, Ecuador. Their research shows that households of migrants exhibit the same levels of happiness as households independent of migration. Borraz et al. (2010) ascribe this pattern to the remittances received by family members at home, which neutralises the effect of the migration. Although the study cannot pinpoint how remittances raise SWB, there is a possibility that the monetary reward makes up for the absence of the loved one but there is also a possibility that the remittance serves as a confirmation of the devotion of the household member who is now absent (Borraz et al., 2010).

Andersson (2014) examined the effect of remittances on household welfare in one of the top 10 remittance-receiving countries in Sub-Saharan Africa, namely Ethiopia. The main findings from the study are that remittances have a significant positive effect on the SWB of households and this positive effect is provisional on receiving remittances. According to Andersson (2014), the positive effect is absent when a migrant member does not remit.

In a recent article by Ivlevs et al. (2019), a global outlook is given for the relationship between SWB of the family that stays behind and remittances. Ivlevs et al. (2019) made use of the Gallup World Poll data for 114 countries from 2009 to 2011. The study made use of different measures of SWB and the OLS estimation results show that receiving remittances is associated with an increase in evaluative SWB (the respondent's life as a whole) (Ivlevs et al., 2019). It is noteworthy that the study also found that having family members in a foreign country is accompanied by greater stress and depression, which are not counterbalanced by remittances.

Joarder et al. (2017) considered the effect of remittances on the SWB of both the receiving household and the migrant by making use of a matched sample. The survey was completed by migrants (living in the UK or Malaysia) and their households of origin (Bangladesh). The SWB variable in the ordered probit models was represented by a single-item self-assessed life satisfaction question from the surveys (Joarder et al., 2017). The findings, in accordance with most other papers, were that remittances by migrants play a substantial positive role in the SWB of both the migrant and the origin household. The next section will discuss the limited literature on dynamic SWB.

The dynamic effect of SWB has mainly been tested on several life-events, such as unemployment, marriage, divorce and having a child. Studies that include the dynamic effect of SWB in standard happiness equations are somewhat scarce in comparison to work done on the determinants of SWB.

Bottan and Truglia (2011) were the first researchers to anticipate that happiness might be autoregressive for individual-level data. They named this channel, where happiness today depends on the level of happiness in the past, the "general habituation" channel. The theory was tested by making use of dynamic and static specifications of happiness regressions, tested on various panel-data sets (Bottan & Truglia, 2011). The results from the models show that the estimates in the dynamic models are not significantly different from the static models (Bottan & Truglia, 2011). Furthermore, the lagged happiness variable in the dynamic specification is statistically significant and positive (Bottan & Truglia, 2011). According to Bottan and Truglia (2011:232), the significance indicates "that happiness is inertial: i.e., ceteris paribus, having greater feelings of happiness in the past directly increases the probability of feeling happy in the present."

The literature on the relationship between SWB and remittances mostly shows that remittances have a positive and significant effect on the SWB of the individuals that stay behind (Borraz et al., 2010 is an exception, this research shows that the effect is neutral). The SWB in the literature is either measured through a single self-assessed question regarding the life satisfaction of an individual or through a type of index, which combines various questions, or aspects of life satisfaction. However, very few studies consider the dynamic nature of SWB and it might have a significant influence on the results of those studies. According to Roth (2013), models that do not consider the dynamic nature of SWB might result in biased results. It seems that there is a consensus that remittances have a positive influence on SWB but whether this positive effect of remittances on SWB compensates for the absence of a loved one, remains to be confirmed.

Methodology

In order to examine the relationship between remittances and the static and dynamic SWB of recipient individuals, a random effects ordered probit model[6] was used in this study. The ordered probit model takes the ordinal nature of the SWB variable into account and the random effects account for an additional normally distributed cross-section error term. The model will be specified as follows (adapted from Long & Freese, 2006; Ferrer-i-Carbonell & Frijters, 2004):

$$y_{it}^{*} = x_{it}\beta + \varepsilon_{it} \qquad (1)$$

y_{it}^{*} is the unobserved 10-point latent variable that signifies the ordinal SWB of individuals i at year t, and x_{it} is a vector of the determinants of SWB (as identified by other studies on the subject, and including remittances). β is a vector of unknown parameters. The error term ε_{it} has the following combined nature (Ferrer-i-Carbonell & Frijters, 2004):

$$\varepsilon_{it} = v_i + \eta_{it} \qquad (2)$$

v_i represents unobserved, time-invariant individual-specific heterogeneity and η_{it} is the white-noise error term. According to Ferrer-i-Carbonell and Frijters (2004:649), v_i and η_{it} are "both normally distributed, orthogonal to each other and both orthogonal to observed characteristics x_{it}."

The unobserved latent variable y_{it}^{*} is related to the observed variable y_{it} as follows (Long & Freese, 2006):

$$y_{it} = \begin{cases} 1 \; if \; y_{it}^{*} < \tau_1 \\ 2 \; if \; \tau_1 \le y_{it}^{*} < \tau_2 \\ 3 \; if \; \tau_2 \le y_{it}^{*} < \tau_3 \\ 4 \; if \; \tau_3 \le y_{it}^{*} < \tau_4 \\ 5 \; if \; \tau_4 \le y_{it}^{*} < \tau_5 \\ 6 \; if \; \tau_5 \le y_{it}^{*} < \tau_6 \\ 7 \; if \; \tau_6 \le y_{it}^{*} < \tau_7 \\ 8 \; if \; \tau_7 \le y_{it}^{*} < \tau_8 \\ 9 \; if \; \tau_8 \le y_{it}^{*} < \tau_9 \\ 10 \; if \; y_{it}^{*} \ge \tau_9 \end{cases} \qquad (3)$$

Where the τ's represents cut points.

The random effects ordered probit model was used in a static, as well as, dynamic panel model setting. The main reason for employing the latter model is that there is evidence to suggest that static models do suffer from first-order serial correlation in the idiosyncratic error term. This issue should not be ignored since the estimated variances of the regression coefficients are likely to be biased – the *t*-statistics will appear to be more significant than they really are.

Our paper also addresses a methodological limitation of some of the previous studies in this field, namely that findings may be biased on account of endogeneity between remittances and SWB. This issue has been a concern for many researchers in this field (Akay et al., 2014) who

[6] There are alternative ways of estimating equation (2) – using logit model with individual fixed effects. However, it has been empirically proven by important scholars in this field (see Ferrer-i-Carbonell and Frijters (2004) that the estimated coefficients derived from such an approach (fixed effects logit) yields similar estimates to the random effect estimates.

believe that endogeneity might exist. If the reverse causation between remittances and SWB does exist, the OLS or ordered probit estimation could bias the result observed and might not be appropriate for policy advice. Therefore, this paper employs an instrumental variable estimator that accounts for possible endogeneity concerns. Specifically, it accounts for endogeneity by using a one-year lagged value of remittances as an instrument[7] which is strongly correlated with current remittances but has no direct effect on SWB beyond its indirect effect via remittances. Certain tests were executed to determine if: (i) remittances are endogenous (ii) validity and adequacy of the instrument used, by means of a Durbin-Wu-Hausman test for endogeneity, the weak instrument test and Sargan test (overidentification test). The test results are reported at the bottom of table 3. The first test (Durbin-Wu-Hausman Test) confirms that remittances are not exogenous and hence an instrumental variable model is an appropriate estimator. As regards to the validity of the instrument, the Sargan Chi-sq(1) p-value of 0.000 does not cast any doubt on the validity of our instrumental variable. While, the Cragg-Donald statistics of 106.03 is much greater than Stock-Yogo weak ID test critical value, suggesting that the hypothesis of weak identification should be rejected.

Data and summary statistics

As noted in the introduction, this paper uses data from the 2008 through to the 2017 NIDS waves to investigate the effect of remittances on static and dynamic SWB. The NIDS is a nationally representative panel study conducted by the Southern African Labour and Development Research Unit (SALDRU) biennially since 2008. The NIDS survey gathers useful information regarding individuals and households, such as employment, household size, remittances, income, gender, age and other related socio-economic and demographic information. The NIDS was particularly valuable for our paper as it monitors and tracks changes in SWB, health and other related aspects of an individual's well-being over time. The single-item measure used to represent SWB in the study is based on a self-assessed life satisfaction question and is similar to the one used in the study by Joarder et al. (2017). In particular, NIDS asks survey respondents the following question (NIDS, 2008): "Using a scale of 1 to 10 where 1 means "very dissatisfied" and 10 means "very satisfied", how do you feel about your life as a whole right now?" Our variable of interest is measured or defined (in the NIDS data) as the number of remittances received by the household of origin. The question is asked as follows "in the last 12 months, did you receive money, food or any other kind of contribution from people who do not usually sleep under this roof for four nights a week?"

In addition to the dependent variable and our variable of interest, we used several control variables in our econometric analysis (as can be seen in Table 1). We use as independent variables several factors identified in the literature as important determinants: socio-economic and demographic variables (such as respondents' health status, years of education, marital status, race dummies, province dummies, employment status, household size, religious affiliation, and province dummies). Some of these control variables (such as age and age squared) are almost non-negotiable in the sense that they show up in almost all the studies of SWB. A common finding in the SWB literature is that age has a U-shape link with SWB, thus we include its squared value to capture this non-linear relationship. Figures 1 and 2 display the responses to this question among the remittance-recipient and non-receiving samples. A

[7] Our paper follows many scholars in this field who have used one-year lagged value of remittances to overcome the endogeneity bias associated with the relationship between between remittances and related outcome variables.

quick glance at the two distributions does not reveal any discernible differences in the average level of SWB between the two groups; the modal level of reported satisfaction is 5. This suggests that the compensatory effect of receiving remittances counterbalances the negative separation effect of migration, at least to some extent, so that the level of life satisfaction among remittance-receiving individuals is very similar to that of non-receiving individuals. The similarities in the distribution across the remittance-receiving and non-receiving samples remain, even when comparing the satisfaction level to ten years ago (as can be seen in Figure 1A and 2A in the Appendix). Unsurprisingly, Figure 3, a scatterplot of the relationship between SWB and remittances, suggests a positive relationship between these variables. However, no firm conclusions (concerning the remittance-SWB nexus) can be derived from Figure 3 since it is purely a suggestive analysis from the raw data. The following section (section 5) will shed more light, using appropriate statistical analysis and controlling for other variables as to whether or not remittances are important in explaining SWB.

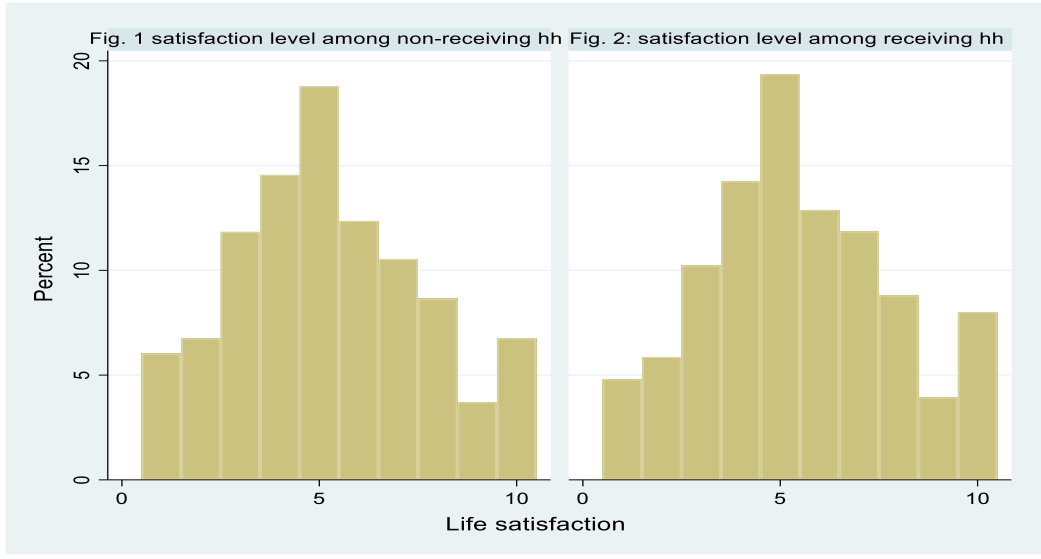
Table 1. Description Of Dependent And Independent Variables

Variables	Type	Description
Dependent variable		
Life Satisfaction (LS)	Continuous	LS is rated on a scale of 1-10, where 1 is very dissatisfied and 10 is very satisfied
Explanatory variables		
Marital status	Dummy	1 = if married/living with partner, 0 = Otherwise
Age	Continuous	Age in years
Age-SQ	Continuous	Age squared
Remittances[8]	Continuous	Amount of remittances received
HH-size	Continuous	Number of members in the household
Education	Continuous	Education in years
Africans	Dummy	1 = Africans, 0 = Otherwise
Coloured	Dummy	1 = Coloured, 0 = Otherwise
Indian	Dummy	1 = Indian, 0 = Otherwise
White	Dummy	1 = White, 0 = Otherwise
Religious-affiliation	Dummy	Whether the individual is affiliated to any religion: 1 if affiliated, 0 = Otherwise
Health status	Dummy	1 = if excellent or very good, 0 = Otherwise
Gender	Dummy	1 = Female, 0 = Otherwise
Employment status	Dummy	1= Employed, 0 = Otherwise
Traditional areas	Dummy	Household in traditional areas
Urban	Dummy	Household in urban areas
Farm	Dummy	Household in farm areas
Eastern Cape	Dummy	Household in Eastern Cape
Northern Cape	Dummy	Household in Northern Cape
Free State	Dummy	Household in Free State
KwaZulu-Natal	Dummy	Household in KwaZulu-Natal
North West	Dummy	Household in North West
Gauteng	Dummy	Household in Gauteng
Mpumalanga	Dummy	Household in Mpumalanga
Limpopo	Dummy	Household in Limpopo

Source: NIDS data

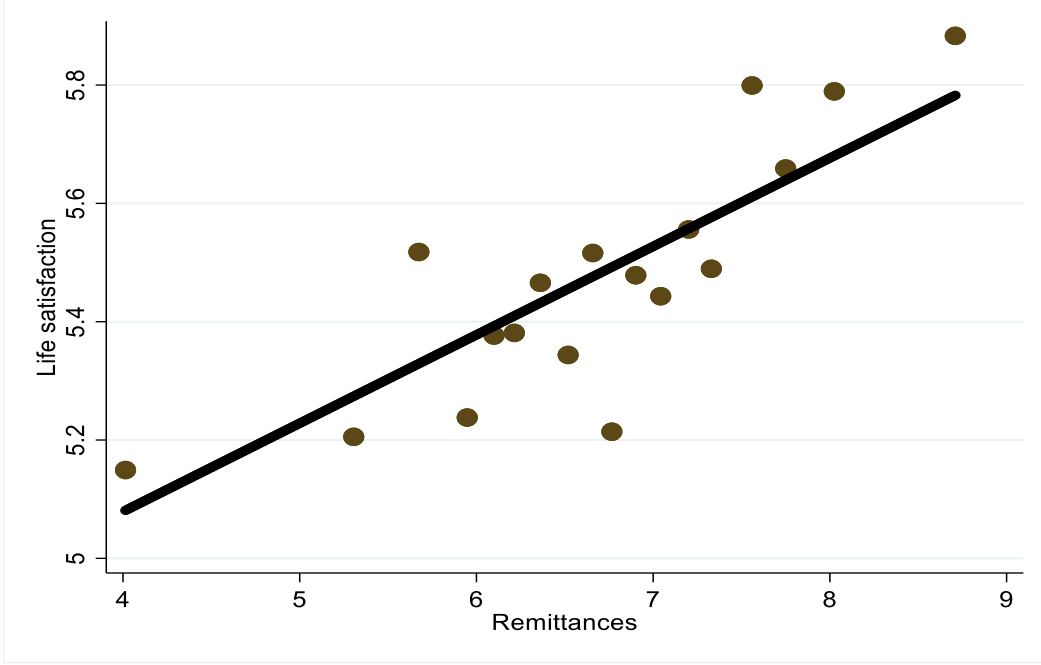
[8] The remittances variable had a skewed distribution and we took a log transformation to obtain a more symmetric distributed.

Figure 1 and 2. Satisfaction Level Among Non-Receiving And Receiving Households, 2008-2017



Source: Authors estimations based on NIDS data (Wave 1, 2, 3, 4, 5)

Figure 3. Satisfaction Level And Remittances For Receiving Individuals, 2008-2017



Source: Authors estimations based on NIDS data (Wave 1, 2, 3, 4, 5)

Empirical Results

Table 2 presents the results of the random effects ordered probit model for the effect of remittances on the single-item measure of SWB and is divided into three columns. The first column displays the variable names, while the second and third columns present the results for the static and dynamic model, respectively. The dynamic model differs from the static model in that, in addition to the usual explanatory variables, we included the lag of the dependent variable (LS_1) as an additional independent variable in the empirical analysis. By incorporating the dynamic nature, we explicitly account for the "general habituation" channel (Roth, 2013).

The results from the static model are in line with our expectations and consistent with existing South African literature; most coefficients are statistically significant and hold their anticipated signs. For example, the relationship between age and SWB is U-shaped. This is a well-known finding in the literature and suggests that as an individual age, their SWB levels decrease up to a certain point, and beyond that point, increases in age correspond with increases in SWB (Blanchflower & Oswald, 2008, 2004; Clark & Oswald, 2006; Winkelmann & Winkelmann, 1998). Moreover, a number of additional demographic and socio-economic variables appear to be significant predictors of SWB (such as the respondent's household size, religious affiliation, marital status, perceived health status, employment, race, geo-type, and provincial location).

For example, we find that on average individuals who are married or living with a partner report significantly higher levels of SWB than those who are single, separated, divorced or widowed. A likely reason for this is that marriage provides emotional and financial support. This finding is in line with other international and South African studies on SWB (see Diener Suh, Lucas, & Smith, 1999; Blaauw & Pretorius, 2013). Unsurprisingly, individuals who are employed or who perceive their health to be "excellent" or "very good" report higher SWB than those who are unemployed or who perceive their health to be only "fair" or "good". Employment and good health are key determinants of SWB because they facilitate a better quality of life. Consistent with the SWB literature, individuals who are strongly affiliated with a religion are happier in comparison to those who are not (Diener, Tay & Myers, 2011). A plausible reason for this is that religion brings a sense of purpose in one's life (Kollamparambil, 2019; Blaauw & Pretorius, 2013). Household geo-type is another important determinant of SWB. In particular, we find that households located in urban or farm areas report significantly higher levels of SWB than households located in rural areas. This finding is consistent with other studies on SWB (see Mulcahy & Kollamparambil, 2016). In the majority of South African studies, Africans are found to have lower levels of SWB than other race groups (Blaaw & Pretorius, 2013; Posel & Casale, 2011). This highlights the racial divide evident in South Africa, which is unsurprising given its well-known history of Apartheid. Contrary to that expected, we find the relationship between education and SWB to be statistically insignificant. This is in line with recent South African studies by Posel and Casale (2015) and Greyling (2018).

Unsurprisingly, the effect of domestic remittances is positive and statistically significant at a 1 percent level of significance, implying that remittances significantly improve the SWB of recipient individuals. This corresponds to the finding of Akay et al. (2014) and suggests that the drawbacks of not having these migrant workers at home are outweighed by the remittances that the migrants pay to whoever gets left behind. A surprising finding is that of

the gender coefficient, which appears to be positive though statistically insignificant in the static model, but significant in the dynamic model. Contrary to domestic studies by Blaauw and Pretorius (2013) and Posel and Casale (2015), this suggests that, once the panel and dynamic nature of SWB are accounted for, females report higher levels of SWB as compared to their male counterparts. However, it is true in most instances that male migrants leave their households to work elsewhere, and hence our sample is somewhat biased because it contains a larger representation of females. Notably, however, such a finding is relatively common in international studies on gender and happiness (Senik, 2016; Graham & Chattopadhyay, 2013; Blanchflower & Oswald, 2004).

The results from the dynamic model show that the explanatory variable capturing the dynamic nature of SWB is positive and significant at a 1 percent level of confidence, confirming the fact that SWB today is significantly influenced by SWB in the past. This finding is in line with Roth (2013), who argued that human decisions are driven by factors including SWB, and which themselves influence one's SWB. Hence, an autoregressive SWB function is "more evolutionarily efficient than a static one" which is likely to result in omitted-variable bias (Roth, 2013:10). Consistent with the static model results, the coefficient of remittances is positive and statistically significant, illustrating its robust positive influence on the SWB of recipient individuals.

Moreover, most covariates in the dynamic model hold the same sign as in the static model, except for one location dummy which turned positive and remained insignificant (North West). Notably, several explanatory variables became insignificant (such as marital status, Eastern Cape and Limpopo) or less significant in the dynamic model (such as household size, religious affiliation, households residing in farm areas, and households located in KwaZulu-Natal). This suggests that by disregarding the dynamic nature of SWB, the static model may be overcompensating (at least to some extent) by placing a larger weight or significance on additional explanatory variables that are considered insignificant in a dynamic panel setting. In summary, this means that the dynamic panel model may be more accurate in its ability to capture the complete picture regarding the happiness of recipient individuals. This is somewhat unsurprising given the fact that human behaviour is complex and dynamic in nature.

Table 2. Random Effects Ordered Probit Estimates of The Effect of Remittances on Swb

	STATIC MODEL			**DYNAMIC MODEL**		
Variables	Coef.	Std. Err.	T-stat	Coef.	Std. Err.	T-stat
Remittances	0.083	0.010	***	0.045	0.012	***
Education	0.003	0.002		0.002	0.002	
HH-size	0.014	0.003	***	0.009	0.003	**
Age	-0.038	0.003	***	-0.023	0.004	***
Age-SQ	0.000	0.000	***	0.000	0.000	***
Religious-affiliation	0.143	0.037	***	0.109	0.044	**
Married	0.102	0.031	***	0.038	0.033	
Very good health	0.105	0.023	***	0.130	0.027	***
Employed	0.172	0.025	***	0.168	0.028	***
Female	0.037	0.024		0.056	0.027	**
Coloured	0.563	0.052	***	0.271	0.059	***
Asian/Indian	0.831	0.145	***	0.466	0.157	***

White	0.833	0.104	***	0.372	0.124	***
Urban	0.117	0.031	***	0.124	0.034	***
Farm	0.164	0.057	**	0.127	0.065	*
Eastern Cape	-0.290	0.061	***	-0.093	0.069	
Northern Cape	-0.268	0.060	***	-0.232	0.066	***
Free State	0.042	0.066		0.048	0.072	
KwaZulu-Natal	-0.268	0.058	***	-0.149	0.066	**
North West	-0.025	0.070		0.072	0.078	
Gauteng	-0.332	0.060	***	-0.274	0.068	***
Mpumalanga	-0.397	0.066	***	-0.388	0.074	***
Limpopo	-0.168	0.064	***	-0.007	0.072	
LS-1				0.220	0.005	***
/cut1	-2.100	0.115		-0.953	0.140	
/cut2	-1.542	0.114		-0.362	0.137	
/cut3	-0.964	0.113		0.201	0.136	
/cut4	-0.407	0.112		0.746	0.136	
/cut5	0.239	0.112		1.381	0.136	
/cut6	0.694	0.112		1.835	0.137	
/cut7	1.167	0.113		2.322	0.138	
/cut8	1.643	0.113		2.807	0.140	
/cut9	1.935	0.114		3.105	0.141	
Log likelihood	-33111			-19413		
Observation (n)	15,418			9,432		

Source: Authors' estimation based on NIDS data
Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

In order to check the reliability of our random effects ordered probit model results, we used an instrumental variable for the migrant's remittances by using the lagged value of remittances. Table 3 presents the robustness results of the fixed effects Instrumental Variable (IV) model for the effect of remittances on the SWB of recipient individuals.

Surprisingly, only a handful of explanatory variables shared the same sign and level of significance in both the fixed effects IV and random effects ordered probit models (including remittances, age, age squared, employed, religious affiliation, race and geo-type and provincial dummies[9]). This finding highlights the importance of conducting such robustness checks in happiness research and also reveals the difficulties that are associated with trying to estimate or model SWB (which is highly subjective from one person to another). Nevertheless, the results are meaningful and find a consistently positive and significant impact of remittances on the SWB of recipient individuals. This confirms and accentuates the importance of domestic remittances in South Africa, as they are consistently found to be a key predictor in the happiness of recipient individuals, irrespective of the econometric model used.

When comparing the magnitude of the coefficient estimates derived from the fixed effects IV to that of the static model, we see that the baseline estimates (which do not account for endogeneity) are downward biased. According to Ibarra et al. (2015), this may be caused by omitting a relevant circumstance and is likely to lead to a substantial underestimation of the

[9] Note that the interpretation of these particular variables do not change from the previous model.

true or actual estimates. Given that the fixed effects IV model accounts for endogeneity bias, it is therefore regarded as the superior model.

Table 3. Fixed Effects- IV Estimates of The Effect of Remittances On Swb

Variables	Coef.	Std. Err.	T-stat
Remittances	0.882	0.262	***
Education	-0.006	0.009	
HH-size	-0.009	0.015	
Age	-0.083	0.016	***
Age-SQ	0.001	0.000	***
Religious-affiliation	0.419	0.172	**
Married	0.110	0.138	
Very good health	0.179	0.106	
Employed	0.534	0.122	***
Female	0.120	0.110	
Coloured	1.155	0.259	***
Asian/Indian	1.229	0.689	
White	1.169	0.735	
Urban	0.531	0.134	***
Farm	0.874	0.298	***
Eastern Cape	-0.271	0.306	
Northern Cape	-0.906	0.319	***
Free State	0.002	0.324	
KwaZulu-Natal	-0.585	0.296	*
North West	0.235	0.340	
Gauteng	-1.100	0.315	***
Mpumalanga	-0.650	0.316	*
Limpopo	-0.130	0.317	
Endogeneity tests:			
Durbin-Wu-Hausman Test: p value		0.003	
Cragg-Donald Wald F statistic		106.03	
Chi-sq(1) Pval=		0.000	
R-squared (within)		0.333	
Number of observations (n)		15,783	

Source: Authors' estimation based on NIDS data
Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Conclusion

This paper aimed to contribute to a growing body of knowledge investigating the relationship between remittance and SWB in South Africa. Existing studies appear to have leaned heavily on static analysis, overlooking the conceivable dynamic effect of SWB (autoregressive nature of the SWB). Given this gap, our paper attempted to establish whether the estimated coefficients are sensitive to model specification (i.e. using a dynamic model alters the estimates). To the best of our knowledge, this is the first paper to investigate this relationship in South Africa. The random effects ordered probit model was used for the single-item measure of SWB in a static as well as a dynamic panel model setting. To assess the robustness of our findings we employed a fixed effects IV model for the single-item measure of SWB.

Perhaps, reassuringly the results from the static model are in line with our expectations and consistent with existing South African literature; most coefficients are statistically significant and hold their anticipated signs. Our variable of interest (domestic remittances) is positive and statistically significant at a 1 percent level of significance, suggesting that remittances significantly improve the SWB of the recipient individual. The coefficient on lagged SWB (derived from the dynamic model) is found to be positive and statistically significant, confirming that SWB today is significantly influenced by SWB in the past. This finding is in line with Roth (2013), who argued that human decisions are determined by factors including SWB, and which themselves influence one's SWB. Hence, an autoregressive SWB function is "more evolutionarily efficient than a static one" which is likely to result in omitted variable bias (Roth, 2013:10). Our results are also robust to various model specifications: we found a strong positive relationship between remittances and SWB, which holds even after controlling for all the covariates. Two policy implications seem to emerge from this analysis. First, remittances play a major role in the SWB of recipient individuals in South Africa and hence should be seen as an important tool for development. Second, is that SWB should be treated as an important indicator of welfare (see Wunder, Wiencierz, Schwarze & Küchenhoff, 2013).

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Appendix A

Figure 1a and 2a: Satisfaction Level Compared To 10 Years Ago Among Non-Receiving And Receiving Households, 2008-2017