Wellbeing in South Africa: Regional economic disparities, conspicuous consumption, and the provision of infrastructure

By

Sakhile Kieth Mpungose

209516715

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School of Accounting, Economics and Finance

College of Law and Management Studies

Supervisor: Prof Colette Muller

Co-Supervisor: Dr Ralitza Debrova

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DECLARATION

I, Sakhile Kieth Mpungose declare that:

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Name of student: Sakhile Kieth Mpungose

Student number: 209516715

[redacted]

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ABSTRACT

This thesis investigates the correlates of subjective well-being in South Africa, with a focus on the role of location, and specifically the impact of regional differences, conspicuous consumption, and access to public infrastructure in South Africa (SA). This thesis contributes to the body of welfare economics in SA by addressing three sets of aspects of well-being. The first of these (Chapter 3) is about individual differences in subjective well-being (SWB) across regions. This chapter makes use of five waves of the National Income Dynamics Study (NIDS) and the Quantac EasyData, corresponding to the NIDS waves. Using a combination of pooled ordered probit (POP), pooled ordinary least squares (POLS), and fixed-effects (FE) estimation, the overall finding from the first study shows that individual SWB differs across regions. Individuals located in urban district municipalities and economically thriving provinces report higher levels of individual SWB relative to individuals located in economically deprived regions.

The second aspect (Chapter 4) examines the effect of conspicuous consumption by others on individual well-being. Using all five waves of the NIDS data, the findings suggest that, after controlling for comparator expenditure at the cluster and district level, conspicuous consumption by others at the district level decreases individual SWB after controlling for other important correlates of SWB. Also, it is worth mentioning that the findings differ depending on the proximity of the reference group. The findings suggest that individual SWB is negatively sensitive to conspicuous consumption by others that occurs in distant proximities, as opposed to close proximities.

The third part (Chapter 5) examines the effect of access to public infrastructure on individual SWB. Access to infrastructure is measured by the distance individuals travel to the nearest educational, healthcare, and police service facility. Using data from the Living Conditions Survey (LCS) 2014/2015, the overall findings show that the effect of access on individual SWB differs across the various kinds of infrastructure facilities. Furthermore, long distances travelled to access public infrastructure pose a significant barrier for vulnerable segments of the population. Therefore, the government's policy framework and commitment should be invigorated towards improving structural and systemic factors that hamper effective access to infrastructure.

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ACRONYMS

ArcGIS	Geographic information system (GIS) software
AsgiSA	Accelerated and Shared Growth Initiative - South Africa
CEE	Central and Eastern Europe
CEX	Consumer Expenditure Survey
CGSS	Chinese General Social Survey
Covid-19	Coronavirus Disease
CPI	Consumer Price Index
CSM	Continuing Sample Members
DHS	Demographic and Health Survey
DHIS	District Health Information System
DOE	National Department of Education
ECDF	Empirical Cumulative Distribution Function
EMIS	Education Management Information System
ESS	European Social Survey
FE	Fixed-Effects
FS	Free State
GCRO	Gauteng City-Region Observatory
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GP	Gauteng
GPS	Global Positioning System
GNP	Gross National Product
GRP	Gross Regional Product
GSOEP	German Socio-Economic Panel
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HSRC	Human Sciences Research Council
HSS	Household Socioeconomic Survey
ICC	Intra-Class Correlation
IES	International Education System
IES	Income and Expenditure Survey
KDE	Kernel Density Estimate

KZN	KwaZulu-Natal
LCS	Living Conditions Survey
LM	Limpopo
MDGs	Millennium Development Goals
MLM	Multilevel Model
MP	Mpumalanga
NC	Northern Cape
NDP	National Development Plan
NIDS	National Income Dynamics Study
NGP	New Growth Path
NPC	National Planning Commission
NT	National Treasury
NW	North West
OECD	Organisation for Economic Cooperation and Development
OL	Ordered Logit
OLS	Ordinary Least Squares
OP	Ordered Probit
POLS	Pooled Ordinary Least Squares
POP	Pooled Ordered Probit
PSU	Primary Sample Units
PSLSD	Project for Statistics on Living Standards and Development
QLI	Quality-of-Life Index
QLFS	Quarterly Labour Force Survey
QOL	Quality of Life Survey
RE	Random Effect
RDP	Reconstruction and Development Programme
SA	South Africa
SAs	South Africans
SARB	South African Reserve Bank
SADC	Southern African Development Communities
SALDRU	South African Labour and Development Unit
SAPS	South African Police Services
SDGs	Sustainable Development Goals
SDT	Self-Determination Theory

SOE	State-Owned Enterprises
StatsSA	Statistics SA
SWB	Subjective Well-Being
SWLS	Satisfaction with Life Scale
TSM	Temporary Sample Members
UIF	Unemployment Insurance Fund
UNWHR	United Nations World Happiness Report
US	United States
WC	Western Cape
WHO	World Health Organisation
3P Model	3-Point Model

Chapter 1: Introduction and overview of research questions

1.1 Background of the study

The measurement of subjective well-being (SWB) is central for monitoring progress, informing, and appraising public policy (Frey & Stutzer, 2002). The subjective quality of life measurement includes establishing conditions that are pivotal towards the betterment of social and economic welfare. The foundations of subjective quality of life measurement date as far back as the work of Aristotle, who suggested that welfare, or the absence of it, governs and guides all human behaviour (Helliwell, 2003). In this sense, wealth, honour, and pleasure, according to Aristotle, are not ends in themselves but are pursued in anticipation of the welfare they could bring (Kahneman et al., 2006; Diener & Seligman, 2004; Graham, 2006). Hence, information on SWB that underlies welfare enables researchers to empirically test many of the social and economic relationships, shaping the understanding and knowledge of what improves human well-being (O'Neill, 2006; Clark et al., 2008). It also enables policymakers to establish what enhances SWB, for whom, and where, as well as the conditions related to deteriorating or improved economic welfare (Kahneman & Krueger, 2006; Stiglitz et al., 2009; Dolan et al., 2011). As a result, questions concerning the measurement of SWB are increasingly included in self-reports and population surveys, reflecting the emergence of subjective evaluations. The significance of the measurement of SWB lies not only in the inherent value of positive human experiences but also in the fact that SWB has far-reaching, positive attributes that are reflective of utility and overall welfare (Kahneman & Krueger, 2006; Stutzer & Frey, 2010, Hochman & Skopek, 2013; Dolan et al., 2017).

South Africa (SA) arguably provides one of the most interesting puzzles among emerging economies for exploring SWB, because of its long-lasting process of transformation in its economy, political system, society, and institutional framework, as part of its transition to a democratic government. The demographic transition in 1994 prioritised policies that aimed at restructuring the way economic policy has been framed (Hunter & Posel, 2012). The emphasis on policy did not only focus on the pursuit of core elements of growth but it was also driven by social welfare interventions aimed at redressing the social ills that were seen as fundamental social inequities at the centre of the economic policy agenda (Rogan, 2013). At that time, the government enacted the Reconstruction and Development Programme (RDP), which placed value on the attainment of greater equity and redistribution ahead of attaining faster economic growth. The orientation of RDP proportioned a significant fraction of the gross domestic product (GDP) spending to social safety nets, largely made of pensions, disability payments, child grants, foster care, grant in aid, care dependency, war veterans' grants, medical provisions, housing subsidies, and the Unemployment Insurance Fund (UIF) (Kanjee & Sayed, 2013).

Regardless of the social developmental interventions, a multiplicity of social and economic challenges continued to spiral along spatial and racial lines, with the lives of many South Africans (SAs) mired in stubbornly high poverty, unemployment, inequalities, social exclusion, rampant corruption, weak public governance, and political instabilities (Leibbrandt et al., 2016). In response to these challenges, the SA government introduced various policy initiatives aimed at combating past injustices and other challenges for achieving inclusive economic growth. These policies included the current National Development Plan (NDP), Vision 2030, which provides developmental objectives the country should realise in combating past injustices and current material conditions of the most vulnerable members of society. Many priorities contained in the NDP are not about new policies or programmes but are about improving the quality of the implementation of existing ones, and the NDP provides a sustainable mechanism to achieve measurable targets, such as alleviating poverty, unemployment, and inequalities by 2030 (Oranje & Berrisford, 2016). The effectiveness of the NDP is placed on achieving these targets and sustaining long-term improvements in the average level of a nation's welfare through economic growth (income/real GDP). Hence, growth is not only pivotal for the realisation of high levels of aggregate – and hence per-capita – levels of output but also for improving human well-being (Gumede, 2017; Odermatt & Stutzer, 2017). In essence, this notion propels expectations that when the country/society gets richer, the positive stimulus in output and income leads to improved levels of SWB and ultimately welfare. This transmission mechanism identifies welfare to be dependent on practical measures of economic growth. Therefore, the question remains as to whether SA has improved the SWB of its people alongside its economic and social progress. And despite progress on several economic and social fronts, have geographic disparities widened rather than narrowed?

Therefore, incorporating SWB into policymaking serves as a complementary indicator for measuring the country's economic progress, especially since the relationship between SWB and GDP has received mixed reactions. Evidence by Stevenson and Wolfers (2008) shows a clear positive link between average levels of SWB and GDP per capita across countries and finds no evidence of a satiation point beyond which wealthier countries have no further increases in SWB. At the within-country level, Stevenson & Wolfers (2008) made comparisons between high and low-income countries and found that high-income countries report higher levels of SWB as opposed to low-income countries. Furthermore, the relationship between changes in SWB and income over time within countries holds as economic growth is associated with rising happiness. These findings are consistent in emerging economies, as Li and Shi (2019) examined the nexus in China and found that economic growth stimulates the demand for enjoyment needs, and the return to SWB from material conditions decreases. A possible mechanism at work is that the stimulated demand for enjoyment intensifies social inequality that triggers relative concerns of deprivation, offsetting the return from economic growth (Clark et al., 2019). Both the findings by Stevenson & Wolfers (2008) and Li & Shi (2019) consider aggregate levels effects of economic growth on SWB. Research by Weiting & Diener (2019) is consistent with earlier findings in terms of the nexus. However, research by Weiting & Diener (2019) further considers within-country economic conditions by examining whether income inequality moderates the association between affluence and SWB. The findings suggest that national income inequality also moderated the effects of individual-level income on SWB – income showed stronger associations with SWB in equal nations than in nations with higher income inequality. Individuals who earned higher incomes had higher life evaluations and positive feelings and lower negative feelings than those who earned lower incomes, but the effects were stronger in more equal nations. Therefore, these findings suggest that money matters less to the SWB of people in unequal nations than those in equal nations. This implies that, in economically depressed countries like SA, the significance of growth and income on SWB remains constrained if within-country economic conditions like income inequality continue to persist.

Drawing on the above-mentioned studies, the within-country economic conditions, such as high inequalities, coupled with low socioeconomic outcomes, poor living conditions, and ailing infrastructural facilities, including weak governmental institutions in some developing countries, offset the positive return of SWB from economic growth. In other words, poor economic conditions in developing countries outweigh the positive SWB gains from economic growth. The poor economic conditions are triggered by poverty, inequality and high or increasing unemployment, and these conditions adversely affect SWB. There are also positional concerns that result in "arms races" – for example, regarding access to housing and schooling in well-developed and well-serviced areas. The within-country economic conditions also imply that developing countries will continue to have difficulties in catching up with developed countries. This is possibly the case in SA, as previous studies for developing nations or low-income countries point in this direction, and the links have not been explored in detail. Furthermore, several theories have pointed to the relevance of location (geographical context) in facilitating/mediating the relationship between material well-being and SWB, but these theories have not been backed by substantial evidence from developing countries. Therefore, more research is required to examine these economic conditions in developing countries.

The above background provides a platform for this thesis to add new knowledge by drawing on some of the within-country economic conditions for developing nations that outweigh the returns of economic growth. The thesis examines three topics in three corresponding chapters within the broader literature, with each examining a different facet of SWB in South Africa. The three topics include regional economic disparities, conspicuous consumption, and access to public infrastructure facilities. The first topic (Chapter 3) examines the impact of differences in SWB across regions of South Africa. The stratification of regions based on spatiality and race is undoubtedly one of the most indelible legacies of apartheid. Spatial stratification has entrenched spatial structures that manifest in different conditions of life, including unequal economic and development potential across regions (McLennan et al., 2016). Hence, the current social and economic divides across regions are likely to perpetuate individual differences in the subjective assessment by South Africans of their well-being, and the extent of these differences remains in question.

The second topic (Chapter 4) examines the effect of conspicuous consumption by others on the subjective assessment by individuals of their well-being. Conspicuous consumption driven by ostentatious status drives explicit positional comparisons to others in society, especially in the presence of high inequalities, which affects SWB (Roychowdhury, 2016). Status races are more common in places of high inequality, like SA (Frank, 1985; Frank, 2005; Kaus, 2013) and since individuals more commonly compare themselves and their circumstances with others in the same vicinity, these comparisons can either enhance or erode SWB. One channel through which status races influence SWB is conspicuous consumption. This effect has received some attention in the international literature (Linssen et al., 2011; Perez-Truglia, 2013; Brown et al., 2020) but to date, research on developing countries, and specifically South Africa, is limited (Kruger, 2002; Kaus, 2013).

The last topic (Chapter 5) examines the effect of access to infrastructure on individual SWB. Universal access to quality services is a critical part of South Africa's long-term goal of reducing poverty and inequality and global concerns articulated in the Sustainable Development Goals (SDGs) (Cumming et al., 2017). However, the volatilities of the apartheid legacy of spatial planning that segregated the population in terms of location and race are still present (Mpako, 2017). As a result, access to basic services is still unevenly distributed according to location and race, and this negatively affects social and economic development for deprived communities. Moreover, the link between infrastructure and SWB has not been studied extensively and there is limited evidence on how these two factors are related. This research adds to the literature on this relationship by studying the relationship in the highly diverse SA context and by considering specific kinds of infrastructure, for example, hospitals, police stations, and recreational facilities.

Overall, the topics covered in this thesis are wide-ranging but share one common theme: They all draw on within-country economic conditions for developing nations that outweigh the returns of economic growth on individual SWB. Although SA has received research attention on SWB, none of the existing studies examines SWB within the confines of the topics covered in this thesis.

The remainder of this chapter is organised as follows. In the next section, the purpose and specific aim for each research topic are discussed in conjunction with the research aims and approaches taken in terms of the methodology. The final section of this chapter outlines the overall structure of the thesis.

1.2 Research Objectives

1.2.1 Objective One (Chapter 3): Regional economic disparities and subjective well-being in South Africa

The physical aspects of regions are usually defined by demarcations that may have been developed for a specific public purpose, and these demarcations often create differences that separate one population group from another (Helliwell, 2003; Wang & Wang, 2016). The first empirical study, Chapter 3, does not contradict this proposition but recognises that there are options for understanding individual disparities in SWB across regions as well as for implementing solutions. For example, provinces and municipalities are different in several ways. Provincial differences show that history, economic factors, culture, and politics have combined to create disparities that cross-province boundaries. These provincial differences—apparent in most parts of SA—point to the need for interprovincial collaboration or national coordination and sharing of resources. Urban-rural comparisons do not reveal consistent patterns of disparity, but rural and inner-city conditions tend to magnify differences associated with other social, economic, and health system characteristics.

The variations in the social, economic, and human environments across various regions often lead to differences across regions (Geppert & Stephan, 2008). This is because some regions have faster growth rates, higher economic development levels, and more favourable economic features than others, resulting in the coexistence pattern of developed and underdeveloped regions in space, bringing unbalanced regional economic development (Rossouw & Greyling, 2017). Therefore, the proposition formulated by Chapter 3 is that these differences predict the level of individual SWB in each region, and the difference implies that individual SWB would differ across regions. The observed regional variation has far-reaching implications for public policy, especially in SA, where positive predictors of individual SWB are likely to be concentrated in high-income regions. As a result, individuals in high-income regions are likely to report higher levels of SWB relative to individuals living in low-income regions. The regional inequality implies individuals living in poor regions are isolated and deprived of economic attributes that improve the quality of life (the poor getting poorer), and high-income regions remain persistently above low-income regions. Another implication arises when individuals in low-income regions report higher levels of SWB as opposed to individuals in high-income regions. This implies that there are factors beyond economic factors that individuals in low-income regions value (for example, aspirations, social connection and motivation or engagement in small homogeneous communities), while population clustering in high-income regions adversely affects SWB.

In terms of the existing research, most international studies on SWB consider the influence of mean national aggregates of SWB, and regional disparity analysis is based on cross-country comparisons at a macroeconomic level, with little emphasis on within-country regional variation (Diener et al., 1995; Stevenson & Wolfers, 2008; Minkov, 2009; Minkov & Bond, 2017). National studies on SWB in SA focus on the relationships at the individual level but neglect the influence of regional factors. Therefore, research on regional disparities in individual SWB remains limited. It is within this context that Chapter 3 addresses the void by exploring whether the individuals' SWB is influenced by their location (as measured by province, geographical type, and metropolitan areas). The aim is to ascertain whether the profile (in terms of economic and social well-being indicators) of individuals in SA differs across locations, whether the geographical location affects individuals' SWB, and the extent to which geographical location compensates for individuals' SWB.

The results of the study are estimated using the National Income and Dynamics Study (NIDS) data from the years 2008 to 2017 (all five waves). The NIDS data is used in conjunction with Quantec EasyData to control for macroeconomic variables measured at the regional level, and the data-collection period of the macroeconomic variables corresponds to all five waves of the NIDS data. The results show that individual SWB differs across provinces, district municipalities and between individuals living in rural and urban areas. The study further estimated a panel fixed-effect (FE) model to account for individual and regional unobserved heterogeneity. Lastly, the study considers the hierarchal structure of the data through a multilevel model (MLM), thus providing the analysis at different levels (individual, household, and regional levels) to test the variance in the outcome between different groups. The MLM results suggest that there is significant clustering in the data, which means regional economic factors have a significant bearing on individual SWB.

1.2.2 Objective Two (Chapter 4): The effect of conspicuous consumption by others on subjective well-being in South Africa

The impact of prevalent economic disparities gives rise to social hierarchies within and across groups. For example, the presence of economically successful neighbours affects the perceived social status of individuals who care about their relative economic position (Luttmer, 2005). Conspicuous consumption expenditure through ostentatious wealth, income, and status by material purchases to acquire or maintain status or prestige has become increasingly evident in modern society (Friedman & Ostrov, 2008). In social groupings, economic success may or may not be conspicuous, and those with actual economic success may or may not believe that their social status is elevated as a consequence of their economic success. However, for the perceivers – who, with incomplete information, perceive themselves as better or worse than their neighbours – this affects their SWB.

In either case, the act has direct implications on the well-being of the individual consuming conspicuously and an indirect (externality) implication on the well-being of others, depending on how it is perceived by others. Chapter 4 draws from the literature on conspicuous consumption (Veblen, 1899; Mason, 1983; Bourdieu, 1984; Frank, 1985; Arrow & Dasgupta, 2009; Charles et al., 2009), in examining the effect of conspicuous consumption by others (or affluent groups) on individual SWB, and whether the effect is explained by socially contingent concerns for relative status.

The rationale is rooted in the notion that class identification based on status becomes the primary source of social division across social groups (Ravallion & Lokshin, 2010). This provides an economic implication, since individuals will try to keep up with their peers or reference groups by consuming conspicuously. Certainly, this assertion has formed reasonable evolutionary arguments by philosophers that support the notion that expenditure patterns that give value to one's relative economic standing provide a higher fitness than those that give value to one's absolute economic standing.

Many free-market economists argue that there is no case for intervention on issues relating to ethical, moral, or economic grounds against the legitimate activity of a status-seeking consumer (Cole et al., 1995; Heffetz, 2011). The significance of modern-day ostentatious consumption is not in dispute, but there is still controversy over the degree to which such economic behaviour should be managed if status-seeking consumption by others affects individual SWB negatively. Hence, the significance of Chapter 4 is based on understanding perpetual perceptions of inadequacy and inequality that are reinforced by obvious and blatant conspicuous consumption by others (particularly if this excess is transparent along other conventional lines of the divide – race, gender, class, etc) can impact mental health (and physical health), affect the general social conscience, have a negative societal impact (criminality, violence, etc), and drive relative concerns for status. As a result, it may potentially create economic consequences for the future, as the demand for socially visible consumption goods will lead to the misallocation of resources (Nelissen & Meijers, 2011).

Nevertheless, the cause of concern for conspicuous consumption is whether the vice of vanity, translated into ostentatious or conspicuous consumption by others or oneself, should be welcomed as a force for good for SWB. Individuals benchmark their economic fortunes based on the economic standing of their relative peers or reference group. Hence, relative expenditure or income of the reference groups that signals higher social and economic standing has a bearing on the individual's overall evaluation of their life (O'Cass & McEwen, 2004). Although the relationship between relative income/expenditure on SWB in the presence of reference groups is well documented in the literature (Frey & Stutzer, 2002; Luttmer, 2005; Kingdon & Knight, 2007; Clark et al., 2008; Howel & Howel, 2008; Posel & Casale, 2011), there remains a void, particularly in the SA context, on the indirect effect of conspicuous consumption by others on individual SWB.

In addressing this void, Chapter 4 focuses on conspicuous consumption by others within the context of SWB while taking into account other covariates that determine individual SWB. This research complements the scarce empirical research by testing this conjecture using the NIDS data from the years 2008 to 2017 (all five waves). Chapter 4 tests the hypothesis that conspicuous consumption is driven by positional concerns for status, which directly affects individual SWB when consumed by the individual in question and indirectly if consumed by others. The area of interest for the study is the latter effect. The study accounts for reference-group measures at the neighbourhood (closer peers) and district level (distant peers/anonymous). All specifications of the POP and POLS are re-estimated using the panel FE model to account for possible individual and district-level unobserved heterogeneities that may lead to endogeneity.

The overall results suggest that conspicuous consumption by others indirectly affects individual SWB. After controlling for comparison expenditure at the cluster and district levels, conspicuous consumption by others decreases individual SWB at the cluster level (this result is significant at the 5 percent level). In contrast, it increases individual SWB at the district level (the result is significant at all levels). This finding suggests that the balance of the positive and negative effects on individual SWB is sensitive to the proximity of others' conspicuous consumption. Therefore, in close proximities, the feeling of envy outweighs the aspirations, social connection and motivation, as individuals are made worse if their close relative peers are consuming conspicuously.

1.2.3 Objective Three (Chapter 5): Evaluating the effectiveness of access to infrastructure facilities on individual subjective well-being in South Africa

Access to infrastructure is pivotal for the advancement of economic development and the general improvement of living conditions (Simma & Axhausen, 2003). The extent of the interconnection between access to infrastructure and SWB is of paramount importance for policymakers (Corral-Verdugo et al., 2003). Infrastructure comprises water and sewer lines, energy, schools, hospitals, transportation facilities, highways, and communication systems (Ingram & Kessides, 1994; Démurger, 2001; Batten & Karlsson, 2012; Srinivasu & Rao, 2013). High levels of infrastructure development increase access to markets and lower the costs of production through the enhanced technical state of transport systems. This allows for the facilitation of further development of regions that provides synergy for the incorporation of new territories into active economic environments. This lowers negative externalities (in the form of service-delivery unrest) and improves human capital through employment, health, and education, which increases the efficiency of production factors such as labour, thus increasing aggregate levels of production (Fedderke & Garlick, 2008). Therefore, a lack of infrastructure and access thereof can be a bottleneck for any economy, since it has the potential to decelerate social development, which negatively affects SWB (Chaurey et al., 2004; Delbosc, 2012).

In terms of empirical research, most macroeconomic studies focus on the effect of comprehensive infrastructure investments on economic growth. In contrast, microeconomic studies focus on the generic elements of infrastructure, with less emphasis on its effect on individual SWB. Although both macroeconomic and microeconomic studies are insightful in revealing the role of infrastructure, however, these studies are limited in providing context on how access to infrastructure measured by distance travelled affects individual SWB in SA.

In developed countries, empirical evidence by Fafchamps & Shilpi (2003), Jacoby & Minten (2007), and Bryan et al. (2014) to some extent incorporates the relevance of infrastructure, but these studies do not examine this effect in the context of SWB. Studies by Ettema et al. (2012) and Stutzer & Frey (2008) explicitly examine the effect of distance, but the emphasis is on transport infrastructure, and the respective findings show that trip duration tends to affect travel satisfaction negatively. If the trip is longer, then travellers become less relaxed and enthusiastic, which increases stress, hence evaluating the efficiency and quality of the trip lower. In Africa, Adewara et al. (2017) analysed the effects of access to basic infrastructure on the SWB of citizens in urban Ilorin South Local Government Area, Kwara State, Nigeria. Although the study by Adewara et al. (2017) is specific in terms of establishing a direct relationship between various infrastructure facilities and SWB, this study still left a void in terms of the access dimension, which would ideally reflect the effect of distance travelled to respective facilities on individual SWB.

Overall, the above-mentioned studies prove the relevance of infrastructure. However, the multifarious links between infrastructure, accessibility, and well-being are still under-examined, as most studies only focus on one aspect of this link. In SA, the measurement of the effect of distance on SWB in previous studies is limited to healthcare or education (Stephenson et al., 2008; McLaren et al., 2013; Julia et al., 2014).

It is within this context that Chapter 5 addresses the existing void in providing context on how the provision of public infrastructure affects individual SWB, and in establishing how accessibility is measured and warranted in terms of determining the effective use of public infrastructure facilities. The aim is to provide a scientific understanding of the impact of public infrastructure facilities on individual SWB. In addition, the aim of this research goes beyond just establishing this relationship between infrastructure facilities and SWB; however, Chapter 5 extends the scope of analysis by taking into account the effect of access (measured by distance) to infrastructure facilities on individual SWB. For this analysis, the scope and context are limited to public infrastructure facilities that are immediate and critical to human sustenance and the development of communities. These public infrastructure facilities include public schools, healthcare, and policing services; hence access to the respective facilities is measured by the distance that individuals travel to access the respective facilities.

In addressing the specific aim, Chapter 5 makes use of the Living Conditions Survey (LCS) dataset of SA from the year 2014 to 2015. Access to infrastructure is measured by the distance that individuals travel to access infrastructure facilities, and the LCS-2014/2015 reports distance information from the individuals' dwelling to the nearest of the following destinations: food markets, public transport (for example, station or rank), schools (pre, primary and secondary), health (clinics and hospitals), safety and security (police stations), religious organisations, banks, the post office/agent, welfare offices, and multi-purpose community centres.

The analysis is performed through multivariate analysis, controlling for several individual and household characteristics. For ease of interpretation, the study estimates both the ordered probit (OP) model and OLS, using a sequence of models that build up by adding different sets of characteristics successively and incorporating the panel characteristics of the data (specifically for the NIDS data, as the Living Conditions Survey is a cross-sectional survey). The overall results suggest that the distance individuals travel to access public infrastructure facilities affects individual SWB, and longer distances have adverse effects on individual SWB. The negative effect is mostly affected by the spatial geographic influences of apartheid policies. Regions that are urbanised, industrialised, and densely populated have a higher distribution of infrastructure facilities. As a result, schools, healthcare facilities, and policing services are concentrated in the high-income provinces of Gauteng (GP), KwaZulu-Natal (KZN), and the Western Cape (WC). Although the study does not provide direct evidence, the general understanding is that the availability and easier access to these services does not equate to efficient quality services, and this varies across regions. The majority of the previously marginalised race are still located in deprived communities that are highly populated and are exposed to poor levels of quality and states of service delivery. Consequently, these individuals will travel a long distance from deprived to wealthier regions to access adequate and efficient high-quality public services.

1.3 Structure of the Thesis and Conclusion

This thesis focuses on three topics within the broader literature of SWB. At first, Chapter 2 provides a general outlay of the data sources and literature on SWB. Chapter 3 considers the extent to which individual SWB differs across regions, given the status quo of regional spatial disparities and high inequality that is entrenched more importantly between regions in post-apartheid SA. Chapter 4 examines the effect of conspicuous consumption by others on the individual's utility function, testing the effect of relative concerns for positional status in the presence of reference groups in post-apartheid South Africa. Chapter 5 tests whether the distance travelled to the nearest public-infrastructure facility has a bearing on the individuals' SWB in post-apartheid South Africa. The results from these three chapters allow for a better understanding of within-country conditions that have a bearing on SWB, which is essential for the measurement of economic welfare. Lastly, Chapter 6 is the conclusion of the thesis, with a summary and brief discussion of the findings from the three studies. Further, Chapter 6 includes limitations and directions for future research.

Chapter 2:
Literature Overview and Data Sources

2.1 Introduction

In the past, the measurement of economic and social progress reflective of economic well-being relied on objective indicators (Diener et al., 1999; Cummins et al., 2003). In essence, inferences on economic well-being were interpreted through macroeconomic indicators such as gross domestic product (GDP), life expectancy, and general living conditions (Welsch, 2006). Over the years, there has been an increasing depth of survey questionnaires that contain evaluative questions, such as the subjective measure of well-being (SWB) that researchers use to describe the quality of life both 'internal' and external to the individual (Kahneman & Krueger, 2006). These survey questionnaires have gained remarkable attention from researchers and policymakers, enabling them to construct a subjective welfare measurement that reflects the individual's overall evaluation of quality of life (Layard, 2006).

This chapter follows the definition by Diener et al. (1997), which defines SWB as judging life positively and feeling good: "Thus a person is said to have high levels of SWB if he or she experiences life satisfaction and frequent joy, and only infrequently experiences unpleasant emotions such as anger or sadness. Contrariwise, a person is said to have low levels of SWB if he or she is dissatisfied with life, experiences minimal joy and affection and frequently feels negative emotions such as sadness, anxiety, and anger" (Diener et al., 1997).

The value of SWB can also be used to measure and interpret national development relating to the social and economic conditions of the population (Stiglitz et al., 2009). Therefore, SWB differs from the conventional economic approaches, as it provides matrices to measure the income and non-income dimensions of SWB (Clay & Abbott-Jamieson, 2006). These matrices are suited to questions where objective social and economic indicators are limited in providing information on economic well-being and welfare. As such, individuals are not at liberty to control the welfare effects of macroeconomic variables, but individuals can evaluate and make inferences on how macroeconomic variables affect their overall well-being and quality of life. Hence, life evaluations enable policymakers to interpret the dimensions of SWB (Diener, 2009).

Furthermore, SWB overlaps the psychological field as it also encompasses the individual's material economic state. SWB involves subjective elements that reflect the individual's evaluation of their life based on social and economic events in a given population, and the process underlying the evaluation is distinctively different from objective social and economic indicators (Campbell et al., 1976; Eid & Diener, 2004; Guillen, 2008; Van Praag et al., 2003; Smith & Clay, 2010).

The purpose of this chapter is to provide an overview of relevant literature and SA data sources for the study of SWB. First, the study provides an overview of the existing literature on SWB. This section outlines the conceptual foundations of SWB and recognises the phenomenon as an all-encompassing and multi-dimensional measurement of the quality of life. The foundations of SWB are then defined or categorised into psychological and economic perspectives of SWB. The conceptual foundations are then linked to the existing theoretical considerations, which are supported by empirical evidence both from international and national studies related to SWB.

Second, the chapter presents the data sources relevant to the measurement of SWB in SA, and this section is divided into two parts. The first part of the data-source section provides an overview of the NIDS data, which is a dataset administered by SALDRU. The NIDS data is the first national household panel study in SA that contains information about the livelihood of individuals and households over time, and the respective waves (waves 1 to 5) of the dataset are used in addressing the specific aims of Objectives One and Two of the research. The overall objectives of the NIDS data, the sample with respect to each wave, and the description of the main variable of interest and other relevant variables related to the specific aim of the research are discussed in this chapter. The second part provides an overview of the LCS of 2014/2015, which is administered by Statistics SA (StatsSA). The LCS provides information on the households' detailed income and expenditure data, as well as information on the households' social and economic living circumstances across SA. This research makes use of the LCS dataset in addressing the specific aims of Objectives Three. The overall objectives of the LCS dataset, the sample, and the description of the main variable of interest related to the specific aim of the research are also discussed in this chapter.

The remainder of this chapter is organised as follows: Section 2 is the literature review section. The literature overview is divided into three parts. Initially, the study provides a conceptual overview of SWB and then relates SWB from both a psychological and an economic perspective. The conceptual foundations are followed by SWB theories. The literature section is concluded by empirical evidence from both international and SA research findings. The last section is the conclusion. Section 3 is the data sources. The data-overview section is divided into two parts: the first part deals with the NIDS data and the second part deals with the LCS data.

2.2 Literature Review

2.2.1 Conceptual overview of subjective well-being

One of the main inherent goals for public policy advocates is improving welfare through a subjective assessment of human life (Diener et al., 1999). Over the years, policymakers and researchers have strived for an all-encompassing approach to measuring individual well-being that would take into consideration the multi-dimensional nature of the quality of life (Fischer, 2009; Frame, 2013). This emphasis brought about SWB, which is an all-encompassing evaluation of one's life that includes the individual's domain satisfaction and emotional response based on the value judgement placed on one's life (Hochman & Skopek, 2013). It also refers to the measurement and evaluation of one's life.

SWB is identified as an appropriate empirical approximation of individual well-being as it is broad and inclusive of life events (Frey & Stutzer, 2002; Adler & Posner, 2006; Diener, 2009a). This subjective assessment of one's life is meaningful and valid since it provides a broad and holistic picture of welfare (Angner, 2010; Stutzer & Frey, 2010; Van Hoorn et al., 2010). Indeed, SWB greatly informs our understanding of ways in which social, economic, and psychological factors interact to influence well-being (Helliwell et al., 2012). In the main, SWB is made measurable by components that individuals acquire as desirable in improving their states of being. These states are exemplified by life satisfaction and the presence of positive emotions in hedonic psychological perspectives and in observable characteristics that relate to SWB (Pouris & Inglesi-Lotz, 2014).

SWB is also considered a multifaceted construct that comprises two major components – cognitive life satisfaction and hedonic well-being (Diener et al., 1984). The cognitive life satisfaction domain is concerned with life satisfaction, while hedonic well-being corresponds to the individual's frequency and intensity of emotional experiences, such as stress, happiness, and joy (Diener et al., 2006; Hansen & Slagsvold, 2012). In contrast, SWB comprises two distinct dimensions, which are evaluative and hedonic measurements of SWB. The evaluative dimension encompasses SWB over the life cycle and considers the individual's opportunities, capabilities, and purpose of life. The evaluative dimension captures how people think and evaluate their entire life. The judgments are based on specific aspects of life, such as their health, relationships, community, health, or occupation, as well as overall evaluations.

The hedonic dimension of SWB is concerned with daily experience and overall quality of life. The hedonic dimension of SWB is more directed to the individual's psychological, environmental, and economic features of their surroundings (Krueger & Stone, 2014). For example, these factors are defined by determinants such as the health status, employment, social infrastructure, and social capital (Vanhoutte, 2014). Thus, hedonic SWB are designed to reflect a combination of "positives affects" and "negatives affects". The positive affects are defined by feelings of joy, happiness, pleasure, or contentment, and the negative negatives affects reflect feelings of sadness, suffering, worry, or distress (Busseri, 2018). These measurements are obtained from subjective survey reports that are generated in real-time or shortly after the event occurs. The distinction between positive and negative affect is essential, as evidence shows that one is not the opposite of the other (Diener et al., 2018), as both affects track at least partially independently SWB that relates to each dimension. Furthermore, other dimensions of hedonic SWB, such as arousal, pain, or anger, that relate to positive and negative emotions in a range of ways, are important in the hedonic assessment of SWB.

Moreover, research has further shown the existence of a third dimension of SWB, which is eudaimonic well-being, and it refers to people's perceptions of the meaningfulness (or pointlessness), sense of value or purpose to life (Kahneman & Krueger, 2006). The third dimension implies a premise that people attain happiness and satisfaction if they experience life purpose, challenges, and growth. “Flourishing” is a phenomenon that captures the essence of this dimension of SWB. An example of a eudaimonic question—developed in the United Kingdom’s Annual Population Survey is; “on a scale of 0 to 10, to what extent do you feel the things you do in your life are worthwhile?”. Where the 0 means the respondent feels the things they do in their life “are not at all worthwhile” and 10 means “completely worthwhile” (OECD, 2013, p. 253).

There has been less research and emphasis on eudaimonic well-being than into either cognitive or hedonic measures of SWB; consequently, the effect of SWB in explaining human behaviour is understated. For some questions, such as eudaimonic feelings may inform emotional states or life satisfaction ratings, such as the “worthwhileness” of particular activities or the role of purpose in assessing a person's overall satisfaction with life. All subjective reports include either cognitive or hedonic or both. However, concepts of “worthwhileness” or purpose appear to be crucial in understanding (or predicting) why and when people engage in different activities or choose different life paths during the day. For example, a study by White & Dolan (2009) measured the value associated with activities using daily reconstructions of time and activities. The findings by White & Dolan (2009) show discrepancies between the activities that people find “enjoyable” and those that are “rewarding” or “meaningful”. For example, time spent with children is relatively more rewarding than enjoyable, while time spent watching television is relatively more enjoyable than rewarding (Tončić & Anić, 2015). Although eudaimonic well-being is less understood, it has been claimed that eudaimonic feelings are reflected in cognitive or hedonic assessments of SWB (Martela & Sheldon, 2019).

Therefore, the concept of SWB is multidimensional and all-encompassing, and it reflects both evaluative and hedonic dimensions of life based on the individual’s life evaluation (Rojas, 2008). It ranges from the individuals’ subjective accounts of happiness to satisfaction or fulfilment of a given list of functions, capabilities, or needs. According to Oishi et al. (2018), the broadest conception of SWB includes not merely individuals’ levels of material comfort, but also their degree of aesthetic fulfilment, their feelings for others, and anything else that they might value, however intangible. In this case, the individual is expected to fully understand how various situations affect their

SWB so that, when the individual is better off, there is no ambiguity about the meaning. Thus, SWB embodies evaluations people make of their lives, and the circumstances that they experience. In the economic context, these conditions are paramount for public policy as they reflect the status and progress towards the fulfilment of utility.

Overall, researchers and policymakers have found a number of distinct dimensions of SWB to coexist but which are not entirely independent from one another, as they overlap. These dimensions of SWB can be viewed as a continuum, with essentially real-time ratings of the individual's emotional state, experiences or sensations at one end (associated with the shortest unit of time) and overall ratings of life satisfaction, purpose, or suffering at the other end (the longest reference periods or no particular reference period). Furthermore, notwithstanding this temporal overlap, the SWB components exhibit different characteristics often correlating to different sets of variables and capture unique aspects of the dimensions, each worth monitoring for different purposes. The terms and dimensions used to describe SWB have often been used in an ambiguous manner, which has confused the discussion and possibly slowed progress in understanding SWB. For example, the term happiness has been used to refer to momentary appraisals of affects as well as general life evaluations. The lack of precision precludes an understanding of the complexities that are known to coexist. Also, a person engaged in stressful or difficult activities, such as working towards an education or professional promotion may find significant meaning or satisfaction in life overall; a person who is generally suffering or hopeless may experience a temporary reprieve in such a happy moment (Cummins 2003; Van Praag et al., 2003).

2.2.2 **Subjective well-being: Psychological and economic perspectives**

2.2.2.1 Subjective well-being: Psychological perspective

Psychologists have long studied the physiological and emotional nature of human beings in an attempt to offer an understanding of the sources that cause happiness or the lack thereof. In this quest, psychologists have attempted to recognise what makes individuals happy or is happiness a state or a trait? Can an individual stay happy? What type of attributes do happy people possess? What are the factors that influence people's happiness? Can happiness be related to certain factors such as race, gender, and age? Is income, education, civil status, and type of employment related to happiness? As a result, information coming from statistical surveys have been analysed and brought together to offer answers that define SWB (Helliwell, 2003).

Psychologists have often adopted the concept of SWB as an embodiment of an individual's emotional/mental state and overall satisfaction that is associated with positive emotions and feelings (Andrews & Robinson, 1991). Invariably, there are various psychological definitions given to SWB. For instance, Mullis (1990) defined SWB to be related to life expectations, personal goals, and the means to sustain human life. Diener & Diener (1996) defined SWB to be a construct of affective and cognitive evaluations of one's life. Consistently, the cognitive domain refers to life satisfaction, whereas the affective evaluation is connected to daily emotions experienced by the individual (Veenhoven, 1994). Kahneman et al. (1999) provided a psychological meaning of SWB that is understood to be a total sum of all good and bad events that individuals experience at any given point in time. Psychologists measure the extent to which individuals experience these events by asking individuals: "On a scale of one to seven, how do you feel right now?" Where one is "extremely unhappy state" and seven is "extremely happy state" (Dolan et al., 2008).

Based on this measurement, it is observed that SWB is closely related to positive psychology (Lyubomirsky, 2001). The concept of positive psychology goes beyond the study of weakness and damages, and the scope extends to the study of strength and virtue. Positive psychology provides a perspective as to how individuals enhance their levels of SWB and sustain these improvements over longer periods, rather than receding to baseline. In this case, the focus is on understanding the structure of SWB and its dynamics (ie, the causes and consequences of SWB).

In so far as the dynamics of positive psychology are concerned, it is important to recognise that, to some extent, SWB is influenced by both previous experience (including, for example, early upbringing) and underlying personality traits (Diener et al., 1999; Heller et al., 2004; Maluka & Grieve, 2008). For example, personality traits such as self-esteem, optimism, intelligence, extroversion, and ability to plan, organise and display low neuroticism are all factors found to be strongly connected with SWB. These underlying personality traits are found to be strongly connected with SWB and they account for about 30 to 35 percent of the variance in the overall evaluation of one's SWB (Seligman et al., 2000). For instance, studies on twins have shown that genetically identical twins record similar levels of SWB. The findings are similar even when the twins are brought up individually apart. Hence, research shows that about 40 to 50 percent of individual well-being is determined by genetics (Senik, 2004).

These personal traits and genetic factors also predict the individual's response to stressful events, and stressful experiences can predispose individuals to subsequent mood and anxiety disorders (Koshaba & Maddi, 1999). Exposure to extremely traumatic events can help to build sustained resilience that actually protects SWB. Although the baseline psychological well-being is fairly sustained, day-to-day events and experiences also exert an impact. For example, even the most resilient person may eventually become very low or depressed, if his or her daily experiences are constantly troubling (Blanchflower & Oswald, 2004). There is strong evidence to show that exposure to work-related stressors over long periods of time will have a negative impact on SWB (Atanes et al., 2015). Although, as mentioned above, short periods of adversity may be helpful in building resilience, long-term stress negatively affects SWB. This includes lower levels of health, like serious illnesses, such as cardiovascular disease, problems with blood sugar control, diabetes and immune-system malfunctions (Denovan & Macaskill, 2017). Hence, SWB is more pronounced among people with good mental and physical health. This notion is consistent with the findings by Diener et al. (2018), who argued that higher levels of health are correlated with higher levels of SWB.

In summary, experience and underlying personality traits create a platform for SWB. Understanding these psychological peculiarities is critical in understanding everyday experiences that define low and high levels of SWB. It also enables researchers/policymakers to ascertain whether some individuals are happier than others (Seligman et al., 2000) and whether discrepancies in SWB arise as a result of personality traits, since individuals are exposed to different experiences (Bos et al., 2016). Overall, these are among the psychological considerations that are present in defining one's SWB.

2.2.2.2 Subjective well-being: Economic perspective

Economists have become increasingly interested in self-reported measures of SWB, what they mean, and whether they might be used for policymaking. In the microeconomic context, the foundations of SWB are based on the Utility Theory which provides a quantitative metric for evaluation of satisfaction that is based on the dimensions of revealed preferences. Utility measures the individual's satisfaction derived from the consumption of goods and services, and the choice of consumption is defined by the individual's revealed preferences (Fuentes & Rojas, 2001). The choices/bundle of goods or services are ranked according to the individual's preferences, axioms, and assumptions. The higher the choice/bundle in the ranking order, the more preferred it becomes for the individual consumer, and the utility function is structured to reflect the ordering of the preferences and the level of satisfaction associated with each preference. Therefore, an increase in utility is associated with increased levels of satisfaction that are associated with higher levels of consumption subject to the individual's budget constraints (Clark & Oswald, 2002). In this case, the utility underlies SWB based on the premise that increased utility is associated with increased levels of happiness and satisfaction, which are both dimensions of SWB.

From the foregoing, SWB possesses a systematic relationship together with utility and SWB is the total of two compositions. These are the elation, otherwise known as short-run SWB, which is dependent on information about lifetime utility, and the baseline mood, otherwise known as long-run SWB, which is a sub-utility function that is derived from emotions, personality traits, nutrition, or health (Dolan et al., 2007). This systematic relationship of utility and SWB for both dimensions is also dependent on income and the level of economic growth (De Neve et al., 2018). For both developed and developing economies, economic growth has long retained a central place and an important goal to achieve for economic policy. Economists associate economic growth directly with well-being, and the success of a country and of its government is generally measured in terms of increments in per-capita income (Zhang et al., 2020). High levels of growth and, subsequently, income is correlated with increased levels of well-being; hence, as income increases, a greater number of needs are satisfied (due to an increase in consumption) and a higher standard of well-being is attained (Clark et al., 2019). Therefore, economic considerations associated with increasing per-capita income arise from the impact of growth on SWB (De Neve & Sachs, 2020; Ding et al., 2021). Following this conclusion, economic growth becomes an important objective of economic policy in any country, as human well-being increases with income.

However, researchers have begun to argue against further attempts to raise the material standard of living, claiming that such increases will do little to raise SWB (Stevenson & Wolfers, 2008). This interest parallels a renewed awareness of the limitations of standard measures of GDP (and allied measures), as well as efforts to redirect the measurement of SWB away from GDP in an era when growth rates are diminishing across much of the rich world (Deaton & Stone, 2013). In addition, individuals place much of their emphasis on relative income considerations as opposed to absolute income considerations that are associated with increased levels of GDP. This notion follows from the Easterlin Paradox (Easterlin, 1974), which postulates that the income effects on SWB are a function of standards changing over time based on the individual's social comparisons and expectations. Hence, the individual's present relative economic state has an impact on their SWB irrespective of their absolute level of income (Meadow et al., 1992). This implies that at a point in time SWB varies directly with income, both among and within nations, but over time the long-term growth rates of income and SWB are not significantly related. The principal reason for the contradiction is social comparison that is based on the relative income hypothesis (Zhang et al., 2017).

The concept of the relative income hypothesis was popularised by Duesenberry (1949), who argued that the relative income hypothesis relates to the attitude of an economic agent in which the consumption and savings rate of an individual are controlled more often by his income when compared to the income of others in the neighbourhood. In this case, the satisfaction a consumer derives from the consumption is a function of his relative consumption rather than the absolute levels. Consequently, individuals rate their income and consumption levels according to the income and consumption levels of their sub-group. These relative considerations are also reflected in the individual's decision-making process, as individuals consider absolute income and consumption in comparison to their relative peers. These relative considerations are supported by empirical evidence (Watson et al., 1996; Clark &

Oswald, 1996; Tsou & Liu, 2001). For example, utility is found to be dependent on relative rather than absolute income. This is because relative income has significantly been an important predictor of different measures of SWB (Clark & Oswald, 1996; McBride, 2001). An increase in a person's relative income would invariably increase individual SWB, as people seem to care about their income in comparison to those around them (Brown et al., 2003; Fafchamps & Shilpi, 2003). In addition, SWB does not only depend on relative income but also positional ranking within a comparison setting, and perceived consumption significantly falls as village mean consumption expenditure increases (Ferrer-i-Carbonell, 2005; Luttmer, 2005; Senik, 2004).

Moreover, the economic foundations of SWB are based on the utility theory on the premise that utility is an underlying measure of SWB. Furthermore, the foundations of SWB well-being are based on the notion of economic growth and income, which positively affect SWB through greater levels of material consumption. Taking into consideration these economic conditions, existing studies in the economics of SWB have found a positive correlation between economic growth and SWB. However, this positive relationship is weak, as both GDP and income do not have a strong influence on either SWB or the probability of happiness. This is because individuals place much emphasis and value on relative economic factors, as opposed to absolute economic factors, and these relative concerns could explain the relative sense of dissatisfaction once a higher growth or income level is achieved.

Nevertheless, various empirical findings cast doubt over the Easterlin Paradox proposition. Veenhoven (1991) suggests that SWB and GDP are positively correlated, particularly in poor countries, and SWB is based on the satisfaction of human needs, including natural and absolute emotions that are not affected by the relative standard. Diener et al. (2006) also suggest a positive relationship between wealth and SWB. A study by Junqiang et al. (2013) used the 2003–2010 Chinese General Social Survey (CGSS) and showed that, despite heightened inflation in the past ten years (as indicated by the CPI), the association between individual absolute income and SWB has always been positive, thus casting doubt on the Easterlin paradox. Overall, various other empirical findings (Di Tella et al., 2003; Bjørnskov et al., 2008; Di Tella & MacCulloch, 2008; Sacks et al., 2012; Stevenson & Wolfers, 2013) have shown growth and income to be positive predictors of SWB, and these studies provide a counter-formative mechanism of the Easterlin Paradox.

Apart from the Easterlin Paradox, there are various other determinants of SWB across demographic and household-related factors. Demographic predictors of SWB, such as gender, age, and race are found to critical predictors of SWB, and the magnitude of the effect differs across individuals. For instance, individual SWB is higher for women compared to males, and this is attributed to psychological and risk-related factors. The relationship between SWB and age suggests a U-shaped curve, as SWB levels are lower for young and middle-aged individuals but high for old age individuals (Blanchflower & Oswald, 2004). This is due to factors relating to depression relating to stress from work, raising children, thwarted ambition, the realisation of mortality, caring for ageing parents, or other related factors (Ferrer-i-Carbonell & Gowdy, 2007; Baird et al., 2010). Individuals with years of schooling above primary level have higher levels of SWB as opposed to individuals with no schooling (Bukenya et al., 2003; Blanchflower & Oswald, 2004; Šilinskas & Žukauskienė, 2004; Ferrante, 2009). This is because education increases the probability of employment, income, and high health outcomes, which are all positive predictors of SWB (Posel & Muller, 2008; Cummins, 2013).

Moreover, the effect of education on SWB is consistent with employment outcomes. Employment is positively correlated with SWB, while unemployment has financial and non-financial implications for economic welfare; hence, individuals who are unemployed report lower levels of individual SWB (Diener & Oishi, 2000; Luechinger et al., 2010). In addition, studies have found marriage and cohabitating as strong positive predictors of SWB, while SWB is lower for individuals who are single, widowed, divorced or separate, after controlling for age and income. Lastly, research (see, Klein, 2013; Delhey & Dragolov, 2016) suggests that social cohesion and community integration are critical predictors of SWB. For instance, individuals who experience a strong bond and social support from family, friends, neighbours, and acquaintances, or those that frequently socialise reported higher levels of SWB as opposed to individuals who are socially isolated. This positive association includes, social welfare, emancipation of values, social cohesion, religious affiliation, which are all critical predictors of SWB (Ngamaba, 2017).

By and large, the core economic foundations of SWB are based on microeconomic and macroeconomic considerations of SWB, and these considerations provide the context on how SWB is used to indicate the individual's subjective welfare and utility levels. The microeconomic perspective of SWB suggests that SWB is a measure that reflects both social and economic welfare after accounting for individual and household-related variables that are critical in determining SWB (Ngamaba, 2017). Conversely, the macroeconomic considerations on SWB focus on cross-country comparisons of SWB as a tool to measure the effectiveness and the level and state of economic growth. The macroeconomic perspective emphasises the importance of income/wealth in predicting SWB under the premise that higher levels of income/wealth and the effect of other macroeconomic indicators (among others, inflation, corruption, and unemployment) are linked to the national measurement of SWB, and these factors provide a context to the evolution of interest towards national SWB in economics. Apart from these considerations, there are psychological theories beyond the microeconomic and macroeconomic considerations.

2.2.3 Subjective well-being theories

The above conceptualisation of SWB, both from a psychological and economic perspective, has enabled the study to answer questions relating to what defines SWB. Is SWB categorised into distinct components, or is it conceptualised as a singular global state? How is SWB measured? What are the psychological and economic consequences of SWB? Answers to these questions are fundamental to our understanding of human life, and there is increasing empirical research in the social and behavioural sciences on the topic of SWB, which addresses these fundamental questions. Most of these studies have crystallised the scientific understanding and foundations of SWB across various theories.

The following are some of the theories that define the scientific foundations of SWB: The Easterlin Paradox/Relative Theory by Easterlin (1974) maintains that the effect of absolute income on SWB depends on standards that vary over time according to the individual's reference group. For example, factors such as the relationship between a person's current and past economic situation and wealth relative to that of reference individuals (Meadow, 1992) can affect a SWB regardless of their income level (Diener & Diener, 1996). However, some scholars have raised mixed reactions and questions about the Easterlin Paradox, particularly when the analysis is performed across countries. The findings by Veenhoven (1991) suggest that SWB is higher in rich countries as opposed to poor countries, and the correlation between per-capita GNP and SWB is as high as 0.84. In these findings, Veenhoven (1991) argues the importance of the Absolute Theory in determining SWB. This theory assumes that SWB is an increasing function of the satisfaction of basic needs. Individuals with high levels of income are able to increase their consumption of basic needs (food, housing, health, etc.) and attain a high level of SWB.

Consistently, findings by Diener et al. (1999) also suggests a significant association between SWB and national wealth (see also Cummins, 2003; Stevenson & Wolfers, 2008). In response to these contrasting findings, Easterlin et al. (2010) revised this theory by drawing on studies of transitional countries, including Eastern Europe, South Korea, and Chile. They suggested a U-shaped pattern of association between economic development and SWB. Whereby, the average SWB trend correlates positively with economic development in the short term, while economic development has only a limited impact on SWB in the long term (Easterlin et al., 2010). The revised Easterlin Paradox is more convincing for its emphasis on the time threshold. However, there remains a clear threshold level where income’s impact on SWB is not important due to the existence of psychological factors (i.e., emotions, mental state, and personality traits), which are paramount to the value judgement individuals place on their lives.

The existence of these psychological factors is based on psychological theories. For example, the Hedonic Adaptation Theory (Brickman et al.,1978) focuses on the individual's emotional abilities to adapt to positive and negative events. Therefore, individuals with higher adaptability tend to be happier (even in low-income situations) than those with lower adaptability. The Hedonic Adaptation Theory postulates that when external conditions change, a person's mental state adjusts to adapt to the new environment, thus maintaining subjective emotion at a relatively stable level. This level is informed by the individual’s baseline or set-point level of SWB, as individuals return to baseline levels of SWB following a change in life circumstances (Lucas, 2007). This baseline SWB level is a proposition of the Set-Point Theory assumes that, factors such as personality and genes, determine the individual's fixed SWB baseline. Hence, as the external conditions and life events change, individual SWB will fluctuate around this baseline. However, as the emotional system adjusts to the new circumstances, SWB returns to baseline. Therefore, the SWB deficiency is only a temporary emotional reaction (Cummins, 2013).

According to the logic of Adaptation and Set-Point Theory, psychologists further proposed the Hedonic Treadmill Theory (aspiration theory) (Brickman & Campbell, 1971; Brickman et al., 1978) for SWB research. According to this theory, regardless of what happens to the individual, their levels of SWB will eventually return to the baseline, and the degree of the evaluation of SWB is related to the ratio of the individual’s satisfied desires to his or her total desires. Individuals who believe their desires are fully satisfied tend to be satisfied than those who believe they have unfulfilled desires, regardless of their income level. This approach to happiness takes into account not only the level of satisfaction of (presumably related to income) needs, but also to overall desires (which are also presumably related to income). With increasing income, the individual’s material desire is likely to increase. As a result, the individual gradually adjusts to their higher income and the degree of SWB due to increases in income decreases.

Although Set-Point and Hedonic Treadmill theory has gained widespread acceptance, Diener et al. (2009a; 2009b) makes five important revisions to these theories. The first adjustment is that individuals’ set points are not hedonically constant, in the sense that a person’s moods change in response to good and bad experiences but return quickly to neutrality. The setpoints are defined by genetics, habits, emotions, and psychological states of mind, which characterise the baseline level of satisfaction (Headey, 2008). Therefore, both good and bad experiences become transitory. Second, each person has a unique set point, which is in part determined by their personality. Third, a single person may have several happy set points from various SWB components, such as positive, negative affects, and life satisfaction. Fourth, and perhaps most critical, is that SWB setpoints can change under different circumstances, but individuals eventually adjust to their natural setpoint. However, the setpoint can permanently change in a life-changing circumstance. Lastly, individuals differ in their adaptation or response to events and circumstances. This is also likely nuanced by (i) one, whether people respond/adapt at all; (ii) what is the magnitude and direction of such adaption?; (iii) whether such adaption is linear or non-linear over time; and (iv) whether response/adaption is immediate or delayed (Knight & Gunatilaka, 2010).

Overall, these SWB theories are paramount in shaping the understanding of the underlying economic and psychological factors that explain the overall assessment of one's life. These theoretical considerations show that various economic and psychological factors are involved in determining SWB, as they affect and predict the individual's hedonic set-point, aspirations, and adaptation levels, which are critical in shaping SWB. In this regard, SWB provides an indication of the individual's subjective welfare and utility levels.

2.2.4 Empirical evidence

At present, the empirical literature on SWB includes more than a dozen major studies that provide output on critical descriptive results on the SWB of certain national populations. Some of these studies also contain extensive data on subgroups within the national population on life evaluations and a wide range of more specific life concerns, such as income, socioeconomic conditions, and many other determinants of SWB.

These studies are the primary source of normative data for SWB measures. As such, these studies are used to determine what was (at the time the study was conducted) the typical level of SWB expressed by many demographically defined groups within a national population, and most of the studies provide a context on the measurement of SWB, and other determinants of SWB from international and SA research.

This section will review the existing empirical literature presented in chronological order, without making any sharp propositions but rather a general overview of the SWB empirical evidence.

2.2.4.1 Empirical evidence on SWB from international research

In the United States (US), Gurin et al. (1960) provided evidence on SWB by addressing questions as to what makes Americans happy or unhappy. What do they do when faced with problems and to whom do they turn? The study sailed under the banner of the "life quality" flag commonly used in SWB studies in the 1970s and 1980s. The life quality flag defines SWB to be determined by the respondents' self-evaluation reports of their life and feelings. The authors used an extensive interview process with a representative sample of 2460 Americans above the age of 21 living with their parents. SWB was measured by asking individuals a single question, such as, "All things considered, how satisfied are you with your life as a whole these days?" or "Taken all together, would you say that you are very happy, pretty happy, or not too happy?". The single-item measures of SWB have been found to have moderate reliabilities, usually between 0.40 and 0.66, even when asked twice in the same session one hour apart.

The study by Gurin et al. (1960) provides a base for the existence of SWB. However, empirical evidence has been developed to provide alternative means and perspectives in the measurement and also in providing a quantitative context of SWB concerning other potential confounders. For example, two decades after the emergence of SWB in the US, empirical evidence by Diener et al. (1985) provided a different context for the measurement of SWB. The study examined the validation and development of an effective measurement of life satisfaction, which is otherwise called the Satisfaction with Life Scale (SWLS). In contrast to the single question measures, the SWLS consists of the average of five related items, each rated on a seven-point scale from Strongly Disagree (1) to Strongly Agree (7). The items are: "In most ways, my life is close to my ideal"; "The conditions of my life are excellent"; "I am satisfied with my life"; "So far I have gotten the important things I want in life"; and "If I could live my life over, I would change almost nothing".

The SWLS has shown to be more accurate than single-item questions since it is the sum of multiple items, and it benefits from error reduction through aggregation. Diener et al. (1985) used two separate samples of undergraduates acting as subjects. Sample 1 was made up of the 176 students adopted during the Study. Sample 2 has the composition of separate entities of 163 undergraduates enrolled in the introductory psychology class. In addition, an average of 53 elderly individuals volunteered for the project among those living in the Urbana-Champaign area. From the findings of the study, the SWLS is shown to have favourable psychometric properties, including high internal consistency and high temporal reliability. Scores on the SWLS correlate moderately to highly with other measures of SWB and correlate predictably with specific personality characteristics. It is noted that the SWLS is suited for use with different age groups, and other potential uses of the scale are discussed.

Approximately two decades later, Diener et al. (1999) re-examined the progress of SWB in the US by providing a progress analysis. The aim was to test the Adaptation Theory by examining the processes underlying adaptation to events and evaluating causal pathways that explain increased levels of SWB. Diener et al. (1999) advanced theories (the Dynamic Equilibrium Theory, Hedonic Adaptation and Set-Point theories) that provide context to the relevance of SWB and the effect of various components that determine SWB. The methodological procedure involved modelling causality, measuring global self-reports, and comparison of persons through impression management. The findings show that the fulfilment of needs that makes an individual happy, are made up of the predisposition of temperament for SWB. Certain individuals have a genetic predisposition to either be unhappy or happy, as it is presumably caused by inborn people's differences in the management of the nervous system. The Dynamic Equilibrium Theory was proposed in which personality was seen to determine baseline levels of responses on emotional intelligence. Cognitive personality traits were connected with SWB; neuroticism negatively influences affect and extraversion has a positive influence on affect.

The evidence provided by Diener et al. (1999) also affirms the importance of personality traits and domain factors in determining how individuals evaluate their level of SWB. Van Praag et al. (2003) support this assertion in their study of the importance of domain factors in determining SWB. Van Praag et al. (2003) used data from the German Socio-Economic Panel (GSOEP), a longitudinal household panel to measure the individual's domain and overall satisfaction and the way in which these two are connected. The study took into account different aspects of life, called domains, such as health, financial situation, job, leisure, housing, and environment. The study used a two-layer model where individual total SWB depends on different subjective domain satisfactions. The findings from this study suggest that self-reported satisfaction is a useful new instrument for the evaluation and design of socioeconomic policy. Moreover, the results help us to understand the composite construction of individual well-being and preferences.

This is consistent and in accord with earlier findings (for example, Frisch et al., 1992; Ferrans & Powers, 1985) that advocated the inclusion of domain factors in the measurement of SWB. The inclusion of domain factors was also supported by Hubley et al. (2005), who argued that quality of life is based on ‘‘a person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are critical to the individual’’ and incorporated domain importance into the Quality-of-Life Index (QLI) of Ferrans & Powers (1985). Accounting for life domains in the measurement of SWB is also known as *importance weighting*, which is an instrument that ask respondents to rate a number of life domains in terms of satisfaction and personal importance and derives weighted satisfaction scores by multiplying the two ratings (Hubley et al., 2005).

However, some researchers have argued that this procedure is both undesirable and unnecessary, and incorporating life domain factors at only the individual level is the main source of controversy (Campbell et al., 1976; Russell et al., 2006; Wu, 2008). Opponents of the (QLI) argue that using life domain as a weighting factor often fails to produce any detectable increase in the power to explain variations in global SWB measures, compared to a simple sum of domain satisfaction scores (Trauer & Mackinnon, 2001; Wu, 2008; Philip et al., 2009).

For example, a study by Trauer & Mackinnon (2001) evaluated the accuracy of the QLI as a measurement of SWB. The authors demonstrate that QLI is both undesirable and that QLI domains are selected based on their inherent importance, rendering separate importance ratings partially redundant, and the weighted scores present difficulties in interpretation. This inaccuracy of the importance of weighting/rating was also tested by Wu (2008), in an empirical study that examined the range-of-affect hypothesis in a within-subject context using the weighting situation faced in the QLI. A study by Wu (2008) used survey data of 332 undergraduates at the National Taiwan University. The QLI questionnaire contained satisfaction, importance, and perceived have-want discrepancy on 12 life domains. The study estimated a multilevel model, and the results suggest that the relationship between item have-want discrepancy and item satisfaction is stronger for high-importance items than low-importance items for a given individual. The result also revealed that weighting item satisfaction scores with item importance scores may be unnecessary because item importance has been considered in a satisfaction evaluation. Another study by Philip et al. (2009) examined the accuracy of QLI with respect to the weighting or not weighting domains of QLI. The study surveyed 194 cancer patients, and the results suggest that weighting the domain (using domain preference as a proxy of domain factor) did not improve the power of the QLI in predicting global SWB, as measured by the Satisfaction with Life scale (SWLS). Therefore, they support the use of unweighted scores in the quality-of-life measurement.

The above studies propelled researchers to provide alternative mechanisms for the measurement of SWB. A study by Durayappah (2011) built on a range of theories based on existing empirical research (see Diener et al., 1985; Emmons & Diener, 1985; Diener et al., 1999) to construct a 3-Point Model (3P Model) to measure SWB. SWB under the temporal states of the 3P Model has been categorised under the components of the past, the present, and the prospective future. The model shows how each of the components is fundamental to the evaluation of global SWB and how the overall individual state is different yet linked up to the other states. In addition, the explanation offered by the 3P Model indicates how the SWB measurements are impacted by cognitive biases (for example; impact bias, retrospective bias, and peak-end rule) that factor into the assessment of the meta-biases and temporal states (for example; temporal perspectives) which factors into the assessments of international life satisfaction. The conclusion from the study is that the 3P Model is based on someone’s design to counteract certain biases or temporal preference in the measurement of SWB.

In the United States, Galinha & Pais-Ribeiro (2012) empirically relates the evaluation found in the predictive power of the affects and cognitive factors to the 3P Model proposed by Durayappah (2011). The study by Galinha & Pais-Ribeiro (2012) shows that there are four components of SWB that were adopted to recognise the identity of various predictors of SWB. The study sampled 303 adult students for two consecutive months using instruments to measure SWB: Global SWB; Satisfaction with Life in Domains; Positive and Negative State Affect; Positive and Negative Trait Affect;

Standards of Comparison; Anxiety, Stress and Depression; Life Events; and Socio-Demographic variables. These instruments included satisfaction with life in domains, positive and negative trait affect, depression, anxiety and stress, life events, socio-demographic variables, and standards of comparison. The findings show that life satisfaction and affect are critical predictors of SWB. The findings also revealed that intrapersonal variables are also major predictors of SWB; however, within a close range, some of the significant predictors also include contextual variables. Lastly, among the main SWB predictors, contextual variables and state affect variables lost the prediction of power, whereas cognitive variables and trait affect gained prediction power in the models. The results also suggest that SWB increases with relative income as opposed to absolute income.

In finding the nexus between the rise in income and overall life satisfaction, researchers (see Easterlin, 1974, 1994; Watson et al., 1996; Clark & Oswald, 1996; Tsou & Liu, 2001) have displayed keen interest in the dilemma of whether increasing income for every individual would improve one's overall assessment with life satisfaction. For example, research by Easterlin (1973) raised concerns as to whether absolute income increases SWB. Using time series data from Japan, nine European countries, and the US, Easterlin (1973) showed that growth in absolute income in each community may not necessarily lead to increased levels of SWB. The conclusions reached from this research are based on the existing data reported from the material norms, happiness, and income gathered in surveys from several nations over the past half-century.

Kahneman and Krueger (2006) viewed the relationship proposed by Easterlin (1973) from another perspective, as they argued that, because of the illusion of the relationship, comparisons for within-country overestimate the nexus between SWB and income. Asking questions about life satisfaction enables individuals to evaluate their lives concerning others, and, hence, they focus on the area in comparison to others on issues relating to a concrete evaluation in which income is inclusive. Kahneman & Krueger (2006) used data on Italy's economy on income and standards of living for the year 2005, and also considered other factors that determine households' SWB. The study used the partial proportional ordered logit model, and the results indicate that financial strain is the most significant dimension of standard of living conditions impacting SWB. However, its impact is subject to the tenure status of accommodation and education level. Essentially, in a situation where the highest education level combines with self-employee status together with household house-owner, then there will be a greater possibility to attain a preferred probability to be satisfied economically. The information emanating from the findings might require various policy measures, which may depend on the levels of the characteristics of households and the corresponding subjective well-being. More specifically, more proactive policies should be adopted in order to maintain the income of the households, permit the young generation to obtain the highest levels of education, and to also encourage the possession of a house.

Stevenson & Wolfers (2008) reassessed the Easterlin paradox by examining the link between the average societal SWB and the corresponding economic growth. Stevenson & Wolfers (2008) used multiple datasets covering several decades together with the adoption of current data on a wider array of countries. The study established a strong positive relationship between GDP per capita and average levels of SWB across nations, with no empirical evidence in the point of satiation beyond which richer nations have no further improvement in SWB. The study further indicates that the relationship maintains consistency across various adopted datasets and this consistency is identical to that found between income and subjective well-being observed within nations. Even though the study's investigation offers a very valuable measurement of the bivariate relationship between well-being and income between and within countries, there is evidence to support the author's doubt that the results of the findings agree with the causal impacts of income on SWB. It appears reasonable that the gradients on the within-country subjective well-being versus income could be upwardly biased through the reversal of causation. This is because happiness might well enhance certain productive traits in various occupations, thereby raising income.

Moreover, the United Nations World Happiness Report (UNWHR) by Helliwell et al. (2012) documented general findings on the nexus by summarising dozens of studies using both panel and cross-sectional data. The findings imply that the cross-sectional response of SWB to income overstates a long-run time-series response in which incomes rise together with SWB and that income growth may fail to increase in SWB, as claimed by Richard Easterlin (Easterlin, 2013). They also imply that individual incomes cause negative externalities to others, which could be used to justify Pigovian income taxes as a measure to discourage people from working hard and so harming others. Overall, the UNWHR by Helliwell et al. (2012) asserts that there are consistent differences in SWB across countries and across time, and that these differences can be understood and can be addressed through effective public policy design and implementation. Therefore, it is imperative to pursue policies that increase welfare among the people as much as the people do in raising the public's national income. Nevertheless, there have been advances in the UNWHR. The latest UNWHR (2022) suggests that there has been progress in the measurement and reporting of SWB.

Diener & Oishi (2013) also contributed to the conjecture of the Easterlin Paradox, by examining the effect of rising income and the SWB of nations. The study aimed to explore whether increased income is associated with increased SWB across nations, with several advances over earlier work. The same well-being questions were asked in the same order and employed broad and equivalent representative samples over time from all the nations sampled in the study. They also assessed psychosocial factors that might mediate the relation between income and SWB. They also assessed psychosocial factors that might mediate the relationship between SWB and income. The findings show that changes in household income were associated with concomitant changes in life appraisals, positive and negative feelings. The impact of GDP change was weaker and only significant for life assessments, perhaps because GDP was a less reliable index of the average household's standard of living. The association of SWB and income is more likely to emerge when the average person's material welfare is accompanied by rising income, a case where people become more satisfied with their finances, and when people become more optimistic about their futures. The results show that people did not adjust to income increments over the years studied because the increments of income resulted in SWB gains that did not return to previous levels. Nevertheless, previous empirical evidence have failed to reach consensus regarding the relationship because of challenges relating to small sample size, inconsistent application of methodologies, and the lack of measures of potential mediating variables. However, the current analyses of income relative to people in one's nation and between-nation suggest that income standards are now largely global, with little effect on national social comparison.

The depth of the relationship between income and SWB is also informed by the level of income inequality within and across countries (see Rözer & Kraaykamp, 2013; Sacks et al., 2013). For example, Sacks et al. (2013) investigate the role of income inequality in accounting for differences in SWB across countries, using Gallup's Annual Global Household Survey, the World Poll. First, to motivate a focus on (ordinal) income quantile rather than cardinal income, they showed that, globally, income quantile within countries is a more powerful predictor of individual SWB than cardinal income. Second, they calculated for each country the economic gradient of SWB, the strength of the relationship between income quantile and subjective well-being, as a reduced form regression coefficient. Thirdly, they adopted rolling regressions carried out by domestic income quantile but pooled across nations to explain SWB in terms of national income and the aforementioned national economic gradient coefficient. The main finding is that, in countries where SWB depends more strongly on one's rank in the income distribution, people are less happy across the entire income distribution. This finding differs from what one would expect if the deleterious effects (or productive incentives) of inequality played out solely through relatively impoverished households. Robustness tests and possible interpretations are supplied.

Empirical evidence by Tsitsianis & Ping-Yin (2013) shed further light on the mechanisms of how relative income influences people's SWB, using four waves of data in the European Social Survey (ESS). The correspondents to the ESS are classified into finer sub-groups according to their income positions relative to the national average and their respective occupational group average earnings. A series of pooled cross-sectional ordered-probit models are estimated for the sub-groups, and the results reveal hitherto new contrasting patterns of the influence of relative income on SWB. Perhaps the most significant finding is that relative gains have no significant impact on SWB in any group, but relative losses do matter. Moreover, the low-income earners from the largest sub-group in society have higher levels of SWB, and the magnitude of their relative loss is positively associated with their SWB. Therefore, the 'social comparison' effect is particularly evident among this group and could have significant implications for social mobility and economic dynamism.

Empirical evidence by Reyes-García et al. (2016) is consistent with earlier findings on the conjuncture of income and SWB, particularly in low-income countries. The study by Reyes-García et al. (2016) argues that absolute income is critical for the SWB of low-income people. To test whether SWB is an increasing function of absolute income, the study used a large sample of individuals in rural areas of developing countries with relatively low-income levels. The study went beyond examining the relationship and but also considered the effect adaptation and reference group comparison effects on SWB. The survey of the study contained a sample of approximately 6973 rural households in 23 countries throughout Latin America, Africa, and Asia. The findings from the study showed that the adult's average total income was US$1555, and SWB levels were found to be consistent with previous cross-country empirical research. The results show that levels of absolute income developing countries is low, however, the overall effect of absolute income on SWB is consistent with previous cross-country empirical evidence. The data shows that absolute income increases SWB for the rich samples, and the magnitude of the effect is lower after controlling for the effect of adaptation and reference group comparison. The results suggest that reference group comparison have a stronger effect on SWB as opposed to has a stronger effect than adaptation. The results suggests that individuals underscore the relevance of adapting to life changing events but value the social standing relative to their reference group even with their low levels of absolute income. Finally, the results are also consistent with previous empirical evidence in terms of the effect of determinants of SWB.

2.2.4.2 Empirical evidence on subjective well-being in South Africa

In SA, SWB empirical evidence emerged in the late 1970s (Schlemmer, 1978) and the measurement of SWB is consistent with international studies, as it is measured by happiness and life satisfaction evaluations. According to Human & Smedley (1979), the emergence of SWB served to improve understanding and future policymaking on economic welfare. This called for the design of social reports that would provide a balanced picture of social life and trends, complementing the objective indicators of SWB. Consequently, social reports that capture SWB evaluations are an effective tool that enables researchers and policymakers to predict living conditions that are described by objective indicators. For the most part, SA studies (Schlemmer, 1978; Human & Smedley, 1979) deemed objective indicators to only explain "how things are", while subjective indicators are found to be all-encompassing, as they measure "how things are seen by the public", hence the emergence of social reports and SWB.

Since the propositions made by Schlemmer (1978) and Human & Smedley (1979), various nationwide surveys began accommodating subjective evaluations and social reports in an attempt to shape welfare measurement and public policy. For example, empirical evidence by Møller (1991) examined the relevance of social-indicator movements and made a case for collecting social reports, allowing for inferences on the individual's SWB. The study by Møller (1991) argued that the relevance of social-indicator movements is motivated by the importance of monitoring a broad range of social-factor changes over time, extending beyond traditional economic indicators by accounting for quality of life. This would yield rich material for social reporting, particularly in plural societies such as SA that had undergone (at that time) a rapid social change.

The overall aim of the study by Møller (1991) is to review existing SA case studies of national surveys that provided reports on the individual's quality of life. These SA case studies included the Trend study of South African quality of life (1983/88), the Multi-Dimensional Study of South African Seniors (1990), the Quality of life in Unemployment (1989), and the Spare Time Use and Quality of Life among Black Urban Youth (1989). All four case studies employed one or more general SWB measure, which performed well in the SA context. In the main, the case studies used a five-point satisfaction scale, and the scores were collapsed below and above the midpoint to yield the values "satisfied", "neither/nor", and "dissatisfied". The findings from Møller (1991) show that the four SA case studies suffered methodological issues that posed a challenge to social scientists when designing and interpreting the quality-of-life surveys. By virtue of this finding, improvements in nationwide surveys were required in the measurement of quality of life and ultimately SWB.

SALDRU designed the PSLSD survey that comprised a life-satisfaction measure captured at the household level. In 1996, empirical evidence by Møller (1996) made use of the PSLSD survey by examining the usefulness of the new SWB indicator by comparing present household satisfaction with individual-level satisfaction trends. Household satisfaction was also compared with past and projected future measures of life satisfaction. This was to provide a detailed overview of attitudes and perceptions of South Africans before and after the democratic elections of 1994. Hence, the comparison of current SWB to past and projected future satisfaction sheds light on the transitional effects of an economy typical to SA, where a large percentage of the population had been granted political rights. The findings from this study suggest that the household satisfaction measure is a critical social indicator in that it yields consistent and readily interpretable results, and the indicator is sensitive to income and expenditure differentials. These findings suggest that high-income households report higher levels of SWB, while individuals living in poverty report lower levels of SWB. Furthermore, current and future SWB is greater than past satisfaction, reflecting the adverse effects of apartheid, given high poverty rates and racial-based inequalities.

Empirical evidence by Klasen (1997) provides a context on the effects of poverty and racial-based inequality. Consistent with the findings by Møller (1996), the study by Klasen (1997) shows that the racial-based inequality dimension is subject to apartheid policies, with poverty concentrated among the African population. Klasen (1997) shows that the racial-based inequality dimension is subject to the Apartheid legacy, and most Africans continue to live under the poverty line. Klasen (1997) constructs a composite SWB index (using the SALDRU, 1993 data) of 12 indicators which included income, education, health, household wealth, access to services, transportation, and perceptions of quality of life. The composite index was then compared to the index to income and expenditure measures of poverty. The findings show that individuals defined as poor by the constructed index only partly overlap with the expenditure. According to the comparison, Klasen (1997) identifies a total of 3.7 million individuals who are deprived and not captured by the income-poverty measure. Furthermore, the results suggests that Africans are the most deprived with 64 percent of them being poor, compared to 33 and 3 percent for Coloured’s and Indians. Whites had the lowest poverty rate.

In the early 2000s, Møller & Saris (2001) extended empirical research on SWB in SA by examining the relationship between SWB and domain satisfaction. Møller & Saris (2001) examined the racial dimension of poverty adopted from Klassen (1997). In the main, Møller & Saris (2001) aimed to build on findings from Klassen (1997) by comparing determinants of SWB across the different race groups in SA. Using a maximum likelihood estimation procedure, the results show that coloureds and Asians did indeed show the expected effects, but the groups with the most extreme living conditions did not. The evaluation of life circumstances by Africans and Whites was determined by expectations for the future rather than current living conditions. Among various determinants of SWB, income is a critical determinant of SWB among coloureds and Africans, while Whites and Indians/Asians were more affected by domestic and health-related factors. Møller & Saris (2001) attributed the gap in variations in the quality of life to high rates of income and wealth inequality in SA. Many Black-headed households still have unsatisfactory access to clean water, health care, education, and energy, and, despite multiple interventions, progress in eliminating this problem remains elusive.

The effect of these relative economic effects on SWB was also examined by Bookwalter & Dalenberg (2004), who estimated a SWB equation that was based on poverty and household characteristics relating to health, education, energy, housing, sanitation, and transportation. The authors used the PSLSD survey and estimated an ordered probit model accounting for 5221 SA households. The findings from this study show that differences exist among groups based on their economic status. For the poorest quartiles, transportation and housing are among the critical factors that affect their overall SWB. While for the richest quartiles, health, water, sanitation, energy, and education are relatively more important. These results have important public policy implications because of the observed differences in income class, and these differences affect SWB. In the main, the material conditions in the societal environment where people live have a lasting impact on their personal and social identities. This affects both the way individuals feel and think about their life regarding aspects of their social behaviour, which are critical in determining SWB.

These relative considerations of one's social and economic environment have a lasting impact on the individual's personal and social identity and can be a source of discomfort, particularly in unequal societies. In this case, individuals at the lowest level of the income distribution are exposed to relative deprivation that unleashes negative emotions of sadness, stress, envy, guilt, and anger, which negative affects SWB (Winkelmann, 2005; Subramanian et al., 2005). In SA, the relative income effects on individual SWB were examined by Kingdon & Knight (2007) using the PSLSD survey.

Their research aimed to provide a context on relative income concerns on individual SWB. The authors used an ordered probit model estimation technique, and the findings suggest that relative income is critical in determining SWB. The comparator income, measured by others' income averages in the neighbourhood, has a positive effect on SWB, while the income of more distant others, most specifically, others in the province or district, negatively affects SWB. Comparator groups based on spatial proximity and race-based comparator groups are important reference groups, particularly in racially divided SA. The overall findings show that reference groups are highly divided along racial lines, which is predictable due to the nation's history of racial oppression and segregation. The effect of relative standing on SWB was found to be more significant when a comparison was made across racial groups.

The research findings by Bookwalter & Dalenberg (2010) relate household-level responses to questions about SWB to several factors, including measures of the household's relative accomplishments, both economic and non-economic. Using the Ordered Logit (OL) model, the results suggest an insignificant effect of economic accomplishments on individual SWB in SA. These results contrast existing empirical reference group effects, as low income or expenditure levels of most SAs living among wealthier people is advantageous (social connection and motivation), compared to the adverse effects associated with being the poorest among the poor peers. Bookwalter & Dalenberg (2010) gave credence to the reference group definition tested by Kingdon & Knight (2007) but argued that the emphasis on geographic neighbours and age or educational peers does not provide the best reference group for comparisons. Bookwalter & Dalenberg (2010) argued for the inclusion of one's economic standing relative to one's parents. Across all these numerous dimensions, the findings show that the most important effects of relative concerns came from economic standing relative to one's parents. Relative income, when compared with that of one's parents, significantly affects SWB. The sequence of their findings is that individuals who perceived their household to be relatively richer than the households of their parents are more likely to report a greater level of SWB.

The common thread from these studies (Moller, 1991; Møller & Saris, 2001; Bookwalter & Dalenberg, 2004; Kingdon & Knight, 2007; Bookwalter & Dalenberg, 2010) is the consistency in the use of nationwide surveys, and the ordered probit/logit models in predicting individual SWB against a host of determinants of individual SWB reviewed in the literature. The nationwide surveys used before the formation of the NIDS data ranged from the Trend study of South African quality of life (1983/88), the Quality of life in Unemployment (1989), the Spare Time Use and Quality of Life among Black Urban Youth (1989), the Multi-Dimensional Study of South African Seniors (1990), to the PSLSD survey (1993), which collected information on SWB at the household level and a wide range of indicators of standard of living. Given various developments in the measurement of SWB and the design of these surveys, it is perceptible that research on SWB based on these nationwide survey's provided a narrow but enlightening perspective on individual SWB.

The emergence of the NIDS data as the first national panel study of individuals of all ages in SA allowed for a comprehensive perspective on living standards and economic welfare. The NIDS data measures and provides an understanding of who is getting ahead and who is falling behind in SA, as well as why some people are making progress and others are not. Building on earlier findings by Kingdon & Knight (2007) and Bookwalter & Dalenberg (2010), these relative considerations were examined by Posel & Casale (2011) using the NIDS data in exploring the impact of subjective relative standing on individual SWB. Subjective relative standing was derived from information collected on individuals' perceptions of where they rank in the income distribution. A wide range of variables involving a broad range of attitudinal, economic, and socioeconomic variables were identified from the literature. Using the OP, the determinants of SWB were consistent with the literature (race, age, level of income, gender, years of education, the number of children, and marital status explain SWB), and the study found considerable differences between objective and subjective measures of relative ranking.

Furthermore, the findings by Posel & Casale (2011) asserts that one's perceived relative status has a more significant impact on SWB in comparison to objective measures that are based on reported income. This study also examined how perceived relative position in the income distribution affects individual SWB, whether those could have changed since childhood, and what they might expect their relative position to be in the future income distribution. The findings suggest that future upward mobility has a minimal effect in comparison to upward mobility compared to one's past, suggesting that SWB is more affected by past achievements than anticipated achievements. These results reaffirm the importance of social comparison and relative standing in determining individual SWB.

Von Fintel (2015) also examined the effects of relative standing and reference groups on SWB in an attempt to expand the understanding of the conjecture, building from empirical evidence by Kingdon & Knight (2007) and Posel & Casale (2011). Von Fintel (2015) argues that individuals evaluate their SWB subject to their reference group. In testing this argument, this study used the first wave of the NIDS data and employed the same methodology as Kingdon & Knight (2007) to examine whether these reference groups have shifted in post-apartheid SA. Using the OP, different parameters are evaluated to ascertain the weight based on the SWB of individuals in the same race group as the respondent versus all the other race groups living in the same province, district, and neighbourhood. After the country's first democratic elections of 1994, the outcomes appear to agree that reference groups have shifted away from their racial domain to a more inclusive one. The results from this study suggest that race-specific relative income is no longer significantly correlated with SWB for the population as a whole, but rather that perceived relative income within the country matters as a significant predictor of subjective well-being. Furthermore, these results show that after the racial integration which took place after 1994, peer groups are deviating from a racial concentrated regions to more inclusive regions. However, for the sub-population within the country, namely, those below the poverty line (who are mostly black), a race-specific reference group remains relevant.

SWB is a relevant measurement of economic welfare in SA, and the context of the measurement is consistent with theory and international empirical evidence. In a country with troublesome levels of poverty and inequality, which are both pronounced deprivations of SWB. This deprivation undermines sustainable economic growth through its negative impacts on human capital, unexploited talent and social cohesion (Botha & Snowball, 2015). Nevertheless, the above empirical evidence is consistent in distinctively predicting SWB, and relative income matters more than absolute income, and race is at the centre of relative economic considerations. The above empirical evidence is in accord with the measurement of SWB shown in the literature and provides context on relevant theories of SWB (Easterlin Paradox, Hedonic

Adaptation, Hedonic Treadmill, and the Set-Point and Hedonic Treadmill) reviewed in the literature.

Moreover, there is a wide scope of SA empirical evidence on other determinants of SWB developed in the realm of SWB theories. Among the existing studies, for instance, Powdthavee (2007a) examined the determinants of SWB using the PSLSD survey, and the predicted relationship was estimated using structural equations. The findings by Powdthavee (2007a) show that correlates of SWB, like age, income, education, health, household living conditions, and household variables are significant predictors of SWB, and the outcome of the relationship is consistent with evidence found in developed countries. A decade later, Blaauw & Pretorius (2013) also added to the realm of SWB by examining the determinants of SWB. Blaauw & Pretorius (2013) used the first wave of the NIDS data to estimate the SWB equation through the OLS and the OP models. The results indicate that age, gender, race, health, marital status, the number of children in the household, income, and years of education, are among critical predictors of SWB. Unlike studies in the developed world, the size and location of respondents in urban areas do not explain SWB. Two of the surprising results point to the significant influence of religion in determining SWB in SA.

The locational dynamic and its relevance were tested by Muzindutsi & Sekhu (2014) in the study of the determinants of SWB among residents living in the township of Kwakwatsi in the Free State province. The study used a household survey using questionnaires to collect data from a random sample of 225 households. The study estimated a multiple regression model, and the estimates show that individuals living in the area were dissatisfied with their lives. Determinants of SWB such as age, educational attainment, employment status of the head, income, and the number of household members employed had positive but varying effects on SWB. The findings from this study are consistent with those found in Blaauw & Pretorius (2013).

Morton et al. (2018) also adopted the recommendation by Blaauw & Pretorius (2013), as they exploited the influence of provincial location when examining the determinants of SWB. The study took into account the effect of social determinants of SWB for young adults living in the Eastern Cape (EC) province. The social determinants are age, gender, marital status, education, income, and employment. The methodology was qualitative, and SWB was measured using the World Health Organisation (WHO) SWB scale. The study computed the analysis of variance (ANOVA) to determine the association between social determinants and SWB. The results indicate that age, education, and income are significant predictors of SWB. Higher levels of SWB were associated with being older, having a higher level of formal education, and having a higher level of income. However, employment status did not significantly affect SWB, suggesting the relative importance of other social indicators of social functioning in the population of the Eastern Cape.

In summary, various SA studies have examined the SWB in relation to a host of factors that underly the country’s history and economic conditions. These studies favour SWB as an all-encompassing life-evaluation measure. These studies validate the measurement of SWB and validate SWB as a measure of social and economic welfare. In terms of established relationships, there are consistencies between international and national studies of SWB in predicting the relationship between SWB and other potential determinants of SWB.

2.3 Data Sources

2.3.1 National income dynamics study

In South Africa, data on the quality of life was first contained in the South African Quality of Life (1983/88), the Multi-Dimensional Study of South African Seniors (1990), the Quality of life in Unemployment (1989), and the Spare Time Use and Quality of Life among Black Urban Youth (1989) surveys. Developments in the measurement of SWB were pioneered in 1993 through the Project for Statistics on Living Standards and Development (PSLSD) survey administered by the South African Labour Development Research Unit (SALDRU), a research unit in the University of Cape Town. The PLSLSD data measured SWB using the head of the household’s level of satisfaction. In the questionnaire, the head of the household was asked, “Taking everything into account, how satisfied is this household with the way it lives these days?” (Bookwalter & Dalenberg, 2004, 2009; Powdthavee, 2007b; Kingdon & Knight, 2007). The SWB evaluation question does not only assume that one person reports objectively on the household’s level of satisfaction, but it also assumes that there is a unified SWB function at the household level. When measuring SWB, studies using the PLSLSD data assumed that respondents would objectively report on their level of satisfaction (Neff, 2007) or would report reliably on the household level of satisfaction (Kingdon & Knight, 2007).

Although various other SA nationwide surveys had already started reporting on well-being, the National Income Dynamics Study (NIDS) data is the first national panel study to report on the dynamic structure of a sample of household members in SA over time. The NIDS data is funded by the South African Presidency and implemented by the Southern African Labour and Development Research Unit (SALDRU) a unit based at the University of Cape Town (UCT). SALDRU conducts research on applied empirical microeconomics with specific emphasis on poverty, income inequality, human capital, labour market, and social policy (Woolard et al., 2010). SALDRU implements a range of innovative surveys in SA. Building on these large data-gathering projects, the unit conducts a range of training and capacity-building activities in the use of survey data to analyse social well-being. The NIDS dataset is among the datasets administered by SALDRU, and the NIDS data collects a broad range of information on an array of social-science topics.

Despite the name of the NIDS survey, the emphasis is not on income but on a wide range of measures of well-being. Some of the topics on which information is gathered include wages, social grants and other income of individuals in the household; the expenditures of the household; the level of education and health status of household members; the mental health and well-being of members of the household; whether household members are still in school or working or looking for work or helping at home or retired; religious and community groups to which members of the household belong; whether household members would like to remain within their current communities and how well-off they are relative to others in their reference group; asset ownership by the household and the services to which the household has access. These topics are viewed against the backdrop of the key concerns highlighted by the Presidency of SA for NIDS to investigate. These included the need to measure whether all SAs are benefitting from economic growth and social mobility, and the concern that a number of SAs might become 'socially excluded', left behind or trapped in a 'second economy' where they are unable to benefit from economic opportunity.

Therefore, the NIDS data is expected to shed light on the circumstances in which SAs find themselves, how these conditions impact their ability to improve their well-being and how public policy administered by the government can play a positive role in shaping and improving the livelihoods of the people (Leibbrandt et al., 2009).

Moreover, the main aim of the NIDS data is to track and understand the shifting face of poverty, well-being and living standards by closely following approximately 28 000 people, old, young, rich, and poor. This process involves following people as they move out of the original 7300 households, whether they are migrant workers, young married couples, or students. Furthermore, the data-collection process targets private households in SA and residents in workers' hostels, convents, and monasteries. This excludes boarding schools, halls of residence, prisons, hospitals, and old age homes.

The NIDS panel data blends elements of both cross-sectional and time-series data in the sense that cross-sectional data describes observations i, and time-series describes the observation across period t (Dielman, 1983). Thus, the behaviour of entities is observed across time. In the first year, 2008, a stratified two-stage cluster sample design was used in sampling approximately 28 000 individuals and 7300 households across SA (Ardington & Gasealahwe, 2014). The first stage involves the selection of spatial units, which are referred to as primary sampling units (PSU). The sampling frame consists of 400 PSUs from Stats SA's 2003 master list. The second stage involves the process by which the survey team constructs an up-to-date list of households within each of the sample clusters, allowing households to be selected from these listings. Hence, the sampled population comprised all individuals living in households in the selected PSUs. The sample covers all nine provinces and fifty-two district municipalities, blending both rural and urban regions.

Individual interviews are conducted biennially for all members of households containing continuing sample members (CSMs),[1] in person or by proxy for individuals aged 15 and over and by the caregiver for children under 15. One person also answers

[1] Continuing Sample Member: All resident members of the original selected Wave 1 households or the Wave 5 Top-Up Sample (including children) and any children born to female CSMs in subsequent waves.

questions about the household as a whole. These categories are among the data files that make up the NIDS dataset in each wave. Table 2-1 shows a summary of the total number of observations in each data file for each wave. The survey has further been conducted for the years 2010/2011 (Wave 2), 2012 (Wave 3), 2014/2015 (Wave 4) and 2017 (Wave 5), spanning the nine years over which each wave of data is spaced approximately two years apart. Each respective wave is designed as a rotating panel of dwelling units, and the study controls for period-specific changes (fixed effects) (Leibbrandt et al., 2010; Branson et al., 2014; Finn et al., 2013; Casale, 2015; Brophy et al., 2018). Table 2-1 shows that the NIDS data covers a sample of approximately 28 226, 34 291, 37 553, 42 372 and 47 055 individuals as per the personal identifier, respectively for each wave.

Table 2-1: Summary of n-values across the NIDS waves

File Name	Identifiers*	n				
		w1	w2	w3	w4	w5
Link File	Pid	-	35167	41396	50369	59677
HHQuestionnaire	wX_hhid	7296	9125	10218	11889	13719
HouseholdRoster	wX_hhid	7296	9125	10218	11889	13719
	pid	31141	35422	40794	47009	50319
Adult	wX_hhid	7289	8841	9965	11605	13464
	pid	16872	21874	22457	26804	30110
Proxy	wX_hhid	1375	898	2067	1383	1685
	pid	1750	1124	2714	1597	1952
Child	wX_hhid	4327	5062	5638	6307	6878
	pid	9604	11293	12382	13971	14993
hhderived	wX_hhid	7296	9125	10218	11889	13719
indderived	wX_hhid	7296	9014	10114	11726	13543
	pid	28226	34291	37553	42372	47055

Source: Data from the National Income Dynamics Study Panel User Manual, Version 1.

*Note: * X represents the wave number i.e., w1*

Table 2-2 below shows the total number of CSM and Temporary Sample Members (TSMs[2]) successfully interviewed in each wave, as well as the number of CSMs and

[2] Temporary Sample Member: A person who is not a CSM but is co-resident with a CSM at the time of the interview.

TSMs that were added to each wave. Approximately 73 percent of the individuals who were interviewed in Wave 1 were successfully interviewed in Wave 5. Approximately 77 percent of the 1856 CSMs who were either added to the study in Wave 2 or not successfully interviewed in Wave 1 were successfully interviewed in Wave 5. Approximately 87 percent of the CSMs who were added in Wave 3 were successfully interviewed in Wave 5, and approximately 92 percent of the CSMs who were added in Wave 4 were successfully interviewed in Wave 5. Based on these estimates, the percentage of successfully interviewed individuals is much larger for the CSMs than for the TSMs and this is because TSMs are not followed if they move out of a CSM household or if the CSMs leave the household. Also, there appear to be low response rates at the Wave 1 baseline sample and subsequent high attrition in waves 2 to 4, which is made of mostly White, Indian/Asian and high-income individuals.

Table 2-2: CSMs and TSMs successfully interviewed by wave.

		Interviewed in Wave 1	**Interviewed in Wave 2**	**Interviewed in Wave 3**	**Interviewed in Wave 4**	**Interviewed in Wave 5**
First Present in Wave 1	CSM	26776	21116	21394	20778	19302
First Present in Wave 2	CSM		1856	1596	1557	1445
	TSM		5565	3144	2281	1845
First Present in Wave 3	CSM			1346	1234	1165
	TSM			5102	2540	1910
First Present in Wave 4	CSM				1723	1584
	TSM				7255	3796
First Present in Wave 5	CSM Total					3278
	CSM Original Sample					1262
	CSM Top-up					2016
	TSM Total					5109
	TSM Original Sample					5109
Total successful individual interviews		**26776**	**26776**	**28537**	**32582**	**37368**
CSMs attempted		28226	26776	29 431	32056	30478
TSMs attempted			5739	5 736	18313	12742

Source: National Income Dynamics Study Panel User Manual, Version 1.

Table 2-3 below provides a descriptive overview of the reasons why there exist household non-responses at the individual level across the waves. Wave 1, the baseline wave, and individual household non-responses were not specified in Wave 1 and therefore there are no reasons for non-responses available for this wave. In waves 2 and 3, the non-responses were mostly attributed to individuals not being located and refusing to be interviewed in the survey. Waves 4 and 5 see an apparent respective spike in “not tracked” outcomes, not located and refusals.

Table 2-3: Reasons for household non-response at the individual level.

		Refused / Not Available	Not Located	Not Tracked	Whole HH Dead	Moved Outside SA	Total
Wave 5	Number	3021	1500	1560	205	30	6316
	Percent	47.83	23.75	24.70	3.25	0.48	100
Wave 4	Number	1958	816	1550	189	38	4548
	Percent	43.05	17.94	34.08	4.16	0.84	100
Wave 3	Number	2051	2118	45	176	117	4453
	Percent	46.06	47.56	1.01	3.95	2.63	100
Wave 2	Number	1805	2198	624	158	82	4870
	Percent	37.06	45.13	12.81	3.24	1.68	100

Source: National Income Dynamics Study Panel User Manual, Version 1.

Table 2-4 provides a summary overview of attrition. Attrition between waves is defined by comparing the number of successful interviews in a wave to the number in preceding waves. For example, the number of successful interviews in Wave 3 is compared to that of Wave 2, providing us with the Wave 3 attrition rate. The sample used to determine attrition contains those respondents that are present in both waves and alive at the beginning of the wave of interest. For example, a respondent must be alive during interviews for Wave 3 but can be deceased at the end of Wave 4. Table 2-4 shows three categories of attrition: “Refusals” are those who were not interviewed across the panel because of an individual or household refusal. “Not Contacted” individuals consist of respondents who were not tracked, not located, or moved outside South Africa. Finally, “Deceased” are those respondents who died between waves. This pattern of missing data is hard to avoid, particularly in a longitudinal dataset. A higher percentage of attrition at each point in time implies that the remaining data at subsequent time points provides less diagnostic information, which may also challenge the validity and robustness of the measurement models (Finn et al., 2017; Daniels et al., 2020).

Table 2-4: Reasons for Attrition

	Reason	Refusal	Non-Contact	Deceased	Total
Wave 5	Number	3481	3040	784	7305
	Percent	48	42	11	100
Wave 4	Number	2294	2400	882	5576
	Percent	41	43	16	100
Wave 3	Number	2481	2276	708	5465
	Percent	45	42	13	100
Wave 2	Number	2425	2890	876	6191
	Percent	39	47	14	100

Source: National Income Dynamics Study Panel User Manual Version 1.

Panel weights are used to correct for the presence of non-random panel attrition in NIDS. The panel weights are the inverse of the probability of appearing in the sample. This probability is the product of the probability of being interviewed in Wave 1 times the probability of being successfully reinterviewed in the subsequent wave, conditional on appearing in Wave 1. The panel weights are therefore the product of two weights: the weight corresponding to appearing in Wave 1 and an attrition weight, i.e., the inverse of the conditional probability of being reinterviewed. Of the 26 775 sample members who were successfully interviewed in 2008, only 15 673 were re-interviewed in all four subsequent waves. This gives an attrition rate for the balanced panel of 41.47 percent. However, between-wave attrition, which is most important in this study, is substantially lower, ranging from 9.3 to 21.1 percent. This is because it is fairly common that respondents who are missed in one wave are successfully contacted again in the next. Schotte et al. (2018)[3] provides more context and details on the construction of panel weights, and Finn et al. (2017) or Daniels et al. (2020) provide the context in dealing with attrition.

Moreover, the main outcome of interest is individuals who report their life satisfaction levels (SWB). The study merges all five waves (2008, 2010/11, 2012, 2014/15, and 2017) of the NIDS dataset to create a pooled panel dataset. In the NIDS data, SWB is measured by a ladder or a cantril scale. Respondents above the age of 15 were asked to rank their level of satisfaction by asking them, '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?'. These items are then recorded on an ordered numerical scale, where the lower case of the scale represents not satisfied at all and the upper case of the scale represents completely satisfied.

One salient feature of NIDS is that a rich set of socioeconomic and demographic variables important in addressing the overall aim of the research were collected alongside the SWB outcome variables explained above. In this chapter, we focus on the variables that are supported by theory and have been used in empirical research (Kahneman et al., 1999; Biswas-Diener et al., 2006). The study controls for demographic, educational and other socioeconomic characteristics. The NIDS data captures personal characteristics by asking respondents questions relating to their age, gender, race, marital status, and location. This study treats age as a continuous variable to enable the study to track lifecycle changes in SWB. Gender enters the estimation equation as a binary categorical variable and the female variable is treated as a reference category. The same notion is applied to race; the study controls for race as a categorical variable whereby the African race is used as a reference category. Given racial imbalances caused by apartheid, it will be interesting to see whether these imbalances are observed for racial differences in subjective well-being across economic regions.

[3] Interested readers should refer to Schotte et al. (2018) for further details on the construction of weights.

The NIDS data captures educational characteristics by asking respondents questions about their highest level of education obtained. This question allows the study to create five education categories/levels for the education variable. Respondents were also asked questions about whether they were working part-time or full-time, the hours they usually worked, which sector/industry of employment they work in, and what are their monthly earnings. The nature of this data makes it relevant for the study to make objective conclusions on the effect of observable characteristics upon the dependent variable.

Lastly, the study is also concerned with understanding the effect of regional-level variables on individual SWB. The regional variables are measured at the district and provincial levels, and they enable the study to provide context on how regional-level variables affect SWB. The study considers the economic regions to be provinces,[4] district municipalities,[5] and geographical type (urban/rural). In the geographic context, the NIDS data captures information on the location of respondents by asking them questions that relate to their area of residence.

Table 2-5 provides a description of the main variables of interest, and it provides context on how these variables of interest are captured in the NIDS data. This study only accounts for the most important variables drawn from the literature on individual determinants of SWB (as presented in Table 2-5). These variables include demographic, social and economic (income, expenditure, how well off is the household/members in comparison to others in the same suburb/village), and regional-level variables (geographic/residential area type, province, and the type of dwelling) (Stubbe et al., 2005; Steel et al., 2008).

[4] (StatsSA, 2021), There are nine provinces in SA, and they differ from each other, not only in population size,8 but also in urban and non-urban population proportions. Gauteng comprises the largest share of the South African population, with approximately 15,2 million people (25,8%) living in this province. KwaZulu-Natal is the province with the second largest population, with an estimated 11,3 million people (19,2%) living in this province. With a population of approximately 1,26 million people (2,2%), Northern Cape remains the province with the smallest share of the South African population.

[5] (StatsSA, 2021), There are 52 district municipalities in SA. These district municipalities share legislative and administrative powers with local municipalities in their area.

Table 2-5: List of observable characteristics and empirical evidence.

Variables	Measurement of Each Variable	Response to Each Question	Direction of the Effect	Existing Empirical Evidence
Age	"What is your date of birth?	"Respondents are expected to specify their age.	Inverted U-shape.	"Diener & Eunkook, (1997), Subjective well-being and age: An international analysis.
Gender	What is your gender?	Respondents were expected to specify whether they are male or female.	Female gender is Positive.	Blaauw & Pretorius, (2013), The determinants of subjective well-being in South Africa-an exploratory enquiry.
Population group	What population group do you belong to?	Respondents were expected to specify their race, choosing between Africa, white, colored or Indian	In SA, All Race are positive relative to Africans.	Neff, (2007), Subjective well-being, poverty and ethnicity in South Africa: Insights from an exploratory analysis.
Marital Status	Is your spouse or partner part of this household?	Respondents were expected to specify whether they are married, not married, living with partner or divorced.	Positive for married and cohabitating.	Casale (2015), Differences in subjective well-being within households: an analysis of married and cohabiting couples in South Africa.
Location of province	In which province were you living in February 2015?	Respondents were to choose from the Nine provinces of South Africa.	Negative for low-income provinces.	Blaauw et al. (2018), The subjective well-being of day labourers in South Africa: The role of income and geographical location.
Living with Biological child	Do you have any biological children to whom you have given birth who are currently living with you?	This question was required a Yes or no response.	Ambiguous depending on the age of the child.	Bojuwoye & Sylvester, (2014), Subjective well-being of adolescent boys living in single-mother households in a Cape Town suburb, South Africa.

Source: National Income Dynamics Study[6]

[6] Note all refusals and do not know's are treated as missing. Also, the variables shown in Table 1 are typically included in most subjective wellbeing studies.

Table 2.5 (continued): List of observable characteristics and empirical evidence.

Variables	Measurement of Each Variable	Response to Each Question	Direction of the Effect	Existing Empirical Evidence
Log per cap ta househo d ncome	What was the tota amount of ncome (after ncome tax) that th s househo d rece ved n the ast month?	Respondent are expected to spec fy an amount	Pos t ve but amb guous.	Bookwa ter & Da enberg, (2004), Subject ve we be ng and househo d factors n South Afr ca.
Status of emp oyment	Are you current y be ng pa d a wage or sa ary to work on a regu ar bas s for an emp oyer (that s not yourse f) whether fu t me or part t me?	Th s quest on seeks to gather whether you are work ng or unemp oyed or not want ng to work r ght now.	Pos t ve re at ve to Not Econom ca y act ve.	L oyd & Le bbrandt (2014), New ev dence on subject ve we be ng and the def n t on of unemp oyment n South Afr ca.
Perce ved ncome Rung	On wh ch step are you today? the poorest stand on the bottom (the f rst step) and the r chest stand on the h ghest step (the s xth step).	Th s quest on draws to our attent on the perce ved econom c rung of the respondent.	Negat ve f perce ved re at ve ncome rung s ow.	K ngdon & Kn ght (2007), Commun ty, compar sons, and subject ve we be ng n a d v ded soc ety.
Locat on of dwe ng	Loca Area Type?	The respondents had to choose the type of geograph ca area n wh ch they are ocated. These nc ude Rura , Farm, Informa Sett ement and Other (Spec fy).	Negat ve to Ind v dua s L v ng n Rura Areas.	Mu cahy & Ko amparamb (2016), The mpact of rura urban m grat on on subject ve we be ng n South Afr ca.
Log per cap ta househo d expend ture	What was the tota food expend ture of th s househo d n the ast 30 days?	Respondent are expected to spec fy an amount	Pos t ve.	No & We ck (2015), Consumpt on expend tures and subject ve we be ng: emp r ca ev dence from Germany.
Educat on	What s the h ghest grade n schoo that you have successfu y comp eted?	Th s quest on seeks to draw nformat on about the respondent’s eve of educat on. Where they are expected to choose from grade 0 up to tert ary eve educat on.	Pos t ve re at ve to No Schoo ng.	Ebrah m at a . (2013), Determ nants of fe sat sfact on among race groups n South Afr ca. Deve opment Southern Afr ca.

Source: National Income Dynamics Study

Table 2.5 (continued): **List of observable characteristics and empirical evidence.**

Variables	Measurement of Each Variable	Response to Each Question	Direction of the Effect	Existing Empirical Evidence
Health	How would you describe your health at present?	Would you say is excellent, good, fair, or poor?	Positive relative to Poor Health.	Ngamaba et al. (2017), How strongly related are health status and subjective well-being? Systematic review and meta-analysis.
Perceived Household income bracket	How would you classify your household in terms of income, compared with other households in your village/suburb?	This question draws to our attention the perceived income bracket of the respondent. Where the upper rank represents much above average income and the low represents much below average income.	Positive relative to Perceived low-income bracket.	Posel & Casale (2011), Relative standing and subjective well-being in South Africa: The role of perceptions, expectations, and income mobility.

Source: National Income Dynamics Study.

Table 2-5 also provides a combination of domestic and international empirical evidence associated with each of the variables of interest in relation to SWB. Nevertheless, the inclusion of these variables is in line with the overall aim of the research, and it is in accord with measuring the effect of regional differences, conspicuous consumption, and infrastructure on individual SWB.

Overall, the NIDS panel survey has benefits over cross-sectional datasets in terms of identifying dynamic relationships among variables. In addition, the NIDS dataset allows the study to control for unobserved heterogeneity, which we cannot do with cross-sectional survey data. However, it should be noted that attrition poses a threat to the validity and general stability of the findings based on multiple waves of panel data. This is because of potential bias in structural-equation parameter estimates due to non-random attrition.

2.3.2 Statistics South Africa - Living Conditions Survey

The Living Conditions Survey (LCS) is designed to examine improvements made and to identify any gaps that remain in socioeconomic needs. Statistics South Africa (StatsSA) collects information from households in South Africa through censuses and surveys. The Living Conditions Survey (LCS) is part of StatsSA's household survey programme and provides detailed information on households' living circumstances, as well as their income and expenditure patterns. The Living Conditions Survey (LCS) provides data that contributes to a better understanding of living conditions and poverty data for monitoring poverty levels over time.

The data has two primary objectives in executing this mandate, namely, to provide relevant statistical information on a) household consumption expenditure patterns to inform the updating of the consumer price index (CPI) basket of goods and services, and b) to track poverty levels and patterns in SA. The data-collection process uses three main approaches in capturing household-consumption expenditure and these include acquisition, the payment, and the consumption approaches. All three methods were used at some stage during data collection for the LCS.

The LCS data comprises three data-collection instruments, namely, the household questionnaire, the weekly diary, and the summary questionnaire, which are all used to collect information from households. The household questionnaire contains a booklet of questions that are divided into 26 sections and spread across four modules. These questions are administered to respondents on different occasions during the course of the survey period. The first module of the data deals with establishing the composition and structure of the household, as well as capturing particulars of all household members, including their information on education and employment. The second and third modules contained information on expenditure-related questions, covering various expenditure categories, such as food, clothing and footwear, housing, furniture and equipment, telecommunications, transport, education, and health. These two modules also include questions on welfare, household assets, socially perceived necessities, and crime. The fourth module comprised sections on subsistence, living circumstances and food security, finance, and banking, as well as particulars of income. Information obtained from these respective modules of the data are used to generate variables of interest for the purposes of estimation and analysis.

Weekly diaries are booklets left with the respondent for each household, and they are used to track all acquisitions made by the household during the diary-keeping period. The household (after being trained by the Survey Officer) was responsible for recording all their daily acquisitions, as well as information about where they purchased the item (source) and the purpose of the item. A household completed a different diary for each week of the survey period.

The summary questionnaire was a booklet of questions for the sole use of the Survey Officer, and this instrument has two primary functions. First, it serves as a code list for survey officers when assigning Classification of Individual Consumption According to Purpose (COICOP) codes for the reported items recorded in the weekly diary. Second, it helps to summarise the household's total consumption expenditure on a weekly basis to allow the survey officers to better understand the household's acquisition patterns so as to ensure the accuracy and completeness of the diary.

Table 2-6: Comparison of past two Living Conditions Survey (LCS)

Distinguishing features		LCS 2008/2009	LCS 2014/2015
Reference year		2009	2015
Sample size		31 473 DUs	30 818 DUs
Methodology		Diary and recall	Diary and recall
Household questionnaire		Seven modules	Four modules
Diaries		Four weekly diaries	Two weekly diaries
Expenditure data collection approach	Goods	Acquisition and payment approaches	Acquisition approach
	Services	Payment approach	Payment approach
	Own production	Consumption approach	Consumption approach
Data collection period		25 August 2008 to 11 September 2009	13 October 2014 to 25 October 2015
Diary-keeping period		1 September 2008 to 31 August 2009	20 October 2014 to 19 October 2015
Number of survey periods		12	26
Visits per household		Six	Four
Classification of expenditure items		COICOP	COICOP

Source: Statistics South Africa (StatsSA, 2014/2015)

The sample for the survey included all domestic households, holiday homes and all households in workers' residences, such as mining hostels and dormitories for workers. It did not include institutions such as hospitals, prisons, old-age homes, student hostels and dormitories for scholars. Boarding houses, hotels, lodges, and guesthouses were also excluded from the sample. The sampled households participated in the survey for a period of four to six weeks. The survey instruments were administered in stages at different visits during the four weeks of data collection. A module was administered at the beginning of each week.

The sample size, the household questionnaire, data-collection procedures, and survey methods differ between the LCS 2008/2009 and LCS 2014/2015. Table 2-6 shows the main differences between the most recent two Living Conditions surveys. The LCS 2008/2009 sampled 31 473 dwelling units, while the data sampled 30 818 dwelling units across the country. Focusing on the most recent LCS 2014/2015, 32 906 households were identified by the survey. Out of these, there was a sample realisation of 27 527 (83,65%) households, with the remaining 5379 (16,35%) households being classified as out-of-scope due to several reasons, such as listing errors and vacant/unoccupied dwellings. The sample covers all nine provinces, blending both rural and urban regions.

The LCS-2014/2015 data measures SWB under module one by asking respondents who are 15 years or older to rank their level of satisfaction on a scale of 1 to 20, where, “Using a scale of 1 to 20 where 1 means “very dissatisfied” and 10 means “very satisfied”, how do you feel about your life right now?”. This measurement of well-being is multifaceted, and it includes a continuum from judgments of life (life evaluation) to feelings (daily affect). Other variables of interest are based on demographic, social and economic, and regional variables and their measurement is consistent with the NIDS data.

2.4 Conclusion

This chapter aimed at providing an overview of the literature and data sources relevant to the thesis for the measurement of SWB. Concerning the literature, this chapter provided an overview of the SWB literature. The literature provided context on the conceptual overview of the foundations of SWB. The literature review section revealed that SWB is a multifaceted construct comprising cognitive life satisfaction and hedonic well-being. The conceptual overview of SWB is followed by theoretical considerations of SWB. The first part of the theoretical considerations deals with the psychological perspective, and psychologists identify the concept of SWB as an embodiment of an individual's emotional/mental state and overall satisfaction associated with positive emotions and feelings. The other aspect of the theoretical considerations deals with the economic perspective, and economists view the validity of self-reported measures of SWB for what they mean and whether reports can be used for policymaking. In the main, the economic foundations of SWB are based on the Utility Theory, which provides a quantitative metric for the evaluation of satisfaction that is based on the dimensions of revealed preferences. Both perspectives are useful in validating the usefulness of SWB but differ in terms of application.

The theoretical consideration provides a foundation for the application of SWB theories formulated from both psychological and economic schools of thought. The application of these theories is paramount in shaping the understanding of the underlying economic and psychological factors that explain the overall assessment of one's life. These theoretical considerations show that various economic and psychological factors are involved in the process of developing measures consistent with the process of determining SWB. The theories provide context on the application and mechanism associated with SWB.

The empirical evidence on SWB from international and domestic studies shows that SWB is relevant and consistent in predicting economic welfare. Both international and SA empirical evidence supports the validity of SWB as a mechanism to measure social and economic progress within and across countries. The measurement of SWB in international studies is consistent with SA nationwide surveys, particularly the NIDS dataset. Although most international focusing on cross-country comparisons of SWB. The international studies reviewed in this chapter highlight the importance of psychological and economic factors in determining SWB. SA studies focus various microeconomic related topics on, and the common thread from SA studies is the troublesome levels of poverty and inequality, which both undermine SWB.This deprivation undermines sustainable economic growth through its negative impact on economic growth and social cohesion. By large and far, the adverse effects of persistent poverty and inequalities are a common thread for SA studies, and the common thread is notable through an emphasis on relative income consideration and race as a unit of analysis.

Lastly, this study provided context on the foundations of the measurement and development of the NIDS data, which is the first nationally representative panel study of South Africa. The study provided context on all five waves (2008, 2010/11, 2012, 2014/15, and 2017) in terms of the distribution of the sample across the respective waves. The distribution of the sample is categorised according to the CMTs and TCMs, and approximately 73 percent of the individuals who were interviewed in Wave 1 were successfully interviewed in Wave 5. This chapter provided context on the measurement of SWB, as well as on the variables considered critical determinants of SWB. The NIDS data is used to address the specific aims of chapters 3 and 4.

The study also makes use of the LCS data of 2014/2015, which is a dataset that is part of StatsSA's household survey programme that provides detailed information on households' living circumstances, as well as their income and expenditure patterns. The Living Conditions Survey (LCS) provides data that contributes to a better understanding of living conditions, and poverty data for monitoring poverty levels over time. The Living Conditions Survey measures SWB using an ordinal ranking of life satisfaction evaluation through a ladder or a cantril scale. The use of the NIDS data is applicable in addressing the specific aims of Chapter 5.

Chapter 3:
Regional Economic Disparities and Subjective Well-being in South Africa (SA)

3.1 Introduction

Interest emerged over the past few years concerning the regional variation in individual SWB and how that variation relates to various micro and macro-level indicators (Rentfrow, 2009). In theory, the microeconomic foundations of scarcity relating to utility maximisation entail filtering and evaluating information on what to do, with whom to do it, and where to do it (Rentfrow & Jokela, 2016). Empirically, emphasis relating to the decision-making process on the three microeconomic questions has been on what to do and with whom, while there is less emphasis on the "where" question that relates to location and regional features (Wang, 2016). The influences of location and regions are based, in part, on deriving an understanding of how the national and local society, its culture, economics, and institutional factors feed into SWB. These features improve the knowledge regarding SWB as they provide context as to how different policy domains interact within a region and how the effect differs across regions. Economic regions are endowed in terms of observable characteristics of SWB. The observable characteristics relate to regional amenities, institutional and governmental policy, spatial planning and socioeconomic, demographic, household, and other health-related factors (Diener et al., 1984; Tversky & Griffin, 1991). SWB is sensitive to these factors, as they continue to shape it and the extent to which they affect individual SWB differs across regions.

South Africa (SA) offers a unique case to examine the "where" question in the context of regional disparities in individual SWB. Regional disparities in SA are entrenched by the legacy of racial separation imposed under colonialism and then reinforced under apartheid through an all-encompassing regime of residential segregation, forced removals, separate public administrations, influx controls, and differentiated public-infrastructure systems (Mudiriza & Edwards, 2021). This includes persistent unequal development and uneven natural resource endowments. This is reflected in the perpetuation of geographical divisions post-apartheid, and further widening in some respects. The regional disparities imply the economic stratification of each region's depth of regional disparities in individual SWB, given the social and economic conditions that define the region. This is evident in SA, as the same cities and towns are exposed to exclusive business precincts and upmarket suburbs with outstanding amenities that are juxtaposed against overpopulation and overcrowded townships, and squalid informal settlements (Todes & Turok, 2018). In rural areas, remote villages with limited access to public infrastructure contrast with luxurious private game lodges and affluent country estates (Todes & Turok, 2018). In both scenarios, these conditions provide perplexed interpretations of their effect on individual SWB, and the downside effects of each scenario give rise to perceptions of injustice and deep resentment, which negatively affect SWB. The effect differs across regions, as individuals are exposed to different experiences and opportunities that shape their life chances profoundly and corrode social trust. Hence, many individuals in poor communities may feel left behind, with no stake in the country's success, and this impedes public policy aimed at redistributing economic welfare.

Therefore, examining the "where" question is critical, and this chapter identifies two implications for public policy aimed at redistributing economic welfare. First, individuals respond to their surroundings, such that the quality (or lack thereof) of amenities influence their subjective assessments of their life. Hence, beautifully kept surroundings enhance SWB, while dereliction and decay reduce SWB (White & Dolan, 2009). Furthermore, how individuals respond to such is different (every individual has a unique preference set) across regions; for example, one person could see decay as a motivation for change and draw positively on this through initiating clean-ups and rejuvenation (Sinclair-Smith & Turok, 2012). In contrast, others could be overwhelmed and decide to relocate, thus contributing to migration flows. Assuming there are low mobility costs and perfect information, the migratory flow will cease if the receiving regions become less desirable as an area to work and live. Second, South Africa ranks as the most unequal country in the world, with a Gini score of 0.63 (Leibbrandt & Pabón, 2021). The country is characterised by entrenched geographical divides that provide economic inefficiencies (Leibbrandt & Pabón, 2021). For example, regional disparities may cause the wasteful use of land, impose sizeable costs on the movement of people and goods between areas, and create artificial barriers to business interaction and trade. The extent to which uneven distribution is related to differences in individual SWB across regions has implications for redistributive policies that seek to redress the reproduction of intra-regional and inter-regional inequalities, especially if positive correlates of SWB are concentrated in high-income regions, while individuals living in low-income regions are isolated and deprived of the economic attributes of SWB. Hence, the analysis of regional disparities in individual SWB is better suited to unveiling the forces reproducing inter-regional inequalities.

Despite the increasing interest in spatial structure (Cole et al., 2018; Turok., 2018; Todes & Turok., 2018; Von Fintel, 2018; Shifa et al., 2021), there is limited evidence in SA of regional disparities in individual SWB. This chapter provides a comprehensive regional-based approach to SWB and examines differences in individual SWB across economic regions of SA using national longitudinal data from the National Income Dynamics Study (NIDS) study. The objective is to examine how the control variables (individual, household, and regional) affect individual SWB and the difference in SWB across regions to show whether individuals in high-income regions report higher levels of SWB relative to individuals living in low-income regions. Therefore, specific research questions for this chapter include: are high-income regions better at compensating for high returns to individual SWB than low-income regions? At the individual and household levels, the emphasis will be on gender, employment status, and household income. At the regional level, the study controls for regional macroeconomic variables. The research aim and objective are addressed using a rigorous quantitative approach that draws on the combination of pooled ordered probit (POP) and ordinary least squares (OLS). The study further estimates a panel-fixed effects (PFE) model to control for unobserved individual and regional heterogeneity. Lastly, the study considers the hierarchal structure of the data through a multilevel model (MLM), thus providing the analysis at different levels (individual, household, and regional levels).

This chapter is structured as follows: Section 2 provides an overview of SWB, its foundations, and how it is affected by place-based characteristics. The emphasis is on the regional dimensions of individual SWB. The discussion is characterised by regional endowments, institutional factors, and micro-macro-level variables. In Section 3, the study provides a discussion of the data source and its applicability in addressing the main objective of the research. This is followed by the methodology in Section 4, which outlines the procedures used to obtain the results. The results of the models are presented and discussed in Section 5, including an exploratory analysis of the causes of regional differences in individual SWB. A brief set of conclusions and implications of the research is offered in Section 6.

3.2 Literature Review

3.2.1 Regional disparities in South Africa

Economists, political scientists, and epidemiologists have long noted the importance of regions and spatial geographical spacing in understanding behavioural and social-science processes that affect individuals (Helliwell, 2003; Kahneman & Krueger, 2006). Economists examine regional differences in various dimensions, and these disparities are viewed as an important sign of underdevelopment, and reducing the depth of regional disparities is regarded as one of the basic criteria for development. (Paluzie, 2001; McCann & Shefer, 2004; Busseri et al., 2009). Political scientists often investigate regional differences in polling data, along with the effect of demographic and socioeconomic factors (Hill, 2002; Liao & Wei, 2012). Epidemiologists study regional differences in rates of disease incidences and their associations with lifestyle, demographic, and socioeconomic factors (George, 2010; Boarini et al., 2012; Liao & Wei, 2012; Jinkins, 2016). The common thread from these fields of study is that the behavioural and social processes linked to the individual's morals, values, aspirations, and health are shaped by the location in which individuals live. These behavioural and social processes also dictate the individuals' perception of their well-being, and the subjective perceptions differ from one region to another according to the regions' classification of social, economic, and territorial conditions.

A growing literature on 'place-based' development suggests that local and regional assets are foundations for national prosperity (Barca et al., 2012; Storper, 2013). Places are 'sticky' in that they attract and embed productive investment, human capital, and associated resources through intense local interactions. These synergies can generate economic dynamism by creating and strengthening comparative advantage through distinctive territorial capabilities, technologies, and economic specialisations, which are steadily upgraded and enhanced over time. However, the depth of economic dynamism in each region determines the extent to which it differs from other regions, thus putting further doubt on the classical or neoclassical view of the world, which predicts regional disparities to be transient (Hildreth & Bailey, 2014). The classical or neoclassical view of regional disparities is informed by the idea that markets would adjust to bring different areas closer to equality. Labour would leave poorer areas for richer areas and capital would move in the opposite direction, thus bringing convergence. However, forces of convergence regarding labour and capital mobility might be weak to non-existent. Because labour markets tend to be national, there is relatively little scope for wage adjustment, and this lack of adjustment will dampen the willingness of investors to move into the poorer areas (Van Dijk & Edzes, 2016). In some senses, this is the inverse of the agglomeration argument. Hence, successful areas are sustained by clusters of firms, comprising a mutually beneficial ecosystem, that is resilient after economic crises, while poorer areas can be trapped in low productivity, thus presenting regional disparities that potentially dictate the depth of individual differences in SWB across regions.

In SA, the country's uncodified, hybrid spatial planning is based on historical developments of apartheid laws that shape the country's economic and spatial geographic conditions (Jacobs & Du Plessis, 2016). These conditions perpetuate a pyramid of social and economic conditions, while inter-regional and intra-regional disparities also remain complex and overlapping, and these disparities outlay the depth of individual differences in SWB across regions. The intra-regional disparities reflect disparities between provinces and districts, while intra-regional disparities reflect disparities within provinces and districts. Both inter-regional and intra-regional disparities are explained by weak resource endowments (range of economic, occupational, and social value) and the distance from markets that constrain development in lagging regions (Adler & Posner, 2006; McLennan et al., 2016). The regional differences also reflect the long-standing, unequal relations of power between advantaged and lagging regions and institutional weaknesses within regions. These conditions persist despite government efforts to undo the damage of the past by creating a unified national regulatory framework (Nel & Rogerson, 2009; Long, 2019).

At present, regional disparities in SA seem to outweigh the benefits of economic efficiency based on two dimensions: first, the physical separation between people and productive activity and, second, the under-development of informal settlements (Rogerson & Nel, 2016). This is consistent with the argument by McKergow et al. (2017), who suggest that the physical separation between people and productive activity is informed by recurrent daily movements between home and work. These movements supplement migration and enhance the stability of community structure by contributing to the flexibility of the industrial-economic organisation. The physical separation between people and productive activity, however, is not without its dysfunctional features. The travel distance between where people live and work may cause severe physiological and psychological strain upon individual employees who must travel long distances to work. These adversely affect the subjective assessments of well-being and are associated with, among other factors, the costs of daily movement to the family budgets of modern workers, the costs of elaborate transportation systems, and the loss of revenue arising out of traffic congestion.

Therefore, SA's regional divide is categorised by a spatial divide between where most people live and where jobs and resources are located (Lessmann, 2012). Both the economic and spatial geographic considerations in SA have seen disadvantaged racial, ethnic, and social groups concentrated in particular regions, and group-based inequities shape individual differences across regions (Cole et al., 2018; Von Fintel, 2018). This is the case in parts of KwaZulu-Natal (KZN), Eastern Cape (EC), and Limpopo (LM), where indigenous groups are both poorer and concentrated in poorer regions (based on social and economic indicators) and in the Western Cape (WC), where the affluent (mostly Whites) are spatially concentrated (Gwaze et al., 2018).

The social construct of the economic and racial concentration across regions implies that individual SWB is to differ across regions. The absence of redistributive fiscal transfers and reforms in the country towards greater decentralisation is a source of aggravated regional disparities. The positive effects of decentralisation may be lost in regions that have weaker fiscal capacity, such as EC and LM. In poor regions where regional elites have particularly concentrated power, decentralisation may also deepen both intra- and inter-regional disparities that are likely to shape the depth of differences in individual SWB.

Furthermore, the country's economy is geographically concentrated, and in some instances (for example, the EC and KZN), there is a mismatch between the geographical landscape, the population, and the resulting economic attributes. According to Von Fintel (2018), this mismatch results in extensive unemployment and poverty for people living in the periphery and imposes an extra cost on their mobility. The mismatch also suggests that, at both the regional scale (between the major cities and well-populated rural areas) and at the urban scale (between the main business districts or industrial centres and the largest townships, which constitute a relatively large population), the economic forces of agglomeration and institutional inertia tend to reproduce this pattern, as success breeds success, and established strengths generate additional resources that get reinvested locally. This cumulative process has far-reaching implications for living standards and human-development prospects in different places.

The uneven economic performance also influences the revenues available to municipalities and their capacity to deliver decent and dependable services. Therefore, the spatial divide between where most people live and where jobs and resources are located implies that the relatively affluent localities have superior access to infrastructure and more liveable public spaces, and a wider range of social and economic amenities (David et al., 2018). These positive externalities (or 'neighbourhood effects') improve people's living conditions and enhance their chances of positively reporting on their SWB. In contrast, poorer localities offer fewer economic opportunities, inferior social infrastructure, and mediocre services. Individuals living in these communities tend to experience poorer access to infrastructure, higher risks of disaster, and more crime and violence (David et al., 2018). Hence, growing up in harsh and inhospitable environments has adverse effects on the individual's prospects of realising their potential and restricts their prospects of the social advancement that could improve their SWB.

Moreover, the regional disparities are also explained by spatial gaps in material prosperity that are deeply inscribed in the under-development of informal settlements. The existence of informality is both a symptom of hardship and exclusion, is cause for concern in the fulfilment of human needs. The informal settlements arise because of spontaneous efforts by the poor people to improve their lives and overcome their adverse conditions by settling closer to economic opportunities and engaging in simple income-generating activities (Lessmann, 2016). The settlements are often not in accord with official rules, legal procedures, and by-laws because informal settlers feel that they are too complex, demanding, and unaffordable for their own, bottom-up solutions. Yet their informal status and existence outside the purview of official rules, legal procedures, and by-laws by the state can also hold them back and ensure they remain vulnerable in various ways. Hence informal settlements can be seen as a sign of ‘under-development’, which reflects limited forms of social and economic devolvement, fragmented social relationships, resource scarcity, and environmental degradation (Todes & Turok, 2018). The spatial dislocation between informal activities, on the one hand, and more affluent consumer markets, employment centres, and formal enterprises, on the other, is among the obstacles to their development and growth.

The persistent levels of informality and their adverse effects have prompted a spectrum of state policy responses, ranging from piecemeal ‘pro-poor’ assistance to hard-hearted evictions by law enforcement agencies (Todes & Turok, 2018). The piecemeal ‘pro-poor’ assistance includes growing support for the township economy, often without acknowledging the informal character of most local enterprises. Elsewhere, efforts to clear informal activity from older urban districts are often intended to attract major private investment, affluent consumers, and tourist spending, yet there may be more effective and inclusive ways to achieve renewal and revitalisation (Redders, 2021). This illustrates one of the dilemmas surrounding responses to spatial divides on whether the policy should be directed at responding to immediate needs and protecting existing livelihoods or rather it should be directed towards creating high standards from the outset, by improving regional space for new activities that demonstrate the potential to transform conditions more effectively.

Therefore, the disparities in the regional classification of social, economic, and territorial conditions perpetuate different conditions of life that are beneficial or to individuals, within a defined (given) set of regions – countries, provinces, and municipalities (Østby et al., 2009). If regional disparities result from regional specialisation based on comparative advantage or economies of scale, then the regional disparity may be beneficial to economic efficiency, as productivity is increased. However, if the regional disparity is caused by external economies that are not internalised, then the existing disparity may not be optimal (Turok, 2018). In particular, regional disparities in the form of agglomeration or excessive concentration of urban population in large cities may be a source of a variety of social ills within and across societies. Hence, these conditions are socially undesirable, as they perpetuate the fragmentation of societies, by threatening sustainable social and economic development and, in the long run, peace.

In addition, the positive and negative conditions imply that the regional disparities present different manifestations that are interpreted as weaknesses and strengths of regional disparities. The weaknesses of the regional disparity demonstrate the vulnerability of examined objects of regions that generally consist of missing sources and capabilities (competencies) that are defined by the availability of resources and endowments for a region. The strengths result in comparative or competitive advantage among regions, generally consisting in unique and valuable capabilities (competencies) that distinguish regions. Therefore, the negative regional disparities can be thereby taken as weaknesses and positive regional disparities as strengths. According to Kutscherauer (2010), these considerations imply that regional policy taken in this sense aims to reduce disparities in the territory of interest (political equalising goal) and at the same time to make efficient use of diversified space development potential (growth goal). Though from a long-term view both goals are rather in conflict, from a short-term view it can be recognised that the relation between both goals can be complementary, i.e., supporting economically weak regions contributes at the same time to strengthening general economic growth.

Overall, these dimensions of the regional disparities in SA present contemporary challenges that threaten regional prosperity, and lay a foundation or shape individual disparities in SWB across regions. As a result, the government should avoid singling out particular regions for special support because market forces are much more reliable and efficient at predicting which places prosper (Azzoni & Haddad, 2018). Regional prosperity for towns and cities will emerge more or less spontaneously, and the expectation is that it is almost impossible for governments to turn around localities whose economic base has collapsed. This implies that resources should be conserved and allocated to places with proven demand for business growth and household preferences. As these areas prosper, stronger links to poorer regions through trade and migration (‘economic integration’) will spread income and narrow the wealth gap (Giannakis & Bruggeman, 2020). These considerations are sufficient in predicting regional disparities; however, individual-based perceptions of SWB across regions provide a clearer fitment for regional prosperity and welfare. Hence, emphases must be directed at ‘space-neutral’ (or ‘spatially-blind’) policies which target the marginalised and equip them with the capabilities to access opportunities wherever they arise.

3.2.2 Regional disparities in individual subjective well-being

The growing research on SWB plays out at broader geographical units of analysis, such as countries, states, and cities (Tversky & Griffin, 1991; Rentfrow et al., 2009; Diener et al., 2010). The "where” the question is concerned with the place where households, firms, economic activities, and the environment interact (Behrens & Thisse, 2007; Diener et al., 2013). Understanding this question is critical to the improvement of economic welfare in many ways. First, it enables policymakers to evaluate patterns of economic activity with the aim, inter alia, of improving urban and regional planning (Lipman, 2007; Van Niekerk & Marais, 2008; Delle Fave, 2014). This enhances public policy that is directed towards improving the living conditions and well-being of the dwellers. Second, the government can identify location-based factors that constrain economic growth (Roller & Waverman, 2001; Kilkenny, 2010; Okulicz-Kozaryn et al., 2014). Lastly, it helps provide an understanding of how firms best locate their activities to gain a competitive advantage in understanding how intra- and inter-regional disparities play out (Carney, 2005; Morrison, 2007; Rentfrow et al., 2009; Calderón & Servén, 2004; Wang & Wang, 2016).

In explaining regional disparities in individual SWB, the subjective evaluations of the quality of life are shaped by existing regional dynamics of inequalities that are influenced by social, economic, ecological, and cultural factors (Zhang & Zhang, 2014; Molnár, 2001; Leyden, 2003; Frumkin et al., 2004; Wood et al., 2008; Richard et al., 2009). Hence, the structure of regions captures how the population is distributed, where indicators such as the economic attributes, urban density and size, ecological, and cultural factors of the place of residence define the structure of regions. These conditions also influence the resulting individual SWB. These place-based characteristics differ depending on the attributes posed by each region. Hence, individual SWB differs across regions because of the differences in the endowments and returns to observable factors across regions (Okulicz-Kozaryn, 2014; Veneri & Edzes, 2019). As a result, the spatial structure of regions affects the individual response to self-reports, and these responses differ across regions according to the spatial and economic features of regions (Sheller & Urry, 2006; Ballas, 2013; Wu & Li, 2017).

The intra-country (provincial disparities) spatial and economic differences that shape regional differences in individual SWB are also traceable within and across regions (within the province and across). At the intra-regional level, Chen et al. (2018) argued that the disparity in the regional economic development level causes economic inequality, and the economic inequality further aggravates the gap in the regional economic development level, which in its turn forms the inter-regional (between districts and rural-urban differences) disparity in individual SWB. The economic growth in developed areas might have the spread effect, which means a positive impact on nearby localities, or the backwash effect, i.e., the adverse effect caused by attracting economic resources and activities away from peripheral areas (Fan et al., 2019). Hence, both benefits and adverse effects of regional growth and development regions are then reflected by how individuals within these regions evaluate their self-reports.

Research on intra-regional disparities in individual SWB shows that individual located in rural report high levels of SWB than individuals living in the urban area (Savahl et al., 2017; Ala-Mantila., 2018; Wang et al., 2019). This can be driven by the spatial expansion of urban areas, which resulted in more and more rural residents finding themselves living and working near metropolitan centres. According to Lenzi & Perucca (2018, 2020), SWB advantages and disadvantages of cities are not within a vacuum or bounded within a city's administrative or functional borders but can spread across the regional urban system and filter down the urban hierarchy. Residents in rural areas located in urbanised regions can benefit from the positive spill-over effects that are generated by larger cities in the region and enjoy their advantages without suffering from their adverse effects Lenzi & Perucca (2018, 2020).

Therefore, the inter-regional difference between rural and urban areas provides a proposition that can be linked to the concept of borrowed size, as introduced by Alonso (1973), which suggests that undeveloped areas can borrow some of the advantages of urbanisation from the neighbouring developed cities without incurring the related disadvantages. According to Camagni et al. (2016), underdeveloped areas are generally less endowed with high-rank social and economic factors and can borrow these factors through the easy accessibility of developed areas in the same regional context. . In turn, developed cities, in turn, can benefit from advantages arising from agglomeration economies, which they borrow from the entire urban system (critical-mass effects). According to Meijers et al. (2016), underdeveloped areas gain from increasing size and economies of scale up to a certain level of urbanization and can become negative after the optimal level. Furthermore, places affect not only the SWB of people within their administrative borders but also the SWB of others in nearby areas. Hence, the spatial structure of regions is critical for a more accurate understanding of spatial interdependencies and spill-overs in the geography of individual SWB. The study by Lenzi & Perucca (2020) tested the idea of regional spill-overs by examining how the proximity to developed areas, and therefore the accessibility to the advantages of agglomeration, is associated with the individual SWB of nearby underdeveloped areas. The propositions presented by this study suggest that residents of underdeveloped areas near developed locations report high levels of SWB.

Moreover, the intra/inter-regional dynamics of inequalities imply that individual SWB will differ according to features that define existing regional disparities. As a result, regions that promote spatial and economic features that are highly correlated with SWB bring about pull factors of migration, while those that are less favoured in terms of spatial and economic features result in push migration. These migration movements between and across regions occur because of the push factor of fewer opportunities in the socioeconomic situation and because of pull factors that exist in more developed areas. In the context of utility maximation and SWB, this movement between regions is in accord with the idea that individuals act in the interest that promotes their satisfaction and will avoid conditions that bring about an unpleasant satisfaction (Frisch, 1992; Posner, 1979; Jessop, 2002).

The justification for regional migration works on the premise that individuals weigh up the decision to migrate as they would do for an investment decision, by weighing up the (expected) costs and benefits of doing so. In this context, one may expect individuals that move to experience a net gain to their utility having moved. As such, individuals have the ability and willingness to migrate to other economic regions in the best interest that maximises their SWB, considering destination factors such as the relative cost of living, the pace of life, health benefits, and the feeling of community. Therefore, regions that promote highly valued spatial and economic attributes (destination factors) can maintain and attract more individuals and firms in the future, thus leading to migration inflow, until this effect is counteracted by emerging costs and congestion that are undesirable (Krugman, 1991; Venables, 1996; Cummins et al., 2003; Vasanen, 2012; Morrison, 2011; Winters & Li, 2017). This is in accord with research that shows that economic regions endowed with high amenities positively attract individuals from other regions, since the city amenities are positively correlated with SWB, hence leading to migration flows (Gonza´lez et al., 2005; Rodríguez-Pose; 2016; Brethel-Haurwitz & Marsh, 2014). These migration flows are a reflection of inter-regional-based inequalities and are associated with individual differences in SWB across regions (McCann, 2020).

In addition, individual differences in SWB across regions are also amplified by a broad set of factors that influence the quality of life in a country. The growing body of evidence across the board suggests that the broad set of factors that influence the quality of life are based on a diverse range of economic, political, cultural, social, and climatic conditions (Adler & Posner, 2006; Puntscher et al., 2015; Jebb et al., 2020). Studies show that economic regions endowed with high-quality amenities such as a high-quality environment, scenery, and entertainment in the form of tourism can positively attract individuals from other regions (Brethel-Haurwitz & Marsh, 2014; Adler & Posner, 2006; Götz et al., 2018). Additionally, individuals value regional amenities and the value placed upon regional attributes strengthens the social connectivity people place upon such regions (Ballas, 2013; Sarrias, 2019). This implies the connection people have with their environment has an effect on their level of SWB. Therefore, it suggests that, if some economic regions promote social connection in terms of their design, then this would most likely positively affect the well-being of the people. In turn, the opposite can be argued for regions that lack these attributes, and for such, individuals residing in such regions are likely to report lower levels of well-being. This relationship is dependent upon spatial developments as to how regions are designed, which has a major impact on the well-being of people living there (Tversky & Griffin, 1991; Jordison & Kieran, 2003; Savageau, 2007 ; Stubbe et al., 2007; Mouratidis, 2019).

The extent to which individual SWB differs across regions is also influenced by how regions are endowed, and the returns to SWB on these endowments vary within and across regions (Strack et al., 1991; Spruk & Kešeljević, 2016). The differences in the returns to SWB rely on social and economic factors that shape each region; hence when regions are endowed differently and the returns to the same endowments are different across the regions (Hägerstraand, 1989; Tanguay et al., 2012; Asadullah et al., 2018). Therefore, the differences in the endowments across regions imply that some economic regions will outperform other regions in terms of wealth and productivity, with little indication of the other regions catching up (Hochman & Skopek, 2013; Jung & Vranceanu, 2019). As a result, wealth and income become relatively concentrated in high-performing regions that are defined by large markets that host a disproportionately large share of production activities subject to increasing levels of SWB (Headey & Wooden, 2004; Brulé & Suter, 2019). On the other hand, individuals in poor regions tend to report lower SWB levels than residents of wealthier regions (Diener et al., 1995; Diener et al., 2018).

Several country-specific studies (for example, each of which is examined within a single country) show that individuals with a high income are more likely to express higher SWB relative to individuals with low income (see; Cummins, 2000; Biswas-Diener & Diener, 2001; Blanchflower & Oswald, 2004; Kasser, 2009; Ballas, 2013). This is particularly because SWB is correlated with the median per-capita household income (Morawetz et al., 1977; Florida et al., 2013; Lu et al., 2015; Rentfrow et al., 2009; Winters & Li, 2017; Brulé & Suter, 2019). However, the nature of the relationship between income and SWB is found not to be linear, particularly in a developing country like SA, as income generates diminishing returns for SWB (Posel & Casale, 2011; Blaauw & Pretorius, 2013; Kollamparambil & Mathentamo, 2020). This association makes it customary for researchers to control for the effects of wealth and income when estimating SWB.

Differences in SWB across regions are also related to many occupational indicators (Van Horn et al., 2004; Hald, 2009; Helliwell & Huang, 2014; Sun et al., 2016). Regions with high proportions of educated and employed residents consist of individuals with higher levels of SWB (Hooghe & Vanhoutte, 2011; Awaworyi & Mishra, 2017). These patterns are consistent with the proportion of residents who have working-class professions (for example, installation, maintenance and repair, production, construction and extraction, material moving, and transportation occupations) (Puntscher et al., 2015; Winters & Li, 2017).

Furthermore, economic regions that promote social connection in terms of their design would most likely positively affect the SWB of the people. Indeed, Wang & Fowler (2019) argue that individuals residing in regions with a higher share of cultural and social diversity also score highly on measures of SWB. However, it is necessary to indicate that this effect only applies within nations and is not replicated at the county level. At the county level, ethnicity and sexual orientation negatively affect individual SWB, and this notion lends further support to the argument that social connectivity is very important for SWB (Miao et al., 2019). This relationship is dependent upon spatial developments as to how regions are designed and their population density (Hägerstraand, 1989; Jordison & Kieran, 2003; Savageau, 2007; Awaworyi & Mishra, 2017; Florida et al., 2013; Veneri & Murtin, 2019; Okulicz-Kozaryn & Valente, 2019).

Indeed, the effect of population densities cannot be isolated from the regional profiling of SWB. According to Morrison (2011), population density is a double-edged sword regarding the individuals' SWB. On the one hand, high population density has adverse effects on welfare through shortages of public facilities, poor sanitation, and environmental degradation (Morrison, 2011; Okulicz & Kozaryn, 2019; Mouratidis, 2019). On the other hand, high population density is conducive to regional economic development. In this case, resources become concentrated, creating production advantages that increase SWB (Veneri & Murtin, 2019; Liu et al., 2017; Mouratidis, 2019). These advantages include cost efficiencies from large-scale production, improved employer-employee job matching, and the creation and dissemination of human capital (LaBarbera & Gürhan, 1997; Frey & Stutzer, 2002; Winters & Li, 2017; Wu et al., 2019). These conditions are dependent on the level and depth of service delivery.

In terms of service delivery, local and provincial governments are often the custodians or discretionary authorities that commonly oversee policy frameworks. Service delivery by the government at the regional and local levels has an immediate impact on the SWB of individuals and communities. This is based upon the understanding that they play a critical role in service delivery that seeks to enhance economic dynamism, health, safety, and public investment (Helliwell & Huang, 2014; Helliwell et al., 2018). Therefore, public-service delivery prospects are positively correlated with well-being (Helliwell & Huang, 2014; Kamerāde & Richardson, 2018). The quality of trust embodied in these institutions by people is integral in determining how challenges faced by citizens are tackled and reflected in spatial disparities across economic regions (Blanchflower & Oswald, 2011; Schaufeli, 2018). These spatial features are critical for understanding mainly because they allow for the understanding of how different policy domains interact within a region and how that might differ from other regions (Musa et al., 2018). Policies on transportation, housing, and land use are among policies closely connected to the SWB of individuals and communities (Ezcurra & Palacios, 2016; Chou et al., 2018; Dong & Kübler, 2021). These works have mainly reported a positive association between SWB and observable characteristics that relate to regional attributes.

In conclusion, addressing the “where” question entails filtering and evaluate information about amenities, endowments and observable characteristics of regions. Economic regions vary in terms of economic performance and living standards, as reflected in income, education, or health outcomes, and all these factors shape individual SWB. Literature on the interlinks between spatial conditions and SWB offers critical insights for understanding the complex factors that shape SWB and provides implications for public policy that is aimed at developing and promoting economic and social welfare.

A mixed picture emerges from the analysis. SA has examples of long-standing regional economic disparities driven by the country’s historical economic and geographical conditions of apartheid policies. These economic and geographical conditions of the past shape the present economic and geographical inter- and intra-regional disparities, and these conditions also outlay the depth of economic and social conditions that determine individual SWB. Developed regions provide a balanced spatial structure that enables individuals to benefit from agglomeration while encountering fewer diseconomies of agglomeration at a local level. Hence, inter- and intra-regional disparities in economic and social conditions are likely to drive individual differences in SWB across regions. Notwithstanding the various channels or determinants (for example, amenities, commuting, social cohesion, access to services, and jobs) that may have a positive and negative influence on individual SWB. However, the specific emphasis is on how individual reports of SWB differ across regions.

3.2.3 Empirical Evidence

Empirical research regarding the regional context of SWB mostly involves cross-country comparisons, and most of the cross-country studies do not examine individual SWB; rather they are considering SWB indices against macroeconomic indicators (growth, unemployment, inflation, etc). For example, in a seminal paper, Easterlin (1974) examined whether "richer countries are happier than poorer countries". The study by Easterlin (1974) used data reported in thirty surveys from 1946 through to 1970, covering nineteen countries, including 11 in Asia, Africa, and Latin America. The findings suggest that, first, within rich countries, income shared a positive relationship with happiness. Second, in terms of across countries, there was no significant difference in SWB between the rich and poor countries. Third, longitudinally, the increase in economic growth and development of the national economy for developing nations did not affect happiness, as individuals in developing nations value relative income as opposed to absolute income. These findings brought about the Easterlin Paradox, which states that, at a point in time, happiness varies directly with income, both among and within nations, but over time the long-term growth rates of happiness and income are not significantly related. This proposition has been questioned by some researchers, particularly regarding cross-country comparative evidence and longitudinal effects. For example, Veenhoven & Hagerty (2006) studied developing countries[7] and found that rich countries have higher levels of SWB relative to the poorer ones. The relationship between SWB and the gross national product (GNP) is positive and significant. This positive association was also found in various empirical studies (Diener et al., 1995; Clark et al., 2008; Stutzer & Frey, 2010; Frank, et al., 2014). The positive relationship between income and SWB is consistent because rises in income, particularly at low-income levels, enable the poor to meet their basic material needs.

This effect remains consistent even after adjusting for inflation. For example, empirical evidence by Wu & Li (2013) examines this relationship using the 2003–2010 Chinese General Social Survey (CGSS), which shows that, in the past ten years, despite heightened inflation (as indicated by the consumer price index; CPI), the association between real absolute income and happiness has always been positive. Gandelman & Hernández-Murillo (2009) use data from the Gallup World Poll to examine the effect of unemployment and inflation on SWB. Their findings show that both variables negatively affect the individuals' assessments of past and present well-being for themselves and their country. This evidence shows that there is a relationship between macro variables and SWB, but the direction of the relationship differs across nations. These macro-variables influence individual SWB, reflecting the socioeconomic environment where individuals live. In earlier findings in Europe, Di Tella et al. (2003) examined this effect by controlling for a set of individual characteristics. The results show that macroeconomic variables such as GDP, unemployment, and inflation affect individual SWB.

When considering microeconomic effects, empirical evidence further roots regional inequality in the policy debate (Martin, 2000). The growing regional inequalities put many pro-growth reforms at risk, prompting a shift towards more inward-looking policies (Tvrdoň & Skokan, 2011). Differences across economic regions reflect a

[7] See Easterlin (1974): The developing countries which were examined included South Africa, Egypt, Nigeria, Brazil, Mexico, India, South Korea, India, South Korea, and the Philippines.

decline of internal factor mobility and the suboptimal use of economic resources (Begg, 1995; Li & Fang, 2014). These factors contribute to weaker long-term growth and lower levels of SWB, as regional inequalities are closely related to economic instability, financial crisis, debt, and inflation (Barrios & Strobl, 2009; Wei, 2015). These adverse effects weaken the prospects of converting national wealth into SWB for the citizens and this translates into lower levels of happiness. Such dissatisfaction can undermine general support for the government, and it has played a role in the rise of populism and even civil unrest.

On the policy front, the effectiveness of conventional microeconomic policies in addressing these differences and stagnant regional growth has raised questions on whether spatially targeted policies should be part of policy tools (Stutzer & Frey, 2010). As a result, the government needs to initiate public policy that will deal with regional inequalities and their effect on individual SWB within their country and the drivers of those challenges in order to craft the right response. Empirical evidence by Rodriguez & Maslaukaite (2011) showed the effect of public policy on SWB across ten Central and Eastern Europe (CEE) countries. Across the ten CEE countries, results indicate that individual SWB is affected by institutional factors such as trust in government, corruption, decentralisation, and the use of public expenditure or taxation on government spending initiatives. These results are consistent with Grimes et al. (2016), who used fiscal data on 35 countries and 130 country-years to examine the relationship between fiscal policy and SWB. Their findings show that institutional factors (governance and service delivery) affect SWB. Furthermore, the variation in SWB across regions within countries is influenced by the geographic clustering of the determinants of SWB. In this case, the geographic clustering of positive drivers of individual SWB will perpetuate the regional divergence. Therefore, mapping the geographical variation in SWB has value, since it provides inferences on how social institutions, the physical environment, and individual characteristics influence SWB.

Moreover, spatial factors that direct urbanisation are also critical for the formulation of public-policy proposals aimed at redistributing economic welfare. Previous studies show that spatial factors regarding urbanisation, built environment, and design positively affect SWB (Ala-Mantila et al., 2000; Brereton et al., 2008; Tobiasz-Adamczyk & Zawisza, 2017). These spatial factors foster the agglomeration of economies, wellness, community interaction, safety, and the quality of consumption opportunities (Okulicz-Kozaryn et al., 2014). However, some of these spatial factors, like the agglomeration of economies and concentrated population, increase congestion, living costs, pollution, and crime, all of which negatively affect individual SWB (Glaeser et al., 2001). Therefore, the spatial categorisation of the region informs differences in individual SWB. In the United States, empirical evidence by Glaeser et al. (2016) showed differences in SWB across metropolitan areas. The results show that individuals in urban areas experience lower levels of SWB, including the New York City MSA, which comprised the lowest level of SWB. Empirical evidence by Brown et al. (2016) showed the relationship between urban structure and SWB across the Organisation for Economic Cooperation and Development (OECD) metropolitan areas. Their findings suggest the existence of a trade-off between densely populated urban regions and individual SWB. This is because population density is explained by accelerated urbanization and the concentration of activities within regions (Winters & Li, 2017). Therefore, areas with a lower population density are presumably further from the city but permit more spacious living arrangements, while the contrary is true of population densities within the cities. These findings are consistent with SA, as findings by Culwick et al. (2018), who in their study, examined the effect of the spatial organisation of economic regions on quality of life, found that regions which are dense in population and fragmented in land use negatively affect individual SWB. The effect is applicable even when the comparison is between urban and rural areas. It is also reported that access to work opportunities differs across races and this divergence is explained by apartheid spatial forms. The urban-rural comparison was also conducted in Romania by Lenzi & Perucca (2018). As expected, the result shows that the quality of life is lower for individuals in urban areas as opposed to their counterparts in rural regions.

The regional divergence is also affected by the regional-based endowments of natural amenities that make the region more desirable. Hence, locations that comprise better amenities increase individual SWB (Ferreira & Moro, 2010). Past studies show that amenities related to better weather conditions play a central role in regional population distribution (Oswald & Wu, 2010, 2011; Rehdanz & Maddison, 2005; Brereton et al., 2008; Moro et al., 2008). Therefore, the divergence is wider, as some individuals reside in regions that lack amenities that place value on the quality of life. The difference in the endowment of amenities exacerbates the difference in individual SWB across regions. In Italy, empirical evidence by Peluso & Michelangeli (2016) adjusts for place-based amenities when examining regional differences. They use a multidimensional index of the Atkinson (1970) type, thus enabling them to separate the effect of different amenities that affect the overall degree of inequalities. The results suggest that place-based amenities (arts and culture and access to parks and outdoor recreation, and a safe neighbourhood) are critical in determining the depth of regional inequalities. In addition, regions are heterogenous in the quality and quantity of the amenities, and some amenities are concentrated in specific regions. The regional concentration of amenities implies that individual SWB will be higher in those regions as opposed to regions with low concentration. This difference provides implications for public policy that is aimed at redistributing social welfare.

The above literature and empirical research show relevant contributions of macro and micro considerations on individual SWB. Both macro and micro-variables affect SWB, but the effect differs across nations and regions. In addition, most of the studies use country or regional-level SWB and overlook the individual difference of SWB across regions. Although the empirical evidence presented above provides some insights, there is still limited research in the SA context that examines individual differences in SWB across regions.

3.3 Data and Descriptive Statistics

3.3.1 Descriptive analysis of variables of interest

The main point of this chapter is to consider regional issues and individual SWB. The study makes use of all five waves of the NIDS data. The regional variables are measured at the district and provincial levels, and they enable the study to provide context on how regional-level variables affect SWB. It is also critical to note that the NIDS data is not representative at the provincial level.

Furthermore, the NIDS data can only provide information on how respondents are scattered across these regions, falling short in providing context on how regional-level macroeconomic variables relate to SWB. This study seeks to account for data relating to regional macroeconomic variables, namely, gross regional product, unemployment, and income. These macroeconomic variables are measured at both the district and provincial level, and these variables are obtained from Quantec[8] EasyData from the years 2008 to 2018 (corresponding to the five waves of the NIDS data) for all nine provinces and subsequent district municipalities of SA. The Quantec EasyData dataset is sourced from a range of official statistical sources like Statistics SA (StatsSA), the National Treasury (NT), and the South African Reserve Bank (SARB) (Aghion et al., 2008; Akanbi, 2016). For the purposes of estimation, the study makes use of Quantec EasyData to obtain information on average household income in local currency (rands), unemployment level (youth and adults), and gross regional product (GRP) at the provincial and district level. In addressing the specific aim, information on the three macroeconomic variables is then merged with the NIDS data. The study considers the economic regions to be provinces,[9] district municipalities,[10] and geographical type (urban/rural).[11]

[8] Quantec's data management process is consistent with relevant electronically available industry and population censuses and surveys published by Statistics South Africa and various other government departments and organisations. This validation process ensures accurate reporting of economic data.
[9] There are nine provinces in SA, and they differ from each other, not only in population size, but also in urban and non-urban population proportions. Gauteng comprises the largest share of the South African population, with approximately 16,1 million people living in this province. KwaZulu-Natal is the province with the second largest population, with an estimated 11,5 million people living in this province. Northern Cape remains the province with the smallest share of the South African population with a population of approximately 1,29 million people (StatsSA, 2022).
[10]There are 52 district municipalities in SA. These district municipalities share legislative and administrative powers with local municipalities in their area (StatsSA, 2022).
[11] An urban area is defined as one in which there is a fully established local government. A nonurban area, on the other hand, does not have an established local authority. The area could, for example, be part of a tribal authority or a regional authority.

The emphasis is on individual life satisfaction levels, and how they differ in the geographical context. SWB is represented by a ladder or a cantril scale, where the lower case of the scale represents not satisfied at all, and the upper case of the scale represents completely satisfied. The question on SWB is measured by asking the individual, “using a scale of 1-10, how do you feel about your life as a whole right now?”. These items are then recorded on an ordered numerical scale from 1 to 20, where 1 is “very dissatisfied”, and 10 is “very satisfied”. Using the NIDS data, Figure 3-1 depicts the percentage distribution of SWB life evaluation responses using a pooled set of responses from all five waves. The figure reveals a distribution that appears to be normally distributed, with an interesting tail at the highest SWB level of 10. Among all respondents, the modal level of reported satisfaction is 5. As expected, the score is moderate but low relative to scores reported in developed countries (Powdthavee & Stutzer, 2014).

Figure 3-1: Distribution of reported life satisfaction ladder, 1–10 Cantril scale

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

The responses to the life evaluation question are concentrated around the middle, with approximately 68,25 percent of the respondents reporting third, fourth, fifth, and sixth rungs of the life satisfaction ladder. Figure 1 depicts a normal distribution of SWB and this distribution indicates that the SWB scores are consistent, such that the frequency of each SWB score is similar to that of the others. The above distribution is consistent with SA SWB studies that found the SWB distribution to be concentrated around the middle of the ordinal scale (see, Blaauw & Pretorius, 2013; Posel & Casale, 2011). The distribution presented in Figure 1 is consistent with that of Blaauw & Pretorius (2013), and the distribution suggests that the distribution in SWB masks differences in demographic and other attitudinal variables, considered in the literature as key determinants of SWB. This includes the municipal district, the province of residence or birth, level of urbanisation, race, gender, marital status, years of schooling, the importance of health, status of employment, and income-related factors.

The graphical representation of the distribution of SWB does not tell the full story. Table 3-1 and Table 3-2 present a descriptive overview of SWB across the province of residential and district municipalities. The descriptive overview also provides a monetary context to the analysis by including household income and expenditure. The inclusion of monetary variables enables the study to establish whether regional differences in individual SWB have any association with how these monetary measures are regionally concentrated. The NIDS data captures information on household-level total income from all available income sources, such as income from primary occupations, self-employment and casual employment, government grants, and remittances. Expenditure is derived from all available expenditure, such as expenditure on food, education, health, and clothing. These variables are transformed into per-capita individual-level variables by dividing each with the size of the household. For the descriptive analysis, both monetary measures are treated as per-capita household total monthly income and expenditure.

Given SA's historical foundations, SWB is expected to differ from one region (province and district municipality) to another. To a certain extent, the regional divergence of SWB is a factor of the historical position of minerals in inland regions (Johannesburg and Pretoria) of GP and the international flow of commodities across all sectors in the port cities of KZN (in Durban and Richards Bay) and the WC (Cape Town). These economic regions (Gauteng (GP), KZN, and WC) explain most of the country's economic activity in inland and in port regions, and they account for approximately 60 percent of the country's GDP (StatsSA, 2021). The GDP contribution of these regions indicates the relevance of agglomeration patterns of economic activities that are closely related to rapid industrialisation, urbanisation, and employment opportunities that directly affect SWB (Krugell & Rankin, 2012). All these factors are likely to have large implications for the well-being of the population of a particular region.

Summary statistics presented in Table 3-1 and Table 3-2 show that SWB differs across provinces and district municipalities, although individual SWB is on average, normally distributed and concentrated around the score of 5. The summary statistics presented in Table 3-1 show that, on average, individuals living in the WC, Northern Cape (NC), and FS have the highest levels of individual SWB, while individuals living in the Eastern Cape (EC), KZN, and LP have the lowest individual SWB scores on average. These findings are unsurprising, as EC, KZN, and LM are spatially rural dense, underdeveloped, and they have the highest incidence of both income and multidimensional poverty (David et al., 2018).

Table 3-1:Summary Statistics of SWB, Per Capita Household Income and Expenditure by Province

Province:	**Western Cape**		**Eastern Cape**		**Northern Cape**	
Measurement:	**Mean**	**Stdv**	**Mean**	**Stdv**	**Mean**	**Stdv**
Subjective Well-being	5.93	2.51	4.89	2.27	6.05	2.47
Household Monthly Income	3614.212	6602.09	2336.63	16641.25	3497.27	23089.69
Household Monthly Expenditure	1897.86	4887.99	899.35	2513.10	1349.17	5051.54
Province:	**Gauteng**		**Mpumalanga**		**Limpopo**	
Subjective Well-being	5.37	2.39	5.10	2.41	4.94	2.46
Household Monthly Income	4058.76	6723.19	2939.47	6963.96	2190.17	4918.28
Household Monthly Expenditure	1773.25	3935.17	1054.36	2671.69	932.93	3234.89
Province:	**Free State**		**KwaZulu Natal**		**North West**	
Subjective Well-being	5.63	2.52	4.96	2.49	5.64	2.41
Household Monthly Income	2818.52	4882.12	2453.99	6256.53	2756.99	4396.67
Household Monthly Expenditure	2818.52	4882.12	2452.99	2818.52	4882.12	2452.99

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: All results are weighted.

Table 3-2: Summary Statistics of SWB, Per Capita Household Income and Expenditure by District Municipality

Province			Western Cape			
District Municipality:	**West Coast**		**Cape Winelands**		**Overberg**	
Measurement:	**Mean**	**Stdv**	**Mean**	**Stdv**	**Mean**	**Stdv**
Subjective Well-being	6.83	1.99	6.16	2.56	6.17	2.46
Household Monthly Income	6023.18	16965.49	2717.61	4894.87	5069.94	6526.84
Household Monthly Expenditure	2311.82	3651.89	1293.58	2778.93	3424.91	9396.65
District Municipality:	**Eden**		**Central Karoo**		**City of Cape Town**	
Subjective Well-being	6.29	2.45	6.90	2.22	5.65	2.51
Household Monthly Income	4634.49	5989.62	2647.01	5599.22	3364.12	5098.48
Household Monthly Expenditure	2623.96	6044.14	11223.19	2656.49	1782.59	4649.77
Province			**Eastern Cape**			
District Municipality	**Sarah Baartman**		**Amathole**		**Chris Hani**	
Subjective Well-being	5.31	2.61	4.76	2.08	4.62	2.21
Household Monthly Income	2039.41	4317.82	1329.27	2053.40	1900.82	3309.13
Household Monthly Expenditure	1171.08	3270.12	762.44	1477.76	1216.29	3625.89
District Municipality:	**Joe Gqabi**		**OR Tambo**		**Afred Nzo**	
Subjective Well-being	4.53	2.05	4.81	2.09	4.49	2.00
Household Monthly Income	1429.60	2268.45	1111.41	2066.80	1100.49	1888.73
Household Monthly Expenditure	706.14	1520.26	455.83	912.52	573.76	1359.45
District Municipality:	**Buffalo City**		**Nelson Mandela Bay**		**-**	
Subjective Well-being	5.79	2.36	5.11	2.61	-	-
Household Monthly Income	12291.42	60628.59	2561.97	4093.95	-	-
Household Monthly Expenditure	2972.27	5863.77	1018.22	1991.94	-	-
Province			**Northern Cape**			
District Municipality	**Namakwa**		**Pixely Ka Seme**		**ZF Mgcawu**	
Subjective Well-being	5.96	2.64	7.02	2.29	5.88	2.51
Household Monthly Income	1988.02	2449.00	10119.85	60816.72	2780.12	3834.96
Household Monthly Expenditure	906.73	2856.49	1957.36	2856.48	1347.08	5430.76
District Municipality	**Frances Baard**		**John Taolo Gaetsewe**		**-**	
Subjective Well-being	5.65	2.35	6.23	2.42	-	-
Household Monthly Income	2129.21	5245.41	3239.74	12484.79	-	-
Household Monthly Expenditure	968.99	1880.71	1911.68	9137.15	-	-
Province			**Free State**			
District Municipality:	**Xhariep**		**Lejweleputswa**		**Thabo Mafutsanyana**	
Measurement	**Mean**	**Stdv**	**Mean**	**Stdv**	**Mean**	**Stdv**
Subjective Well-being	5.94	2.65	5.39	2.73	5.55	2.54
Household Monthly Income	1467.16	9065.71	1911.98	2984.89	1989.39	2702.47
Household Monthly Expenditure	607.97	1528.48	1023.34	2736.59	625.87	1065.58

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: All results are weighted.

Table 3-2 (continued): Summary Statistics of SWB, Per Capita Household Income and Expenditure by District Municipality

District Municipality:	Fezile Dabi		Mangaung		-	
Subjective Well-being	5.73	2.21	5.82	2.52	-	-
Household Monthly Income	5841.50	7509.77	2851.29	3608.83	-	-
Household Monthly Expenditure	1876.54	3430.77	1269.01	2245.71	-	-
Province			**KwaZulu-Natal**			
District Municipality:	**Ugu**		**Umgungundlovu**		**Uthukela**	
Subjective Well-being	4.81	2.26	4.99	2.39	4.78	2.27
Household Monthly Income	1251.43	1966.17	2807.38	4153.21	911.11	1649.71
Household Monthly Expenditure	521.29	959.91	1918.01	9047.12	425.53	1054.95
District Municipality:	**Umkhanyakude**		**Uthungulu**		**Harry Gwala**	
Subjective Well-being	4.58	2.69	4.57	2.23	4.97	2.46
Household Monthly Income	1146.92	1860.79	1571.34	4911.29	2275.82	3925.98
Household Monthly Expenditure	595.08	1005.49	893.48	2986.96	787.89	1301.17
District Municipality:	**Umzinyathi**		**Amajuba**		**Zululand**	
Subjective Well-being	5.15	2.45	5.05	2.15	4.35	2.21
Household Monthly Income	1909.43	3330.81	1300.68	1798.91	1293.19	3772.90
Household Monthly Expenditure	893.32	1754.74	565.83	793.66	560.28	1454.65
District Municipality:	**Ilembe**		**eThekwini**		**-**	
Subjective Well-being	5.09	2.49	5.12	2.66	-	-
Household Monthly Income	2441.02	6780.57	3546.48	8556.36	-	-
Household Monthly Expenditure	843.83	1715.02	1454.85	3591.42	-	-
Province			**North West**			
District Municipality:	**Bojanala**		**Ngaka Madiri Molema**		**Dr Ruth Segomodi**	
Subjective Well-being	5.73	2.25	5.38	2.40	5.52	2.56
Household Monthly Income	3500.40	5211.88	2015.96	3649.85	1299.25	2513.28
Household Monthly Expenditure	1619.73	3187.58	12285.68	366559.98	613.70	1657.78
District Municipality:	**Dr Kenneth Kaunda**		**-**		**-**	
Measurement:	**Mean**		**Stdv**		**Mean**	
Subjective Well-being	6.00	2.59	-	-	-	-
Household Monthly Income	3805.15	4264.14	-	-	-	-
Household Monthly Expenditure	2086.83	2807.22	-	-	-	-
Province			**Gauteng**			
District Municipality	**Sedibeng**		**West Rand**		**Ekurhuleni**	
Subjective Well-being:	4.74	2.43	5.61	2.39	5.75	2.33
Household Monthly Income	2228.19	3228.57	3051.12	6604.90	5156.03	6604.90
Household Monthly Expenditure	1091.11	2422.53	1546.78	3851.49	1929.34	3405.52

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: All results are weighted.

Table 3-2 (continued): Summary Statistics of SWB, Per Capita Household Income and Expenditure by District Municipality

District Municipality	City of Johannesburg		City of Tshwane		-	
Subjective Well-being:	4.98	2.32	5.99	2.32	-	-
Household Monthly Income	3368.76	7325.36	5692.92	7876.76	-	-
Household Monthly Expenditure	1485.41	3673.60	2681.09	5459.16	-	-
Province			**Mpumalanga**			
District Municipality	**Gert Sibande**		**Nkangala**		**Ehlanzeni**	
Subjective Well-being:	5.37	2.29	5.02	2.38	4.98	2.49
Household Monthly Income	3132.54	7996.66	4091.8	8389.18	1852.69	4188.18
Household Monthly Expenditure	1025.77	2525.32	1354.93	3358.18	806.25	1960.74
Province			**Limpopo**			
District Municipality	**Mopane**		**Vhembe**		**Capricorn**	
Subjective Well-being:	4.48	2.39	4.96	2.65	4.80	2.47
Household Monthly Income	1586.38	4627.39	3001.86	7352.87	1561.04	3127.16
Household Monthly Expenditure	613.44	3470.40	1055.42	2188.92	868.60	4372.37
District Municipality	**Waterberg**		**Greater Sikhukhune**		**-**	
Subjective Well-being:	5.46	2.36	5.05	2.36	-	-
Household Monthly Income	2630.07	4454.99	2543.25	4974.71	-	-
Household Monthly Expenditure	1242.95	2342.33	967.11	2614.55	-	-

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: All results are weighted.

At the district level, summary statistics presented in Table 3-2 show that the mean scores of individual SWB follow those of the provinces. Individuals living in WC, NC, GP, and Free State (FS) municipalities are on average better-off in their evaluation of life relative to individuals living in EC, KZN, and LP municipalities. These differences in individual SWB across regions can be characterised by socioeconomic, environmental and governance-related factors (Blaauw et al., 2018). For example, unemployment differs across regions, reflecting the variation in GDP and the spatial dimension of the labour market across regions. According to the quarter three of the Quarterly Labour Force Survey (QLFS) (StatsSA, 2022), the average unemployment rate (using the narrow definition) across the provinces of SA is 32.9 percent. The WC and GP have the lowest levels of unemployment, under 34 percent, while the EC is the only province where it is 42.4 percent, almost more than half of its adult population is unemployed. These differences are concerning, as they imply economically depressed regions will continue to struggle to level up with economically thriving regions (Blaauw et al., 2018).

Moreover, individual SWB is on average the highest in WC and NC district municipalities. In particular, Pixley Ka Seme, the West Coast and Central Karoo are on average among municipalities with the highest individual reports to SWB, respectively. What is common about these municipalities is that they are all rural-dense in terms of spatiality, and they comprise a small population of approximately 220 830, 472 559, and 75 122 for Pixley Ka Seme, West Coast, and Central Karoo, respectively (StatsSA, 2021). These district municipalities do not hold the highest share of GDP contribution, but the summary statistics on SWB suggest that there are factors that explain individual SWB beyond monetary measures of GPD, economic opportunities, industrialisation, and urbanisation (StatsSA, 2021).

It is worth noting that post-1994 communities have become more integrated. However, it may also be worth pointing out, though, that integration (in terms of residence) is still very much class/income-driven and income inequality is still very much along race lines. Even though there are communities which appear to be more racially or otherwise integrated, there are still communities which are very much ‘Black’ ‘White’ Indian, etc, and these divides are locational, as well as along income lines. Nevertheless, the integration has improved social and economic mobility in inland and coastal regions that provide economic opportunities (Lemanski, 2006). This has seen an increase in internal migrations in regions that prioritise infrastructure development through rapid industrialisation, urbanisation, and income opportunities. As a result, highly industrialised regions experience high levels of internal migration, as they seek better income opportunities (Puntscher et al., 2015). However, if households remain in specific locations despite low-income opportunities (ie, factors that would ordinarily ‘push’ households away), then there are likely other pull factors (factors that would ordinarily ‘pull’ households) that keep the individuals in their current locations (Thet, 2014). This is evident in the case of Central Karoo, Pixley Ka Seme, and uMzinyathi because, despite their economic contribution and low-income opportunities, individuals’ livings in these regions comprise the highest levels of SWB across regions.

As shown in the literature section, standards of living and welfare distribution are often evaluated based on, among other factors, per-capita household income and expenditure levels. The correlation between per-capita household income/expenditure and SWB across the regions is high, which confirms that per-capita household income/expenditure level is a good indicator of individual SWB (Blaauw et al., 2018). However, in terms of the direction of the correlation, the deviations between the two measures are often large. These deviations can be observed, in particular, if the comparison is between high- and low-income regions. For example, in Table 3-1, GP has the highest mean value on per-capita household income and expenditure, and the expectation is that the high monetary value translates into higher average levels of individual SWB. Surprisingly, this notion does not hold, as per-capita household income/expenditure of the NC is lower than that of GP, but NC has a higher mean value of individual SWB than GP. Therefore, despite the positive relationship between income/expenditure and SWB, there are factors beyond income/expenditure, whether social or institutional, that are critical in determining individual SWB.

This study extends this analysis by considering other factors that determine individual SWB, including macroeconomic variables measures at the regional level. Table 3-3 presents summary statistics of variables considered as determinants of SWB. The study considers three sets of explanatory variables: demographic; household; and income characteristics. The inclusion of the broad categories is drawn from the literature on the determinants of SWB (Biswas-Diener et al., 2004; Kahneman et al., 1999; Steel et al., 2008; Stubbe et al., 2005).

As expected, the average individual SWB level is 5, consistent with the findings as presented in Figure 3-1. The majority of the respondents are Black African young adults, and the average age of the sample is approximately 30 years. Females make approximately 51.3 percent of the entire sample, relative to 48.7 percent of males. These demographic statistics are consistent with Statistics South Africa’s (StatsSA) 2021 mid-year population estimates. They indicate a large future workforce and a tax base for the country, if much of the population is absorbed by the labour market. These demographics are also advantageous to public-policy proposals that seek to create a platform for women to assume strategic positions of power, hence reversing the social ills of apartheid.

These advantageous factors have not been exploited, as 28 years into democracy, the youth and women, in particular, bear the brunt of the country's worrying jobless rate (De Lannoy et al., 2020). According to the 2021-Q1 of the Quarterly Labour Force Survey (QLFS) by StatsSA, SA's unemployment rate stands at 32.6 percent, and this rate ranks among the worse in the world's major economies. One of the concerning factors is that individuals aged between 15 and 24 account for 58.2 percent of the unemployment rate. The joblessness in SA is clearly reflected in the above summary statistics, as approximately 14.8 and 43.4 percent of the sampled respondents are unemployed and not economically active, respectively. These worrying findings are caused by the legacy of apartheid, the country's low economic growth rate, skills mismatches, continued spatial inequalities, and labour market inefficiencies, and the recent impact of the coronavirus (Covid-19) pandemic (Kingdon & Knight, 2007; Posel et al., 2021).

In addition, the government still has some way to go in improving both education and improving standards of living, for example, access to basic infrastructure. These factors form an integral part of the country's public policy, as they advance social, economic, and environmental progress. The average level of education in SA is 8 years education, which is equivalent to a grade eight level of secondary education. As a consequence, this has perpetuated the intergenerational cycle of poverty, as children continue to inherit the social standing of their parents or caregivers, irrespective of their abilities (Richardson, 1977). This limits the knowledge, skills, and values that learners require to become full members of society and improve their social mobility. These conditions are undesirable as they impede acceptable levels of individual SWB.

Table 3-3: Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Dependent Variable:			
Subjective Well-Being	Using a scale of 1-10, where 1 is "very dissatisfied", and 10 "very satisfied", How do you feel about your life as a whole right now?	5.285	0.015
Individual Variables:			
Age	Respondents age in years	30.10	0.089
Male	1 if male; 0 otherwise#	0.487	0.002
African	1 if African; 0 otherwise#	0.804	0.002
Coloured	1 if Coloured; 0 otherwise	0.092	0.001
Indian	1 if Indian; 0 otherwise	0.023	0.001
White	1 if White; 0 otherwise	0.081	0.002
Years of Schooling	Number of years invested in education (Dummies for Estimation)	8.090	0.024
Married	1 if married; 0 otherwise	0.243	0.002
Cohabitating	1 if cohabitating; 0 otherwise	0.052	0.001
Divorced or widowed	1 if divorced or widowed; 0 otherwise	0.080	0.001
Never Married	1 if single; 0 otherwise#	0.624	0.003
Health status	1 if health status is excellent/good; 0 otherwise#	0.881	0.002
Employed	1 if employed; 0 otherwise	0.434	0.003
Unemployed and searching for employment	1 if unemployed; 0 otherwise#	0.148	0.002
Not Economically Active	1 if not economically of active; 0 otherwise	0.434	0.003
Rural informal	1 if household is in rural informal area; 0 otherwise#	0.105	0.001
Urban	1 if household is in urban area; 0 otherwise	0.787	0.001
Rural Formal	1 if household is in rural formal; 0 otherwise	0.107	0.001
Piped water on site	1 if household has piped water on site; 0 otherwise#	0.757	0.002
Flushable Toilet	1 if household has flushable toilet; 0 otherwise#	0.576	0.002
Electricity	1 if household has electricity/card meter; 0 otherwise#	0.852	0.002
Per capita household income	log per capita of household total monthly income	3037.04	64.75
Perceived Poorest-Third	1 if the individual perceives to be poor; 0 otherwise#	0.443	0.003
Perceived Middle-Third	1 if the individual perceives to be in the middle; 0 otherwise	0.519	0.003
Perceived Richest-Third	1 if the individual perceives to be rich; 0 otherwise	0.037	0.001
Perceived rank in SA: Poorest-Third (2yrs)	1 if the individual perceives to be poor in 2 years; 0 otherwise#	0.177	0.002
Perceived Middle Third (2yrs)	1 if the individual perceives to be in the middle in 2 years; 0 otherwise	0.623	0.003
Perceived Richest Third (2yrs)	1 if the individual perceives to be rich in 2 years; 0 otherwise	0.199	0.003

Source: Own calculations using the National Income Dynamics Study Data and Quantec EasyData (2008 to 2017) [12].

Note: # Reference category.

All results are weighted.

[12] Note all categorical variables included in this vector are treated as a set off dummy variables. In addition, refusals and don't know are treated as missing. # Is an identification for the reference category.

Table 3-3 (continued): Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Perceived Lowest Third (5yrs)	1 if the individual perceives to be poor in 5 years; 0 otherwise#	0.084	0.002
Perceived Middle Third (5yrs)	1 if the individual perceives to be in the middle in 5 years; 0 otherwise	0.452	0.003
Perceived Richest Third (5yrs)	1 if the individual perceives to be rich in 5 years; 0 otherwise	0.464	0.003
Macroeconomic variables			
Mean District Average HH Income	logged, measuring the district of average household income	12.78	0.005
Mean District Unemployment	logged, measuring the district of unemployment	15.68	0.004
Mean District Gross Regional Product	logged, measuring the district of gross regional product	13.91	0.006
Mean Provincial Average HH Income	logged, measuring the provincial of average household income	14.41	0.003
Mean Provincial Unemployment	logged, measuring the provincial of unemployment	17.29	0.002
Mean Provincial Gross Regional Product	logged, measuring the provincial of gross regional product	15.59	0.003

Source: Own calculations using the National Income Dynamics Study Data and Quantec EasyData (2008 to 2017) .

Note: # Reference category. All results are weighted.

The rollout of infrastructure remains a priority for the government and there has been commendable improvements in the availability and access to basic services post-apartheid (Mutyambizi et al., 2020). The summary statistics on basic infrastructure show much-needed improvements as 75.7, 57.6, and 85.3 percent of the sample respectively report having access to piped water on site, a flush toilet, and electricity. These conditions are fundamental in fulfilling basic social needs and human development, as they are interrelated with SWB (Clark et al., 2008; Layard et al., 2010).

Economic regions (both provincial and district municipalities) have distinctive factors (as shown in the literature) that define their contribution to the livelihoods of individuals. These distinctive factors are explained by pull and push elements of internal migration. As shown in Table 3-1, individuals in low-industrialised regions with low economic opportunities comprise higher levels of SWB relative to highly industrialised regions with high economic opportunities. Therefore, the pull factors that keep individuals from moving are fundamental in improving the overall SWB. In examining the differences in SWB across regions, the study will further control for other determinants of individual SWB, outlined in Table 3-2.

3.4 Method of Estimation and Strategies

This study seeks to determine the extent to which individual SWB differs across economic regions of SA. The hypothesis formulated is that individuals in high-income regions have higher individual SWB than those in low-income regions. The study will employ a multivariate regression framework to examine the determinants of SWB and how they perpetuate individual differences in SWB across regions. The dependent variable (SWB)[13] is all-encompassing (rated from 1 to 10) and refers to the overall satisfaction and happiness of an individual respondent (*i*) over time (t). The study follows Long & Freese (2006) in estimating a SWB equation as specified below:

$$SWB_{it} \quad \beta_0 + \beta_1'(\boldsymbol{Regions})_{it} + \beta_j{}'\boldsymbol{x}_{it} + \beta_2 \boldsymbol{LnAvhhinc}\,(\boldsymbol{prov})_{it} + \beta_3 \boldsymbol{LnAvhhinc}\,(\boldsymbol{distr})_{it} + \beta_4 \boldsymbol{LnUnem}\,(\boldsymbol{prov})_{it} + \beta_5 \boldsymbol{LnUnem}\,(\boldsymbol{distr})_{it} + \beta_6 \boldsymbol{LnGRP}(\boldsymbol{prov})_{\,it} + \beta_7 \boldsymbol{LnGRP}(\boldsymbol{distr})_{\,it} + \varepsilon_{it} \qquad (1)$$

Where, β_0 is the intercept and the parameter vector β_1[14] corresponds to the coefficients of each of the economic regions in question. The variable $\boldsymbol{x}_{it}$, is the vector of context-specific explanatory variables for individual i at period time t. The vector of context-specific explanatory variables accounts for the determinants of SWB is in accordance with empirical evidence (Di Tella et al., 2003; Diener & Ryan, 2009; Posel & Casale, 2011; Blaauw & Pretorius, 2013; Morton et al., 2018).

The regional level macroeconomic variables are expressed as; $\boldsymbol{LnAvhhinc}\,(\boldsymbol{prov})_{it}$, $\boldsymbol{LnAvhhinc}\,(\boldsymbol{distr})_{it}$, $\boldsymbol{LnUnem}\,(\boldsymbol{prov})_{it}$, $\boldsymbol{LnUnem}\,(\boldsymbol{distr})_{it}$, $\boldsymbol{LnGRP}(\boldsymbol{prov})_{it}$, and $\boldsymbol{LnGRP}(\boldsymbol{distr})_{\,it}$, Which measures log of average household income, unemployment level, and Gross Regional Product, measured at the provincial and district level. These variables are expressed in natural logarithms to yield a growth rate both at the district and provincial levels. The logarithm transformation pulls outlying data from a positive skew distribution closer to the bulk of the data in a quest to have a variable that is normally

[13] The economic interpretation and measurement thereof imply that higher levels of SWB correspond to higher levels of utility.
[14] KwaZulu-Natal and uMkhanyakude municipality are the reference categories for provinces and municipalities respectively.

distributed. The random error term ε_{it}, is assumed to be normally distributed with a mean equal to zero and constant variance. The models are specified in three stages. The first and second level controls for only the individual and household explanatory variables.

The study estimates a POP model[15] given the ordinal nature of the dependent variable (Kockelman & Kweon, 2002). The model is estimated through a maximum likelihood function and the probabilities enter the likelihood function. The POLS model is used as a reference model for the purposes of interpreting the estimated coefficients. The ordinal or cardinal ranking of SWB scores makes little difference; hence, the results between the two models are not expected to vary substantively (Ferrer-i-Carbonell & Frijters, 2004).

The regional analysis enables the study to test the hypothesis of whether individuals living in GP/JHB have a higher SWB than those in KZN/DBN. The hypothesis formulated enables the study to provide context to the existing debate of individual SWB being statistically different across economic regions. The findings from the estimations are expected to confirm the importance of geographical features as key determinants of individual SWB. Furthermore, the expectation is that migration flows[16] will increase in regions that are economically better-off in determining SWB. In this case, lower levels of economic activity because of a lack of job opportunities become push factors for regional migration (StatsSA, 2020). Hence, individuals leave their family and familiar surroundings behind in search for better opportunities that make such benefits possible in improving quality of life.

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[15] These are statistical models in which the outcome of an ordered dependent variable is explained by a number of arbitrarily scaled independent variables.

[16] According to StatsSA (2021), most international migrants settle in Gauteng (47,5%) while the least are found in the Northern Cape province (0,7%). Gauteng is considered the economic hub of the country, attracting international migrants as well as domestic migrants from rural provinces such as Limpopo, KwaZulu-Natal, and Eastern Cape. The Western Cape receives the second highest number of in-migrants for the period 2016 to 2021. In this instance, the “push” factors are what may drive people from the Eastern Cape (EC) towards the Western Cape.

However, it should be noted that these potential gains of individual SWB in high-income regions can be largely cancelled out by increased levels of competition, congestion and the oversupply of labour which reduces levels of individual well-being (Mulcahy & Kollamparambil, 2016). Also, the geographical links across regions provide context on the effect of the dual land tenure system that comprises private and communal land ownership. It may well be the case in SA that in urban dense regions, individual SWB, particularly that of Africans, is dampened relative to those who reside in rural dense regions that comprise strong communities and strong ancestral connection (Kollamparambil, 2019).

Thus far, the POP and POLS models do not adjust for unobserved heterogeneity, given the panel structure of the NIDS data. In accord with the heterogenous nature of SA, there exist unobserved heterogeneities in cross-sectional units. The unobserved heterogeneities are at the individual and regional levels. At the individual level, they include factors such as sadness and introversion, while the regional fixed effects include factors such as regional amenities, justice, and institutional politics (Powdthavee, 2007a). Notably, if the individuals did not move across the districts and provinces, then the fixed effects nest the regional fixed effects. When both these individual and regional fixed effects are correlated with explanatory variables, this leads to different structural biases of the estimated coefficients, depending on the type of endogeneity (Kingdon & Knight, 2007). In the context of this study, factors such as unobserved personal traits and tribalistic behaviour differ across regions (particularly in KZN, EC, and LM). These unobserved heterogeneities resonate with race and ethnicity, which are underlying causes of inequalities in SA (Neff, 2007). In this case, the unobserved heterogeneities are confounders of regional differences in individual SWB, and if they are correlated with the standard errors, omitting these unobserved fixed effects from the analysis understates SWB (Nickell, 1981).

Also, incorporating the unobserved fixed effects on the estimation while neglecting their relationship with standard errors violates the strict exogeneity assumption and results in endogeneity. The adjustment process for endogeneity depends on the exogeneity assumption. If the exogeneity assumption holds, such that the unobserved fixed-effects are not correlated with any of the explanatory variables, then the random effect (RE) model is a permissible model for interpreting the coefficients. However, if the assumption of strict exogeneity does not hold, then the FE model is the appropriate estimation model as the time demeaning procedure deals with the unobserved time-invariant heterogeneities (Hedges & Vevea, 1998; Hunter & Schmidt, 2000; Firebaugh, 2013).

In the context of SWB research, it would be unrealistic to assume strict exogeneity (Borenstein et al., 2010; Shifa & Leibbrandt, 2018). Therefore, the study performs a Hausman Test[17] for exogeneity (see Appendix). The study adjusts for endogeneity by re-arranging equation (1) to control for the unobserved heterogeneity as specified below:

$$SWB_{it} \quad \beta_0 + \beta_1'(\boldsymbol{Regions_{it}}) + \beta_j'\boldsymbol{x_{it}} + \beta_2\boldsymbol{LnAvhhinc_{it}} + \beta_2\boldsymbol{LnUnem_{it}} + \beta_3\boldsymbol{LnGRP}_{\ \boldsymbol{it}} + A_i + \varepsilon_{it} \quad (2)$$

Where the variable A_i, represents fixed effects. It should be noted that fixed-effects estimations are normally sensitive to time-invariant variables. However, the regional dummy variables are not expected to be time-invariant, and what needs to be established is the extent to which individuals move between regions (between provinces; between municipalities).

Lastly, SWB is to be influenced by variables at different levels, from individual to country-level variables (Peugh, 2010). The NIDS data is a two-stage stratified cluster sample and it is hierarchically structured. The individual respondents are nested within households that are nested within districts, which are nested within provinces (Leibbrandt et al., 2009; Cheng et al., 2016; Novak & Pahor, 2017). Given hierarchical structure, individuals living in the same district are likely to share some common values. In this case, individuals living in the same neighbourhood/district are likely to

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[17] The null hypothesis is that there is no correlation between the standard errors and regressors. The null hypothesis is that the preferred model is random effects; The alternate hypothesis is that the model is fixed effects. The Hausman test results show that we reject the null hypothesis.

experience similar conditions (for example, brought about by living in the same neighbourhood) or context (for example, sharing the same political leadership), and the effect of these conditions on individual SWD differs between the neighbourhoods/district (Haining, 2009; Ballas & Tranmer, 2012). These similar experiences violate the independence of observation assumption, which assumes that the observations in the sample are independent of each other, and that the measurements for each sample subject are in no way influenced by or related to the measurements of other subjects. The violation of the independence of observation assumption implies that the standard errors and degrees of freedom used for clustered coefficients become inaccurate (Dedrick et al., 2009). In the hierarchal structure of the data, standard errors are underestimated for only higher-level variables, resulting in spurious claims of statistical significance and increased Type I errors (Gelman, 2006).

The above conventional linear and FE model fails to adjust for the nested structure of the NIDS data, as it fails to account for group-level effects, and it assumes that the mean outcome between groups does not differ. In addressing this inconsistency, the study follows Ballas & Tranmer (2012), Shifa & Leibbrandt (2018), and Kollamparambil (2019) by estimating a multilevel model (MLM), which takes into account both individual- and regional-level random effects. The MLM model is essential in this regard, as it decomposes the error term into different segments (fixed and random components) that arise from the unobserved effects at different levels, and then estimates their variance to allow for the calculation of standard errors. The coefficients and standard errors estimated through MLM take into account clustering at different levels (individual, household, and area-level) (Rasbash & Browne, 2001; Snijders & Bosker, 1999). This enables the study to estimate different variances for different group levels or geographical locations (Cheng et al., 2016).

Therefore, the study employs MLM to examine differences in individual SWB across regions. The MLM partitions the variance in the outcome between different groups and a variance measured at different hierarchical levels becomes a multilevel problem (Gorard, 2007). The MLM is expressed by the following equation:

$SWB_{it} \quad \beta_{0t} + \beta_1 \boldsymbol{X_t} + \varepsilon_t$ (3)

Where the intercept term is equal to the average intercept plus group-dependent deviation as expressed below:

ε_{it} : $\beta_{0t} = \lambda_{00} + \delta_{0t}$

In the fixed-intercept model, the assumption is that the mean outcome between groups does not differ, such that the intercept term is equal to the average intercept. If this assumption holds, then the fixed coefficient estimates produced by this model will be analogous to those of the linear regression (Krull & MacKinnon, 2001). This study relaxes this assumption, as individuals from the same group/district are exposed to similar traits (violating the independence of errors assumption) in comparison to individuals in other groups/districts. This implies the mean outcomes differ between groups by some random factor from the grand mean (Maas & Hox, 2005). The study assumes that the random component follows a normal distribution with a mean equal to zero, conditioned on the explanatory variables and constant variance (Heck, 2001). The random intercept model accounts for the fact that the average effect of control variables is similar for individuals living in the same region/district in comparison to those in other districts. The random slope/coefficient model is expressed below:

$SWB_{it} \quad \beta_{0t} + \beta_t \boldsymbol{X_t} + \delta_{0t}$ (4)

Where $\beta_{0t} \neq \lambda_{00}$, therefore:

$\beta_{0t} = \lambda_{00} + \varepsilon_t$ (5)

$\beta_{1t} = \lambda_{10} + + \varepsilon_t$ (6)

Substituting (5) and (6) into (4) yields:

$SWB_{it} \quad \lambda_{00} + \delta_{0t} + \lambda_{10} \boldsymbol{X_t} + \delta_t \boldsymbol{X_t} + \varepsilon_t$ (7)

Equation (7) above is the random-intercept model, and it provides further alterations that enable the study to model within-group variation. The model decomposes both the intercept slope coefficient of each group into a fixed and random component as shown by equations (5) and (6). The decomposition of the slope coefficient for the two components implies, for example, there is a general slope across all districts, and each district slope coefficient is allowed to differ from the general slope by some random slope component that is unique to each district (Ballas & Tranmer, 2012).

Following Shifa & Leibbrandt (2018), equation (7) yields a two-level MLM to be estimated by the study, where individuals (level 1) are nested within households that are nested within district municipalities (level 2). The first specification will be the variance component model (estimated without control variables), which helps explain the variation in the dependent variable. The first specification is followed by postulated models, starting with variables that are measured at the lowest level (between individuals) to those that are measured at the group level.

The MLM estimation assumes strict exogeneity such that the unobserved individual/regional heterogeneity is independent of the dependent variable or any of the control variables. The MLM model adopts a random coefficient approach that is sufficient in dealing with potential spatial heterogeneity. Therefore, the relationship between the dependent variable and control variables is allowed to differ at each level or by geographical location (Snidjers & Bosker, 1999). In this case, the variance in SWB is in three categories, since the three components sum to the total variation in SWB.

3.5 Results Analysis and Discussion

In accord with the objective of the study, the hypothesis formulated is that high-income regions have higher returns to individuals' SWB than low-income regions. This research is executed by estimating equation (1) through a series of model specifications, as discussed in the previous section. The study employs a POP regression, where the dependent variable is ordered, ranging from 1 (very dissatisfied) to 10 (very satisfied). The ordered probit regression results are presented along with the pooled POLS, and estimating both models is consistent with empirical evidence. The POP estimated coefficients and their standard errors are reported in Table 3-4. The POLS estimated coefficients and standard errors are reported in Table 3-5B in Appendix A. The positive significant values suggest that these variables lead to higher SWB levels (increased SWB), whereas the negative significant values lead to lower SWB levels (decreased SWB). The estimated coefficients for both estimation techniques show marginal differences in the returns to observable characteristics. However, there is little to no difference between the two techniques in the signs and probabilities of the estimated coefficient. The focus of analysis is on examining individual differences in SWB across regions. The study accounts for the regional difference by controlling for the municipal and provincial dummy variables, as reported in Table 3-4.

To make the results easier to comprehend, the model specifications are presented in a stepway. The models begin by accounting for regional dummy variables, which are then augmented by other determinants of SWB. For the purposes of interpretation, uMkhanyakude district municipality and KwaZulu-Natal are both used as reference categories. To a certain extent, Model 1 shows that the district municipalities are critical determinants of individual SWB. All coefficients and significance levels of the respective districts differ, implying individual SWB differs across district municipalities. These differences raise equity concerns, particularly if they underly the overall within-country, province, and district inequality. In particular, if individual differences in SWB is linked to the inequality of opportunity, as measured by, say, standards of living. The differences in individual SWB has harmful implications for economic efficiency, as limited standards of living for those stuck in the wrong regions leads to the underutilisation of resources/potential, thus constraining overall growth. The results suggest that majority of the district municipalities report higher levels of individual SWB as opposed to uMkhanyakude district municipality. For example, the results in Table 3-4 show that individuals living in the 44 district municipalities, on average, report higher levels of individual SWB relative to individuals living in uMkhanyakude district municipality.

Table 3-4: SWB — Pooled Ordered Probit Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Subjective Well-being					
District Municipalities:					
West Coast	0.964***		0.259***		
Cape Winelands	0.685**		0.162**		
Overberg	0.861*		0.192**		
Eden	0.728***		0.129		
Central Karoo	0.999***		0.512***		
City of Cape Town	0.464***		-0.065		
Cacadu	0.327***		-0.026		
Amathole	0.104		-0.125*		
Chris Hani	0.046		-0.191***		
Joe Gqabi	0.027		-0.150**		
O.R Tambo	0.144***		0.015		
Alfred Nzo	0.005***		-0.153**		
Buffalo City	0.543***		0.008		
Nelson Mandela Bay	0.237***		-0.03		
Namakwa	0.604***		0.228***		
Pixely Ka Seme	1.055***		0.465***		
Siyanda	0.581***		0.167**		
Frances Baard	0.484***		0.192***		
John Taolo Gaetsewe	0.717***		0.531***		
Xhariep	0.605***		0.397***		
Lajweleputswa	0.372***		0.049		
Thabo Mofutsanyane	0.432***		0.162**		
Fezile Dabi	0.528***		0.109		
Mangaung	0.551***		0.266***		
Ugu	0.139***		-0.024		
Umgungundlovu	0.202***		-0.159**		
Uthukela	0.127**		0.116**		
Uthungulu	0.025		-0.084		
Sisonke	0.199**		0.098		
Umzinyathi	0.274***		0.049		
Amajuba	0.238***		0.213***		
Zululand	-0.053		-0.236***		
iLembe	0.243***		0.0001		
eThekwini	0.258***		-0.081		
Bojanala	0.515***		0.211***		
Ngaka Madiri Molema	0.371***		0.225***		
Dr Ruth Segomotsi	0.422***		0.410***		
Dr Kenneth Kaunda	0.623***		0.145		

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-4 (continued): SWB — Pooled Ordered Probit Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Sedibeng	0.093		-0.126*		
West Rand	0.462***		0.032		
Ekurhuleni	0.514***		-0.035		
City of Johannesburg	0.198***		-0.152**		
City of Tshwane	0.615***		0.163***		
Gert Sibande	0.368***		0.084		
Nkangala	0.216***		-0.178***		
Ehlanzeni	0.194***		-0.007		
Mopani	-0.016		-0.224***		
Vhembe	0.182**		-0.193**		
Capricorn	0.118**		-0.112		
Waterberg	0.409***		0.008		
Greater Sekhukhune	0.230***		0.006		
Provinces:					
Western Cape		0.391***		0.053*	
Eastern Cape		-0.025		-0.026	
Northern Cape		0.452***		0.328***	
Free State		0.281***		0.186***	
North West		0.284***		0.289***	
Gauteng		0.167***		-0.016	
Mpumalanga		0.058**		0.004	
Limpopo		-0.011		-0.036	
Individual Variables:					
Age			-0.024***	-0.024***	-0.024***
Age-squared			0.0003***	0.0002***	0.0003***
Male			-0.050***	-0.049***	-0.050***
Colored			0.331***	0.336***	0.298***
Indian			0.558***	0.546***	0.605***
White			0.419***	0.429***	0.419***
Primary Education			0.010	-0.016	0.005
Secondary Education			0.039	0.007	0.025
Matric			0.062*	0.038	0.059*
Tertiary Education			-0.056	-0.081	0.032
Married			0.094***	0.098***	0.087***
Cohabitating			-0.011	-0.025	0.051***
Divorced or widowed			0.002	0.0003	0.0003
Good Health			0.143***	0.147***	0.139***
Employment Status					
Employed			0.087***	0.087***	0.085***
Not Economically Active			0.026	-0.035	-0.027

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-4 (continued): SWB — Pooled Ordered Probit Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Household Variables:					
Geographical Type: Urban			-0.098***		-0.135***
Household infrastructure:					
Piped water on site			-0.006	-0.027	0.006
Flushable Toilet			0.029	0.027	0.009
Electricity			0.145***	-0.147***	-0.142***
Income variables:					
Log of per capita household income			0.138***	0.140***	0.145***
Perceived Relative Economic Position:					
Perceived Middle-Third			0.198***	0.197***	0.197***
Perceived Richest-Third			0.538***	0.546***	0.547***
Perceived Middle Third (2yrs)			0.159***	0.161***	0.159***
Perceived Richest Third (2yrs)			0.245***	0.244***	0.246***
Perceived Middle Third (5yrs)			0.300***	0.294***	0.288***
Perceived Richest Third (5yrs)			0.373***	0.365***	0.355***
Regional Macroeconomic Variables:					
Mean District Income					-0.109
Mean District Unemployment					-0.024
Mean District Regional Domestic Product					0.066*
Mean Provincial Income					0.720***
Mean Provincial Unemployment					-0.582***
Mean Provincial Regional Domestic Product					-0.255***
Wave	0.014***	0.012***	-0.029***	-0.029***	-0.032***
Number of Observations	71,943	71,943	60,731	60,731	60,731
Pseudo R^2	0.0093	0.0047	0.0455	0.0427	0.0432
Log-pseudolikelihood	-2.885e+08	-2.898e+08	-2.375e+08	-2.382e+08	-2.381e+08
χ^2	2339.85	768.02	5196.82	4002.34	4035.16

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).
Macroeconomic variables were sourced from Quantec EasyData.
*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*
All results are weighted.

The 44 district municipalities are West Coast, Cape Winelands, Overberg, Eden, Central Karoo, City of Cape Town, Cacadu, OR Tambo, Alfred Nzo, Buffalo City, Nelson Mandela, Namakwa, Pixley Ka Seme, Siyanda, Frances Baard, John Taolo Gaetsewe, Xhariep, Lajweleputswa, Thabo Mufutsanyane, Fezile Dabi, Mangaung (metro), Ugu, Umgungundlovu, uThukela, Sisonke, Umzinyathi, Amajuba, iLembe, eThekwini, Bojanala, Ngaka Madiri Molema, Dr Ruth Segomotsi, Dr Kenneth Kaunda, West Rand, Ekurhuleni, City of Johannesburg, City of Tshwane, Gert Sibande, Nkangala, Ehlanzeni, Vhembe, Capricorn, Waterberg, and Greater Sekhukhune.

In contrast, the majority of the 44 districts are a combination of both urban- and rural-dense municipalities (a combination of formal and informal). Notably, living in any of the large SA metropolitan regions reduces self-reported SWB. CPT, DBN, and JHB are SA's largest metros in terms of population and GDP contribution (StatsSA, 2021). The three metropolitan cities are constituted by densely populated urban agglomeration and their surrounding territories consist of industries, commercial spaces, and transport infrastructure (Monkam, 2014). These regions play a critical role in SA's economy, as they drive economic growth, are the pinnacles of labour productivity, creators of new employment opportunities, and portals to the knowledge economy (Rogerson, 2010; Morrison & Weckroth, 2018).

Therefore, the economic and social attributes of cities imply that individuals living in the cities are exposed to a wider variety of economic benefits such as jobs, easier opportunities to acquire additional skills and to move among jobs, reduced poverty, and exposure to healthcare facilities (Wish, 1986; Glaeser et al., 2001), while individuals located in rural peripheries (for example, uMkhanyakude, Amathole, Chris Hani, Joe Gqabi, Uthungulu, Zululand, Sedebeng, and Mopnani) are exposed to poor living conditions and lack of service delivery, employment opportunities, and limited exposure to healthcare facilities. The rural peripheries are characterised by the presence of small towns in their areas, communal land tenure and villages or scattered groups of dwellings and are typically located in former homelands (Jacobs et al., 2019). Therefore, because of the economic and social attributes of these regions, individuals living in metropolitan municipalities have higher levels of SWB as opposed to individuals living in the uMkhanyakude district municipality.

Notwithstanding the economic and social drawbacks of living in rural areas, individuals living in formal rural areas also report higher levels of SWB. The results presented in the study suggest that formal rural dense municipalities like the West Coast, Winelands, Overberg, Eden, Central Karoo, Cacadu, Namakwa, Frances Baard, Umgungundlovu, iLembe, Gert Sibande, and Waterberg district municipality consist of no large town as a core urban settlement. Typically, these district municipalities have a relatively small population, a significant proportion of which is urban, based in the small town. These district municipalities are categorised by the presence of commercial farms, as these local economies are largely agriculturally based (Monkam, 2014). The impact of the agriculturally driven economic activity has spill-over effects on infrastructure, health, and poverty, which all positively affect individual SWB (Brettenny & Sharp, 2016).

The positive subjective assessment of SWB in formal rural areas has been demonstrated in SWB-related studies. These studies cite, among other factors, community and societal feelings to be high in rural-dense areas (Shucksmith et al., 2009; Sorensen, 2014; Gu & Wei, 2018; Hoogerbrugge & Burger, 2021). Community and societal feeling is characterized by personal social direct/indirect interactions, coupled with values, beliefs and roles that are based on interactions. As such, individuals living rural-dense areas, but relatively small settlements display these intense patterns of social contact in small networks, whereas individuals living in urbanized regions are characterized by diverse and transient contact patterns, with relatively fewer social relationships (Gebre & Gebremedhin, 2019). This is consistent with earlier findings by Rentfrow et al. (2009), who suggest that individuals who reside in regions with a higher share of cultural and social diversity also score highly on measures of SWB.

The results presented in Model 1 suggest that socioeconomic conditions differ between urban, formal rural and informal rural district municipalities, and these different socioeconomic conditions predict the extent to which individual SWB differs across these regions. The urban/rural divide has widely been considered across the empirical literature; for example, increasing income inequality is high in urban regions, and it has adverse effects on individual SWB (Burger et al., 2020). The adverse effects are notable when dissatisfied individuals living in rural-dense areas migrate to the cities because of push factors. Urbanised cities are dominated by, among other factors, singles, unemployed, and migrant individuals, which reduces the average SWB (Veenhoven, 1994). Furthermore, rural and urban dense regions attract people with different preferences and personality traits that contribute differently to the individual SWB (Luechinger, 2010; Ferreira et al., 2013; Galinha & Pais-Ribeiro, 2012). For example, urbanised regions attract highly skilled individuals because of industrialisation, economic opportunities, and better pay in the labour market. As a result, highly educated people thrive by these possibilities offered in highly urbanised regions. The rural preference differs in the context that the rural regions attract individuals who value community attachment, values, culture, customs, and tradition (Okulicz-Kozaryn & Valente, 2019; Burger et al., 2020; Hoogerbrugge & Burger, 2021). As a result, the difference in the advantages possessed by these regions brings about different effects on individual SWB.

Moreover, Model 1 results reflect the regional dynamics of SA and these regional dynamics form an integral part of SA's economic and development strategies. The economic conditions in rural municipalities constraining growth include low productivity; under-investment in agriculture and non-farm rural employment; a lack of adequate infrastructure; poor occupational safety and health and working conditions; and limited or no access to services, including financial services (Nel, 2018). These challenges are interrelated with poor public governance mechanisms that include finance, planning, human capital, the non-payment of services, corrupt supply chains and weak accountability mechanisms (Ndaguba & Hanyane, 2019).

Therefore, SA's within-country effects present contrasting findings relating to the notion that individual SWB is higher in rural municipalities as opposed to urban municipalities. Research findings in developed countries suggest that individual SWB is lower in large metropolitan areas as opposed to lower metros or rural municipalities (Ferrer-i-Carbonell & Gowdy, 2007; Brereton et al., 2008; Gunatilaka, 2010; Morrison, 2011). For instance, Morrison (2011) suggests that the average level (fixed effect) of SWB in New Zealand and Auckland ranks at the bottom, which implies living in large urban areas/cities is associated with lower levels of cognitive well-being. In contrast, despite the evidence that suggests that living in an urban area negatively affects SWB, the predicted estimates in Model 1 suggest otherwise. The major difference is that most empirical literature is based in developed countries, and the comparison is mostly limited between urban and formal rural areas. SA presents a different facet, as the country is categorised by a combination of both formal and informal rural areas.

However, the estimated results in Model 1 for formal rural areas is consistent with empirical evidence. The difference is only notable when considering informal rural areas in the peripheries, as individuals located in these regions report lower levels of SWB.

Model 2 controls for the province fixed-effects. The study isolates district municipal variables from this model to mitigate against multicollinearity. Apart from EC and LM, The sign, magnitude, and significance levels of all coefficients on the province variables suggest that individual SWB differs across the provinces of SA. The WC, EC, NC, FS, GP, NW, and MP all have positive significant coefficients, implying individual SWB is higher in these respective regions than those living in KZN. As expected, individuals in the high-income provinces WC and GP report higher levels of SWB, as opposed to the KZN province. The observed divergence in reported SWB is perpetuated by regional inequalities and reflects vast territorial disparities between high- and low-income provinces. This regional divergence also reflects the problem of clustering economic activities across provinces. Model 2 also shows that individuals living in NC, NW, FS, MP, and NW have higher levels of SWB relative to those living in KZN. Although material conditions are the same across these regions, KZN stands out in terms of population, economic contribution, and opportunities. However, KZN remains constrained by socioeconomic challenges, which include, among other factors, unemployment, poverty, and limited access to public services. Amid the socioeconomic challenges facing KZN, individuals living in the NC, NW, FS, MP, and NW report higher levels of SWB as opposed to KZN.

Models 3 and 4 augment the first two models by controlling for other observable characteristics. As expected, the coefficients on the regional dummy variables change as the study controls for other observable characteristics. The change in the estimated coefficients for the regional dummy variables suggests other observable characteristics affect individual SWB. The study presents five specification models for both estimation techniques presented in Tables 3 and 4. SWB is correlated to a range of demographic, household, and regional indicators (Cummins et al., 2005; Morrison, 2011; Smarts, 2012; Valdmanis, 2015; LU et al., 2015). The estimated coefficients for the respective control variables are consistent with empirical evidence on the importance of individual and household variables in determining individual SWB. Individual SWB is significant, with a quadratic U-shape relationship with age. As expected, males are less satisfied with their lives compared to females. This seems to suggest that the post-1994 legislation has not achieved equalising gender disparities (Venter et al., 2007; Joshi, 2010; Akala, 2018). This is consistent with empirical findings, as Cummins et al. (2003) suggests that women are happier relative to men on average.

The relationship between race and SWB was statistically significant. Of the total sample, Whites, Indians, and Coloured's respectively exhibit higher levels of SWB relative to Black Africans. This is consistent with empirical evidence by Hinks and Gruen (2007), who found that Black SAs exhibited the lowest levels of SWB. The results are also consistent with other empirical evidence (Blanchflower & Oswald, 2004; Neff, 2007; Ebrahim et al., 2013). As explained in the literature section, marriage enhances high levels of individual SWB because of the extra social companionship that is shared by married couples (Campbell et al., 1976; Brown & Harris, 1978; Haring-Hidore, 1985; Diener et al., 1984; Diener et al., 1992; Pouris & Inglesi-Lotz, 2014).

The estimated coefficients on Models 3 and 4 include household-level living-standard measures, such as household income and other household control variables. As expected, log per-capita household income and the individual's perceived rank in the national income distribution increase SWB. Perceived economic class has a far greater effect on individual SWB compared to actual income. As a result, individuals who perceived their class status as being among the richest in SA comprise the highest level of individual SWB, relative to those in the poorest third. This effect is significant even when considering the individual perceived status two and five years from today.

In Model 5, the study controls for regional macroeconomic controls (excluding regional dummy variables because of multicollinearity): log average household income, unemployment, and GRP, which are measured at both the district and provincial levels. In Model 5, the signs and significance levels for GRP imply that GRP positively affects SWB at the district level and negatively affects individual SWB at the provincial level. At the provincial level, all macroeconomic variables are significantly negative. Income and GRP at the provincial level negatively affect SWB and this finding is consistent with the notion that rising incomes of all do not increase SWB, because the benefits of higher income on SWB are offset by the negative impact of high costs and standards of living that are associated with growth in incomes (Easterlin, 1974). The results presented in Model 5 also show that the estimated coefficient of unemployment is negative and significant. The negative result implies that unemployment remains a social and economic burden on livelihoods and that rising unemployment decreases SWB.

Thus, far, the estimated results are consistent with the finding that individual SWB differs across the regions of SA. Table 3-5 presents the FE estimated results on all the models presented in Table 3-4. The FE estimation makes use of data on individuals having multiple observations, and estimates effects only for those variables that change across these observations. The FE estimation makes necessary adjustments for the existence of unmeasured (unobserved) differences between observations or samples that are associated with the (observed) variables of interest. The Hausman test was performed in choosing between the FE or RE models, and the null hypothesis is that the preferred model is random effects and the alternate hypothesis is that the model is fixed effects. The Hausman test results are reported in Table 3-5C in Appendix A.

In Table 3-5, models 1 to 4 control from district and provincial dummy variables in a stepway and most estimated coefficients on the regional dummy variables are insignificant.

Table 3-5: SWB — Fixed Effects Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
District Municipalities:					
West Coast	0.489		-0.036		
Cape Winelands	-0.589		-0.519		
Overberg	-0.060		-0.729		
Eden	-0.534		-0.479		
Central Karoo	1.289*		0.710		
City of Cape Town	-0.152		-0.789		
Cacadu	-0.538		-0.688		
Amathole	-0.903**		-1.601***		
Chris Hani	-0.941**		-1.053**		
Joe Gqabi	-0.352		-0.739		
O.R Tambo	-0.452		-0.625		
Alfred Nzo	-0.384		-0.733*		
Buffalo City	-0.526		-1.130*		
Nelson Mandela Bay	-0.559		-1.018*		
Namakwa	-0.349		0.139		
Pixely Ka Seme	1.377*		0.985		
Siyanda	-0.475		-0.976*		
Frances Baard	0.512		0.505		
John Taolo Gaetsewe	0.577		0.570		
Xhariep	-0.052		-0.669		
Lajweleputswa	0.243		0.232		
Thabo Mofutsanyane	-0.079		-0.595		
Fezile Dabi	-0.480		-0.641		
Mangaung	0.240		-0.238		
Ugu	-0.596		-0.647		
Umgungundlovu	-0.307		-0.679		
Uthukela	-0.257		-0.259		
Uthungulu	-0.789*		-0.544		
Sisonke	0.016		-0.262		
Umzinyathi	0.056		0.221		
Amajuba	0.194		0.332		
Zululand	-0.850*		-0.748*		
iLembe	-0.330		-0.246		
eThekwini	-0.035		-0.433		
Bojanala	0.848*		0.587		
Ngaka Madiri Molema	0.262		0.319		
Dr Ruth Segomotsi	0.304		0.417		
Dr Kenneth Kaunda	0.270		-0.187		

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-5 (Continued): SWB — Fixed Effects Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Sedibeng	-0.121		-0.357		
West Rand	0.114		-0.214		
Ekurhuleni	-0.367		-0.716*		
City of Johannesburg	-0.274		-0.684*		
City of Tshwane	0.479		-0.021		
Gert Sibande	0.206		-0.207		
Nkangala	-0.208		-0.628		
Ehlanzeni	-0.205		-0.151		
Mopani	-1.332***		-1.632***		
Vhembe	-0.642		-0.544		
Capricorn	-0.571		-0.922**		
Waterberg	0.099		-0.302		
Greater Sekhukhune	-0.001		-0.045		
Provinces:					
Western Cape		0.240		-0.301	
Eastern Cape		-0.322**		-0.495***	
Northern Cape		0.519**		0.407	
Free State		0.125		-0.227	
North West		0.547***		0.443**	
Gauteng		0.122		-0.312**	
Mpumalanga		0.047		-0.285	
Limpopo		-0.209		-0.364*	
Individual Variables:					
Age			-0.036***	-0.037***	-0.036***
Age-squared			0.0004***	0.0004***	0.0004***
Male					
Colored					
Indian					
White					
Primary Education			0.303**	0.298*	0.297**
Secondary Education			0.267	0.261	0.268
Matric			0.299*	0.283*	0.298*
Tertiary Education			0.261	0.239	0.263
Married			0.281***	0.286***	0.284***
Cohabitating			0.155**	0.151**	0.154**
Divorced or widowed			0.208***	0.214***	0.210***
Good Health			0.178***	0.179***	0.178***
Employment Status					
Employed			0.066*	0.062	0.067*

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-5 (Continued): SWB — Fixed Effects Regression of Subjective Well-Being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Not Economically Active			-0.086**	-0.087**	-0.089**
Household Variables:					
Geographical Type: Urban			-0.148*		-0.159**
Household infrastructure:					
Piped water on site			-0.114***	-0.129***	-0.114***
Flushable Toilet			0.134***	0.092*	0.126**
Electricity			0.218***	0.215***	0.221***
Income variables:					
Log of per capita household income			0.172***	0.166***	0.172***
Perceived Relative Economic Position:					
Perceived Middle-Third			0.411***	0.410***	0.408***
Perceived Richest-Third			0.831***	0.831***	0.828***
Perceived Middle Third (2yrs)			0.314***	0.319***	0.317***
Perceived Richest Third (2yrs)			0.561***	0.571***	0.568***
Perceived Middle Third (5yrs)			0.621***	0.618***	0.616***
Perceived Richest Third (5yrs)			0.828***	0.822***	0.820***
Regional Macroeconomic Variables:					
Mean District Income					0.263
Mean District Unemployment					-0.336
Mean District Regional Domestic Product					-0.086
Mean Provincial Income					0.379
Mean Provincial Unemployment					-0.806**
Mean Provincial Regional Domestic Product					0.254
Constant	**5.390**	**4.655**	**3.305**	**3.112**	**10.50**
R-Squared (within)	**0.0029**	**0.0007**	**0.0570**	**0.0546**	**0.0544**
Model P-Value	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
Number of Observations	**72,004**	**72,032**	**60,731**	**60,797**	**60,731**

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

In Model 1, all significant coefficients on district dummy variables are negative apart from Central Karoo, Pixely Ka Seme, and Bojanala district municipalities. The Model 1 results imply that individual SWB is significantly positive for individuals located in Central Karoo, Pixely Ka Seme, and Bojanala relative to individuals located in the uMkhanyakude district municipality. SWB remains significantly negative for individuals located in Amathole, Chris Hani, uThungulu, Zululand, and Mopani relative to individuals located in the uMkhanyakude district municipality. The estimated results in Model 2 show that individual SWB is significantly higher in NW as opposed to KZN, and that individual SWB remains lower in EC and LM relative to KZN. Models 3 to 4 show similar results reflected in models 1 to 2, with some adjustments in the significance levels for both district municipalities and provincial regions. In summary, the estimated coefficients on the FE estimate are, to a limited extent, consistent in finding differences in individual SWB across the district and provincial levels.

Lastly, as mentioned in the methodology section, SWB is determined by factors at different levels. A problem that is defined by the relationships between the variables measured at a number of different hierarchical levels is a multilevel problem (Gorard, 2007). Also, the data used in this chapter stem from a two-stage sampling design, where in the first stage the primary units (countries) are sampled and then a random sample of secondary units (individuals) is taken. A single-level equation or a panel-data analysis with random or fixed effects is therefore not adequate because it does not allow for different slopes. The single-level equations fail in recognising the hierarchical structure of data, which limits inferences and the standard errors of the regression coefficients will be underestimated, leading to an overstatement of statistical significance.

Table 3-6 presents the estimation results of the multilevel linear mixed-effects model (MLM). The results of the MLM are based on equation (7), using two model specifications. The study estimates a two-level MLM, where individuals are nested within households (level 1) and households are nested within district municipalities (level 2). Model 1 is the unconditional null model or variance component model with only the constant term in the fixed and random parts. The purpose of the variance component model is to establish whether there is evidence of significant clustering in the data. The MLM estimates shown in Table 3-6 suggest that the estimated between-districts variance is 0.383, while the between-household within-district variance is 4.936. The intra-class correlation (ICC) coefficients indicate that the proportion of the variance in individual SWB that stems from the between-district variation is 5.99 percent, while 83.14 percent of the variance in individual SWB is due to the between-household within-district variation.

Table 3-6: SWB — 2 level Linear-Mixed Effects Multilevel Regression of Subjective Well-Being

Model Estimation	Model 1 (Null Model)	Model 2
Individual Variables:		
Age		-0.029***
Age-squared		0.0002***
Male		-0.052**
Colored		0.099
Indian		1.165
White		0.619
Primary Education		0.037
Secondary Education		0.055
Matric		0.066
Tertiary Education		-0.118
Married		0.191***
Cohabitating		-0.269*
Divorced or widowed		0.111
Good Health		0.232***
Employment Status		
Employed		0.257***
Not Economically Active		0.280***
Household Variables:		
Geographical Type: Urban		-0.172***
Household infrastructure:		
Piped water on site		0.059
Flushable Toilet		0.183**
Electricity		0.199***
Income variables:		
Log of per capita household income		0.275***
Perceived Relative Economic Position:		
Perceived Middle-Third		0.294***
Perceived Richest-Third		0.981***
Perceived Middle Third (2yrs)		0.266***
Perceived Richest Third (2yrs)		0.355***
Perceived Middle Third (5yrs)		0.309***
Perceived Richest Third (5yrs)		0.427***
Regional Macroeconomic Variables:		
Mean District Income		0.715**
Mean District Unemployment		-1.287
Mean District Regional Domestic Product		0.126
Constant	5.308***	11.657***

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-6 (continued): SWB — 2 level Linear-Mixed Effects Multilevel Regression of Subjective Well-Being

Model Estimation	**Model 1 (Null Model)**	**Model 2**
Random-Effect Parameters:		
Var (District)	0.383	0.108
Var (Household)	4.936	4.431
Var (Residual)	1.078	0.975
Interclass Correlation (ICC):		
Districts	0.059(0.012)	
HH| Districts	0.831(0.004)	
Log-likelihood	-1.908e+08	-1.574e+08
Number of Observations	71,943	60,731
AIC	3.82e+08	3.15e+08
Wald Chi2	-	**3458.72**
Model P-Value	-	**0.0000**

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec EasyData.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

The ICC estimates suggest that two-level multilevel modelling is the appropriate estimation technique, as opposed to a single-level equation. Values of the ICC that are greater than 0.5 imply that there is significant clustering in the data, and the higher the ICC the greater the level of substantial clustering (Shifa & Leibbrandt, 2018). In addition, the estimated variance of the SWB measure at the district level is relatively low compared to household variance. This implies that most of the variation in SWB is attributed to household-level variations.

Notably, Model 2 is the full model that augments Model 1, by controlling for observable characteristics and level predictors that occurs at the group level (macroeconomic variables). The variance at both the district and household levels is reduced, suggesting that the observed control variables are critical in determining SWB. The coefficient of age (quadratic), race (relative to females), marital status (relative to single), educational attainment (relative to no schooling), income and economic rung, employment, and health status have all the expected signs that are consistent with empirical evidence (Blaauw & Pretorius, 2013). This includes the rates for average household income, gross regional product, and unemployment. All level three predictors have the expected signs but are insignificant in determining individual SWB.

Overall, the findings of this study need and deserve to be further examined because they are crucial for the understanding of the economic gains reducing individual differences in SWB across regions. Understanding what makes individuals more satisfied with their lives – and the society as a whole – enables the effective use and allocation of scarce resources in a more efficient way. The major strengths of this study include the use of a large, nationally representative sample and the analysis that takes into consideration the hierarchical nature of the data by using MLM analysis and controlling for important confounders of SWB.

3.6 Conclusion

In this chapter, the study examines differences in SWB across regions of South Africa (SA). These regions include 52 districts municipalities and nine provinces of SA. The study makes use of life satisfaction scores from five waves of the nationally representative longitudinal NIDS data to measure the level of SWB. The NIDS data is the first national household panel study in SA that contains information on SWB and other rich socioeconomic information such as poverty, income inequality, human capital, labour market, and social factors. This dataset is used along with EasyData from Quantec, which contains information on the average household income, unemployment level, and gross regional product, all measured at the district and provincial levels.

The study makes use of a combination of POP, OLS, panel FE, and MLM to ascertain whether individual SWB differs across regions of SA. The finding from the estimation suggests that regions are significant determinants of individual SWB and that SWB differs across regions. This finding confirms previous empirical evidence that geographical regions are significant in determining individual SWB (Ferrer-i-Carbonell & Gowdy, 2007; Brereton et al., 2008; Knight & Gunatilaka, 2010; Morrison, 2011). Moreover, some regions contribute higher to SWB than others, such that the variation is observed across provinces, district municipalities, and urban-rural regions. At the district level of analysis, the study finds that, after controlling for all observable predictors of SWB, individuals living in high-income regions have higher SWB levels than individuals in low-income regions. The coefficients on most urban and formal rural districts are significantly positive and higher in magnitude than uMkhanyakude district municipality. In contrast, these findings suggest that individuals living in any of the three major metros (Cape Town, Johannesburg, and Durban) are more satisfied than individuals living in the uMkhanyakude district.

Likewise, the regional difference observed across the district municipalities is not different from the observed differences found across provinces of SA. The findings show that individuals living in the major provinces in terms of population, industrialisation, and economic contributions are more satisfied than individuals living in KZN. As a result, high-income provinces are likely to attract individuals from other regions, and the expectation is that push factors drive individuals to migrate to better-off regions. Consequently, this implies that factors such as industrialisation, urbanisation, and economic contribution are critical in determining individual SWB. Low levels of individual SWB in low-income regions are likely to be influenced by poor standards of living. One potential explanation for this effect is that living in a region with poor standards of living might decrease one's aspiration levels, which in turn may reduce individual SWB due to comparison effects that individuals may observe in economically thriving regions (Ulbrich et al., 2019; Nijman & Wei, 2020; Tonkiss, 2020).

Consequently, regional disparities in individual SWB raise equity concerns, as they are likely to reflect the overall within-country inequality. They can be linked to the inequality of opportunity, as measured by, for example, intergenerational mobility. The differences in SWB across regions may also reflect adverse effects of economic efficiency, as limited economic opportunities for those stuck in the wrong regions leads to the underutilisation of potential, which constrains overall growth and individual SWB. More broadly, regional disparities in individual SWB, including urban-rural differences, can fuel social tensions and pathologies (Case & Deaton 2020), promote political polarisation (Taylor, 2011), increase populism and resentment towards urban elites (Rodríguez-Pose 2018), threaten countries' social fabric and national cohesion, and in extreme cases lead to conflict, particularly where the disparities reinforce existing racial, ethnic, linguistic, or religious divisions.

Therefore, policymakers may want to consider policies that impact socioeconomic conditions as well as community attachment, values, culture, customs, and tradition (Burger et al., 2020; Hoogerbrugge & Burger, 2021). Some of these policies are linked to the social determinants of SWB, the study contends that the measurement of SWB and living standards is at the core of place-based policy. It also contends that the government should champion community attachment (Tsurumi et al., 2019), culture (Puntscher et al., 2015), customs (Wang & Wang, 2016), and traditions (Mouratidis, 2021) through policy in a way that is in line with the values of the people. In general, this is likely to impact the quality of life, particularly in urbanized regions, hence, reducing the burden of inequality, considering the historical context of the country.

Chapter 4:
The effect of conspicuous consumption by others on individual subjective well-being in South Africa

4.1 Introduction

South Africa (SA) is regarded as the most economically unequal country in the world[18] (World Bank, 2019). The country's horizontal inequality, in particular across race, can also be traced through the composition of the economic strata and resources, whereby the lower class is characterised by the poor African[19] race group with limited access to opportunities and resources (Nattrass & Seekings, 2001; Seekings, 2011; Omotoso & Koch, 2018; Meiring et al., 2018; Mpeta et al., 2018). The impact of these prevalent economic disparities gives rise to social hierarchies within and across groups (Bhorat & Van der Westhuizen, 2012; Leibbrandt et al., 2012; McLennan et al., 2016). For example, the presence of economically successful neighbours affects the perceived social status of individuals who care about their relative economic position (Darity & Nembhard, 2000; Luttmer, 2005; Omotoso & Koch, 2018). In social groupings, economic success may or may not be conspicuous, and those who have achieved success may or may not believe that their social status is elevated as a consequence. However, for the perceivers (or onlookers/their neighbours) – with incomplete information – it can be that they perceive themselves as better or worse than their neighbours. In this case, class identification based on status becomes the primary source of social division across social groups (Lokshin & Ravallion, 2005). This has an economic implication, since individuals will try to keep up with their peers or reference groups by consuming conspicuously.

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[18] The World Bank Report suggests that SA's Gini Coefficient stands at 63%, the highest in the world. According to the report, labor market incomes are the largest contributor to inequality in South Africa, contributing more than 90 percent of the overall Gini coefficient between 2006 and 2019.
[19] Mpeta et al. (2018) provide insight on Black living standards before and after democracy. The Blacks are indigenous and Bantu-speaking people. Their living standards are noted to be poor before democracy, while some progress has been made after democracy. However, within-group differences further show that inequalities have been widening the most among Black South Africans.

The implication arises when individual subjective well-being (SWB) is affected by the conscious consumption of others. Conspicuous consumption is seen as an act of “keeping up with the Jones”, especially among the least well-off subgroups (Frank, 1985; Christen & Morgan, 2005; Frank, 2007). This is an indication that, through expenditure patterns, the consumption of high-income earners affects those just below, which in turn affects those further below (Frank et al., 2014). In general, this action causes prevalent unhappiness among the least well-off subgroups. On the one hand, the observation of the consumption of others which is over one’s means can signal an income/economic divide which may, in turn, result in feelings of inadequacy/discomfort. However, this is provided that such consumption is something that the individual even aspires to (not everyone is driven/influenced in this way). On the other hand, the observation of such conspicuous consumption can motivate behavioural change – the drive to improve one’s circumstances or perhaps the removal of oneself from ‘experiencing’ the conspicuous consumption of others (O'cass & McEwen, 2004).

SWB is a reflection of general well-being based on one’s perspective (Grzeskowiak & Sirgy, 2007; Diener et al., 2010; Bhattacharjee & Mogilner, 2014). However, there remains limited research on how individual SWB is affected by one’s own conspicuous consumption and that of others. Most studies emphasise own conspicuous consumption, but, in this study, the emphasis is on the conspicuous consumption of others. Notwithstanding the growing importance of absolute conspicuous consumption in all parts of the world, conspicuous consumption by others is more important to the study of SWB (Zhang & Merunka, 2015). This is because growth in the material economy has the potential to increase wealth and prosperity, but individual consumers also use material consumption to intensify 'positional' competition among themselves (Clark & Oswald, 1998). This is an attempt to improve their social status, prestige, and relative standing, neglecting the effect it has on individual well-being (Carlsson et al., 2009; Linssen et al., 2011).

Therefore, the question remains on whether economic activities only add to social, economic growth and SWB, and whether the vice of vanity, translated into ostentatious or conspicuous consumption by others, should be welcomed as a force for good for SWB (Perez-Truglia, 2013). The debate is inconclusive, particularly in the SA context. Many free-market economists argue that there is no case for intervention on issues relating to ethical, moral, or economic grounds against the legitimate activity of a status-seeking consumer (Cole et al., 1995; Heffetz, 2011). However, this assertion is disputable if status-seeking consumption by others affects individual SWB. Furthermore, disagreements may arise as to how the demand for status goods could be redistributed or characterised into more productive areas of consumption. The significance of modern-day ostentatious consumption is not in dispute, as there is still controversy over the degree to which such economic behaviour should be managed. Part of the concern may be that perpetual perceptions of inadequacy and inequality that are reinforced by obvious and blatant excess (particularly if this excess is transparent along other conventional lines of divide – race, gender, class, etc) can impact mental (and physical) health, affect the general social conscience, have a negative societal impact (criminality, violence, etc), but also drive social change. As a result, conspicuous consumption may potentially create economic consequences for the future, as the demand for conspicuous consumption goods continues to draw out significant resources from the economy (Nelissen & Meijers, 2011). Therefore, public policy proposals are to be reconfigured to be cognisant of status consumption and conspicuous waste.

This study seeks to assess the effect of conspicuous spending by others on individual SWB. This is to examine how relative positional aspirations of individuals in their spending patterns affect individual SWB. This study draws from the signalling model of status-seeking (Charles et al., 2009), in testing whether spending on conspicuous consumption can be explained by socially contingent concerns for relative status and how this might affect individual SWB. Drawing from established and more recent literature (Veblen, 1899; Mason, 1983; Bourdieu, 1984; Frank, 1985; Arrow & Dasgupta, 2009), this study is executed under the assumption that conspicuous consumption by others either positively or negatively affects individual SWB.

In addressing the specific aim of the research, the study relaxes two assumptions; firstly, most SWB research explicitly recognises that SWB is affected by individual consumption at all, and individual consumption is implied by the individual's own financial and employment status and/or that of their households (Linssen et al., 2011; Jaikumar et al., 2018). Second, what others spend on can affect an individual's SWB, particularly if the expenditure can be regarded as 'conspicuous' (Frank, 1997). There arise a few challenges in examining the relationship between consumption and SWB. One is bi-directional causality. Individual consumption affects individual SWB, and individual SWB can affect individual consumption (for example, spending in the moment, spending because one is excited/depressed). Two, it brings about multicollinearity concerns when others' consumption is expected to influence an individual's well-being. The bidirectional causality between SWB and one's spending implies that, if spending by others affects SWB, then, in turn, it affects individual spending as well, since individuals spend due to emotions, hence directing their emotions through individual spending. In this case, the pattern implies that others' spending and individual spending will be correlated.

This research aims to relate conspicuous consumption by others within the context of SWB while taking into account other covariates that determine individual SWB. This study complements the scarce empirical research by testing this conjecture using SA household data. Overall, the study contributes to the existing knowledge of socially contingent consumption behaviour that is described by Veblen (1899) and Kaus (2013). However, the research extends the scope by examining the element of positionality as a critical ingredient of effective status-seeking in a less affluent county. The first section of the study deals with the literature and empirical evidence. This is followed by the data and estimation methods. The last part of this chapter presents the results analysis, discussion, and the overall conclusion of the study.

4.2 Literature Review

4.2.1 Foundations of conspicuous consumption

Consumption is a critical part of our existence as individuals, family units, and social beings. At a micro-level, the welfare of the economy is dependent upon it, and it plays a critical role in socioeconomic development, as consumption patterns and size are the concrete embodiment of people's living standards (Tukker et al., 2010). Consumption consists of expenditure on all goods and services (durable and non-durable) purchased by the individual/household to satisfy their needs and wants (Nelson & Consoli, 2010). The consumption of these goods and services is dependent upon a multitude of factors that influence what any individual regards as a baseline in respect of consumption – and not all individuals have the same baseline (or, in some cases, the means to achieve their desired baseline). In most cases, the baseline is often determined by the household's disposable income, while the individual consumer is in pursuit of their economic and psychological utility (Noll, 2015). However, this process is not always influenced by economic or psychological utility, but by social and psychological considerations (Jinkins, 2016). These social and psychological considerations persuade individuals to buy certain goods and services that reflect an ostentatious display of purchasing power, a phenomenon known as conspicuous consumption.

Conspicuous consumption is defined as readily observable consumption (Charles et al., 2009). It has two sides: one, consumers spend conspicuously to signal social status, wealth, class, position in society, to meet expectations (their own or those of significant others, family/society/colleagues). Two, regardless of the intention of the spender, another may view someone's consumption as conspicuous depending on either their actual and/or perceived relative position. Therefore, individuals may spend conspicuously deliberately or unintentionally. That is, even individuals who are not trying to signal anything to anyone (and whose spending aligns with their own 'baseline') could be viewed as spending conspicuously if others perceive their expenditure as conspicuous.

Conspicuous consumption is mostly carried out in close proximities (among neighbours) or in anonymous social settings, portable across social interactions (Frank, 1985). In this way, individuals who consume conspicuously feel pressured to communicate their social status in groups or societies where they are not known in an attempt to signify their relevance (O'cass & McEwen, 2004). While these visible items can be moved from one anonymous group/society to another, nevertheless, the aim to consume conspicuously is linked with the idea that possessing more of these visible goods signals a better economic circumstance or reflects desired social norms/expectations. However, conspicuous consumption is not always conscious and deliberate, as its contingent on the underlying nature of one's preference set to maximise utility. As postulated by the Theory of Revealed Preferences,[20] individual preferences are all unique, with multiple factors influencing the shape and position of the utility curves (Samuelson, 1948).

The foundations and contributions to the phenomenon originate from the works of Veblen (1899, p. 2)[21] and Bourdieu (1984).[22] These were among the first economists to systematically introduce status considerations into the economic theory of conspicuous consumption. They considered conspicuous consumption as a social-differentiating mechanism within and across social interactions (Cole et al., 1995). Conspicuous consumption elicits one's relative socioeconomic standing in the social hierarchy (Hopkins & Kornienko, 2004). Visible consumption belongs to the realm of luxury spending, if luxury spending is contingent on the intention of the spender and on the status of the perceiver. Hence, those disguised as preservers of a privileged

[20] Economic theory of consumer behaviour is built up on the notion of revealed preferences. That is, by comparing the costs of different combinations of goods at different relative prices, we can infer whether a given batch of goods is preferred to another batch. Individuals make a choice among the baskets and their behaviour reveals their preference pattern.
[21] The work by Veblen (1899, pp. 2) provides behavioral insights for conspicuous consumption and this is found in his famous theory of "the leisure class". In his words, "In order to gain and hold the esteem of men, it is not sufficient merely to possess wealth or power. The wealth or power must be put in evidence, for esteem is only rewarded on evidence." Veblen suggested that the only way that one may possibly convey evidence of wealth is through conspicuous consumption.
[22] Bourdieu (1984) describes these consumption practices as those that are aimed at maintaining social relationships of dominance and submission.

minority reinforce their wealth and social superiority through often outrageous levels of conspicuous consumption (Heffetz, 2011).

According to Veblen (1899), not even the ‘‘desolately poor’’ are immune to this positional economic behaviour. The reason being is that individuals compare to one another based on their economic achievements and status. These interpersonal comparisons are critical in one’s human behaviour, as they constitute and convey the individual’s recognition by society (Diamond, 1967). This is owing to the esteem in social groups that provides respect and recognition, and the lack thereof lowers the individual’s self-assessment. Therefore, in pursuit of self-respect, individuals aim to have at least as much as their reference group. Hence, satisfaction is fulfilled by the desire for social recognition (O'cass & McEwen, 2004). In this case, conspicuous consumption becomes a mechanism used to signal a higher socioeconomic position in interpersonal exchanges (Danzer et al., 2014).

4.2.2 The effect of conspicuous consumption and subjective well-being

Interest has emerged on whether SWB, especially in developing countries, is affected by conspicuous consumption, as has been demonstrated to be the case for wealthier developed countries (Solnick & Hemenway, 1998; Bogaerts & Pandelaere, 2013). Differences in spending patterns are a result of social interactions with one’s own reference group (Khamis et al., 2012). In emerging economies, social interactions shape consumption expenditures as one tries to improve one’s relative standing (Binder & Pesaran, 2001). In less affluent social groupings, demonstrating one's socioeconomic standing increases the demand for the status-bearing object from peers (Case et al., 2013), while in highly affluent subgroups, individuals become more concerned but motivated by positional concerns. Hence, they do not passively accept their relative economic rank but instead consume conspicuously to reflect their status, which is just “keeping up with the Joneses” (Mason, 1983). While it is certainly the case that this could be deliberate on the part of the spender, it is also the case that someone with no intention of being deliberately conspicuous is perceived as conspicuous by an observer.

Moreover, this act is explained by value placement towards status. Status is hardwired into human beings (Veblen, 1899). Ideally, conspicuous purchases are made for the direct personal satisfaction that the product consumption offers (Postlewaite, 1998). However, visible purchases that give value to one's relative economic standing (status) provide a higher fitness relative to those that give value only to one's absolute economic standing. In addition, relative status is instrumental to individuals matching with their wealthy counterparts (Carlsson et al., 2003; Luttmer, 2005; Hopkins & Kornienko, 2006). In high-income groupings, the incentive to distinguish oneself from lower-income groupings rises. This effect is persistent in anonymous interactions where individuals frequently interact with one another (Corneo & Jeanne, 2001). Therefore, individuals consume highly observable goods to signal their wealth but impose externalities on others (Moldovanu et al., 2007). For example, the act of consuming conspicuously (again, depending on the observer) does not only affect how individuals evaluate the goods they consume, but it also affects the real benefit that others can potentially gain by consuming conspicuous goods, for example, an increase in the demand for Louis Vuitton bags that is stimulated by conspicuous consumption would drive prices of Louis Vuitton bags, making them relatively expensive to others. Such an influence is an externality – "the cost or benefit" of one person's decision affecting the well-being of others (third party). Hence, competing for status through conspicuous expenditure has the potential to generate positional externalities (Layard, 2006).

In the positional context, the nature of competition and activity in the economy is complex. Contrary to the adverse context, the so-called positional goods are desired not only for their social prestige but also because they add, at the same time, to the security, prosperity, and longer-term socioeconomic advancement of a household (Davis, 1992). Competition for status-conferring employment, occupation, and for private-education advantages at all levels (primary, secondary, and tertiary) are examples of such prosperity that positional activities provide (Fennis, 2008).

Examples of conspicuous consumption for employment, among others, include employment benefits such as income, medical aid, car allowance, subsidies, and travel opportunities (Philip et al., 2021). Job occupation examples include sectoral advantages, e.g., expensive suits, gadgets, and vehicles that are often possessed by white-collars and football stars (Law et al., 2021). The type of education that parents choose for their children can signify conspicuous consumption, e.g., private schools that are classified in the International Education System (IES) signify conspicuous consumption, as students that attend these schools are most likely to come from families that are high in terms of socioeconomic rank (Cedeño et al., 2016).

While the perception of these products is an individual and self-centred process, the effect of the consumption behaviour on other people remains pivotal (Noll & Weick, 2015). The notion that consumers are not greatly influenced by the consumption patterns of “relevant social groups” in their social environment has not been sustainable. As discretionary incomes have risen, consumer expenditures have increasingly reflected society’s growing preoccupations with identity, style, and with a social relative standing and prestige based, in a large part, on the conspicuous consumption of status-conferring goods and services that affect SWB (Friedman & Ostrov, 2008). Indeed, the role that marketers, influencers and media (social and other) have to play here cannot be understated. Therefore, satisfaction drawn from consumption is dependent upon the gap between actual levels of consumption and a comparison benchmark (Senik, 2009). Benchmarking is generally categorised to be internal and external. The internal benchmarks relate to a set of aspirations and comparisons with one’s own income or consumption at different points in time (Linssen et al., 2011). In contrast, the external benchmarks relate to the consumption levels of significant others with whom one has daily interactions, such as family, neighbours, and friends. Both internal and external benchmarking affect SWB interdependently.

Additionally, positional concerns for status impose social limits on economic growth. Resources are diverted into satisfying positional concerns relative to basic needs (Oswald, 1997). Competition for status and relative social standing is a zero-sum game, holding constant the utility gained from consuming conspicuously (Solnick &

Hemenway, 2005). Striving for social status and esteem can increase consumption, and effort in productive activities, while demand for social status may divert resources (Frank, 2005). Hence, it would be interesting to know the value-add of conspicuous consumption on the overall SWB. Additionally, encouraging competition for socially conspicuous goods when economic resources are finite, produces crowding and congestion. This destroys the social value at considerable economic, environmental, and social costs to the SWB of the wider community (Sarracino, 2008).

In a more intelligible way, spending on conspicuous consumption potentially crowds out spending on instruments for reducing poverty and inequality (for example, health and education) (Eggoh et al., 2015). This diminishes their chances (those in lower socioeconomic standards) of improving their socioeconomic status that increases with SWB (Hudders & Pandelaere, 2012). This implies over-proportioned conspicuous consumption is likely to distract saving commitments needed to realise investments in the future. This results in the misallocation of resources, resulting in decreased levels of SWB (Linssen et al., 2011). This holds if status goods are preferred at the cost of basic social needs (Adler, 2012; Winkelmann, 2012). Hence individuals trade-off the consumption of basic needs in exchange for conspicuous goods in an attempt to compare themselves to others, thus judging how well they are doing (Festinger, 1954). In contrast, it should be noted that the conspicuous consumption market still exists, and there is demand that creates employment arising from the sale of conspicuous goods and services. One question is, how are profits concentrated in such markets? The value chain ranges from production, marketing, and sales to increased income and expenditure (Krähmer, 2006). Also, is conspicuous consumption self-enforcing or is it a mechanism to maintain social prestige? The extent to which conspicuous consumption is self-enforcing or directed towards social prestige is dependent on how it is perceived and how individuals compare themselves with one another.

4.2.3 Theoretical framework

In standard economic theory, it is generally assumed that people always behave in a way that maximises their utility such that the individuals' observed choices (revealed preferences provide enough information for economists to make inferences on their consumption behavior (Frey & Stutzer, 2002). In other words, individuals are assumed to make decisions that derive satisfaction. According to the Utility Theory,[23] individuals express their preferences over a bundle of commodities. These bundles are ordinally ranked based on preferences, and the resulting utility function is constructed to reflect the order. Therefore, an increase in the individuals' utility is related to the attainment of the preferred bundles. Thus, rational consumers pursue utility maximisation, among others, constrained by their budgets. In this case, the individual's objective is utility maximization given their budget constraints (needs are unlimited, and resources to satisfy them are scarce) (Belk, 1985). However, the behaviour of individual consumers is influenced by much more than just utility maximisation. Consumers consider factors such as the price of the product, the quality, functionality, value placement, and the status derived from the consumption of the product. When these considerations are made, then some level of utility, in particular, that of psychological utility,[24] is derived (Pettit & Sivanathan, 2011).

One possible misconception when predicting this consumer behaviour is that the buyer makes the decisions entirely based on his own needs (Vigneron & Johnson, 1999), whereas individuals observe the consumption of their peers before making purchase decisions. The comparison is two-fold, upward (favourable) and downward (unfavourable), and the upward comparison occurs faster by default because of self-evaluation purposes (Drèze & Joseph, 2009). As a result, individuals who are lower in terms of possession try to "keep up with the Jones" by attaining and publicly displaying the same level of possessions as those who are better off (Ordabayeva & Chandon,

[23] Fishburn (1970) gives a detailed overview on the foundations of utility theory.
[24] See, Kahneman & Krueger (2006). The authors provide a detailed analysis of the usefulness of SWB in measuring consumer preferences and social welfare.

2011). This process temporarily affects SWB, as people quickly adapt back to hedonic neutrality (Diener et al., 2009; Lee & Shrum, 2012).

According to the Hedonic Treadmill Theory,[25] individuals put effort into maintaining the relative ‘‘status’’ quo as if they are running on a treadmill (Frank, 1985). Underlying the idea that individuals do not only keep up, but they have to maintain the status quo; hence individuals have to run faster on the treadmill (Richins & Fournier, 1991). In this case, the stubbornness to consume conspicuously is fuelled by the irrational idea that everybody can outperform everyone. Hence, as pointed out by Hopkins & Kornienko (2004, 2009), high-income equality enhances social competitiveness, thus making it necessary for individuals to outperform one another. Therefore, running on the positional treadmill results in lower levels of SWB, since consuming conspicuously only temporarily affects SWB, as individuals quickly adapt back to their hedonic natural set-point (Helson, 1948, 1964).

Although this theory (relating to SWB) has gained widespread acceptance, Diener et al. (2009) make five important revisions to the model. The first is that individuals’ set points are not hedonically constant, in a sense that a person’s moods change in response to good and bad experiences but return quickly to neutrality. The setpoints are defined by genetics, habits, emotions, and psychological states of mind, which characterise the baseline level of satisfaction (Headey, 2008). Therefore, both good and bad experiences become transitory. Second, set points differ according to the individual’s personality traits. Third, individuals have multiple set points from different components of SWB such as negative and positive affects, and life satisfaction. Fourth, and perhaps most critical, is that SWB setpoints can change under different circumstances, but individuals eventually adjust to their natural setpoint. Unless otherwise, it is a life-changing circumstance that brings about an overall change in the natural setpoint of SWB. Fifth, individuals differ in their adaptation or response to

[25] The Hedonic Treadmill Theory is an adaptation-level theory used for subjective well-being studies. According to Brickman & Campbell (1971), the hedonic treadmill model suggests that bad and good situations temporarily affect subjective well-being, as individuals eventually adapt to their hedonic neutral position.

events and circumstances. This is also likely nuanced by, first, whether or not people respond/adapt at all. Second, what is the magnitude and direction of such adaption? Third, whether or not such adaption is linear or non-linear over time. Fourth, whether or not response/adaption is immediate or delayed.

According to Self-Determination Theory (SDT),[26] this human behaviour is driven by two types of motives, namely, intrinsic and extrinsic motives (Milyavskaya & Koestner, 2011). The intrinsic motives are derived within the individual, rather than from any external factors. Intrinsic motives are internal factors such as background, genetics, and personality (Reiss, 2012), while extrinsic motives are derived from sources that are external to the individual (Deci & Ryan, 2000; Ryan & Deci, 2000). Extrinsic motives are driven by factors such as action based on incentives, ego, sense of importance, altruism, and expressions of self and identity (Bénabou & Tirole, 2003). Behaviours that are driven by intrinsic motives are positively correlated to the individual's SWB, whereas those driven by extrinsic motives damage one's SWB. This principle was applied by Shrum et al. (2014) in examining consumer behaviour. Therefore, the proposition formulated is that consumers' materialistic consumption is driven by either intrinsic or extrinsic motives. Therefore, the intrinsic-signalling motive is related to visible meanings linked to a materialistic possession of oneself, directed at fulfilling obligations that are of internal value to the individual, while extrinsic-signaling motives are related to showing meanings linked to materialistic consumption and signaling of wealth (Sirgy & Lee, 2006).

Depending on whether the perceiver views this as such, materialistic consumption driven by extrinsic-signalling motives negatively affects SWB. This is because individuals that value materialistic consumption have a strong sense and tendency of using status goods to signal their socioeconomic level in the income strata (Hudders et al., 2013; Kastanakis & Balabanis, 2014; Chan et al., 2015). Such individuals have a preference for and engage in other-signalling behaviours. Ultimately, they bear the

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[26] A comprehensive analysis and application of the theory is provided for by Ryan & Deci (2000), where they examine the effect of the theory in relation to intrinsic motivation, self-development and well-being.

negative consequences of other-signalling forms of conspicuous consumption (Frijters & Leigh, 2008).

According to Frank (1985),[27] imposing a consumption tax on luxury conspicuous consumption categories that pose significant external negative effects on others will to a certain extent correct the distortions. The idea is that consumption tax on these goods/services would engineer changes in the pattern of demand for status-linked goods. This will help mitigate against consumer aspirations that seek to improve their social-economic standing through the conspicuous display of status goods (Heffetz & Frank, 2011). Nevertheless, Mason (2000) has raised several questions regarding the implementation and effects. First, there is no certainty on who and what would determine categories deemed sufficiently negative in their effect on others. In addition, there is no certainty on what would happen to those that display their success and wealth in a manner that is of direct benefit to the society at large. Second, a punitive tax would effectively increase the price of the conspicuous good/service in question, and this would, paradoxically, increase its attractiveness to status-seeking individuals. Lastly, it raises the risk of a recession and unemployment along the value chain if demand is successfully and significantly reduced. Therefore, the alternative proposition is to change public attitudes toward status. Policies should prioritise widening the distribution and availability of status goods to drive down prices associated with status-bearing, socially exclusive, premium goods and services.

[27] This argument is in line with the view that progressive consumption tax has a potential to precisely change incentives in more desired ways. The proposal for a consumption tax will raise the spectre of forbidding complexity—of citizens having to save receipts for each purchase, of politicians and producers bickering over which products are to be exempt, and so on.

4.2.4 Empirical Evidence

4.2.4.1 Conspicuous consumption in developed and developing countries

The quest for conspicuous consumption, the accumulation of income, and wealth takes a central place in the lives of many consumers (Ger & Belk, 1996; Kasser & Ahuvia, 2002). As observed in various developing countries (Podoshen et al., 2011), the phenomenon is counter-intuitive as individuals consuming conspicuous goods can be unaware of their action, and also its effect on others depends on how they perceive the action. Also, classifying what constitutes conspicuous consumption is an empirical task, and it depends on data availability. It varies across countries and economic regions, since consumption activities rely heavily on preferences, norms, and culture. Research in this field has gained wide acceptance, particularly in developed countries. In the United States (US), Charles et al. (2009) examine the phenomenon across races using expenditure data from the Consumer Expenditure Survey (CEX). The authors define conspicuous consumption as readily observable goods that communicate information about economic status. The authors categorise the conspicuous-consumption basket from spending on clothing, accessories, such as jewellery and watches, and personal care. The authors show that Blacks and Hispanics devote higher shares of their expenditure on conspicuous consumption comparable to Whites. They also show that consumption expenditure on visible goods (cars and clothing) is negatively correlated with the mean income in their area of residence. This suggests that if the mean income of the resident rises, then conspicuous consumption would fall.

In the context of reference groups, this is in contrast to the findings by Kuhn et al. (2011), who offered related evidence on the link between conspicuous consumption and reference-group income. They examined the effect of a lottery in the Netherlands, which awards prizes to every ticketholder in a randomly selected postal code each week. The results show that, when a higher proportion of households is winning the lottery in one postal code (thereby increasing average income in that postal code), then the non-winning households in that neighbourhood alter their consumption in favour of highly conspicuous goods (for example, expensive cars and major exterior home renovations). These opposite findings between Charles et al. (2009) and Kuhn et al. (2011) signify the idea that individuals in different countries have different items of preferences, norms, and culture. Therefore, what is perceived to be true of conspicuous consumption in one country may not necessarily hold in another country. In the US, Heffetz (2011) tests the applicability of conspicuous consumption and the effect of income elasticities. In doing so, he examines thirty-one consumption categories (such as, personal care, jewellery, vacations, insurance, transportation, home care, and religious expenses) using a nationally representative survey among US households and then matches these visible consumption categories with the CEX data on household expenditure. The findings show that high-income households spend larger shares of their income (but not all) on visible goods, and it is consistent with the conspicuous consumption theory. This implies income elasticities hold, as individuals spend more on goods that are visible and lower if not.

In developing countries, conspicuous consumption is driven by two motive forces. One, increased economic growth creates abundant material and resources. Two, social status achieved through abundant resources motivates conspicuous consumption (Bloch et al., 2004). Therefore, individuals want to exude more than status and wealth through their consumption behaviour. In Bolivia, Van Kempen (2004) examines the effect of conspicuous consumption for low-income neighbourhoods. He used Calvin Klein perfume as a conspicuous good that poor households can afford. The findings suggest that, although poor-income neighbours are reluctant to pay a premium on designer goods, they sometimes prefer conspicuous goods over basic needs.

In India, Bloch et al. (2004) used 800 households randomly chosen from five districts of Karanataka State to examine the status-signalling model of wedding celebrations. The authors stress the existence of the highly conspicuous nature of ritual expenditures, specifically that of a dowry during wedding celebrations. The nature of conspicuous consumption during events and ceremonies is also observed in South Africa. Case et al. (2008) used data from the Household Socioeconomic Survey (HSS) to examine the risk associated with household expenditure on funerals. Burial practices and expenses in SA of the Black race have over the years signalled social status, as households, on average, spent an equivalent of a one-year household income to bury their deceased family member or relative. As postulated earlier, one's level of conspicuous consumption is determined by one's peer group. Most Black SA resides in poor communities, and such spending gives them more status relative to others in the community (Lamont & Molnár, 2001). In general, the need to consume conspicuously is higher in poor communities than in rich, and this is consistent with earlier findings by Van Kempen (2004).

Conspicuous consumption is also evident along racial lines. Racial differences in utility preferences constitute differences in conspicuous consumption (Charles et al., 2009). In SA, Kuas (2013) used the Income and Expenditure Survey (IES) to examine this conjuncture of visible consumption spending across race groups. They used a conspicuous-consumption basket categorised by expenditure on personal care, clothing and footwear, jewellery, and cars. The findings suggest that Black and Coloured households spend more on conspicuous consumption relative to White households. Compared to Whites, African households spent approximately 50 percent more on conspicuous consumption. In SA, Burger et al. (2015) conducted a similar study to Kaus (2013), using IES data (2010/2011) administered by StatsSA. The aim is to examine why the vulnerable middle-class exhibit varying priorities. The authors measured conspicuous consumption as spending on clothing, footwear, grooming products and services, restaurants, handbags, watches, televisions and satellite dishes. Consistent with the findings by Kaus (2013), the estimated results suggest that Black and Coloured households spent higher proportions of their income on conspicuous consumption relative to White households. In this case, spending on conspicuous consumption is a result of the legacy of apartheid. Blacks and Coloureds are exposed to opportunities that were previously denied them during apartheid. Therefore, exposure and increased levels of purchasing power are among the factors leading to high levels of conspicuous consumption.

In summary, the empirical evidence reported from both developed and developing countries is consistent with Veblen's (1899) and Bourdieu's (1984) theory on conspicuous consumption. The studies show that conspicuous consumption appears to be socially contingent, and individuals are sensitive about their status and rank compared to their reference group. Also, in line with the literature, conspicuous consumption is measured by expenditure on visible goods that are portable. What is considered conspicuous differs across countries and depends on preferences, culture, and norms. The composition of the conspicuous-consumption basket depends on preferences, culture, and socioeconomic standards. However, there is consensus across all the studies on conspicuous consumption being measured by items such as food, clothing personal and home care, jewellery, and cars.

4.2.4.2 The effect of conspicuous consumption on subjective well-being

Status concerns are a critical feature of an individual's social existence. Mainly because how individuals perceive their life and well-being is, among other factors, affected by how they compare themselves to others (Duesenberry, 1949). The literature suggests that high-income individuals are more satisfied with their life as opposed to low income-income individuals (Cowell & Victoria-Feser, 2002). Relatedly, actions of other individuals, like consuming visible goods, provide a "point of reference" for their own decisions, and this can lead to inefficient market outcomes. In particular, individual SWB is dependent not only on the level of their consumption but also on how that level compares with the consumption of others (Guillen-Royo, 2011). The extent to which conspicuous consumption affects the SWB of others remains under-researched. It is only recently that there has been growing interest in establishing the relationship.

Wang & Wallendorf (2006) used a divergent sample of college students and adults to empirically explore how SWB is linked to the consumption of products that they have purchased. Conspicuous consumption is measured by expenditure on jewellery, business suits, sunglasses, laptop, dress shoes, personal digital assistants, jeans, computers, athletic shoes, backpacks, sandals, sweatshirts, calculators, and a pen. They show that conspicuous consumption negatively affects SWB. They provide two reasons that explain the negative relationship. The first is that visible expenditure reflects an individual’s endless struggle to fulfil extrinsic needs (for example, fame, social comparison). This is against a sustainable way of life, since the quest for extrinsic satisfaction may succeed the quest of intrinsic satisfaction (for example, self-actualisation), which is positively related to SWB (Ryan & Deci 2000; Hudders, et al., 2013). Second, the visible consumption of goods may lead to social rejection. Individuals associated with wealth-orientated spending rather than experiential purchases are considered to be self-centred and selfish by their social interconnections and subgroups (Van Boven et al., 2010). Social interconnection and surroundings are essential to one’s SWB (Vigneron & Johnson, 2004). This is another reason why conspicuous consumption may be unfavourable to SWB. Hence materialistic individuals experience more negative feelings and become less satisfied with their life (Christopher et al., 2007; Kashdan & Breen, 2007). This implies that there are psychological factors that explain why individuals consume conspicuously.

These findings are consistent with Linssen et al. (2011), who examines the effects of relative income and conspicuous consumption on SWB. Their results suggest that conspicuous expenditure negatively affects SWB. Individuals who pursue material or visible goals tend to experience lower levels of SWB (Kashdan & Breen, 2007; Christopher et al., 2009; Miesen, 2009). Individuals spend more on conspicuous goods, hence reducing the likelihood of increasing their SBW. Not only does this negatively affects SWB, but conspicuous consumption is conceived as a waste of social resources, as consumers demonstrate their wealth and status as opposed to consuming necessities that increase with SWB. This then raises an obvious question of why any individual would continue to pursue conspicuous consumption if it negatively affects their well-being. Utility theory is premised on the notion that individuals maximise utility, subject to constraints. If conspicuous consumption, which is a self-directed behaviour (ie, individuals choose what to purchase), has a genuinely negative effect on SWB, this demonstrates that individuals are not always motivated for self-benefit or, perhaps, that there is a disconnect between their wants and needs and the full sense of self and behaviours required to fulfil such.

Research by Hudders & Pandelaere (2011) investigates mechanisms that contribute towards the continued pursuit of materialistic consumption. The authors used a survey collected in 2009 from 584 students to simultaneously investigate the relationship between luxury consumption, materialism, and cognitive and affective SWB. The authors used five material product categories (for example, cars and clothes) and five experiential product categories (for example, travel, entertainment, wine/champagne) that are classified as major products. The authors separate the effect of conspicuous consumption between materialistic and non-materialistic individuals. The results suggest that materialistic individuals consume luxury goods as opposed to non-materialistic individuals. This implies that the impact of luxury consumption on SWB is more pronounced for materialistic individuals as opposed to non-materialistic individuals. Together, these results suggest that materialistic individuals do not only consume more conspicuously, but they also benefit more from it (in the short run). Consequently, materialistic individuals are engaged in their lifestyle, irrespective of the long-term adverse effects on self and society.

As stated earlier, SWB is affected by the difference between one's own conspicuous consumption and average conspicuous consumption in the relevant distribution (Guillen-Royo, 2011). This effect is examined by Perez-Truglia (2013), who uses data from rounds 5 to 19 of the Russian Longitudinal Monitoring Survey (RLMS) to show how the signalling model of conspicuous consumption predicts the consumer's SWB. In measuring conspicuous consumption, they used monthly expenditure on clothing as an observable category and monthly expenditure in food consumed at home as the unobservable category. Their finding suggests that the signalling model of conspicuous consumption indicates that SWB should increase based on the individuals' ranking of observable consumption within the reference group. This finding is consistent with the findings by Jaikumar et al. (2018), who used a panel of 34 621 households from the India Human Development Surveys (2004 and 2011), to examine the relationship between conspicuous consumption and SWB. To classify conspicuous consumption, the authors used expenditure on footwear, personal transport equipment, travel, furniture and fixtures, social functions, maintenance, house rent, entertainment, clothing and homeware, jewelry and ornaments, and recreational goods. The results are in support of the results by Perez-Truglia (2013), as higher conspicuous consumption results in improved SWB, and that effect is higher for households in the bottom of the pyramid.

The commonality regarding the above empirical evidence (Wang & Wallendorf, 2006; Linssen et al., 2011; Hudders & Pandelaere, 2011; Perez-Truglia, 2013; Jaikumar et al., 2018) is, among others, how they measure the direct relationship between conspicuous consumption and SWB. These studies have shown how conspicuous consumption affects one's well-being (direct effect). What is also common across these studies is how they account for positional concerns through reference effects that suggest individual utility is not only dependent upon one's own consumption but also on how that level is affected/compares with the consumption of others (Veblen, 1899). The cause of interdependence has been explored, and the relationship between relative income/consumption and SWB is sensitive to the income measures used (Biswas-Diener & Diener, 2001; Lever, 2004; Arku, 2008; Guillén-Royo, 2008).

In Venezuela, Kuegler (2009) shows that individuals who perceive their income as higher relative to their siblings' income report higher levels of SWB. In South Africa (SA), Posel & Casale (2010) used the NIDS data to examine the effect of individuals' perceptions of income and relative standing on SWB. Their findings are aligned to the findings by Kingdon & Knight (2006), who found that relative income/consumption does appear to affect SWB among high-income individuals. Both findings are consistent with the Easterlin Paradox (Easterlin, 1973) as perceived relative income has a significantly larger effect on SWB relative to absolute income. This is consistent with recent findings by Shifa & Leibbrandt (2018), who argue that relative income matters more in determining SWB as opposed to absolute income. Therefore, individuals feel relatively dissatisfied or deprived if compared to their counterparts, particularly if their reference group is moving upward in the socioeconomic rung (Duesenberry, 1949; Runciman, 1966). While these studies are not attempting to measure conspicuous consumption directly, they are indicative that status hierarchies in society (perceived or actual, as proxied by income) are relevant in predicting individual SWB.

Despite interest in microeconomic theory (Veblen, 1899; Bourdieu, 1984) and the growing reference to the concept in the economic literature (Bagwell & Bernheim, 1996; Mason, 2003), there is surprisingly little evidence that measures the indirect effect of conspicuous consumption by others on SWB. What makes the indirect measure stand out from a direct measure of conspicuous consumption is the presence and size of consumption externalities. That is, conspicuous consumption by others can result in a behavioural choice to be made (ie, consume conspicuously oneself) in an attempt to adjust/influence their perceptions. It is empirical evidence by Winkelmann (2012) that examined the effect of consumption externalities in the context of conspicuous consumption and the SWB of others. The study focused on a specific instance of conspicuous consumption, the purchase and display of luxury cars (Ferrari and Porsche) in Switzerland. The author used data from multiple sources: Swiss Household Panel Data, the Federal Roads Office, and the Swiss Federal Tax Administration. The results from the fixed-effects regression show that an increase in the purchase of luxury cars negatively affects own SWB, while the effect of luxury purchases on the well-being of others is inconclusive.

Moreover, various other characteristics and factors contribute to an individual's SWB. First, the relationship between age and SWB varies. Clark et al. (1994) found a U-shaped pattern, and this finding is consistent with the literature (Seifert, 2003; Hayo & Seifert, 2003). Second, religion positively affects SWB, and the effect varies across religious cultures (Helliwell, 2003). Third, higher educational attainment is associated with higher levels of SWB (Helliwell, 2003). Fourth, individuals who perceive themselves as healthy report higher levels of SWB. Howell et al. (2007) argue that both short-term and long-term positive physical health outcomes are found to be positively related to SWB. Fifth, there is gender variation in self-reports of SWB (Lucas & Gohm, 2000). Arguably, in developing countries (Nolen-Hoeksema & Rusting, 2003), men are happier compared to women, whereas in developed countries, the opposite holds (Tesch-Römer et al., 2008). Sixth, the conventional wisdom holds that absolute income does matter, but relative income significantly matters more (Diener & Biswas-Diener, 2002; Frey & Stutzer, 2002; Luttmer, 2005; Kingdon & Knight, 2006; Clark et al., 2008; Howel & Howel, 2008; Posel & Casale, 2010). Seventh, unemployment is found to significantly lower SWB as discouraged work seekers are significantly worse-off than those who are not-economically-active (Lloyd & Leibbrandt, 2014). Lastly, married and cohabiting people are generally happier than divorced, widowed, and single individuals (Casale, 2015). Overall, while all these factors are critical in determining SWB, it is critical to recognise that they are interrelated with conspicuous consumption. For example, mental health (and health more generally) and one's conspicuous consumption are likely to be correlated. Religion will be correlated with health, one's conspicuous spending, and how one views others' conspicuous spending. Similarly, age will be correlated with conspicuous consumption, or perhaps the influence of conspicuous spending may differ across age groups. Therefore, the elucidation of the transmission mechanism will be critical in the results analysis section.

In conclusion, the existing empirical evidence suggests that conspicuous consumption is categorised by goods and services that signal status (Heffetz & Frank, 2011). What is considered conspicuous varies across countries depending on preferences, culture, and socioeconomic standards. Most studies measure conspicuous consumption using expenditure information on items such as food, clothing personal and home care, jewellery, and cars. When investigating conspicuous consumption, it is critical to consider reference groups. This is because an individual's utility is not only dependent on one's consumption, but also on how their utility is affected/compares to the consumption of others. Therefore, the effect of conspicuous consumption on SWB is direct and indirect. The direct effect is when own conspicuous consumption affects one's own SWB. The indirect effect is when conspicuous consumption by others affects individual SWB. There remains a void on the indirect effect of conspicuous consumption, and the pattern of data attributed to conspicuous consumption by others concerning SWB remains inconclusive.

4.3 Data and Descriptive Statistics

The study uses the National Income and Dynamics Study (NIDS) data from the years 2008 to 2017 (five waves[28]) to examine the effect of conspicuous consumption by others on individual SWB. The expenditure outcomes in the NIDS data are then used to construct a measure for conspicuous consumption in the individual's own household and that of other households. The measurement of conspicuous consumption requires consumption outcomes to be at least highly desired, visible, and observed by others. Hence, the ownership of such goods and services provides a signal or impression that individuals or households consuming such items are, on average, economically better off than their counterparts (Roychowdhury, 2017). Therefore, the study uses monthly expenditure[29] on goods and services consumed by the respondents. In the NIDS data, expenditure information is obtained by asking households to report on monthly expenditure during the last 30 days. The expenditure information is then used to identify categories that are considered highly conspicuous.

Following the work of Charles et al. (2009), Heffetz (2011), and Kaus (2013), this study treats expenditure on personal care, clothing (including accessories such as jewellery), and cars (excluding maintenance) as categories that constitute a basket measure for conspicuous consumption. However, the conspicuous-consumption basket is not explicitly limited to particular products, as each expenditure item in other countries may represent a need or want that may correspond to a different interpretation in SA (Kaus, 2013). Also, there is no absolute or all-encompassing measure for conspicuous consumption, but there are similarities across studies in consumption categories deemed conventional in constructing a basket for conspicuous consumption. The choice of consumption categories that constitute a

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[28] South Africa has 56.5-million people, according to 2017 estimates. The 2011 census puts it at 51.5 million. Black South Africans make up around 81% of the total, Coloured people 9 percent, Whites 8 percent and Indians 3 percent. The NIDS data comprises of 28 226 Continuing Sample Members (CSMs) and this study will restrict the CSMs to only the African race.

[29] The respondent answering the household questionnaire is asked about total household expenditure in the last 30 days for food and non-food items.

conspicuous-consumption basket depends on the objective of the research and data availability.

In this case, the measure for a conspicuous-consumption basket is based on, first, the objective of this research and, second, similarities in conspicuous-consumption baskets that are observed across studies. The notable similarities include expenditure on personal care, homecare, clothing, jewellery, and automobiles. These expenditure categories constitute a somewhat conventional measure for a conspicuous-consumption basket. For example, in Australia, O'cass & McEwen (2004) used a sample survey via a non-probabilistic sample of 18–25-year-old students to examine the relationship between status and conspicuous consumption. The authors delineated items such as fashion clothing and sunglasses as products used in a visible way to signal one's socioeconomic status. The authors argued that the purpose of these categories was to satisfy higher-level hierarchical wants, such as conveying prestige and self-image.

In developed countries like the United States (US), consumption surveys capture conspicuous consumption categories in assessing the depth of inequality and socioeconomic mobility. Charles et al. (2009) also used the survey approach to measure the conspicuous-consumption basket. They randomly surveyed business students from the University of Chicago. Based on the responses provided by the students, expenditure items such as clothing, accessories (jewellery and watches), and personal care are among the most conspicuous goods that signal better economic circumstances in anonymous interactions.

Heffetz (2011) also also used a telephonic survey from a random sample of the US population over a period of 18 years. Readily visible goods, such as cars, cigarettes, jewellery, and designer clothing, are ranked highest. Both studies by Charles et al. (2009) and Heffetz (2011) show similar results. In SA, surveys at this level of disaggregation are unfortunately not available; instead, researchers rely on expenditure information contained in the household data. For example, Kaus (2013) examines differences in conspicuous consumption across race in SA by using the SA

Household Expenditure Survey data. The author used information on expenditure items like personal care, clothing and footwear, jewellery, and cars to construct a conspicuous-consumption basket. As stated before, the definition of a visible consumption basket is not explicitly restricted, as each expenditure item in other countries may correspond to a different interpretation of conspicuous consumption. However, spending on the somewhat conventional categories may still serve as a means to convey information about one's status. This study follows empirical evidence (particularly Charles et al., 2009; Heffetz, 2011; Kaus, 2013) when classifying conspicuous goods.

In line with the existing literature, for the purposes of the empirical analysis in this chapter, conspicuous consumption is therefore defined as the sum of all household expenditure on food, clothing, personal care, jewellery and watches, and cars (Kastanakis & Balabanis, 2014; Jaikumar et al., 2018). The NIDS data provides detailed information on consumption at the household level (with approximately 97 categories). This permits the construction of a measure or basket of conspicuous consumption. Therefore, the conventional conspicuous-consumption basket is given by expenditure on food, personal care (clothing and footwear), homeware (furniture and appliances), jewellery, and expenditure on car instalments and maintenance.

Table 4-1 provides a list of categories used in this study to construct the conspicuous-consumption basket. The choice of the categories is informed by the existing empirical literature (Kruger, 2002; Chipp et al., 2011; Heffetz, 2011; Linssen et al., 2011; Kaus, 2013; Friehe & Mechtel, 2014). The assumption underlying the composition of this conspicuous expenditure measure is critically based on two assumptions. First, is the idea that these items are readily observable or visible by others. Second, depending on awareness (whether the person consuming is aware or not), observers form the impression or perception that individuals who consume more of these items are economically better off, relative to those who consume less of these items. The items listed in Table 4-1 are applicable in both close and far proximity, and this makes it feasible for the study to observe the effect of reference groups. Household food consumption, clothing, asset holding (cell phones, car ownership, and homecare) and jewellery are all positive predictors of individual SWB (Neff, 2007; Howell & Howell, 2008; Sulemana et al., 2019). The consumption of tobacco negatively affects SWB due to its hazardous effects on health (Rashied & Wilmans, 2020).

Table 4-1: Conspicuous Consumption: Expenditure Categories (Conventional)

Variable	Descriptions
Household food consumption	Non-alcoholic food expenditure items for the four main socio-economic sub-segments.
Clothing and footwear	Clothing and footwear, that represents a person's class affiliation.
Furniture and homeware	Range of furniture times, homeware and accessories that are visible.
Car instalments	Total car instalment expenditure of the household in the last 30 days.
Tobacco	Fraction of total household income spent on cigarettes.
Cell phones and telecoms	Cell phone, telephone, Wi-Fi and other related expenses.
Jewelry	Conjures the image of glamour and wealth, reflecting socioeconomic status.

Source: National Income Dynamics Study (2008 to 2017).

Although the classification of the visible consumption basket follows that of Charles et al. (2009) and Heffetz (2011), it is reasonable to provide an extended measure in line with SA realities. This study creates a second conspicuous-consumption basket that extends from the conventional conspicuous consumption measure to consider SA realities on expenditure categories that distinguish individuals in terms of their socioeconomic class. The extended conspicuous-consumption basket expands the conventional measure by accounting for additional expenditure categories, such as swimming pools, gifts, baby food, restaurants (this expenditure not included in the food expenditure category above, for example, takeaways), entertainment (such as cinema, music, MNet, and DSTV), sporting (gym and club membership), weddings and funerals[30] (particularly by the Indian and African races). This includes lobola (in the Zulu culture) payments that are based on a Zulu idiomatic expression that “the beauty of a man is judged by the number of cows possessed in the household kraal”, thus asserting wealth (Posel et al., 2011; Khomari et al., 2012). Funeral policies or burial societies are no exception from expenditures on ceremonies, as individuals

[30] See Case et al. (2008) for a more comprehensive overview of such practices in South Africa.

spend the equivalent of a year's income on adult funerals, measured at median per-capita African (Black) income (Case et al., 2013). To provide more context concerning SA realities, Table 2 provides an extended list of conspicuous consumption items. These are among consumable goods that distinguish one's relative economic position from contiguous but yet anonymous interactions. It would be interesting to iteratively determine which of the two bundles is critical in determining SWB.

Using the above information, Figure 4-1A (see Appendix) depicts the average distribution of the conspicuous consumption categories. As expected, individuals, on average, spend the most on visible items such as household food, car instalments and maintenance, and ceremonies. Household food consumption is determined by, among others, the standards of living. It differs in the structure and pattern of food expenditure dependent on the household's characteristics and habits (Charles et al., 2009). In the context of conspicuous consumption, it resembles symbolic values that successfully reveal identities as it demonstrates preferences and where individuals belong within the society. According to StatsSA (2021), poor households spend 34 percent of their total household expenditure on food consumption, while non-poor households spend 10 percent of their total household expenditure on food consumption. In contrast, there are distinct differences in the food items that the poor and non-poor households' purchase. Poor households spend on starch meals (rice, bread, and maize), while non-poor households spend on healthier items. Accordingly, the variation is defined by income and signifies the household's socioeconomic position. Barauskaite et al. (2018) argue that these consumer preferences on food consumption, in particular, healthy food, are not only driven by not only health-related factors but social and hedonic motives (Zaharia & Gogonea, 2019). Hence, the social and hedonic motives drive the need to consume conspicuously.

This behaviour is also related to car purchases and instalments, as individuals may be motivated to purchase luxury cars to reflect their income and wealth status compared to their peers. Fundamentally, the automobile industry is critical to the SA economy (Ambe & Badenhorst-Weiss, 2011). The industry comprises the largest manufacturing sector in the world, with an output equivalent to that of the world's sixth-largest economy (Black et al., 2017). While the industry is key in SA's economy, it is also of increasing significance in producing status cars (Gokhale et al., 2021). This has prompted interest in these cars, especially luxury cars, which bring satisfaction through consumption and status-seeking behaviour. Hence, the satisfaction that results from such a purchase, and that is arguably a major reason to pay extra for these cars—their purchase promises satisfaction. Di & Su (2021) find that this behaviour is particularly strong among consumers living in low-income neighbourhoods that comprise high-income inequality. Therefore, these luxury cars bring about much more happiness than economical cars, say a Toyota Corolla or a Honda Civic. While this notion is true in some cases, it can also be observed that purchasing a car is a key financial decision for most people, as it is the single largest purchase (after housing).

Expenditure on ceremonies is no exception, as Africans and Indians partake in various traditional and religious practices, as they signify their identity, which by and large defines their proportional expenditure on ceremonies (Bennett & Levy, 2018). These festivities are regarded as important social and religious occasions, reflecting the social standing of the deceased and their families (Matanzima & Saidi, 2022). This information is critical in developing a measure for conspicuous consumption. Therefore, the study makes use of all the variables presented in Tables 4-1 and 4-2 to create a conventional and an extended conspicuous consumption measure. In doing so, conventional conspicuous consumption is measured by taking the sum of all household expenditures listed in Table 4-1. The extended conspicuous consumption measure is calculated by taking the sum of all household expenditures listed in Table 4-2.

To a certain extent, consumption expenditure is often determined by household income, and the latter depends on various factors, i.e., human capital investment, health, inequalities, and economic growth. Income is spent on goods and services from which individuals derive utility (Cummins, 2000). This implies income affects SWB through consumption expenditure (whether visible or not) that is driven by the desire to fulfil necessities. Any improvements in expenditure are attributable to a stimulus in the demand for goods and services, and that stimulus is caused by an increase in income levels (Friedman, 2018). Therefore, this implies a clear relationship between income and expenditure, and the direction of the trend shapes conspicuous consumption. Figure 4-1 presents a cumulative distribution function of household income, expenditure, and conspicuous consumption.

Table 4-2: Conspicuous Consumption: Expenditure Categories (Expanded)

Variable	Descriptions
Household food consumption	Non-alcoholic food expenditure items for the four main socio-economic sub-segments.
Clothing and footwear	Clothing and footwear, that represents a person's class affiliation.
Furniture and homeware	Range of furniture times, homeware and accessories that are visible.
Car instalments	Total car instalment expenditure of the household in the last 30 days.
Tobacco	Fraction of total household income spent on Cigarette.
Cell phones and telecoms	Cell phone, Telephone, Wi-fi and other related expenses.
Jewellery	Jewellery that conjures glamour and wealth, reflecting socioeconomic status.
Swimming pool maintenance	Representative of a lavish lifestyle in a high-end neighbourhood.
Expenditure on gifts	Items that express gratitude, and they are conspicuous in their absolute terms.
Baby food consumption	Expenditure on baby food.
Restaurants and takeaways	All food dispensed for immediate consumption outside home.
Ceremonies and rituals	Wedding, funerals, and rituals expenses as a reflection of one’s relative standing.
Lobola expenditure	Gifts to the parents of a bride, usually in the form of cash or livestock.
Gym and sporting activities	Type of membership and related expenses.
Holiday and related leisure	Includes holiday related expenditure on the trip, accommodation, and leisure activities.
Entertainment and related leisure	Particularly catering, movies, arts, and theatrics performances.

Source National Income Dynamics Study (2008 to 2017)

Figure 4-1 depicts an empirical cumulative distribution function (ECDF) of logged per-capita household income, expenditure, and conspicuous consumption. The ECDF is an ascending function, starting from the minimum to the maximum values of logged (to normalise the distribution) per-capita household income, expenditure, and conspicuous consumption observed for each individual in the dataset. Panel A shows the distribution of per-capita household income and expenditure. As expected, both income and expenditure exhibit a similar trend (see Figure 4-6D in Appendix B) in line with the literature that postulates a relationship between income and expenditure (Chung & Choe, 2001). The positive relationship is consistent with SA findings by

Kaus (2013), who found that expenditure (particularly on food) is an increasing function of income and family size. Although a positive relationship is observed, there are marginal differences between the two distributions. The ECDF of per-capita household expenditure lies to the left of per-capita household income distribution as a fraction of income is spent on savings and investments (Habanabakize, 2021).

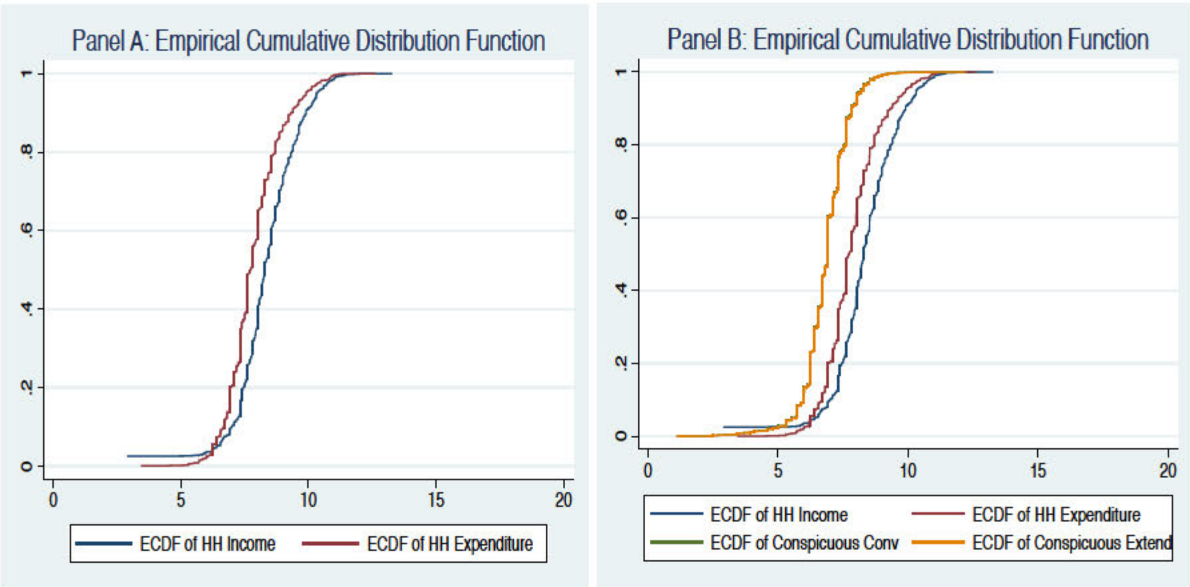

Figure 4-1: *Cumulative Distribution Function of Household Income, Expenditure and Conspicuous Consumption.*
Note: Own calculations from the National Income Dynamics Study (2008 to 2017) [31].

The differences in the distributions are further observed in Panel B, as the ECDF of per-capita conspicuous consumption lies far to the left of the ECDF of income and expenditure. For most households, the share of conspicuous expenditure increases as a household's total income and expenditure increase. This relationship is interrelated to the individual's reference group, as empirical evidence from the US and

[31] The CDF in Panel B shows that the conventional and extended conspicuous consumption share a similar distribution.

SA reveals that increased conspicuous consumption is associated with the average income of the reference group (Charles et al., 2009; Kaus, 2013). This implies that individuals belonging to social groups that possess a relatively high average income will spend less on conspicuous consumption compared to those belonging to social groups with a low average income.

The distributions for both conventional and extended conspicuous consumption are similar. Both distributions lie to the left of the income and expenditure trend. The curvature of the trends follows that of income and expenditure, except at the lower tail of the distribution. In contrast, the extended conspicuous consumption has a similar distribution compared to the conventional measure. Also, the distribution of both conspicuous consumption measures follows that of income and expenditure. Therefore, there is a clear relationship between the three measures, as they are subsets of total expenditure. One possible explanation of the relationship with income is that conspicuous consumption is more likely to be funded by borrowing for lower-income households.

Figure 4-2 presents the kernel density estimate (KDE) of the log of household income, expenditure, and conspicuous consumption (conventional and extended). The KDE is better at displaying the shape of the distribution, as it shows the probability density function of the three monetary measures. The KDE is a smoother version of the histogram, and it enables the study to depict and compare the shape of the distributions. Panel A of the KDE shows that the plot for income and expenditure is positively skewed. The peaks of the plots represent values that are concentrated over the interval of 5. Despite the two distributions having similar tails, income plot is to the right of the expenditure distribution. The KDE plots for the two respective measures are consistent with the findings depicted by Panel A of the ECDF. Income is higher than expenditure, and this is explained by the notion that expenditure is a function of income.

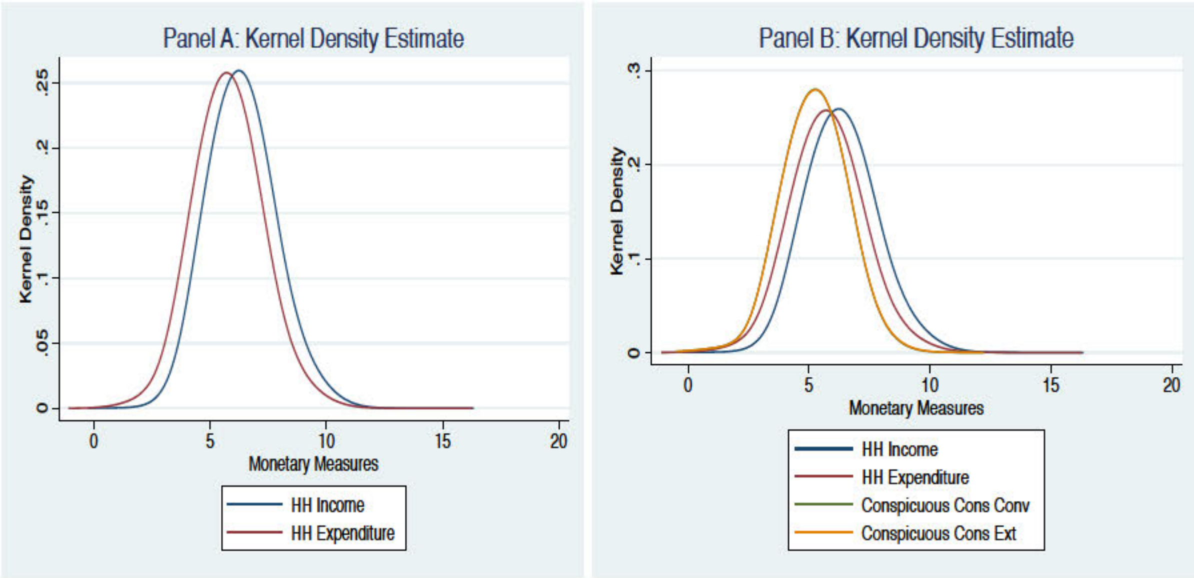

Figure 4-2: *Kernel Density Plot of Household Income, Expenditure and Conspicuous Consumption.*
Note: Own calculations from the National Income Dynamics Study (2008 to 2017)[32].

In Figure 4-2, Panel B of the KDE includes the conventional and extended measures of conspicuous consumption. The shape of the conventional and extended measure remains similar across the two distributions, consistent with the findings in Panel B of the ECDF. Furthermore, approximately 90 percent of the distribution lies between the interval value of 4 and 6, and this implies that most individuals are average income earners and spenders. All four distributions are positively skewed, as most values are clustered around the left tail of the distribution while the right tail of the distribution is longer. The majority of the observations are concentrated around the mean and interval value of 5. Overall, income, expenditure, and conspicuous consumption are unequally distributed, and this underlies the inequitable access to resources, such as education, health, employment, and public services (Christen & Morgan, 2005).

[32] The CDF in Panel B shows that the conventional and extended conspicuous consumption share a similar distribution.

The level of economic growth, development attained, regional dynamics, institutional factors, and human and land-resource endowment are among the factors identified as affecting the distribution of income and expenditure (Ataguba et al., 2012; Leibbrandt et al., 2012). These unequal distributions of resources amplify social hierarchies and the perception of social mobility changes (Steele, 2015). As a result, individuals become concerned about their social position, as it becomes fundamental in defining their identity and social progress. As mentioned in the literature, in communities with lower levels of income and anonymous interactions, status-bearing consumption acquires a greater relative burden. Also, it triggers the need to acquire and possess goods and services of the reference group. Overall, these are all features of a society with higher levels of inequality.

Table 4-3 presents a much clearer perspective on the distribution of income, expenditure, and conspicuous consumption across various categories. Given SA's history, the comparison is limited to individual and household factors that are pivotal in directing the distribution of income and expenditure. What is obvious from these results is the direction of the relationship between income, expenditure, and conspicuous consumption. This is consistent with earlier findings from the ECDF and the KDE that, as household income grows, disposable income rises, and thus consumers can purchase more goods and services. This positive relationship between income and expenditure is also reflected by the linear fit plot in Figure 4-4B in Appendix B. As both income and expenditure increase, so do the conventional and extended measures of conspicuous consumption.

What stands out from the estimates presented in Table 4-3 is the depth of inequalities across the various categories concerning income, expenditure, and conspicuous consumption. For example, income, expenditure, and conspicuous consumption are unequally distributed across race groups.

Table 4-3: Summary Statistics for Income, Expenditure and Conspicuous Consumption

Variable:	Per Capita HH Income	Per Capita HH Expenditure	Conspicuous Consumption Conv	Conspicuous Consumption Ext
Race:				
African	3072.57 (1400034.06)	1179.44 (53974.73)	453.93 (757.56)	467.15 (966.23)
Colored	2657.75 (7272.59)	1305.23 (2794.86)	541.42 (619.53)	548.41 (628.72)
Indian	7329.56 (22866.64)	3317.41 (4297.58)	1078.19 (1525.29)	1078.49 (1525.19)
White	9364.31 (13228.62)	4736.53 (11070.85)	1144.93 (831.49)	1164.75 (971.55)
Gender:				
Males	2988.07 (11804.48)	1867.54 (69288.70)	560.02 (840.54)	570.69 (916.06)
Females	4257.99 (175034.21)	1208.02 (3296.37)	480.12 (742.56)	494.99 (1019.37)
Health				
Good Health	1848.93 (4579.85)	1886.26 (62046.40)	586.67 (895.44)	603.19 (1121.84)
Poor Health	3724.32 (93400.74)	1088.39 (2778.93)	483.14 (612.88)	495.56 (707.78)
Geographical Type				
Urban	1153.35 (3058.78)	2098.93 (62147.33)	627.20 (900.93)	641.87 (1064.91)
Rural	5260.58 (161354.73)	649.51 (2262.90)	352.35 (548.24)	362.36 (774.66)
Education:				
No Schooling	1005.64 (2790.01)	543.23 (1804.20)	276.41 (332.85)	280.62 (380.55)
Primary Education	3784.28 (193449.97)	751.73 (2602.41)	339.66 (424.46)	345.51 (486.68)
Secondary Education	2680.21 (127546.22)	964.43 (2638.98)	455.89 (589.49)	469.48 (812.08)
Matric	5303.61 (11868.23)	3229.58 (92236.55)	828.39 (1174.90)	849.03 (1422.60)
Tertiary Education	13266.62 (56396.70)	4571.83 (10114.58)	1107.11 (1087.69)	1140.87 (1299.94)
Employment Status:				
Not Economically Active	1878.25 (6127.83)	1061.38 (2994.18)	435.34 (610.85)	449.36 (860.38)
Unemployed	1141.66 (2342.99)	756.28 (2253.48)	391.29 (552.07)	398.72 (567.69)
Employed	5790.77 (128624.38)	2847.55 (85775.64)	779.44 (1010.57)	800.02 (1337.19)
Perceived Economic Position:				
Perceived Poorest-Third	1346.09 (2796.78)	795.35 (2111.46)	408.71 (571.57)	412.43 (579.22)
Perceived Middle-Third	4737.49 (122223.98)	2485.26 (81396.61)	681.47 (979.56)	702.96 (1291.49)
Perceived Richest-Third	12194.87 (42650.18)	4058.29 (7172.60)	1202.04 (1580.08)	1233.10 (1855.88)
Perceived Poorest-Third (2yrs)	4001.97 (216901.82)	715.11 (2361.15)	352.17 (537.18)	354.30 (540.23)
Perceived Middle Third (2yrs)	2892.90 (8575.85)	1977.91 (76712.49)	585.69 (825.18)	601.49 (1106.71)
Perceived Richest Third (2yrs)	5436.24 (20104.05)	2474.87 (5542.65)	883.98 (1293.43)	908.42 (1517.45)
Perceived Poorest-Third (5yrs)	7641.59 (327608.66)	778.18 (2755.64)	309.50 (419.81)	311.34 (423.89)
Perceived Richest Third (5yrs)	2483.01 (9076.05)	2034.82 (92534.12)	512.311 (702.37)	519.53 (744.81)
Perceived Middle Third (5yrs)	4068.25 (14274.31)	1943.43 (4652.45)	741.41 (1125.51)	764.66 (1439.98)

Source: Own calculations are weighted and were conducted using the National Income Dynamics Study (2008 to 2017).

Note: All values are the averages measured in '000 Rands.

All standard errors are reported in parenthesis.

All results are weighted.

On average, there are stark and persistent contrasts, as Whites have the highest income and expenditure compared to other race groups. This is consistent with Kaus

(2013) who argued that, on average, white households are more affluent compared to other race groups, and they spend more in absolute terms on conspicuous goods and services. However, when comparing income that is spent on conspicuous consumption, Whites spend lower on conspicuous consumption, compared to Blacks and Coloured households. Most Black and Colored communities are in low-income communities, and they spend more on conspicuous consumption. This suggests that low-income individuals experienced reduced attractiveness of alternative mechanisms to signal status (e.g., profession and qualifications) and well-functioning financial institutions that inhibit status-seeking savings (Jaikumar & Sarin, 2015).

These income and expenditure considerations concerning conspicuous consumption are closely related to objective and subjective measures of the individual and household's relative position in society.

Concerns for actual and relative standing are instrumental in the sense that individuals derive utility from both their actual and relative standing. Hence, concerns for relative economic position affect the consumption of goods and services. On average, the distribution of income, expenditure, and conspicuous consumption is higher for individuals who perceive themselves to be the highest in the income distribution compared to individuals who perceive themselves to be the poorest in the income distribution. However, when examining the income that is spent on conspicuous consumption, the poorest individual spends almost half of their income on conspicuous consumption. Therefore, this reaffirms the notion that inequalities are related to high levels of income, expenditure, and conspicuous consumption (Atik, 2011).

Therefore, the contribution of income to utility is realized through consumption as the individual improves their status, and it implies individual utility is also dependent on relative consumption. Relative concerns for status are related to the increasing acceptance that the welfare of individuals is not only determined by material circumstances but dependent on their relative position in society. Table 4-3 shows that class position is a considerable factor, as on average, income, expenditure, and conspicuous consumption is higher among individuals who today perceived themselves to be in the richest third. Also, there are differences between how individuals rank concerning their class and how they perceive themselves, particularly in the poorest third. The estimates shown by the perceived ranking suggest a positive nexus between income, expenditure, and conspicuous consumption. As expected, low-income individuals have higher aspirations than middle- and higher-income groups. Consistent with Posel & Casale (2011), these individuals are not perfectly informed about the income of others, and the expectation is that their perceived relative standing has a higher effect on SWB compared to the individual's actual standing, and more so among the poor, where the divergence between perceived and actual economic standing is larger.

Table 4-4 provides a descriptive overview of the relevant demographic and household characteristics in the NIDS (2008-2017) data.

Table 4-4: Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Dependent Variable:			
Subjective Well-Being	Using a scale of 1-10, where 1 is "very dissatisfied", and 10 "very satisfied", How do you feel about your life as a whole right now?	5.29	0.016
Individual Variables:			
Age	Respondents age in years	30.10	0.089
Male	1 if male; 0 otherwise#	0.486	0.002
African	1 if African; 0 otherwise#	0.804	0.002
Coloured	1 if Coloured; 0 otherwise	0.092	0.001
Indian	1 if Indian; 0 otherwise	0.023	0.001
White	1 if White; 0 otherwise	0.081	0.002
Years of Schooling	Number of years invested in education (Dummies for Estimation)	8.090	0.024
Married	1 if married; 0 otherwise	0.243	0.002
Cohabitating	1 if cohabitating; 0 otherwise	0.053	0.001
Divorced or widowed	1 if divorced or widowed; 0 otherwise	0.080	0.002

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: # Reference category.

All results are weighted.

Table 4-4 (continued): Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Never Married	1 if single; 0 otherwise#	0.624	0.003
Health Status	1 if health status is excellent/good; 0 otherwise#	0.882	0.002
Employed	1 if employed; 0 otherwise	0.434	0.003
Unemployed and Searching for Employment	1 if unemployed; 0 otherwise#	0.148	0.002
Not Economically Active	1 if not economically of active; 0 otherwise	0.418	0.003
Geographical type: Urban	1 if living in an urban area; 0 otherwise#	0.606	0.002
Rural informal	1 if household dwelling is in a rural informal area; 0 otherwise#	0.105	0.002
Formal Dwelling	1 if household dwelling is formal; 0 otherwise	0.787	0.002
Rural Formal	1 if household dwelling is in rural formal; 0 otherwise	0.107	0.001
Electricity	1 if household has electricity; 0 otherwise	0.813	0.001
Piped Water on Site	1 if household has piped water; 0 otherwise#	0.757	0.002
Flush Toilet	1 if household has flush toilet; 0 otherwise#	0.576	0.002
Log Per Capita Household Income	Per capita of household total monthly income	3638.54	547.29
Log Per Capita Household Expenditure	Per capita of household total monthly expenditure	1529.84	201.04
Conspicuous Consumption Conventional	Per capita of household total monthly conspicuous expenditure conv	519.18	6.802
Conspicuous Consumption Extended	Per capita of household total monthly conspicuous expenditure ext	532.00	7.372
Log District Level Expenditure	Average expenditure at the district level	7.210	0.005
Log Cluster Level Expenditure	Average expenditure at the cluster level	7.019	0.008
Log Own Race and District	Average expenditure for own race at the same district	7.095	0.007
Log Own Race and Cluster	Average expenditure for own race at the same cluster	7.00	0.008
Log Own Age and District	Average expenditure for own age at the same district	7.108	0.015
Log Own Age and Cluster	Average expenditure for own age at the same cluster	7.324	0.010
Perceived Poorest-Third	1 if household perceives to be poor; 0 otherwise#	0.443	0.003
Perceived Middle-Third	1 if household perceives to be in the middle; 0 otherwise	0.519	0.003
Perceived Richest-Third	1 if the household perceives to be rich; 0 otherwise	0.037	0.001
Perceived rank in SA: Poorest-Third (2yrs)	1 if household perceives to be poor in 2 years; 0 otherwise#	0.177	0.002
Perceived Middle Third (2yrs)	1 if household perceives to be in the middle in 2 years; 0 otherwise	0.624	0.003
Perceived Richest Third (2yrs)	1 if the household perceives to be rich in 2 years; 0 otherwise	0.199	0.002
Perceived Lowest Third (5yrs)	1 if household perceives to be poor in 5 years; 0 otherwise#	0.084	0.002
Perceived Middle Third (5yrs)	1 if household perceives to be in the middle in 5 years; 0 otherwise	0.452	0.003
Perceived Richest Third (5yrs)	1 if the household perceives to be rich in 5 years; 0 otherwise	0.464	0.003

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: # Reference category. All results are weighted.

As expected, the average level of SWB is 5, and this is consistent with other studies that examine determinants of SWB (Bookwalter & Dalenberg, 2004; Diener & Ryan, 2009; Kingdon & Knight, 2007; Neff, 2007; Posel & Casale, 2011; Blaauw & Pretorius, 2013). More than two-thirds of the respondents are Black Africans. Approximately 45 percent of the sample are male respondents. The variance in the level of education is immediately noticeable as well. The same applies to the fact that more than 50 percent of the respondents are single, while the remaining proportion is attributed to cohabitating, divorced, and married. Approximately 90 percent of the sample reported good health, and a significant majority of the population is located in urban areas. These observed differences form a key part of the empirical analysis, which is formulated in the subsequent sections.

4.4 Method of Estimation and Strategies

4.4.1 The subjective well-being equation

The overall objective of the study is to examine the effect of conspicuous consumption by others on individual SWB. The aim is to measure the magnitude of the effect to which conspicuous consumption by others affects individual SWB. The dependent variable is individual SWB, and it is measured using a Cantril scale under the assumption that all respondents share the same understanding/interpretation of each possible ordinal response. Most empirical studies on SWB rely on the use of Pooled Ordered Probit (POP) and Pooled Ordinary Least Squares (POLS) (Ferrer-i-Carbonell & Frijters, 2004; Kingdon & Knight, 2007; Stevenson & Wolfers, 2009; Posel & Casale, 2011; Blaauw & Pretorius, 2013; Casale, 2015). Following the aforementioned studies, the study employs a POP model to test the hypothesis that conspicuous consumption is driven by positional concerns for status, hence directly affecting individual SWB when consumed by the individual in question and indirectly if consumed by others. The area of interest for the study is the latter effect. The POP is designed for analysing answers to a question where the possible item or dependent variable in question is ordered and discrete (Kockelman & Kweon, 2002). The model further allows the study to effectively use the additional order information when computing the likelihood of an individual reporting each of the possible responses (Winkelmann, 2005). The estimates produced by the POP are then compared to the POLS, which will also be used for interpretation purposes, as the POP is only limited to analysing the direction and marginal effects.

This study follows the work of Perez-Truglia (2013)[33] in formulating the empirical specification. The corresponding SWB regression equation (1) to be estimated is presented below:

$$SWB_{it} \quad \beta_0 + \beta_1 \boldsymbol{X_{it}} + \beta_2 \boldsymbol{Wave} + \varepsilon_{it} \tag{1}$$

The estimator β_0 is the intercept that for estimation. The determinants of SWB are given by the vector, $\boldsymbol{X_{it}}$. and the regression analysis will account for their effect on individual SWB (Table 4-4 provides a list and description of the observable determinants of SWB).

In the context of this study, income and expenditure are perhaps the most important control variables. These are proxies for own consumption and are used as a natural monetary comparison scale to measure the magnitude of the consumption externality (Perez-Truglia, 2013). Moreover, the model captures the effect of the household size, measured by the number of individuals in the household. Per capita, household income and expenditure are used as proxies for permanent income, measured in thousands using SA currency. Income measures all forms of income (from, among others, labour, rent, and grants) generated by the household. The expenditure variable covers all expenditure made by household residents to meet their everyday needs, such as food, housing, clothing, energy, durable goods, transport (notably cars and travel fares), health costs, miscellaneous services, and leisure. The natural logs are

[33] This paper stresses the importance of clear observability such that the signaling model of conspicuous consumption is influenced by how the individual SWB increases based on the ranking of conspicuous consumption within the reference group. This is a reflection that individual SWB is not affected by unobservable consumption.

applied to the household income and expenditure to mitigate the skewness of expenditure/income. Overall, all other individual and household determinants of SWB outlined in Table 1 are part of the estimation of the results.

The wave variable is represented by $\boldsymbol{Wave}$ and this variable is measured by pooling the cross-sections. For example, the pooled cross-section enables the study to determine whether the effects of selection bias (as shown by the coefficients on key variables of interest either increasing or decreasing from the pooled cross-section to the panel regression) are positive or negative for the variable(s) of interest Lastly, ε_{it} is the random error term and it refers to the sum of deviations within the regression line, which provides an explanation for the difference between the theoretical value of the model and the actual observed results. The assumptions is that the error term is random, normally distributed, with a constant variance and zero mean.

The results for estimation equation (1) are presented in Table 4-5. Two specifications are employed. The first specification accounts for individual-related determinants of SWB, and the second specification augments the first by controlling for household determinants of SWB. The expectation is that augmenting household determinants of SWB will change the coefficients of the first specification, as these are critical determinants of SWB (Blaauw & Pretorius, 2013).

4.4.2 Prediction and specifications: Conspicuous consumption by others and the role of reference groups

This research aims to examine the indirect effect of conspicuous consumption by others on individual SWB. As stated in the literature, theories on conspicuous consumption argue that an increase in others' expenditure makes one feel deprived, thus decreasing the individual's SWB (Veblen, 1899). However, it remains unclear whether the effect is widely accepted because, first, those engaging in conspicuous consumption may not be aware that their consumption of goods and services is deemed luxury. Second, how conspicuous consumption is perceived by the next person determines the direction of its effect on one's own SWB. Third, others' may not be aware that their actions are instilling external positional concerns for status to others, as they may believe that their actions are warranted by the desire to fulfil their intrinsic needs/wants and not that their actions are directed at affecting others.

Conversely, SWB may increase as the expenditure of others on conspicuous consumption increases. This occurs, particularly, when individuals take consumption by others to determine their future level of expenditure (Truong, 2010). Consequently, this triggers aspirations that are enhanced by the expenditure of others. This implies the expected level of the individual's future expenditure will increase, thus increasing the individual's SWB as they expect their socioeconomic position to improve in the future (Kruger, 2010). According to Bossuroy & Cogneau (2013), emerging economies like SA are rapidly changing, and these economies are characterised by uncertainty relating to how positional wealth evolves through the years. Therefore, economic mobility and the evolution of expenditure by others may, to some extent, help reduce uncertainty. In this context, conspicuous consumption by others acts as a useful signal about the future level of consumption.

Although expenditure by others drives expectations of one's future expenditure, expenditure by others is difficult to predict. In the literature, it is assumed that comparison often occurs among individuals in the same subgroup. Given SA's historical foundations, the expectation is that conspicuous consumption by others will have a negative effect on individual SWB. This is because SA continues to report the highest levels of inequality, with race being the determining factor, approximately 10 percent of the population (same race) owns more than 80 percent of the country's wealth (Francis & Webster, 2019). As a result, low- income groups in SA are likely to be dissatisfied with the gap between them and those in the higher-income rankings, which motivates their claim of discriminatory advantages that favour those in the higher-income rankings. On the other hand, higher-income groups may feel that the empowerment of low-income groups by the government comes at their expense, as a result of progressive taxation. In both cases, the expenditure by others is a source of envy or concern. Therefore, reference become pivotal in understanding how positional concerns shape individual SWB.

In addressing the above considerations, equation (1) is modified to account for conspicuous consumption and the effect of reference groups. The modification is expressed below:

$$SWB_{it} \quad \beta_0 + \beta_1 \boldsymbol{X_{it}} + \beta_2 \boldsymbol{Wave} + \beta_3 \boldsymbol{Lnh'_{it}}C + \beta_4 \boldsymbol{Lnh'_{it}}E + \beta_5 \boldsymbol{Lnh'_{it}}Cother\ C + \beta_6 \boldsymbol{Lnh'_{it}}Cothers\ D$$

$$+ \beta_7 \boldsymbol{Lnh'_{it}}Eothers\ C + \beta_8 \boldsymbol{Lnh'_{it}}Eothers\ D + \beta_9 \boldsymbol{Ln}Expend_{it}\ C + \beta_{10} \boldsymbol{Ln}Expend_{it}\ D$$

$$+ \beta_{11} \boldsymbol{Ln}Avexpagegen_{it}\ C + \beta_{12} \boldsymbol{Ln}Avexpagegen_{it}\ D + \beta_{13} \boldsymbol{Ln}Avexpagegen_{it}\ D + \varepsilon_{it} \qquad (2)$$

Let $\boldsymbol{Lnh'_{it}}C$ be the variable that captures the conventional conspicuous-consumption basket of all expenditures on food consumption, clothing, home care, automobiles, tobacco, cell phones, and jewellery for individual *i* at period time *t*. This is the sum of expenses on conspicuous goods in terms of the SA currency. For a comparative analysis, $\boldsymbol{Lnh'_{it}}E$ is the extended[34] conspicuous-consumption basket that includes all expenditures on swimming pool maintenance, gifts, baby food, restaurants and takeaways, ceremonies and rituals, lobola, gym and sporting activities, and holiday and related leisure, as well as entertainment.

Conspicuous consumption by others is measured by the average level of conspicuous consumption within the cluster (nearby others) and the district (distant others), excluding the specific household. This measurement is adopted from the calculation of reference groups (as done by Kingdon & Knight, 2007; Winkelmann, 2012; Von Fintel, 2015) and now the study applies in the context of conspicuous consumption. The variables $\boldsymbol{Lnh'_{it}}Cother\ C$ and $\boldsymbol{Lnh'_{it}}Cothers\ D$ respectively, measure the average

[34] The categories in this variable relative to the conventional one overlap. To avoid multicollinearity, both conspicuous consumption measures are not included in the same estimation.

level of conventional conspicuous consumption by others within the cluster (nearby others) and the district (distant others), excluding the specific household. Variables $\boldsymbol{Lnh'_{it}}Eothers\ C$ and $\boldsymbol{Lnh'_{it}}Eothers\ D$, respectively measure the average level of extended conspicuous consumption by others within the cluster (nearby others) and the district (distant others), excluding the specific household. For ease of interpretation, the analysis of the results will be limited to the extended measure of conspicuous consumption.

Moreover, spending on conspicuous consumption by others may or may not serve as a means to convey information about one's economic status. It depends on how others and those affected by the action perceive it. However, linking these potentially conspicuous consumption categories to relative expenditure is dependent upon a clear definition of each individual's reference group. As discussed in the literature, individuals are likely to randomly interact with strangers during social interaction. This anonymous random setup provides an incentive for the need to signal wealth or status, especially if individuals live and work in the same geographical area. Hence, reference groups[35] are defined by proximity or geographical location. Reference groups are critical, as they provide proximal peers, and these are believed to have direct social networks with the household and may shape consumption decisions of the household as they interact with one another (Childers & Rao, 1992). This is because signallers live and work around a geographical area where they commonly interact with strangers (Kahneman & Krueger, 2006). Thus, the study employs the area of residence as the definition of the individual's reference group. The use of the geographic classification to define a reference group is certainly not perfect, but it is widely used in the literature in defining reference groups (Clark et al., 2008; Charles et al., 2009). In SA, subgroups are clustered at provincial, district, municipal, and at community levels. Inferences on

[35] Bossert & D'Ambrosio (2006) define reference groups as groups that include individuals that influence our attitudes, beliefs, opinions, and behaviours. They serve as reference points in terms of an individual's direction and aspiration when it comes to daily living. They are often distinguished into normative (based on their influence on norms) and comparative (based on their effect to influence aspirational levels).

subgroups in contiguous but anonymous interactions are necessary as they reflect one's place of residence and social affiliation.

In equation (2), the study controls for spatial reference groups as defined by proximity and area of residence, which are both critical factors in social interactions in SA. Research by Kingdon & Knight (2006, 2007) distinguish spatial reference groups as those nearby and those far apart. Hence, neighbours living nearby have a positive effect on SWB (due to aspirations, social connection and motivation). In this case, conspicuous consumption items such as radio, cookware, television, and costly kitchens are visible only to a narrow peer group, while those far apart negatively affect SWB (due to envy). In this case, conspicuous items in distant proximities include items that are portable and easily observable in anonymous interactions.

Following Kingdon & Knight (2006, 2007); and Von Fintel (2015), spatial reference groups are measured both at the neighbourhood (household cluster) and the district level (district municipality). All reference groups are logged, and they are measured by the mean monthly per-capita household expenditure by others in the same cluster $\boldsymbol{Ln}Expend_{it}\ C,$ and at the same district level, $\boldsymbol{Ln}Expend_{it}\ D$, excluding each household's contribution to the average. Alternatively, the reference group measure can be calculated as the difference between the logarithm of monthly household income and the per-capita log of the mean of household income at the district level (Dynan & Ravina, 2007; Knight et al., 2009; Ravallion & Lokshin, 2010; Shifa & Leibbrandt, 2018). This alternative approach relaxes the conditioning of household being in the same cluster or district. However, in terms of the objective of this study, the focus is on households in the same cluster and district. Therefore, the study follows the proposition by Kingdon & Knight (2006, 2007); and Von Fintel (2015) in measuring reference groups.

In addition, the study controls for age, gender, and race-specific reference groups both for the cluster and the district. The age- and gender-specific reference group is measured by the mean expenditure of all others of the same age (excluding minors) and gender residing in the same cluster $\boldsymbol{Ln}Avexpagegen_{it}\ C,$ and the district

$\boldsymbol{Ln}Avexpagegen_{it}\ D$, excluding each household's contribution to the average. The race-specific reference group is measured by mean expenditure of own race residing in the same area (cluster and the district). The age, gender, and race reference groups enable the study to test the hypothesis of whether, individuals care if their peers (concerning age, gender, and race) are spending or if the expenditure is not for their reference group.

Table 4-6 presents the specifications and estimation results for equation (2). The emphasis is on conspicuous consumption of others (cluster and district), spatial reference groups (cluster and district), and individual and household-level characteristics. *Ceteris paribus*, the first specification controls for the conspicuous consumption variables (conventional and extended) under the assumption that these goods are observable and serve as status-bearing objects. The second specification augments specification one by controlling for conspicuous consumption by others (both conventional and extended) in close (cluster) and far (district) proximities. In this case, the study seeks to examine whether consuming visibly serves as a signal for socioeconomic status (Luttmer, 2005). The second specification takes into account for actual and relative consumption effects as one's SWB or utility is not only dependent on own consumption (and other relevant variables) but also on how their consumption compares to others. This assertion is based on the premise that acquisitions and conspicuous consumption by others have the potential to instigate externalities, as individual SWB is likely to be affected by the conspicuous consumption of others (Dupor & Liu, 2003). The exposition that demonstrates the superiority of those goods provides an external effect on current consumption and individual SWB (Dutt, 2006). Therefore, increased conspicuous consumption by others makes one less superior, hence resulting in an inferiority complex that is negatively correlated with SWB (Frey et al., 2009). Controlling for relative conspicuous consumption by others enables the study to measure the depth of consumption externalities.

The above specification is estimated with the households' perceived economic rank. The expectation is that both the sign and magnitude of the coefficients will be consistent, since perceptions of one's own socioeconomic rank is critical in determining SWB. The NIDS data captures these variables by asking individuals how they rank in the income distribution (income bracket) and how they perceive their economic rank relative to their counterparts. The relative-income variables provide the context to one's monetary comparison scale (Clark et al., 2008). This allows for the evaluation of the evidence that preferences which add value to one's relative standing grant higher fitness as opposed to absolute standing (Hopkins & Kornienko, 2009; Posel & Casale, 2011). In addition, social status is determined by positional concerns, hence the rank occupied by the individual in the relevant distribution determines their social status (Bilancini & Boncinelli, 2012; Winkelmann, 2012). In addition, the second specification includes the permanent-income measure, which is the log of per-capita household income. The inclusion of the inclusion of the permanent-income measure is based on the idea that, through revealed preferences, individuals choose across various consumption choices but are constrained by income.

Specifications three to five are estimated along with spatial reference groups in a stepway towards the full model. These specifications are estimated under the assumption that the individual's reference group comprises individuals living within the same proximity or neighbourhood (Charles et al., 2009[36]). This assumption is explained by the notion that individuals compare themselves with fellow subgroups or neighbours. Moreover, the expectation is that the coefficient of the mean reference group will be significant and positive. This would imply concerns for status to be an important factor in explaining SWB. Specification four is the full model, and, and includes all control variables. As the study iterates towards the full model, the coefficients on the variables included in earlier iterations will change because of their effect on individual SWB (Ross et al., 1986; McClendon & O'Brien, 1988; Blaauw & Pretorius, 2013; Diego-Rosell et al., 2018).

[36] Charles et al. (2009) provides more context. They argue that narrowing the definition of reference groups (for example, at the neighbourhood level) would require specific assumptions and, accordingly so, a different model of estimation.

All five specifications are re-estimated through the FE model to account for possible individual and district-level unobserved heterogeneities that may lead to endogeneity. Unobservable interpersonal characteristics such as pessimism/optimism can affect the individual's response to questions on their life satisfaction. Variables like pessimism/optimism are also likely to influence the conspicuous consumption. The exclusion of such variables may cause endogeneity in the form of omitted variable bias, measurement error, or simultaneity. Omitting unobserved effects such as pessimism/optimism may overstate or understate the influence of observed explanatory variables on SWB. Pessimism/optimism affects SWB but not controlling for it implies it is part of the error term, and therefore the error term is correlated with the dependent variable or some of the control variables. This has implications for the estimated coefficients, as some portion of the error term is a potential confounder of the dependent variables.

Moreover, controlling for the individual-specific effects provides some challenges when dealing with ordinal scale variables (Wooldridge, 2005). Even if the ordinal response is dichotomised, allowing for the use of fixed effects models in a binomial logit/probit model setup through Chamberlain's technique, the results remain troublesome, as a great deal of information is lost, and this may likely lead to measurement errors (Ferrer-i-Carbonell, & Frijters, 2004). The Ferrer-i-Carbonell and Frijters estimator controls for the individual heterogeneity (Ferrer-i-Carbonell, & Frijters, 2004; Knabe & Ratzel, 2011; Clark et al., 2009; Jones & Schurer, 2011). This is done along with individual-specific thresholds that are chosen by selecting a specific threshold for each individual. However, the choice of cut-off points can be endogenous, biased, and inconsistent, especially when dealing with a small number of observations (Baetschmann et al., 2011). Given these considerations, the study performs a Hausman test for exogeneity (see Appendix). The study controls for the unobserved heterogeneities by re-arranging equation (2) to account for the unobserved fixed effects as specified:

$$
\begin{aligned}
SWB_{it} \quad & \beta_0 + \beta_1 \boldsymbol{X_{it}} + \beta_2 \boldsymbol{Wave} + \beta_3 \boldsymbol{Lnh'_{it}} C + \beta_4 \boldsymbol{Lnh'_{it}} E + \beta_5 \boldsymbol{Lnh'_{it}} Cother\ C + \beta_6 \boldsymbol{Lnh'_{it}} Cothers\ D \\
& + \beta_7 \boldsymbol{Lnh'_{it}} Eothers\ C + \beta_8\ \boldsymbol{Lnh'_{it}} Eothers\ D + \beta_9 \boldsymbol{Ln} Expend_{it}\ C + \beta_{10} \boldsymbol{Ln} Expend_{it}\ D \\
& + \beta_{11} \boldsymbol{Ln} Avexpagegen_{it}\ C + \beta_{12} \boldsymbol{Ln} Avexpagegen_{it}\ D + \beta_{13} \boldsymbol{Ln} Avexpagegen_{it}\ D \\
& + A_{it} + \varepsilon_{it} \qquad (3)
\end{aligned}
$$

Where the variable A_i, represents the unobserved fixed effects. It should be noted that fixed-effects estimations will be sensitive to the regional dummy variables since they are time-invariant. The FE[37] specifications and results are presented in Table 4-7.

4.5 Results Analysis and Discussion.

In this section, the study estimates the baseline SWB equation (1). The purpose of the baseline SWB equation is to validate whether the estimated coefficients are consistent with the empirical evidence before accounting for the main variables of interest. The analysis makes use of both the POP and the POLS for comparison and interpretation proposes. The panel structure of the NIDS data enables the study to control for the unobserved FE, as it contains information for each individual at difference points in time, corresponding to the waves of the NIDS data. Hence, the panel structure of the data enables the study to control for unobserved fixed effect/characteristics that are time-invariant using the FE (or first differencing) estimation techniques, and test whether the findings are robust to heterogeneity bias. Therefore, the study re-estimates all specifications using the FE model of estimation to control for the possibility of endogeneity.

[37] The null hypothesis is that there are no systematic differences between the coefficients from a random and fixed effects model. Hence, the independence allows for the use of Random Effects (RE) models. The Hausman test results suggests that a fixed effects model is more appropriate, and therefore, the study accounts for unobserved heterogeneity using the FE technique.

4.5.1 The baseline subjective well-being equation

Table 4-5 below presents results obtained from the SWB equation based on a set of individual and household regressors. The estimated coefficients for Model 1 are robust across the three estimation techniques. As far as the individual variables are concerned, age and SWB share a U-shaped relationship. Racal differences in SWB can be observed across race dummy variables. Whites and Coloured's display higher levels of SWB compared to the African race, *ceteris paribus*, while there are significant differences between Africans and Indians. The racial divide is a factor of the historical legacy of apartheid that has entrenched inequalities across various factors (for example, health and education) that are fundamental to quality of life (Inglehart, 2002; Steptoe et al., 2015; Reyes-García et al., 2016). Education dummy variables enter the SWB equation monotonically and significantly for all levels above primary education. As expected, good health is associated with increased levels of SWB. Lastly, those who are not economically active (institutionalised) are less satisfied compared to the discouraged and strictly unemployed individuals, while the employed display higher levels of SWB compared to the discouraged and strictly unemployed individuals.

The second specification augments the first by controlling for the household-level variables. As expected, the estimated coefficients for individual-level variables change and remain significant, and this implies that household-related control variables are robust predictors of individual SWB. As far as household factors are concerned, an increase in the number of individuals in the household increase individual SWB. This relationship is the reverse norm, as an increase in the size of a household is likely to result in congestion and may lead to high costs of maintaining the household in terms of utilities and food consumption (Etinzock & Kollamparambil, 2019). In SA, the effect of household size is dependent on the nature of the larger household – if a larger household comes with pooled resources (both earned income, grant income, and time, ability to care communally, assistance with household tasks etc) this may well increase SWB. SA households tend not to be nuclear (and reasons for this are often deeply rooted in cultural considerations), and the utility gained from this is intrinsically linked to the positive SWB of individuals and the more 'western' nature of households would in fact decrease well-being for many individuals in SA.

Table 4-5: SWB — Pooled Ordered Probit, POLS, and Fixed Effects Regression of Subjective Well-Being

Models and Estimation	Model 1 (POP)	Model 1 (POLS)	Model 1 (FE)	Model 2 (POP)	Model 2 (POLS)	Model 2 (FE)
Subjective Well-being						
Individual Variables:						
Age	-0.0279***	-0.0641***	-0.0084	-0.0219***	-0.0476***	-0.0360***
Age-squared	0.0003***	0.0007***	0.0005***	0.0002***	0.0005***	0.0004***
Male	0.0093	-0.0182		-0.0398***	-0.0794**	
Coloured	0.4113***	0.9572***		0.2759***	0.5972***	
Indian	0.6642***	1.5109***		0.4606***	0.9809***	
White	0.6452***	1.5348***		0.3076***	0.7123***	
Primary Education	0.0349	0.0758	0.2689**	0.0161	0.0234	0.2493
Secondary Education	0.1636***	0.3715***	0.3008**	0.0275	0.0492	0.2357
Matric	0.3227***	0.7423***	0.3206***	0.0286	0.0558	0.2229
Tertiary Education	0.2731***	0.6508***	0.2701	-0.1238	-0.2488	0.2527
Married	0.1853***	0.4266***	0.3303***	0.0663***	0.1460***	0.2852***
Cohabitating	0.0161	0.0395	0.2076***	-0.0244	-0.0465	0.1695**
Divorced or widowed	0.0664**	0.1537**	0.2617***	-0.0099	0.0211	0.1991**
Good Health	0.1700***	0.3826***	0.1996***	0.1414***	0.2979***	0.2026***
Employed	0.2505***	0.5816***	0.2585***	0.0899***	0.2038***	0.0826*
Not Economically Active	0.0852***	0.2059***	-0.0800**	0.0344	0.0868*	-0.0659
Member of a Religion	0.2282***	0.5112***	0.3711***	0.1219***	0.2577***	0.2643***
Household Variables:						
Household Size				0.0035	0.0086	0.0163
Dwelling type: Informal				-0.0080	-0.0272	-0.0943
Dwelling type: Formal				-0.0088	-0.0299	-0.0372
Electricity				0.0586**	0.1039*	0.0348
Piped water on site				-0.0530**	-0.1181***	-0.1626***
Flushable Toilet				-0.0266***	-0.0542	0.1492***
Log of per capita household income				0.0740***	0.1584***	0.0540**
Log of per capita household expenditure				0.0775***	0.1669***	0.1492***
Perceived Relative Economic Position:						
Middle-Third				0.1915***	0.4196***	0.4152***
Richest-Third				0.5327***	1.1563***	0.8805***

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Note: District municipal dummy variables are included according to the model specifications, but the results are reported in Table 4-5A in Appendix B.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4-5 (continued): SWB — Pooled Ordered Probit, POLS, and Fixed Effects Regression of Subjective Well-Being

Models and Estimation	**Model 1 (POP)**	**Model 1 (POLS)**	**Model 1 (FE)**	**Model 2 (POP)**	**Model 2 (POLS)**	**Model 2 (FE)**
Middle Third (2yrs)				0.1403***	0.2820***	0.2837***
Richest Third (2yrs)				0.2031***	0.4317***	0.5055***
Middle Third (5yrs)				0.2579***	0.5094***	0.5479***
Richest Third (5yrs)				0.3312***	0.6799***	0.7512***
Asset Index				-0.0313***	-0.1222***	-0.1121***
Wave	0.0159***	0.0300***		-0.0313**	-0.0719***	
Constant		4.4445	3.6695***		2.4045	3.3993***
District FE (Municipalities)	**NO**	**NO**	**NO**	**YES**	**YES**	**YES**
/cut1	-1.1879			-0.2618		
/cut2	-0.7708			0. 1819		
/cut3	-0.3478			0. 6359		
/cut4	0.0602			1. 0673		
/cut5	0.5622			1.6030		
/cut6	0.9094			1.9731		
/cut7	1.2671			2.3471		
/cut8	1.6879			2.8043		
/cut9	1.9192			3.0466		
Number of Observations	**70,952**	**70,952**	**71,036**	**54,357**	**54,357**	**54,390**
Pseudo R^2	**0.0238**			**0.0455**		
R-Squared		**0.1043**	**0.0102 (within)**		**0.1865**	**0.0571**
Log-pseudolikelihood	**-2.797e+08**			**-2.125e+08**		
χ^2	**2217.25**			**4854.33**		

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Note: District municipal dummy variables are included according to the model specifications, but the results are in Table 4-5A in Appendix B.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

The baseline regression shows that infrastructure services such as electricity and water access negatively affect the individuals' SWB. Although there have been advancements post-1994 in the rollout of basic services, there remain considerable service-delivery issues relating to efficiency (for example, load-shedding), maladministration, and corruption (Cramm et al., 2010; Blaauw & Pretorius, 2013). This has seen a multitude of service protests across SA, reflecting some of the citizen's dissatisfaction with the state of governance. Furthermore, the results confirm that the log of per-capita household income and expenditure has a positive and significant effect on individual SWB. Perceived economic rank presently and in the future significantly increases SWB for those in the middle and richest rank compared to the poorest rank. Lastly, the district dummy variables suggest that individual SWB differs according to the area of residence, and that individual SWB differs across the district municipalities of SA.

Overall, the estimated results presented in Tables 4-5 are consistent with empirical evidence on the determinants of SWB (Bookwalter & Dalenberg, 2004; Diener & Ryan, 2009; Kingdon & Knight, 2007; Neff, 2007; Posel & Casale, 2011; Blaauw & Pretorius, 2013). The next section explores whether and how conspicuous consumption by others that are close or more distant affects individual SWB.

4.5.2 Conspicuous consumption by others and reference groups

In keeping with the literature, the analysis of conspicuous consumption by others is closely related with reference expenditure. The first stage of the analysis is the general effect of conspicuous consumption on individual SWB. The general effect measures the direct effect of one's conspicuous consumption on their individual SWB. The second stage of the analysis is based on comparison effects, as the study controls for the effect of conspicuous consumption by others on individual SWB, excluding the household's contribution the average. To capture the effect of conspicuous consumption on individual SWB, conspicuous consumption of those in within-close-proximity versus those further away is compared. This follows the assumption that conspicuous consumption goods and services are observable in contiguous interactions (close proximity) and portable in anonymous interactions (distant proximity).

In the context of this study, close proximity is defined by the household cluster and households at the cluster-level are homogenous in nature. The distant proximity is defined by the district council, and households in district municipalities are more varied. Therefore, the household cluster is a proxy for conspicuous consumption by close others, and the district council is a proxy for conspicuous consumption by distant others. The analysis of conspicuous consumption by others is presented in accordance with the effect of reference groups. Following the work of Kingdon & Knight (2006, 2007) and Von Fintel (2015), variables that control reference groups are accounted for in a stepway in order to capture their effect on SWB. The reference group[38] measures include the average expenditure of the household at the cluster and district level, own-race-specific reference group, and age- and gender-specific reference group. In generating the reference groups, the study removed the individual's own household's value (and the individual themselves where necessary).

Table 4-6 displays the main results. As mentioned above, the first model considers the general setting of the direct effect of own conspicuous consumption on individual SWB. The first model provides an idea of the general impact of conspicuous consumption on SWB. In the first column of Table 4-6, the coefficient on own conspicuous consumption is positive, implying conspicuous consumption increases SWB. In other words, the positive coefficient suggests that, on average, an increase in one's own conspicuous consumption is associated with an increase in individual SWB at all levels of significance. The direction of the effect implies there are perhaps psychological or economic reasons that explain why individuals put continued efforts in consuming conspicuously.

Model 2 in the second column of Table 4-6 presents the parameters of interest. The estimated results suggest that conspicuous consumption by others increases individual SWB if the consumption occurs in the same neighbourhood where the household is located. At the cluster level, an increase in conspicuous consumption by others by one standard deviation will, on average, increase individual SWB. In this case, conspicuous consumption by others is beneficial to the individual. Individuals compare themselves to each and all the other individuals along the income distribution and those individuals have a different sensitivity for those different comparisons.

[38] For any given individual, the value for cluster/district conspicuous consumption of others must not have included the individuals own or their household's value in the calculation.

Table 4-6: Pooled Ordered Probit Regression of Subjective Well-Being

Model Estimation	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Employed	0.0190	0.0032	-0. 0005		
Not Economically Active	0.0282	0.0416	0. 0192		
Log per capita household income	0.1366***	0.1117***	0.1206***		
Conspicuous Consum Ext	0.0375***				
Cluster: Conspicuous Consum Others		0.0634***	0.0482**	0.0237	-0.0431
District: Conspicuous Consum Others		-0.0722***	0.0602**	-0.0489*	0.0242
Cluster: Average expenditure			0.0197	0.1595**	0.3654***
District: Average expenditure			0.0463**	0.0844*	-0.2569**
Cluster: Own race average exp				-0.1715**	-0.4139***
District: Own race average exp				0.1789***	0.1771***
Cluster: Age and gender specific					0.0558
District: Age and gender specific					0.1578**
Perceived Economic Position:					
Middle-Third		0.1633***	0.1309***	0.1742***	0.1557**
Richest-Third		0.4324***	0.4633***	0.5025***	0.7283***
Middle Third (2yrs)		0.0915**	0.1059**	0.1122**	0.1916**
Richest Third (2yrs)		0.3089***	0.3820***	0.4011***	0.4616***
Middle Third (5yrs)		0.2723***	0.1928***	0.1883***	0.2511**
Richest Third (5yrs)		0.3000 ***	0.1905**	0.1779***	0.1977
Asset Index	-0.1570***	-0.1062***	-0.1025***	-0.1366***	-0.1344***
Wave	0.0074	0.0370***	0.0208*	0.0237	0.0158
District FE (Municipalities)	**YES**	**YES**	**NO**	**NO**	**NO**
/cut1	-0.2787	-0.6725	-0.2064	-0.4363	-0.466
/cut2	0.1758	-0.1949	-0.6638	0.0061	0.924
/cut3	0.6066	0.2558	-1.1055	0.4474	0.425
/cut4	1.0327	0.6946	-1.5134	0.8498	0.961
/cut5	1.5320	1.2233	2.0235	1.3555	1.450
/cut6	1.9081	1.6124	2.4106	1.7413	1.076
/cut7	2.2866	1.9654	2.7385	2.0597	2.688
/cut8	2.6966	2.3731	3.1053	2.4161	2.280
/cut9	2.9193	2.5537	3.2719	2.5829	2.058
Number of Observations	**27,934**	**12,550**	**9,724**	**9,811**	**3,596**
Pseudo R^2	**0.0372**	**0.0450**	**0.0265**	**0.0243**	**0.0277**
Log-pseudolikelihood	**-1.068e+08**	**-47514703**	**-36538628**	**-37426063**	**-16342355**
χ^2	**2573.44**	**1514.53**	**502.58**	**483.53**	**201.00**

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note: District municipal dummy variables are included according to the model specifications, but the results are reported in Table 4-6A in Appendix B.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4-7: **SWB — Pooled Ordinary Least Squares Regression of Subjective Well-being**

Model Estimation	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Employed	0.0587	0.0478	0.0349		
Not Economically Active	0.0877	0.1361	0.0886		
Log per capita household income	0.2956***	0.2257***	0.2544***		
Conspicuous Consum Ext	0.0924***				
Cluster: Conspicuous Consum Others		0.1415***	0.1097**	0.0535	-0.0949
District: Conspicuous Consum Others		-0.1665***	-0.1491**	-0.1224**	0.0359
Cluster: Average expenditure			0.0496	0.3491*	0.8040***
District: Average expenditure			0.1186**	-0.1891*	-0.5905**
Cluster: Own race average exp				-0.3753**	-0.9082***
District: Own race average exp				0.4213***	0.4252***
Cluster: Age and gender specific					0.1175
District: Age and gender specific					0.3564**
Perceived Economic Position:					
Middle-Third		0.3746***	0.3319***	0.4258***	0.3806***
Richest-Third		1.0357***	1.1460***	1.2464***	1.7479***
Middle Third (2yrs)		0.1512	0.1829	0.1982**	0.3595*
Richest Third (2yrs)		0.6547***	0.8464***	0.8898***	0.9951***
Middle Third (5yrs)		0.5291***	0.3928***	0.3825***	0.5259**
Richest Third (5yrs)		0.6045 ***	0.3987**	0.3722***	0.4219
Asset Index	-0.3518***	-0.2332***	-0.2357***	-0.3113***	-0.3140***
Wave	0.0092	0.0789	0.0485*	0.1065***	0.0322
District FE (Municipalities)	**YES**	**YES**	**NO**	**NO**	**NO**
Constant	**2.4347**	**3.3512**	**1.2229**	**2.6460**	**2.5896**
Number of Observations	**27,934**	**12,550**	**9,724**	**9,811**	**3,596**
R-Squared	**0.1549**	**0.1810**	**0.1114**	**0.1044**	**0.1174**

Source Own calculations using the National Income Dynamics Study Data (2008 to 2017).

Note District municipal dummy variables are included according to the model specifications, but the results are reported in Table 4-7A in Appendix B..

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Intuitively, individuals affected by the conspicuous consumption of others will have to increase their consumption of similar items, as their actions are in response and comparison to the actions of their peers. The increased consumption is, *ceteris paribus*, assumed to have a positive effect on individual SWB. However, if the income or expenditure of all individuals were to increase by the same amount, the utility that one receives from consuming more would be partly offset by an increase in consumption by the rest of the population.

The estimated coefficient on conspicuous consumption of others in distant interactions is negative and the results suggest that conspicuous consumption by others in distant interactions has adverse effects on individual SWB. The confounding effect of conspicuous consumption by others in distant interactions is two-fold. First, individuals may consume conspicuously to address their economic and psychological intrinsic needs. Hence, individuals may be unaware that the goods being consumed are conspicuous or have external effects on others, and this is reflected by the positive relationship between one's own conspicuous consumption and individuals' SWB. Second, the act of consuming conspicuously can be driven by the competitive nature of individuals due to economic and psychological (for example, insecurities, possessiveness, and power) extrinsic needs. In some cases, the psychological extrinsic needs outweigh the economic extrinsic needs. For example, individuals may use conspicuous consumption to divert their insecurities by believing that their material possessions will define their public image and mask their shortcomings, particularly in anonymous interactions. In other cases, the act is explained by the individual's actual and relative economic standing when compared to their peers. As a result, conspicuous consumption is used to signal one's socioeconomic status and superiority. Consequently, individuals end up competing over the ownership of such goods, and this drives-up conspicuous consumption. Therefore, when the act of conspicuous consumption by others is driven by economic or psychological exterior motives, then it negatively affects individual SWB, as observed in the results.

Model 2 is estimated along with perceived relative economic rank variables. These variables enter the estimation model to conceptualize the individual's perception of where in the income distribution their household lies. The estimation accounts the individuals perceived relative economic rank today, in two years and five years. Individuals in the low class have fewer resources and opportunities, while those in the upper class have abundant resources and opportunities. The estimated coefficients on perceived relative ranking increase (size of the coefficient gets bigger) as the individual's perception of standing increases relative to the base. So those who perceive themselves (their households) as currently better off and in the future have a significantly higher SWB relative to the base, with the highest coefficients for those who perceive themselves (their households) to be in the top third of the income distribution currently and in future. This implies the relevance of perceived economic status is translated into increased levels of SWB, as those who perceive themselves to be in the middle or highest economic rung comprise higher levels of SWB than those in the lowest economic rung. This finding reaffirms that individuals take into consideration how their economic state is compared to their peers when making evaluations about their overall well-being.

Following the approach taken by Kingdon & Knight (2007), Models 3 to 5 of the estimation of the results presented in Table 4-6 are augmented with the inclusion of spatial reference groups (district expenditure, race, and age & gender). The assumption is that an individual's reference group comprises individuals living within the same proximity or neighbourhood. The reference groups shape the individual's beliefs, attitudes, and behaviours. These reference groups are a standard measure of comparison for the individual, such that individuals take the standards of significant others as a basis of comparison and self-evaluation (Chen, 2019).

In Tables 4-6, Model 3 controls for reference expenditure measured at the cluster and district levels. Given SA's economic foundations, the expectation is that individuals will take others' expenditures to predict their future expenditures. If this is the case, social connection and motivation at the cluster level or the information effect will be thus strong enough to offset envy. Respectively, Model 3 of the result estimation shows that average expenditure at the cluster and district level enters the SWB equation positively. However, the result is only significant for reference expenditure at the district level. Notably, the coefficients on conspicuous consumption at the cluster and district level are significantly positive after accounting for average expenditure at both the cluster and district level. The changes in the coefficients imply that individuals value relative expenditure, as it predicts one's future expenditure and mobility. The expected expenditure and mobility are likely to drive aspirational outcomes that affect individual SWB (Petrescu & Kara, 2018). Therefore, after controlling for reference expenditure, conspicuous consumption by others at both the cluster and district level increases individual SWB. In this case, social connection and motivation appears to be stronger than envy at both the cluster and district level.

Model 4 controls for race-specific reference groups both at the cluster and district level to examine whether the conspicuous consumption of race-specific reference groups is relevant for individual SWB and whether estimated coefficients on conspicuous consumption by others change after controlling for race comparison effects. The race-specific reference group measures the log of the race-specific cluster and district mean income. The race-specific reference group is given by the mean per-capita household income of all households of the same race within the household's cluster and district. It is evident from Table 4-6 that the race-specific reference groups are significant at both the cluster and district levels. The negative coefficient on conspicuous consumption by others at the district level implies that individuals are sensitive to conspicuous consumption by others if the act occurs in anonymous interactions. Conspicuous consumption in anonymous interactions is, among other factors, considered as signalling one's socioeconomic status. Signalling is closely related to the fulfilment of exterior motives and, in this case, envy outweighs aspirations, social connection and motivation by those perceiving the signalling behaviour. The coefficient on race-specific reference group is significantly negative at the cluster level and positive at the district level. Therefore, on average, an increase in the mean per-capita household income of all households of the same race within the household's cluster decreases individual SWB, while an increase in the mean per-capita household income of all households of the same race within the household's district increases individual SWB. This result implies that individuals are concerned about changes in income of their peers of the same race, particularly of the changes occurs in close proximity. The result on race-specific reference group implies individuals are sensitive to income-related inequalities within the same race if the gap widens among within-proximity peers.

Model 5 includes a measure for the reference groups based on age and gender. The age- and gender-specific reference group enters the SWB equation positively at both the cluster and district level. Notably, the estimated coefficients and significance levels on conspicuous consumption by others change after controlling for age and gender-specific reference groups. When accounting for the age and gender comparison effects, individuals who are the same age and gender positively affect individual SWB. After controlling for the age and gender-specific reference groups, conspicuous consumption by others does not significantly affect individual SWB, both at the cluster and district level.

Overall, apart from Models 4 and 5, these findings suggest that conspicuous consumption by others at the cluster level increases individual SWB, and conspicuous consumption by others at the district level decreases individual SWB. This finding suggests that individual SWB is sensitive to conspicuous consumption that occurs in distant proximities, as opposed to close proximities. This implies the feeling of envy outweighs the aspirations, social connection and motivation, as individuals are made worse of if their relative peers are consuming conspicuously at the district level. The feeling of envy is associated with the fear of being left behind in terms of socioeconomic standards, in particular, if the action is motivated by exterior motives and the action is perceived to signal one's status or wealth.

Individuals at the receiving end are likely to respond by consuming conspicuously, which also affects the SWB of others. In this case, the individual's response to conspicuous consumption by others at the district level, amid its effect on their SWB, motivates the desire to consume conspicuously. Consequently, conspicuous consumption becomes a compensatory strategy that individuals use to respond to conspicuous consumption by others, reversing the causality. Therefore, this action is like running on a positional treadmill, and the relationship between conspicuous consumption and SWB is defined by the vicious cycle. Hence, SWB may affect conspicuous consumption, and conspicuous consumption affects an individual's SWB, as observed. It is also possible that the treadmill keeps spinning because of temporary hedonic adaptation, thus leading to reverse causality.

In addition, given the structure of the data, the above estimations have not accounted for possible endogeneity in the form of unobservable interpersonal or regional characteristics that could affect conspicuous consumption or individual SWB. For example, ego and pride could be intrinsic motives that drive conspicuous consumption, and pessimism/optimism can affect the individual's response to questions on their life satisfaction. The exclusion of such variables may cause endogeneity, in the form of omitted variable bias, and the effect of conspicuous consumption on SWB is understated. To account for possible causality and endogeneity, the study re-estimates the five models presented in Table 4-6 and Table 4-7 using the FE estimation technique. Table 4-8 below provides the results of the FE estimation technique. The Hausman test results for the choice of the estimation technique is included in the appendix.

In this analysis, the study isolates time-invariant variables like gender and race, as the outcome of each of the variables is not likely to change with time, as individuals are born into one gender and race. Accordingly, the outcomes of these dummy variables will not change with time. Also, there is likely to be less variation in terms of the movements of the observations between districts. The FE estimates presented in Table 4-8 provide opposite findings of conspicuous consumption by others when compared to the POP and POLS models. Model 2 estimates show that conspicuous consumption by others at the cluster level enters the SWB equation negatively and conspicuous consumption by others at the district level enters the equation positively, although the result remains insignificant.

The estimated coefficient on conspicuous consumption by others is only significant at the cluster level in Model 2, as the conspicuous consumption by others in other specifications is found to be insignificant. For example, Model 3 controls for comparison effects in the form of reference expenditure both at the district and cluster level, and the results suggest that district-reference expenditures enter the SWB equation negatively. The result is only significant for the comparison expenditure at only the cluster level, while conspicuous consumption by others at the cluster and district levels remains insignificant in predicting individual SWB. Furthermore, in

Models 3, 4, and 5, conspicuous consumption by others remains insignificant, along with all comparison reference groups.

Table 4-8: SWB — Fixed-Effects Regression for Subjective Well-being

Model Estimation	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Employed	0. 0758	-0.3521**	-0.2784		
Not Economically Active	-0.0666	-0.2114	-0.1642		
Log per capita household income	0.2482***	0.3283	0.2623***		
Conspicuous consum ext	0.2406***				
Cluster: Conspicuous Consum Others		-0.1633*	-0.0750	-0.0527	-0.2556
District: Conspicuous Consum Others		0.1026	0.0984	0.1289	0.1952
Cluster: Average expenditure			-0.2456**	-0.3172	0.0332
District: Average expenditure			0.0402	-0.3131	-0.7580
Cluster: Own race average exp				-0.0374	-0.3623
District: Own race average exp				0.1921	0.3026
Cluster: Age and gender specific					0.3652
District: Age and gender specific					0.0153
Perceived Economic Position:					
Middle-Third		0.2239*	0.0437	0.1038	0.2563
Richest-Third		0.6298*	0.6101	0.5331	1.2900
Middle Third (2yrs)		0.4638***	0.5940***	0.5969***	0.6565*
Richest Third (2yrs)		0.7704***	0.7539**	0.8162***	1.2015**
Middle Third (5yrs)		0.3787**	0.3907*	0.3856*	-0.0137
Richest Third (5yrs)		0.4353**	0.3142***	0.3398***	0.3020
Asset Index	-0.2997***	-0.3104***	-0.2607***	-0.2607	-0.1292
Constant	**2.8229*** **	**3.9836*** *	**3.8445*** **	**6.9408*** **	**7.6545**
District Municipalities	**YES**	**YES**	**NO**	**NO**	**NO**
Number of Observations	**27,985**	**12,581**	**9,760**	**9,848**	**3,612**
R-Squared (within)	**0.0753**	**0.1147**	**0.0838**	**0.0695**	**0.0771**
Prob > F	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).
Note: District municipal dummy variables are included according to the model specifications, but the results are reported in the Appendix.
*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*
All results are weighted.

4.6 Conclusion

The chapter examines the effect of conspicuous consumption by others on individuals' SWB using the NIDS data from the years 2008 to 2017.

Conspicuous consumption is defined as readily observable consumption. The effect of conspicuous consumption on individual SWB is two-fold. One, consumers spend conspicuously to signal social status, wealth, class, position in society, and to meet expectations (their own or those of significant others, such as family/society/colleagues). In this case, own conspicuous consumption has a direct effect on conspicuous consumption, whether it is directed by intrinsic individuals or extrinsic motives. The intrinsic motives are personal to the individual, and these motives are hardwired to the psychological factors of the individual. The extrinsic motives are based on external factors that have a psychological impact on the individual, such as; praise, fame, and status. In this regard, own conspicuous consumption has a positive effect on individual SWB. The findings from this study show that own conspicuous consumption positively affects own individual SWB.

Two, own conspicuous consumption has an indirect effect on the well-being of others. This premise is based on the idea that own consumption is not only dependent on own consumption but also on the relative consumption of the comparison group. Regardless of the intention of the spender, another person may view someone's consumption as conspicuous depending on either their actual and/or perceived relative position. So individuals may spend conspicuously deliberately, but even individuals who are not trying to signal anything to anyone (and whose spending aligns with their own 'baseline') could be viewed as spending conspicuously, if others perceive their expenditure as conspicuous. In examining the second effect, the study takes into account reference groups. This enables the study to account for the effect of conspicuous consumption by others in close proximities (among neighbours, family, and friends) and in distant proximities (anonymous interactions).

Overall, the findings suggest that prior to accounting for comparison effects, conspicuous consumption by others at the cluster level increases individual SWB and conspicuous consumption by others at the district level decreases individual SWB. After controlling for average expenditure at the cluster and district levels, conspicuous consumption by others at the district level decreases individual SWB at a 5 percent level of significance. This finding suggests that individual SWB is negatively sensitive to conspicuous consumption that occurs in distant proximities, as opposed to close proximities. Moreover, conspicuous consumption by others at the district level is categorized by mostly anonymous interactions, and the feeling of envy outweighs social connection and motivation that comes with conspicuous consumption. The feeling of envy is associated with the fear of being left behind in terms of socioeconomic standards, particularly if the action is motivated by exterior motives, that is, perceived by others as a signal of one's status or wealth. On the other hand, conspicuous consumption by others at the cluster level positively affects individual SWB. The feeling of aspiration, social connection and motivation outweighs feeling on envy and information effects, as individuals are better-off if their close relative peers are consuming conspicuously.

The apartheid policy of divide and rule accentuates these relative concerns and they, partly, emanate from inequalities that are entrenched along racial lines. The individual's response to conspicuous consumption by others, amid its effect on their SWB, motivates the desire to consume conspicuously. Consequently, conspicuous consumption becomes a compensatory strategy that individuals use to respond to conspicuous consumption by others, reversing the causality. Hence, the need and gratification from exhibiting status via conspicuous consumption would imply households would need to increase their share of conspicuous consumption to feel better and this will likely be pronounced in poorer communities. This does not present a pathology for those who are made worse-off but rather a possible response to the institutional and structural elements that provide an alternative solution to feeling better. While consuming conspicuously in close proximities is beneficial to the individual, continuous consumption of these visible items is indicative of a substantial diversion of resources from other uses (savings, health, and education) which, in the long run, may improves the households' socioeconomic status.

Chapter 5: Evaluating the effect of access to infrastructure facilities on individual subjective well-being in South Africa

5.1 Introduction

At the dawn of the new democratic dispensation, the South African (SA) government was tasked with providing a foundation for racial harmony and economic prosperity (Bond & Garcia, 2000). This was to be achieved through a peaceful, stable, and racially balanced political system that thrived on political freedom and civil liberties (Luiz, 2007). During the period of transition, on the one hand, the country was amongst the most developed in Africa (Rogerson, 2011); while on the other hand, the SA government inherited a contradictory legacy and a daunting task of addressing the volatilities and legacies of apartheid. Some challenges included working with a divided nation towards unity, addressing racial and spatial integration, and healing social and economic ills that largely affected Black Africans (Hopkins, 2009). These challenges provided complex social and economic dimensions coupled with racially entrenched (mostly affecting Black Africans) and widespread levels of poverty, unemployment, and inequalities (Freund, 2010).

Over the years, the SA government has combined a development path that seeks to address these inherent challenges. This developmental path has been orientated towards maintaining a prudent macroeconomic outlook, ensuring export-oriented growth, a sustainable fiscal expenditure framework, and radical infrastructure development initiatives with specific emphasis on deprived regions (Rogerson, 1998; Carmody, 2002; Makgetla, 2004; Alexander, 2010). These ideals have been targeted through the enactment of a series of policies[39] ranging from the Reconstruction and

[39] See World Bank Report (2018). It provides a comprehensive analysis of the evolution of South African policy directions.

Development Programme (RDP),[40] the Growth, Employment and Redistribution (GEAR)[41] strategy, the Accelerated and Shared Growth Initiative - South Africa (AsgiSA),[42] and the New Growth Path (NGP)[43] to the National Development Plan (NDP)[44] (Rossouw & Ferreira, 2016). Notwithstanding the critics, these policies have been developed in respect to each other, and comprise a broad vision that provides a strategic overview of how the economy is to be driven.

However, the depth of racial and income divides in SA makes it difficult to predict the cycle of redistribution and the success of these policies (Bhorat & Van der Westhuizen, 2012; Mosala et al., 2017; Hurlbut, 2018). Moreover, according to the World Bank (2019), SA's economic outlook remains constrained by its low growth potential.

Improving this state of affairs requires breaking away from the equilibrium of low economic growth and high inequality levels in which the country has been trapped for decades (Bekun et al., 2019). It further requires the creation of an economic and social-political environment where citizens would be able to enjoy equal access to infrastructure. Infrastructure facilities such as schools, healthcare centres, police facilities, highways, streets, airports, electricity, and water systems are all positive contributors to the output growth because they increase productivity while decreasing costs associated with productivity (Rogerson & Nel, 2016; More & Aye, 2017).

Against this backdrop, it is important for economists to evaluate the economic impact of public infrastructure and access to these facilities on individual SWB. The provision

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[40] The Reconstruction and Development Programme (RDP) was initiated by former President Nelson Mandela in 1994. This is the first socio-economic policy framework by the African National Congress (ANC) government. The aim was to enhance the economy through a macroeconomic growth-orientated approach.
[41] GEAR deals with issues relating to fiscal policy, stability, and job creation.
[42] AsgiSA brings up terms related to projects in institutions with a specific emphasis on agriculture.
[43] NGP emphasizes the need for centrally planned economic growth in dealing with employment creation. It recognizes the threat of youth unemployment and introduces the importance of a green economy.
[44] The widespread poverty, unemployment, and inequalities were amongst the failures of the RDP. Former President Jacob Zuma then appointed the National Planning Commission in May 2010 that was tasked with drafting a national development plan that would detail a 2030 vision for SA. The composition of the commission has 26 policymakers drawn largely from outside government.

of infrastructure in its broad sense relates to economic development that improves access to quality work, enterprise opportunities, and other essential services that directly contribute to the well-being of the people (Mullen, 1984; Linneker & Spence, 1996; Cooper, 1999; Roller & Waverman, 2001; Khadaroo & Seetanah, 2007). Infrastructure is pivotal for the pursuit of socio-developmental goals, and it improves the competitiveness of markets and the general stability of the economy (Sabatini, 2008; Kasser, 2009); citizens enjoy access to safe, competitively priced quality goods and services in a non-exploitative system that encourages producers to respond to individual needs while providing effective recourse mechanisms that improve levels of SWB (Coulthard et al., 2011; Pereira et al., 2011). Hence, if there is a lack of infrastructure, the inadequacy would resonate with the inability to build sufficient platforms that citizens ordinarily enjoy (Salze et al., 2011; Spaull, 2013). As a result, the government is required to prioritise infrastructure, aligned with improving economic welfare (Simcock & Mullen, 2016; Hammer & Pivo, 2017; Makmuri, 2017).

Evidence is still required to demonstrate the importance of access to social and economic infrastructure on individual SWB in SA. As a result, this study aimed to examine the impact of access to public infrastructure on individual SWB. The novelty of the aim is two-fold. First, the study provides a perspective on the importance of infrastructure provision in determining individual SWB. This perspective enables the study to provide an understanding of welfare implications relating to public policy proposals that seek to optimise economic welfare through equitable provision of public services. The analysis of SWB in this regard has merit for public policy design because it establishes an understanding of individual SWB beyond a purely income-based approach (Layard, 2006; Dolan & White, 2007; Kroll & Delhey, 2013; Patrizii et al., 2017; Veneri & Murtin, 2019). Second, the study goes beyond merely establishing the importance of infrastructure, and provides a spatial perspective on access to educational, healthcare, and police service facilities and the channels through which these impact individual SWB. Access is measured by the distance individuals travel to the nearest educational, healthcare, and police service facility. The study incorporates distance information on the respective public facilities and other household infrastructure into the SWB equation, thus enabling the study to contextualise the effect of access to the respective infrastructure facilities on individual SWB.

The remainder of this chapter is organised as follows: Section 5.2 provides a contextual overview of the existing literature on infrastructure and individual SWB. This is followed by Section 5.3, which provides an analysis of the data and a descriptive overview of the respective infrastructure facilities. Section 5.4 presents the methodological approaches adopted by the study. An overview and discussion of the findings is presented in Section 5.5. The conclusion of the research is drawn from the findings, and the study provides potential directions for future research under Section 5.6.

5.2 **Literature Review**

5.2.1 **Background: South Africa's policy development and infrastructure**

South Africa's political, economic, and social challenges are a legacy of apartheid (Bond, 1999). Apartheid was a system renowned for institutionalising racial segregation, particularly the suppression of Blacks (Maylam, 1990). In this system, the allocation of resources and opportunities was uneven, and race was used as a determining mechanism (Klasen, 2000). In particular, racial segregation was pervasive in government, the labour market, and the political structure of the whole country (Teeger & Vinitzky-Seroussi, 2007). As a result, in post-apartheid South Africa (SA), the Whites are relatively the prosperous race, regardless of gender or geographical dispersal. They can readily access developed economic, social, and physical infrastructure, while the economic and social strata of marginalised groups (Blacks, Coloureds, and Indians) are both unpleasant and enduring (Feinstein, 2005; Madlingozi, 2007; Kon & Lackan, 2008; Mhlauli et al., 2015).

Two decades after the dawn of democracy, race is still a commonly used threshold predictor of the rich and poor (Williams, 2018). Hence, strengthening SA's democratisation process is largely dependent on breaking down the down geographical and other socioeconomic barriers faced by the historically disadvantaged citizens (African, Coloured, and Indian). The country's three tiers of government[45] therefore have the responsibility to plan to ensure that the basic human rights of the citizens are met (Constitution of the Republic of South Africa, 1996, Chapter 2, Section 27.1 a, b, c). The government is mandated to provide collective goods, such as basic social infrastructure, education, health, and security (Bertrand et al., 2003; Edigheji, 2010). These collective goods are considered part of basic human rights, irrespective of the citizen's race, gender, geographical location, ethnicity, or income level (Gnade et al., 2017).

Accordingly, in 2011, the SA government tasked the National Planning Commission (NPC) to determine a vision and a plan for what the country should look like in 2030. This included determining how the plan could be achieved and, as such, developing a mechanism that will evaluate the success of the plan (National Planning Commission, 2013). The NPC provided a diagnostic overview that detailed how poverty could be abolished and inequalities reduced if attention were given to the following nine issues: high disease burden, a divided community, uneven public service performance, divided spatial patterns, poor education outcomes, low employment levels, corruption, decaying infrastructure, and a resource-intensive economy.

These nine causes of poverty and inequality are interlinked in various ways (Hendriks, 2013): Targeting only one cause would have various direct and indirect effects on the other causes, in addition to the impact these causes have on poverty and inequality. These nine causes were also noted to be underpinned by the location of citizens, with general welfare levels being lower in rural areas than in urbanised areas (NPC, 2013). This is because economic development in urban areas is, to some extent, influenced

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[45] At the highest level is the national government, with ultimate authority. It consists of an elected parliament, which elects the President, who then appoints his cabinet from parliament who control the organs of state. There are other organs of state, such as the judiciary and the Public Protector that act specifically at the national level.
Below that are the provincial governments. They are governed by executive councils and elected legislatures and can draw up their own constitutions and enact their own laws, as long as these do not conflict with the national constitution or laws.
In the third tier of government are the municipalities, which are structured much like the national and provincial tiers. They have elected councils that elect an executive mayor who then appoints an executive committee. Municipalities have special responsibility for implementing the service delivery, social development programs, and the rollout of infrastructure.

by the timely delivery of infrastructure, which is essential in improving the material living conditions of the people (Gabdrakhmanov & Rubtsov, 2014). In contrast, if rural areas remain deprived of infrastructure, the residents remain constrained from pulling themselves out of poverty (Gaal & Afrah, 2017). Therefore, infrastructure is conceptualised as part of the country's plan to revitalise the economy, reduce rampant unemployment, and alleviate the spatial ills of the legacy of the Group Areas Act 41 of 1950, and the Bantu Homelands Citizenship Act 26 of 1970 (Ramokgadi, 2014).

For this reason, the NDP sets out the infrastructure objectives to be achieved by 2030. However, the country is currently far from achieving its NDP target for public sector infrastructure. This is due, among other things, to underspending across all spheres of government, ailing state owned enterprises (SOEs), and an overall reduced state implementation capacity.

Moreover, the formation of the NDP was to foster the Millennium Development Goals (MDGs) of the United Nations, which were time-bound and quantified targets for addressing poverty, reducing child mortality, improving mental health, combating HIV/AIDS (this includes malaria and other diseases), ensuring environmental sustainability, and developing global partnerships for development (Hulme, 2009). The MDGs concluded in 2015 and this saw the launch by the United Nations (UN) of the bold and transformative 2030 Agenda for 17 Sustainable Development Goals[46] (SDGs) (Sachs, 2012). The 17 SDGs build on the eight MDGs, which specifically sought, by 2015, to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability, and develop a global partnership for development (General Assembly, 2015). The targeted year for the SDGs by the UN and for the NDP

[46] See the General Assembly (2015) resolution report on SDGs. The General Assembly adopted the following outcome document of the United Nations summit for the adoption of the post-2015 development agenda: *Transforming our world: The 2030 Agenda for Sustainable Development*.
Also, Le Blanc (2015) provides a comprehensive analysis on what SDGs entail.

by the SA government is 2030 and it will be interesting to compare the success of the NDP and the SDGs.

5.2.2 Infrastructure overview

Infrastructure is generally defined as a physical framework of facilities through which goods and services are provided to the general public (Ingram & Kessides, 1994; Alcira & Margaret, 2000; Démurger, 2001; Kusharjanto & Kim, 2001, 2003; Leipziger et al., 2003; Simma & Axhausen, 2003; Goel; Calderón & Servén, 2004; Fay et al., 2005). It forms part of basic human necessities and an unavoidable part of human sustenance, making life unbearable when it is not available or accessible (Davis et al., 2008). It provides a base for development, thus enhancing the impact of interventions that improve access to social assets (Gibson & Olivia, 2010). Therefore, *access to infrastructure* is the ability to provide and make available the physical framework of facilities. Its linkages to the economy are multiple and complex. It affects consumption and productivity directly and involves large inflow and outflow of expenditure (Batten & Karlsson, 2012; Gori-Maia, 2013; Srinivasu & Rao, 2013).

According to the World Development Report (2008), infrastructure has two broad categories, namely: social and physical infrastructure. The former includes education, safety, culture, tourism, and health facilities, while the latter includes the electrical grid, transportation system, telecommunication, bridges, roads, water, and sanitation systems (Paez et al., 2010). This division between the two broad categories is relatively symbolic and interrelated. Social infrastructure has a significant impact on physical infrastructure, and the physical infrastructure presumes the level of development for social infrastructure (Gasper et al., 2013).

Investment in both social and economic infrastructure occurs in huge sums and the rollout is mostly implemented by the public sector (Conrad & Seitz, 1994; Chandra & Thompson, 2000). As mandated by the SA constitution, the government provides these services through the budget obtained from revenue that is generated through taxes and borrowings (Agénor, 2008). In this case, public infrastructure is non-excludable and non-rival. Therefore, the use of the infrastructure facility by one person does not necessarily exclude others, and it is not based on the rivalry translated through purchasing power (Clifton et al., 2016). Also, consumers do not voluntarily pay for public services or facilities, and these necessarily become unpaid input into consumption and production possibilities (Aradowska, 2018).

Public investments in infrastructure serve as a powerful mechanism for the enhancement of economic development (Frischmann, 2004). They advance industries in the national economy by striving for a reasonable allocation of resources between industries, stimulating economic activities, and providing governmental regulation of business processes (Albalate et al., 2015). Therefore, in some cases, policy advocates are challenged to match the demand and supply of infrastructure (Popova, 2017).

Moreover, access to infrastructure has become a principal tool for achieving national goals (Brook & Irwin, 2003; Fafchamps & Shilpi, 2003). It affects the efficiency of the national economy and economic growth, such that the sustainable development of industries and entire regions is, to some extent, determined by the quality and quantity of infrastructure and its sustainable functioning (Satterthwaite, 2003). Thus, the level of infrastructure development is interrelated with investments, economic development, human capital, and development thereof.

Infrastructure development increases access to markets and decreases the costs of production (Parnell & Robinson, 2006; Fedderke & Garlick, 2008; Jacoby & Minten, 2008). This is achieved through enhanced transportation systems that allow the involvement of new territories in an active economic environment (Banerjee & Morella, 2011): Unoccupied areas become interesting for investors as well for the population if infrastructure in the surrounding area is being developed (Blanc-Brude, 2013; Cheteni, 2013). Furthermore, infrastructure development lowers negative externalities in the form of service delivery unrests, improves human capital through education and health, and increases the efficiency of other production factors, including capital, labour, and aggregate productivity (Palei, 2015). Thus, it improves the global competitiveness of the country’s economy because, for example, foreign direct investment is significantly dependent on the density of infrastructure development (Carrion-i-Silvestre & Surdeanu, 2016).

5.2.3 Access to infrastructure: subjective well-being and spatial developments

Infrastructure is a factor for economic living standards because access to infrastructure has social and economic benefits for individuals (Head & Mayer, 2004; Ding & Haynes, 2006). This is through community connectivity that provides active interaction and participation in necessary or voluntary daily activities (Morrison, 2007). This allows citizens to communicate, interact, and participate in the community (Gutiérrez et al., 2010; Fischer & Amekudzi, 2011; Salze et al., 2011; Brown & Barber, 2012). One of the ways access to infrastructure contributes to economic development is by increasing amenities that enhance the overall SWB (Wu, 2015). Areas where infrastructure facilities are available and accessible are coupled with high levels of SWB (Kahneman & Krueger, 2006; Parker et al., 2008). In this context, SWB provides a broad illustration of the standard of living, given that the level of SWB is, among others, determined by access to infrastructure (Chongvilaivan et al., 2016). This includes other related objective measures, such as health, built environment, social belonging, education, recreation, and leisure time (Popova, 2017). In essence, SWB is not static, because it changes together with perceptions and ideas the people have about their life, both personally and socially (Yu et al., 2017).

The interconnection between infrastructure and SWB is of paramount importance for policymakers (Simma, 2003). This is mainly because underdevelopment and challenges relating to the pursuit of infrastructure can be a bottleneck for any economy. Lack of infrastructure can cause restrictions on economic activity and can decelerate the social development of the country (Haughwout, 2002; Chaurey et al., 2004). As a consequence, impeded economic activity and decelerated social development due to the lack of infrastructure negatively affect individual SWB (Delbosc, 2012). In some instances, communities manage to cope with the lack of infrastructure after adjusting to the reality of its unavailability (Olayiwola & Adeleye, 2005). In other communities, lack of infrastructure is a source of discomfort and may lead to civil unrests, reflecting decreased levels of individual SWB (Gabriel & Abraham, 2011). These service delivery unrests are consistent with infrastructure that is uncertain, inadequate, or inefficient.

Hence, the lack of infrastructure and its potential effect on SWB cannot be generalised. The effect is likely to vary from one race group to another, from one culture to another, from one region to another, and from one country to another. Consequently, policymakers need to take proactive measures when formulating policy frameworks to address the inadequacy of infrastructure that results in social unrest among the populace (Wener et al., 2003; Olsson et al., 2013).

Moreover, the provision of infrastructure enables policymakers to describe and determine the spatial distribution of infrastructure facilities that affect SWB (Paez, 2004; Holl, 2007; Ottaviano & Pinelli, 2006; Paez et al., 2010). The spatial distribution of infrastructure facilities is related to the distance individuals travel to access these infrastructure facilities (Johansson, 1993; Linneker & Spence, 1996; Vickerman et al., 1999; Limao & Venables, 2001). The distance, mobility, and the flow of people are defining features of contemporary access to infrastructure (Hannam et al., 2006; Sheller & Urry, 2006; Bertolini et al., 2008; Batty, 2013).

Increasing polycentric regional forms, together with other structural changes in growing regions, have made the patterns of daily mobility more and more complex (Gutiérrez & García-Palomares, 2007; Hoyler et al., 2008; Vasanen, 2012; Batty, 2013). Access to infrastructure services in a specific location reflects the location's ability to reach or to be reached by other locations such as markets or input sources. This ability is determined by the travel distance between the two points. The travel distance is a fundamental measure of accessibility, and it varies from point to point in space (Taylor, 2012). This measure first involves defining how to determine ‘near’ or ‘far’ and the ‘cost’ implications of travelling from one point to the other. These factors affect SWB, and they depend on both the mode of travel (foot, bicycle, motor transportation, or commuting) and the time of the day when the trip is made (Páez et al., 2012). Therefore, infrastructure systems and land use enable people to reach diverse locations. Good infrastructure systems have an unquestionably significant positive bearing on the functioning of regions, societies, and the environment, which are all positive contributors to human sustenance and SWB (Karou & Hull, 2014).

Therefore, access to infrastructure connects households with available infrastructure. It provides a base for education, health and safety, and economy-related opportunities, which are positive contributors to individual SWB (Mair & Thivierge-Rikard, 2010). The distance travelled by economic agents to access infrastructure is determined by spatial planning, distribution, and the level of infrastructure (Flavin et al., 2011). This implies access to infrastructure, mainly social and economic infrastructure, is interrelated with spatial planning. The interrelation between infrastructure and spatial planning implies that the level of stratification in and across economic regions determines access and the distribution of infrastructure facilities (Valls & Valls-Tuñon, 2014). Indeed, accessibility is considered an essential conceptual tool for the effectiveness of spatial planning and integrated land use. The spatial pattern of infrastructure networks and accessibility within regions direct the distribution of the rapidly growing population and subsequently, if implemented unsustainably, they could threaten biodiversity, tropical ecosystems, and amenities that positively affect SWB (Aubad et al., 2010; Sloan et al., 2018). The interlinks between infrastructure development and maintaining sustainable environments are a major challenge for contemporary planning, public policy, and decision-making in a country where inequalities are traced in spatial planning.

Spatial disparities in the distribution of infrastructure and their effect on individual SWB are stark and deeply carved in the landscape of regions (Hill, 2002). Spatial inequalities have become increasingly apparent at all local, regional, national, and international levels (Kanbur & Venables, 2007). The existence of spatial inequalities perpetuates the depth and extent of inequalities in access to social and economic infrastructure across economic regions (Turok, 2012).

Unequal access to and development of infrastructure are attributed to a variety of factors. They are mainly driven by uneven natural resource endowments, which determine the physical separation of people by productive activities where jobs and resources are located (Archibong et al., 2015). This implies that the economy becomes more geographically concentrated than the actual population. This leads to a lack of infrastructure and can presumably result in an access burden of infrastructure for people living in the periphery, and this imposes an indirect cost (distance and mobility costs) on their mobility. In the SA context, this spatial discrepancy applies at both the urban scale (between the main business districts or industrial centres and the largest townships) and the regional scale (between the major cities and well-populated rural areas) (Atkinson et al., 2016). This hinders equitable and integrated spatial development, thus decreasing SWB.

Furthermore, access to infrastructure becomes the basis for production agglomeration when new industries concentrate around the existing industrial clusters (Head et al., 1995; Parr, 2002; Holl, 2004; McCann & Shefer, 2004; Renkow, 2007; Partridge & Rickman, 2008). The resulting industry agglomeration increases the economies of scale and stimulates the production factors that improve employment opportunities for society. In this case, individual SWB becomes a function of economies of scale and employment opportunities. The downside of industry agglomeration dynamics is that a growing number of towns and regions become increasingly 'left behind' (Son, 2009). This is evident in sparsely populated rural areas, particularly in the old industrialised economic regions (Partridge et al., 2010; Puga, 2010; Easterlin et al., 2011).

In SA, agglomerated towns and cities, exclusive business precincts and upmarket suburbs with outstanding amenities are coupled with overcrowded townships and squalid informal settlements, indicating polarisation even in agglomerated towns and cities (Geyer et al., 2012). On the other hand, the level of poverty, unemployment, and inequality in the rural areas could be a result of rural-urban migration. In remote rural areas, villages with no access to electricity and with mud-walled schools' contrast with luxurious private game lodges and affluent country estates. These spatial differences are undesirable because they are likely to perpetuate inequalities. The effect can be destabilising if the regional divergence contributes to general social instability (Jiang, 2017; Winters & Li, 2017; Von Fintel, 2018).

Overall, spatial inequalities are interrelated with inequalities in access to infrastructure facilities, and this arouses deep resentment in individuals who are adversely affected (Kenny, 2005; Lall & Chakravorty, 2005). Also, spatial inequalities in access to infrastructure facilities can cause social discomfort, because exclusion and hardship negatively affect the individual's overall assessment of SWB (Morrison, 2007). As a result, differences in access to economic infrastructure require attention from government policy with special emphasis on underdeveloped economic regions (Kilkenny, 2010; Requena, 2016). This addresses migration flows because low standards of living in rural contribute to individuals' migrating to urban areas. Consequently, poor access to infrastructure coupled with poor service delivery is not trivial – rather, it is indicative of welfare constraints and reflects ineffective policy implementation. Therefore, economic growth coupled with increased social and economic infrastructure provides more fitment in determining SWB (Lenzi & Perucca, 2016; Winters & Li, 2017).

5.2.4 **Empirical evidence**

This empirical evidence section outlines some of the existing literature on access to infrastructure and its effect on individual SWB. The context of this section is based on macroeconomic and microeconomic considerations of access to infrastructure.

Access to infrastructure plays a substantial role in determining SWB (Costanza et al., 2007; Tay & Diener, 2011). An increasing body of empirical evidence has examined the social and economic impact of advances in infrastructure. Increased investment in basic infrastructure has been shown to improve social development and economic growth and, through the transmission mechanism, this positively affects SWB (Roller & Waverman, 2001; Holl, 2004; Tervo, 2005; Banerjee et al., 2012). The development of physical infrastructure improves an economy's income and long-term production levels from both a macroeconomic and a microeconomic perspective (Barro, 1990;

Easterly & Rebelo, 1993; Futagami et al., 1993; Esfahani & Ramírez, 2003; Etter et al., 2006; Canning & Pedroni, 2008; Ettema et al., 2012; Calderón et al., 2015).

In a macroeconomic context, empirical evidence by De la Fuente & Estache (2004) used panel data encompassing over 100 countries and spanning the years 1960 to 2000 to examine the impact of infrastructure investment on growth and income distribution. The results indicated that economic growth is positively affected by the stock of basic infrastructure and that income inequality declines with higher infrastructure quantity and quality. The increase in economic growth and a decline in income inequality have a positive spill-over effect on economic welfare and SWB.

In India, Hulten et al. (2006) conducted a similar study, with specific emphasis on the externalities of infrastructure, and how positive externalities enhance manufacturing productivity. Ideally, the expectation is that infrastructure positively affects productivity through infrastructure investments. It leads to increased revenue, employment, and income, which are all positive contributors to SWB. The results suggest that, between 1972 and 1992, highways and electricity in India contributed approximately half of the growth of the Solow[47] residuals in manufacturing industries. The results are consistent with this assertion that infrastructure externalities result in increased manufacturing productivity, and through the transmission mechanism, this leads to increased revenue, employment, and income, which are positive predictors of SWB.

Other macroeconomic studies have also examined the positive productivity effects of access to physical infrastructure, particularly in rural and agricultural sectors (Zhang & Fan, 2004; Salze et al., 2011). Most related findings suggest that access to infrastructure and development is likely to eradicate poverty by enhancing economic growth, given the positive relationship between income growth and poverty that has

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[47] In 1957, Robert Solow constructed a Solow residual model that explained how a portion of an economy's output growth can be attributed to other economic factors beyond (or holding constant) the accumulation of capital and labour (the factors of production). In other words, the Solow residual model represents output growth that happens beyond the simple growth of inputs. In the context of infrastructure, availability and access to infrastructure is an enabler for productivity and growth.
See Solow (1957) for the explanation of the Solow residuals.

been widely observed (see Ravallion, 2001; Besley & Burgess, 2003; Dollar & Kraay, 2004). These findings reaffirm the coexistence of a strong relationship between basic infrastructure and growth (for example, Aschauer, 1989; Easterly & Rebelo, 1993; Robles, 1998; Eshfahani & Ramírez, 2003). This observed relationship is consistent with SA findings, because Fedderke et al. (2006) used time-series data from the years 1875 to 2001 to explain the relationship between investment in economic infrastructure and long-run economic growth. Their findings suggest that basic infrastructure affects productivity and growth, while economic growth increases the demand for basic infrastructure. Therefore, productive public expenditure on infrastructure (such as roads, transportation, and housing) plays a critical role in advancing economic growth and economic welfare.

Generally, studies on public infrastructure or facilities show that public investments in infrastructure are a critical feature of economic welfare. This is because economic welfare is translated through public infrastructure investments aimed at enhancing economic development and growth. Bom & Ligthart (2014) studied this premise by examining the effect of public infrastructure in a small open economy. Their findings suggested that long-term public investments in infrastructure increase welfare if the output elasticity of public capital is greater than the public investment-to-GDP ratio that averages 3 percent in OECD countries.

Consistent with the findings by Bom & Ligthart (2014), Ganelli & Tervala (2016) showed that the welfare multipliers[48] of public infrastructure investment are sensitive to the output elasticity of public infrastructure. Ganelli & Tervala (2016) suggested that the welfare multiplier is virtually zero when the output elasticity of public infrastructure is three percent. The welfare multiplier of public investment depends on its

[48] Welfare multipliers of infrastructure investments are defined as the consumption equivalent change in welfare for one dollar change in public spending. A more recent study by Ganelli & Tervala (2020) provides more context on how the welfare multiplier of public investment is dependent, not only on the productivity (output elasticity) of public capital, as shown by earlier studies, but also on the depreciation rate of public capital and the efficiency of public investment defined as a fraction of public investment spending that translates into the public capital stock.

productivity, and therefore maintaining high investment productivity is the key to fully reaping the benefits of an infrastructure spending push. The International Monetary Fund (2015) argued that government should prioritise strengthening the institutions responsible for the planning, allocation, and implementation of public investments into public infrastructure facilities. This would enhance the productivity of public investment, and efficient public investment management would secure a positive welfare multiplier of public investment in public infrastructure facilities.

In a microeconomic context, infrastructure is pivotal for the advancement of economic welfare, and access to infrastructure facilities, such as healthcare, schools and community safety stations, is among the indispensable components of social and economic welfare. For example, healthcare infrastructure is understood to be a vital component of human life. Thomas & Strauss (1992) showed that child height in Brazil is significantly affected by better availability of modern sewage disposal, piped water, and electricity. In Africa, Brockerhoff & Derose (1996) examined this assertion by testing whether preventive primary healthcare enhanced early childhood survival in the late 1980s and early 1990s in five East African countries. Their findings suggested that child mortality rates were considerably lower than they would have been in the absence of specific immunisations, access to safe drinking water, frequent antenatal care visits, and proper fertility regulations. All these factors are considered critical to human life, and whether individuals access these factors is determined by the availability and access to infrastructure. This finding is consistent with the findings by Lavy et al. (1996), who examined the effect of the quality and accessibility of healthcare services as well as other public infrastructure facilities on the health of children in Ghana. Emphasis was on child survival, height, and weight. Their results support the findings by Brockerhoff & Derose (1996), because they argue the importance of public policy in eradicating rural-urban inequalities in health status, in particular, improving the health conditions of children in rural areas, and reducing their mortality rates. Furthermore, increased availability of healthcare facilities, as well as improved water and sanitation infrastructure would have an immediate payoff in healthcare and the general levels of well-being.

What is learned from these studies is that the effect of infrastructure facilities is all-encompassing, and infrastructure facilities are interrelated. For example, access to healthcare facilities requires road networks and transport systems (Jacoby, 2000). Health status is also dependent on safe drinking water and sanitation systems. Consistently, if individuals are healthy, then *ceteris paribus*, they are able to supply their hours to labour, increasing their probability of being productive participants in the labour market.

Ilahi & Grimard (2000) examined the trade-off between infrastructure and time spent collecting water in Pakistan. The aim was to show the effects of the availability and quality of infrastructure. The context was on time allocated by women in collecting water instead of spending that time on market-orientated activities (wages from employment or other market-related activities) and leisure. Their findings show a negative correlation between improvements in public water supply infrastructure and the time women spend collecting water. This negative correlation implies that there is a trade-off between water collection and market-orientated activities. As a result, improvements in water-supply infrastructure increase the time women allocate to income-generating activities.

Lokshin & Yemtsov (2004) extended the above analysis by examining the effect of infrastructure on poverty reduction and how community-level infrastructure improvement projects affect water supply systems in rural Georgia. The results suggest that improvements in education and transport infrastructure produce non-trivial gains in SWB at the village and country levels. School rehabilitation projects benefit the poor, while road projects benefit the poor and non-poor. This finding on road projects is consistent with two points. One is that poor areas that had the least access to infrastructure in the past have high benefits from new investments. Two, some regions are concentrated in sectors of the economy where the rate of return to infrastructure is higher, particularly if there are new investments. These points are supported by an empirical study by Gibson & Rozelle (2003) of the effect of access to infrastructure in reducing poverty in Papua New Guinea. The authors used a survey design for the years 1995 to 1996. Emphasis was on access to roads in rural areas, and the distance between the point at which villagers could gain access to the road and the nearest government station that could serve as a proxy for access to infrastructure. The findings are consistent with later findings by Lokshin & Yemtsov (2004) that poor regions have the least access to infrastructure, although the poor derive the most benefit from new investments. Therefore, an increase in infrastructure spending, whether on new or existing facilities, can provide a source of comfort for poor individuals.

A comparative cross-country microeconomic study by Leipziger et al. (2003) used Demographic and Health Survey data conducted in 43 developing countries to examine the determinants of three child health outcomes related to the MDGs. The results show that increasing access to quality basic infrastructure services for the poor in developing countries has a significantly positive effect on health outcomes. It also has a positive effect on education that is related to increased income and welfare. These findings are consistent with Chong et al. (2007) who used panel data for Peru from the years 1994 to 2000 to examine the effect of household infrastructure on economic welfare. The findings suggested that improving a community’s access to a comprehensive set of basic infrastructure services yields welfare effects that are greater when compared to communities where certain components of basic services are missing.

Consistently, a study by Metwally et al. (2007) used survey data on the progress of behavioural changes towards appropriate behaviours related to water, environment, and sanitation. Metwally et al. (2007) used household surveys that were administered over three years, in three phases representing three governorates in Upper Egypt. The findings showed that basic infrastructure is a prerequisite for effective service delivery of social infrastructure services such as hospitals, schools, and police stations. This is on the basis that comprehensive basic infrastructure investment in itself is essential for economic growth and development because it is a necessary precondition for further economic and welfare creation.

All these studies reviewed thus far are consistent in showing a correlation between basic infrastructure and economic welfare. This correlation was also found by Seethepalli et al. (2008) in East Asia. The data was from World Bank, for the years 1985-2004. The findings show that greater stocks of infrastructure like energy, telecommunications, water supply, sanitation, and transport were indeed associated with higher growth and economic welfare.

The above macroeconomic and microeconomic studies are insightful in contextualising the effect of infrastructure on economic growth, living standards, and overall economic welfare. However, according to the best of the existing literature and empirical evidence, most research is limited to contextualising the effect of infrastructure on availability and components like health and education. In developed countries, empirical evidence by Stutzer & Frey (2008) and Ettema et al. (2012) incorporated the effect of distance on the SWB equation. In Germany, Stutzer & Frey (2008) used the German Socio-Economic Panel Study to examine the effect of time spent commuting on individual SWB. While in Sweden, Ettema et al. (2012) surveyed 155 undergraduate students at Karlstad University to develop and test a measure of travel-related SWB. Both studies used distance travelled to the nearest facility as a measure that defined access. Both findings show that trip duration tends to affect travel satisfaction negatively. If the duration of the trip is longer, then travellers become less relaxed and enthusiastic, thus increasing stress. This affects the overall evaluation of the trip because it is considered less efficient and of poor quality.

In the African context, SA research on the relationship is limited to the independent effects of the components of infrastructure facilities (for example, health and education) on SWB, while the effect of access on individual SWB is limited. For example, MacLaren et al. (2013) make use of the NIDS data to examine the role of distance to the nearest facility on patterns of healthcare utilisation. The findings show that many apartheid legacies remain in place, and health is negatively affected by travel distance. In particular, because of spatial effects, individuals who travel a long distance to access healthcare facilities are negatively affected by travel time and cost.

Although this study examined the effect of distance, however, it did not examine the effect of infrastructure access on individual SWB.

A recent study by Adewara et al. (2017) aimed at providing a stylised analysis of the effect of infrastructure on SWB. Adewara et al. (2017) examined its effect in Nigeria using survey data collected from the citizens located in the urban Ilorin, the South Local Government Area, and Kwara State. Specifically, their study examined the effects of sanitation, access to water, the provision of electricity, and cleaner cooking methods on SWB. The results show that access to sanitation, safer drinking water, frequency of medical check-ups, socialisation, cleaner cooking energy, and subjective health status are significant positive determinants of individual SWB. Although this study examined the direct relationship between infrastructure and SWB, there is still a void in terms of the effect of distance on individual SWB.

Overall, the multifarious links between infrastructure, accessibility, and SWB are still under-examined, particularly in developing countries. Most macroeconomic studies have focused on the aggregate effect of infrastructure, with limited emphasis on SWB. Microeconomic studies have focused on the availability of household infrastructure services like access to water and sanitation, and electricity. In SA, the measurement of the effect of distance is independently limited to healthcare or education. There's no specific evidence that examines access to social infrastructure (education, health, and police services) on individual SWB.

It is in this context that this study addresses the existing void. The novelty of the aim is based on providing context for the impact of access to public infrastructure on individual SWB, basing the measurement of access on the distance individuals travel to the nearest educational, healthcare, and police service facility.

5.3 Data and Descriptive Statistics

5.3.1 Data source

This research aimed to establish the nature of the relationship between access to infrastructure and individual SWB. Ideally, the study intended to use confidential NIDS data, which contains information relating to primary sampling units, employment codes, and other personal information (Brophy et al., 2018). This includes personal information such as date of birth and the exact location of the household for each respondent. The location of the household is defined by the Global Positioning System (GPS) coordinates of the household, and this information would have been used along with multiple datasets that contain GPS coordinates of infrastructure facilities. Then, both the household and infrastructure coordinates would be incorporated into ArcGIS software to allow for the geographical measurement of accessibility based on distance. This procedure would yield a distance variable that would enable the study to examine the relationship between accessibility of infrastructure facilities and individual SWB. Nevertheless, this process was deterred due to constraints in accessing the NIDS secure data amid the COVID-19 pandemic and the regulations in place.

As a result, the study made use of the Living Conditions Survey (LCS)[49] dataset relating to SA from 2014 to 2015. The LCS-2014/2015 data measured SWB under module one by asking respondents who were 15 years or older to rank their level of satisfaction from a scale of 1 to 10, where 1 means “very dissatisfied” and 10 means “very satisfied”, in answer to the question “How do you feel about your life right now?”. This measurement of well-being was multifaceted, and it included a continuum from judgments of life (life evaluation) to feelings (daily affect).

The measurement of access to infrastructure presents technical difficulties, and this is due to data limitations (Cervero, 2005; Bocarejo & Oviedo, 2012). For example, a SA study by Lionjanga & Venter (2018) examined infrastructure provision in the context of transport in the City of Johannesburg. They used the Quality of Life Survey conducted by Gauteng City-Region Observatory, which assesses the subjective and

[49] The LCS 2014/2015 data is implemented by Statistics South Africa (StatsSA) and presided over by the Presidency of SA. StatsSA is a national statistical service of South Africa with the goal of producing timely, accurate and official statistics, in order to advance economic growth, development and democracy. To date, StatsSA provides official demographic, economic and social censuses and surveys concerning the country.

objective well-being of Gauteng City-Region residents. This dataset contains information relating to the self-reported distance travelled to access transportation services, and the scope and context of the data were confined to transportation mechanisms. However, the scope and context of the data are confined to transportation mechanisms and to the province of Gauteng.

The aim of this research goes beyond establishing a relationship the existence of infrastructure facilities and SWB, rather, the scope was extended to take into cognisance the effect of access (measured by distance) to infrastructure facilities on individual SWB. For the purposes of this analysis, the scope and context were limited to public infrastructure facilities that are immediate and critical to human sustenance and the development of communities. Access to infrastructure is measured by the distance that individuals travel to access infrastructure facilities, and the LCS-2014/2015 reports distance information from the individuals' dwelling to the following nearest destinations: food markets, public transport (for example, station or taxi rank), schools (pre-, primary and secondary), health (clinics and hospitals), safety and security (police stations), religious organisations, banks, the post office/agent, welfare offices, and multi-purpose community centres. The LCS-2014/2015 also contains information on the mode of transport used to access these infrastructure facilities, because respondents reported on whether they walked, travelled by bus or taxi, or used their private transportation when accessing the respective infrastructure facilities.

It was assumed that every individual in the household had the same value for access but that the mode of travel might differ for each respondent. The expectation was that a long travel distance to access infrastructure facilities would have a negative bearing on individual SWB and therefore that infrastructure utilisation (depending on the type of infrastructure) would be lower for individuals who travel longer distances.

For example, socio-economically disadvantaged South Africans are more likely to experience poor health status, disability, the simultaneous occurrence of more than one condition/disease (multi-morbidity) and are less likely to use inpatient care (Nteta et al., 2010; Smith et al., 2013). As a result, unavailability of primary care increases vulnerability to adverse health outcomes, including mortality, and fetching water for drinking or for other household uses is a substantial burden that affects water quantity and quality in the household.

In SA, the effect of the distance from household to school is well known. Several studies have shown that shorter distances from home to school are associated with higher rates of school attendance and performance, but the effect is comparable between urban and rural areas (Dieltiens & Meny-Gibert, 2012; Bayat et al., 2014; De Kadt et al., 2014).

This also applies to police service stations, where police access and visibility are still constrained, particularly in rural areas that are situated in underdeveloped municipal districts, because people travel long distances to access basic services (De Juan & Wegner, 2019). All these conditions affect the individual's perception and judgement of their overall SWB, because persistent incidents of crime may lead to unsafe communities, which erodes social trust and cohesion, thus negatively affecting individual SWB.

5.3.2 **Descriptive statistics**

The descriptive statistics section presents a spatial analysis of infrastructure and its purpose, and the spatial overview does not draw on the LCS but rather on ArcGIS software. Both the spatial analysis and data tables shed light on the relevance of infrastructure as an economic and social measure of individual SWB.

The importance of infrastructure facilities to the socio-economic advancement of a nation cannot be overemphasised. Infrastructure facilities and their development are a prerequisite for poverty alleviation and employment creation, and ensure better living conditions for the general population. Improving access to infrastructure has an effect on the individual's assessment of SWB.

Figures 5-1, 5-2, and 5-3 provide a geographic overview of the distribution of public schools, clinics and hospitals, and police stations, respectively. The study used multiple datasets that contained various infrastructure facilities and their GPS coordinates to provide a geographical overview of the distribution of all the three respective infrastructure facilities. The public schooling GPS coordinates are obtained from the Human Sciences Research Council, the National Department of Education (DOE), and the Education Management Information System that is linked to the school-level data from the DOE. The above datasets were combined to create a master list of all public schools in SA.

Information on health facilities was obtained from the National Department of Health, the Human Sciences Research Council, MedPage, and the District Health Information System (DHIS). The DHIS contains data regarding the location of public health facilities, the type of facility, and the services provided. The DHIS captures, validates, and updates health-related information every month.

GPS coordinates relating to police stations are limited. However, the study used OpenAFRICA, which is an independent repository of open data, to examine the distribution of all police stations in SA. OpenAfrica collects data relating to, inter alia, the SA coordinates of all police stations, and the statistics per police station for 29 different crime categories and provides the boundaries of all police stations and administrative geographic data of South African Police Services (SAPS), both provincially and nationally.

The spatial distribution of infrastructure facilities in SA is still affected by the legacy of apartheid, and the distribution is characterised by unequal access to infrastructure across regions. The Natives Land Act no.27 of 1913 and the Group Areas Act no.41 of 1950 restricted the majority race from land ownership and limited their existence to the peripheries of the major regions, thus shaping SA's regional distribution of infrastructure and economic opportunities (Du Plessis, 2011). As a result, major infrastructure services are concentrated in high income provinces and cities. The former Bantustan homelands and townships on the peripheries of the major regions remain densely populated with limited access to major social infrastructure facilities such as housing, education, healthcare, and policing (Turok, 2012; Newton &

Schuermans, 2013). These services are crucial in every society because they are the direct resource of people who rely on these services to meet their immediate social needs.

More than twenty years into democracy and the repeal of the Natives Land Act.27 of 1913 and the Group Areas Act no.41 of 1950, SA is facing several challenges regarding the provision and access to infrastructure (Williams, 2018). These challenges related to infrastructure delivery systems, institutions, and finance; and to normative dimensions, such as sustainability, inclusion, liveability, efficiency, and their spatial implications; and to socio-political, governance, and institutional dimensions, such as the politics of decision-making, community participation and negotiation (Rogerson, 2014; Ruhiiga, 2014). Consequently, access to infrastructure services such as schools, hospitals, and policing remains constrained.

Figure 5-1 shows the spatial distribution of schools in SA by their GPS coordinates. What is evident from the map is that schools are concentrated in the high-population and high-income regions of Gauteng (GP), KwaZulu-Natal (KZN), and Western Cape (WC). The availability of schools is correlated with the population of these regions, and economic opportunities coupled with industrialisation are among the pull factors that define the high density of schools (Meny-Gibert, 2018). It is paramount to note that, although these areas are dense with public-school offerings, the high population strains the limited resources, and the quality of services differs comparatively (Todes & Turok, 2018). In particular, the Eastern Cape (EC) province is dense in the north-eastern section, but most of the schools are in poverty-stricken communities that are characterised by dilapidated infrastructure with inadequate learning and teaching facilities (Maistry & Africa, 2020).

The low population density in the rest of the country is largely influenced by the push factors of internal migration and rapid urbanisation in high-income regions: Individuals move to such regions for better economic opportunities and civil liberties. The areas that people migrate from are usually the former Bantustan homelands and townships, which are extremely under-serviced with weak infrastructure systems and allocation of resources (Dell & Kahn, 2017).

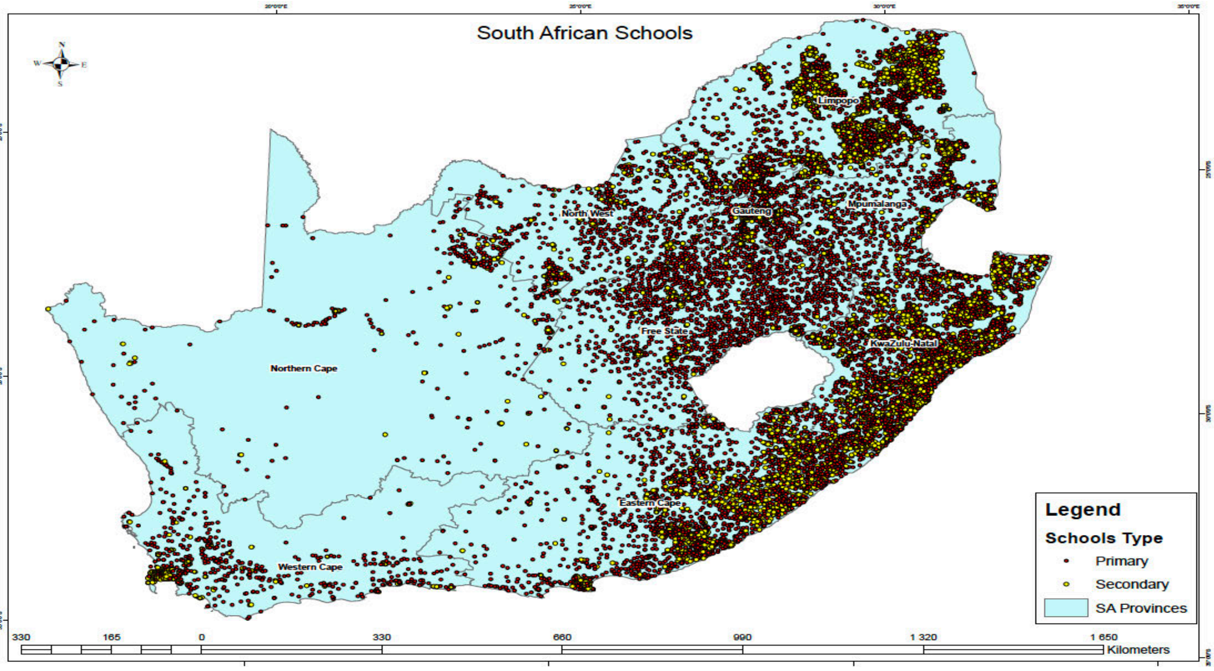

Figure 5-1*: Spatial Distribution of Schools by GPS Coordinates.*

Source: Own measurement using ArcGIS software.

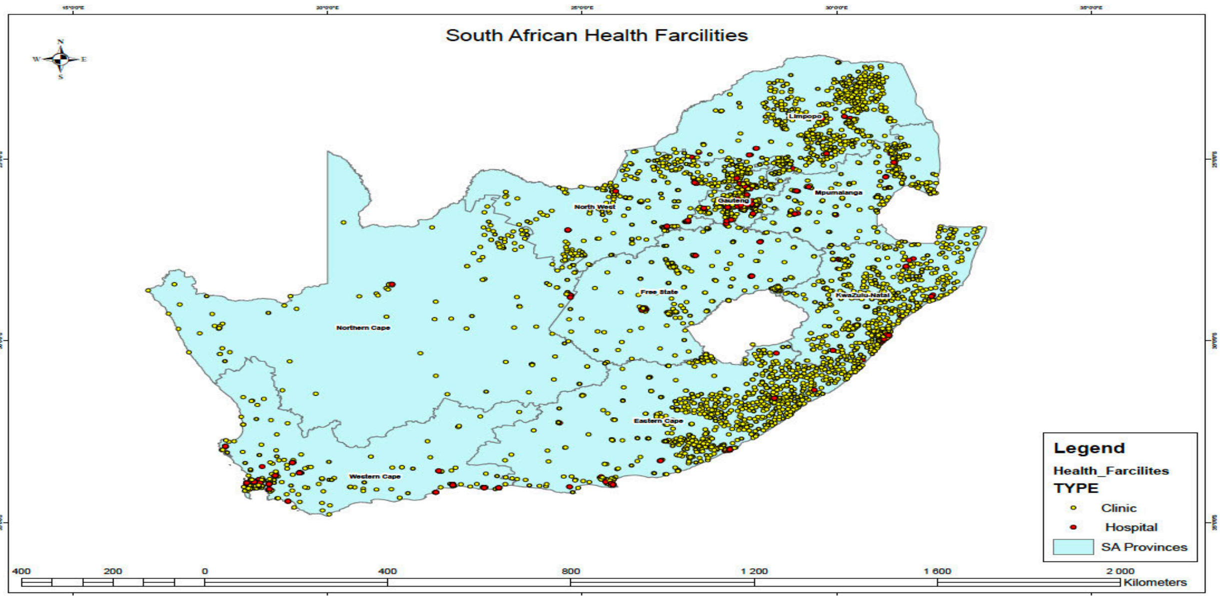

Figure 5-2*: Spatial Distribution of Hospitals by GPS Coordinates.*

Source: Own measurement using ArcGIS software.

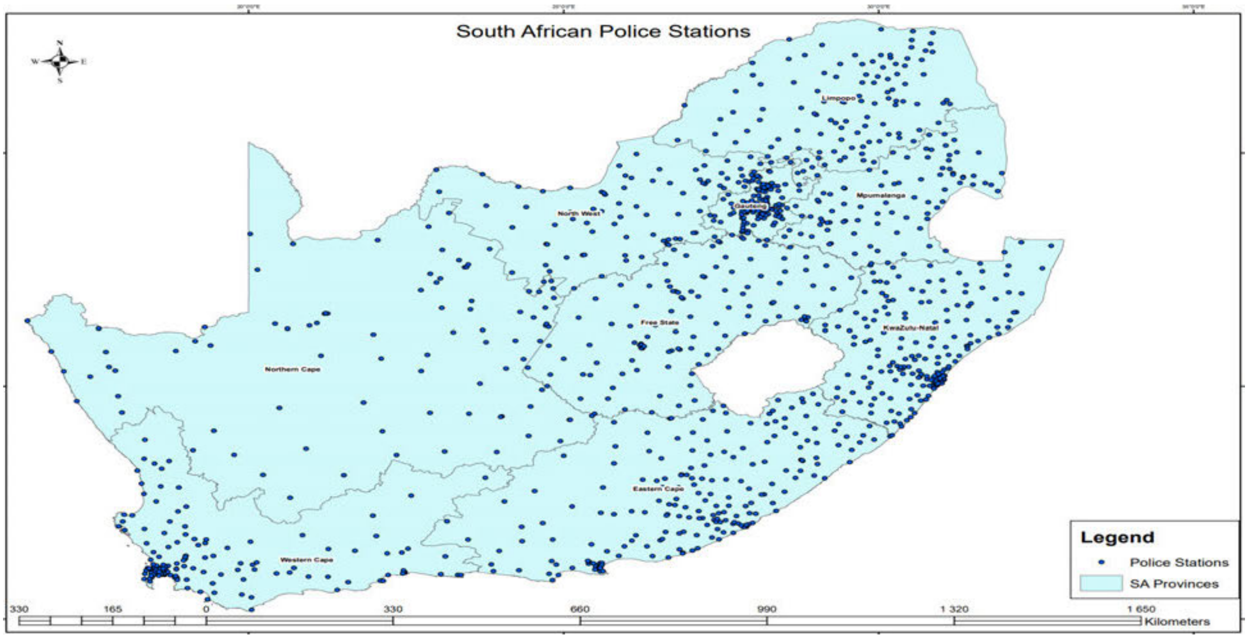

Figure 5-3*: Spatial Distribution of Police Stations by GPS Coordinates.*
Source: Own measurement using ArcGIS software.

The distribution of hospitals and police stations across the country also reflects population density. Provinces that have a high population have a high density/presence of hospitals and police stations, while provinces with a low population are categorised by the low presence of hospitals and police stations (Strauss, 2019). As shown on the maps, GP, the EC, KZN, and the WC have the most public hospitals and police stations. However, factors such as crime, maladministration, and corruption are spatially and temporally correlated and are affected by circumstances such as governance, a high population that is coupled with high levels of poverty, and law enforcement inefficiencies (Cabrera-Barona et al., 2019).

Moreover, the spatial geographical overview of the positioning of the three infrastructure facilities depicts a stark image of the distribution of public infrastructure. The positioning of these facilities also reflects how the spatial dimension of the economic regions of SA affects the distribution of and access to these infrastructure facilities. Also, the geographic overview of the spatial positioning of the three infrastructure facilities led to the expectation that the distance travelled to schools would be lower than the distance that individuals travelled to access hospitals and policing services.

Table 5-1 below presents a univariate overview of the distribution of infrastructure facilities and access to these facilities defined by the distance that individuals travel to access these facilities. In Table 5-1, the scope is extended to consider a broader perspective of distance that includes the distance that individuals travel to access other infrastructure facilities.

Table 5-1: Distribution of distance and mode of transport across various infrastructure facilities

Variable: Distance	Less than 500m	501m to 1km	1km to 2km	2km to 5km	5km to 10km	10km to 20km	More than 20km
Basic Infrastructure:							
Pre Pr mary Schoo	36.29 (36.29)	32.29 (68.66)	17.70 (86.36)	9.10 (95.46)	3.19 (98.65)	0.68 (99.33)	0.67 (100.00)
Pr mary Schoo	30.16 (30.16)	31.18 (61.33)	20.77 (82.11)	11.89 (93.99)	4.59 (98.58)	0.95 (99.53)	0.47 (100.00)
Secondary Scoo s	22.51 (22.51)	25.06 (47.57)	21.46 (69.03)	17.70 (86.73)	8.71 (95.44)	2.93 (98.37)	1.63 (100.00)
C n cs	14.50 (14.50)	19.24 (33.74)	18.93 (52.68)	22.56 (75.24)	14.67 (89.91)	6.97 (96.88)	3.12 (100.00)
Hosp ta s	3.79 (3.79)	8.53 (12.32)	10.15 (22.48)	18.73 (41.21)	20.88 (62.10)	17.82 (79.91)	20.09 (100.00)
Po ce Stat ons	8.96 (8.96)	14.03 (22.99)	15.24 (38.23)	21.45 (59.68)	18.16 (77.84)	12.54 (90.38)	9.62 (100.00)
Other Infrastructure Facilities:							
Transportat on (e.g., Tax Ranks)	55.64 (54.64)	27.02 (81.66)	10.05 (91.71)	5.12 (96.83)	1.78 (98.61)	0.79 (99.40)	0.60 (100.00)
Food Markets/Supermarkets	44.04 (44.04)	25.42 (69.46)	11.14 (80.60)	8.64 (89.25)	5.47 (94.72)	2.81 (97.53)	2.47 (100.00)
P ace of Emp oyment	19.10 (19.10)	8.99 (2040.63)	7.94 (36.03)	11.74 (47.77)	14.97 (62.74)	17.13 (79.87)	20.13 (100.00)
Post Off ce	8.94 (8.94)	15.82 (24.76)	15.64 (40.40)	20.83 (61.23)	16.18 (77.41)	11.32 (88.73)	11.27 (100.00)
Banks and F nanc a Inst tut ons	7.01 (7.01)	12.63 (19.64)	13.30 (32.95)	19.65 (51.55)	17.63 (70.22)	13.62 (83.84)	16.16 (100.00)
We fare Centers	6.52 (6.52)	12.35 (18.86)	12.80 (31.66)	19.89 (567.87)	19.01 (70.56)	14.43 (84.99)	15.01 (100.00)
Mu t purpose Centers	15.42 (15.42)	16.12 (31.55)	15.11 (46.66)	17.12 (63.78)	14.37 (78.14)	10.39 (88.53)	11.47 (100.00)
P ace of Re g on	44.94 (44.94)	25.23 (70.17)	12.16 (82.33)	9.29 (91.62)	4.51 (96.12)	2.11 (98.24)	1.76 (100.00)

Variable: Mode of Transport	Walking	Taxi	Public Bus	Train	Private Vehicle
Basic Infrastructure:					
Pre Pr mary Schoo	81.62 (81.62)	4.83 (86.45)	0.84 (87.29)	0.02 (87.31)	12.69 (100.00)
Pr mary Schoo	80.45 (80.45)	5.62 (86.07)	1.00 (87.07)	0.02 (87.10)	12.90 (100.00)
Secondary sch	74.09 (74.09)	10.57 (84.66)	1.93 (86.59)	0.11 (86.70)	13.30 (100.00)
C n cs	53.84 (53.84)	29.02 (82.86)	1.19 (84.04)	0.06 (84.10)	15.90 (100.00)
Hosp ta s	12.87 (12.87)	66.60 (79.47)	2.18 (81.65)	0.14 (81.79)	18.21 (100.00)
Po ce Stat ons	30.04 (30.04)	50.88 (80.92)	1.86 (82.78)	0.09 (82.87)	17.13 (100.00)

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.
Note: All results are weighted.

Table 5-1 (continued): Distribution of distance and mode of transport across various infrastructure facilities

Variable: Mode of Transport	Walking	Taxi	Public Bus	Train	Private Vehicle
Other Infrastructure Facilities:					
Transportat on (e.g., Tax Ranks)	85.08 (85.08)	3.80 (88.88)	0.11 (88.99)	0.01 (89.00)	11.00 (100.00)
Food Markets/Supermarkets	70.21 (70.21)	15.85 (86.06)	0.21 (86.28)	0.04 (86.32)	13.68 (100.00)
P ace of Emp oyment	32.55 (32.55)	27.30 (59.85)	6.96 (66.81)	4.44 (71.25)	28.75 (100.00)
Post Off ce	30.20 (30.20)	50.88 (81.08)	1.41 (82.49)	0.10 (82.59)	17.41 (100.00)
Banks and F nanc a Inst tut ons	19.97 (19.97)	60.40 (80.37)	1.85 (82.23)	0.16 (82.39)	17.61 (100.00)
We fare Centers	23.47 (23.47)	57.23 (80.70)	1.77 (82.61)	0.13 (82.61)	17.39 (100.00)
Mu t purpose Centers	38.66 (38.66)	43.00 (81.66)	1.34 (83.00)	0.10 (83.10)	16.90 (100.00)
P ace of Re g on	74.24 (74.24)	10.70 (85.03)	0.21 (85.24)	0.08 (85.32)	14.68 (100.00)

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted

Other infrastructure facilities include, transport taxi ranks, food markets, places of employment, the post office, banks, welfare centres, multipurpose centres, and religious places. This broad perspective of infrastructure encompasses all social and economic conditions that significantly affect how well and how long individuals live (Huang, 2017). The provision of these infrastructure services is critical because it forms part of the service delivery chain. These infrastructure facilities are expected to be provided spatially in a manner that is rationally based on where people live and where they can best access such services because quality living conditions that are internally well-provisioned or have access in a reasonable distance to various infrastructure facilities are required for a productive life.

Schools, health services, and police stations form part of the individual's immediate environment. As reflected in Table 5-1, the distance measured to these various infrastructure facilities is disentangled into seven distance categories. In addition, the study took into account the mode of transport individuals used in accessing the various infrastructure facilities. The distribution of access/distance for the major infrastructure facilities relates to the spatial geographic overview presented in Figures 5-1 to 5-3, because individuals travel less when they access pre-primary, primary, and secondary schools. This is consistent with the earlier analysis because schools are much densely clustered across the economic regions of SA than healthcare and policing facilities.

The majority of the respondents travel less than 500 meters and between 501m to 2km, respectively, when accessing schools, while a smaller proportion of the respondents travelled distances greater than 5 km. The distance measurement to schools is consistent (high concentration of schools and distance travelled to schools) with the distribution of schools that are reported in spatial geographical maps. This relationship is consistent with the idea that schools are correlated with urbanisation, industrialisation, and the geographic clustering of the population (Tripathi & Mahey, 2017). Therefore, the spatial distribution of schools is greatly affected by the social development and economic progress of a region (Cilliers & Victor, 2018). These distance measures reflect accessibility that is indicative of consumer choice and increased levels of mobility, and hence some individuals are likely to use schools outside their local ward.

Although the availability of schools is high and the distance travelled is low, the quality of the education produced remains worrisome, and most of the respondents walked to their respective schools, exposing themselves to additional risks of crime, snakebites, and treacherous rivers (Lembani et al., 2020). According to the World Bank (2020), SA's education budget is comparable to OECD countries as a percentage of GDP and exceeds that of most peer sub-Saharan African countries in per capita terms. The main explanatory factors for poor quality schools are complex, multifaceted and associated with insufficient subject knowledge of some teachers, history, race, language, geographic location, and socioeconomic status. Hence, their low educational attainment is likely to contribute to the country's low productivity growth, high levels of poverty, unemployment and inequality, and lower levels of SWB (World Bank, 2020).

There were notable differences and discrepancies when considering the health and policing services. The distance travelled to clinics was found to be shorter than the distance travelled to hospitals because clinics provide primary care, and they are the first point of reference when individuals seek medical care (McLaren et al., 2013). Hence these primary care centres were much closer to where individuals resided.

However, the distance that individuals travelled to access hospitals is a cause of concern because most individuals travelled from 2 km to 20 km and above. These distances denote social constraints because health services that are far from the individuals or households may pose a significant barrier to the vulnerable segments of the population, leading to overall poorer health and may perpetuate poverty and inequalities (Maseko & Harris, 2018). These conditions make it difficult for individuals who travel a long journey to get medical treatment for major illnesses that require the attention of hospitals facilities. Also, the considerable distance that individuals travel to access hospitals, as reflected by the maps and Table 5-1, points to the extent to which access to healthcare is largely spatially defined. Given South Africa's spatial distribution, those who are closer to these healthcare facilities can access and afford healthcare (Smith et al., 2018), while those who are further away are worse-off. This inequality imposes social limits on welfare if there are barriers in accessing health facilities (Mee et al., 2020).

The distance individuals travel to access police services is also consistent with the geographical overview depicted on the map. Most individuals travel between 2km to 5km and 5km to 10km to access policing services, while a significant proportion still travels 20km or more. The variation in the distance travelled to access policing services still reflects the spatial clustering of individuals across regions. In highly populated, urbanized, and industrialized regions, individuals travel shorter distances to access services, while those in homelands and rural demarcated areas travel longer distances (Moyo & Ziramba, 2013). Also, crime traditional areas (formally known as homelands) and rural areas is commonly thought to be less extensive compared to more developed urban areas. However, individuals living in rural areas are victimized at rates similar to those of their urban counterparts (Moyo & Ziramba, 2013). This implies that the overall chances of becoming a victim of crime may be identical, and the impact of victimization may be more severe in rural areas due to underlying issues relating to unemployment and poverty. Hence, without access to social services and other support, the rural poor are the least able to deal with the impact of crime and this may negatively affect SWB.

Overall, schools, healthcare facilities, and policing services are concentrated in the high-income provinces of GP, KZN, and WC, respectively. More than two-thirds of the respondents travel live within 2km of the nearest public schools, two-thirds live less than 2km away from clinics, less than one-third live within 2km away from hospitals, and one-third live less than 2km from the police station.

Moreover, Table 5-1 shows that access to recreational infrastructure varies substantially across the various recreational infrastructure categories. Access to such services, to some extent, is determined by the spatial dimension of each region and the mode of transport used (Schoeman, 2015). For example, access to infrastructure services like transport ranks, food markets/supermarkets, places of employment, post office, banks/financial institutions, welfare centres, multipurpose centres, and religious places differs across the various infrastructure categories. The distance that individuals travel to transport ranks, food markets, and religious places is shorter, and these services are closer to where individuals reside. Assuming perfect mobility and holding constant mobility costs, the shorter the distance travelled to taxi/bus ranks, the greater the ease with which that individuals can connect between regions through transport links and can be exposed to a wider scope of infrastructure services such as, among others, supermarkets, healthcare facilities and other recreational services that are integral in determining SWB (Mashiri et al., 2017).

Living closer to supermarkets and the agglomeration of similar services also implies that customers and firms have easier access to one another. This collaboration establishes a self-enforcing virtuous circle that spurs creativity and economic activity through the purchase and sale of goods and services, thus generating growth from within each region. These “dynamic” advantages of living closer to services become increasingly significant over time in determining SWB. In contrast, living far from services such as places of employment, banks, welfare and multipurpose centres is associated with hardship that has a negative bearing on SWB (Lorenz, 2018).

Across all the infrastructure services, based on the mode of transport distribution presented in Table 5-1, most individuals walk or travel by taxi to access the various infrastructure services. Given these travel differences, the expectation was that individuals who walk to access services are those who live closer to where these services are located. For example, schools and clinics are in close proximity to where individuals live, given the distance individuals travelled to access such facilities. As a result, the closeness of these facilities implies that individuals can easily access these services, even when walking or using taxis.

According to the distribution presented in Table 5-1, most of the individuals either walk or use taxis to access all infrastructure services, with the exception of hospitals, banks, and welfare centers. The distribution of hospitals is consistent with the mode of transport as individuals travel a long distance to access hospitals, banks, and welfare centers. The lack of access to these services often overlaps with poverty, and it has far-reaching consequences for the economy (Makhathini et al., 2020). Hospitals, banks, and welfare centres are mostly located in cities, far from individuals living in the urban peripheries or rural areas, which are characterised by unevenness in economic and political terms and challenges in terms of provision of and access to infrastructure (De Groot & Lemanski, 2021). As a result, walking a long distance to access the various infrastructure facilities may negatively affect SWB.

Figures 5-4 presents histograms (Graphs A to F) that depicts the relationship between SWB and access to the respective infrastructure facilities. The histograms are categorised to show the distribution of SWB across the social infrastructure facilities, while the relationship between SWB and the various recreational facilities is reported in the Appendix.

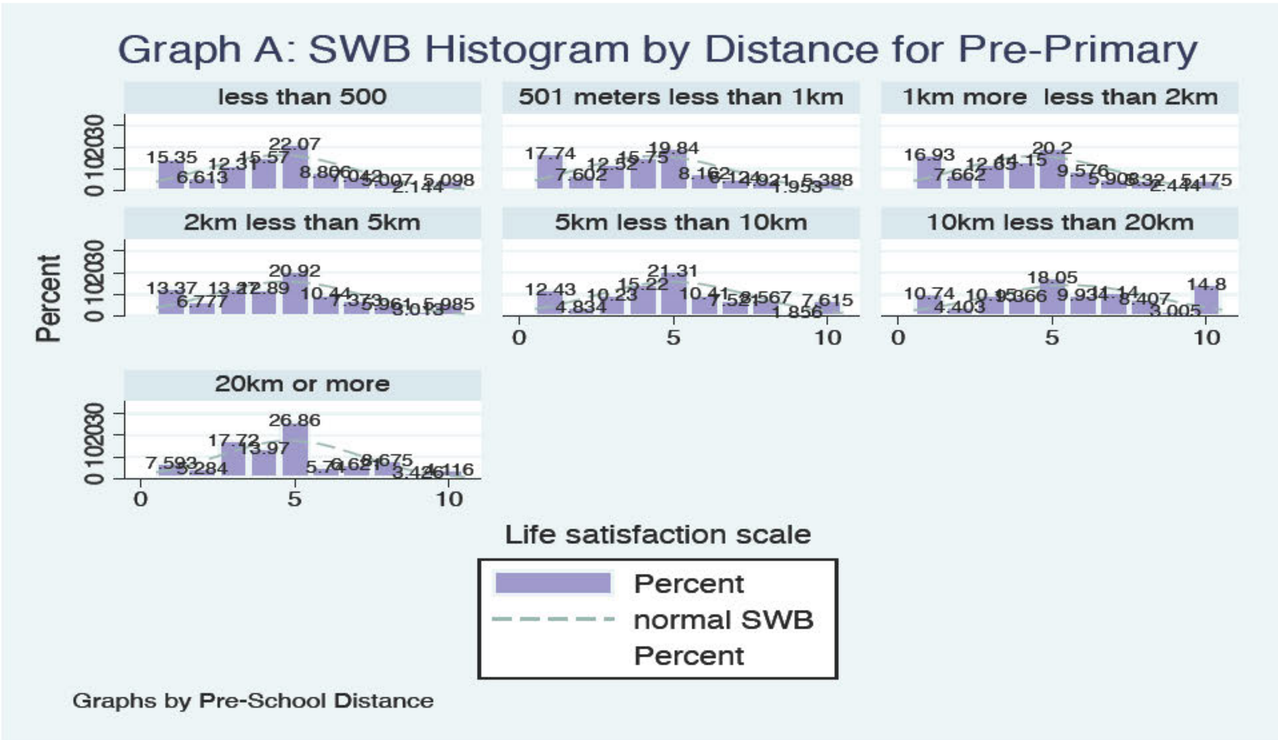

Figure 5-4: SWB Histogram by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

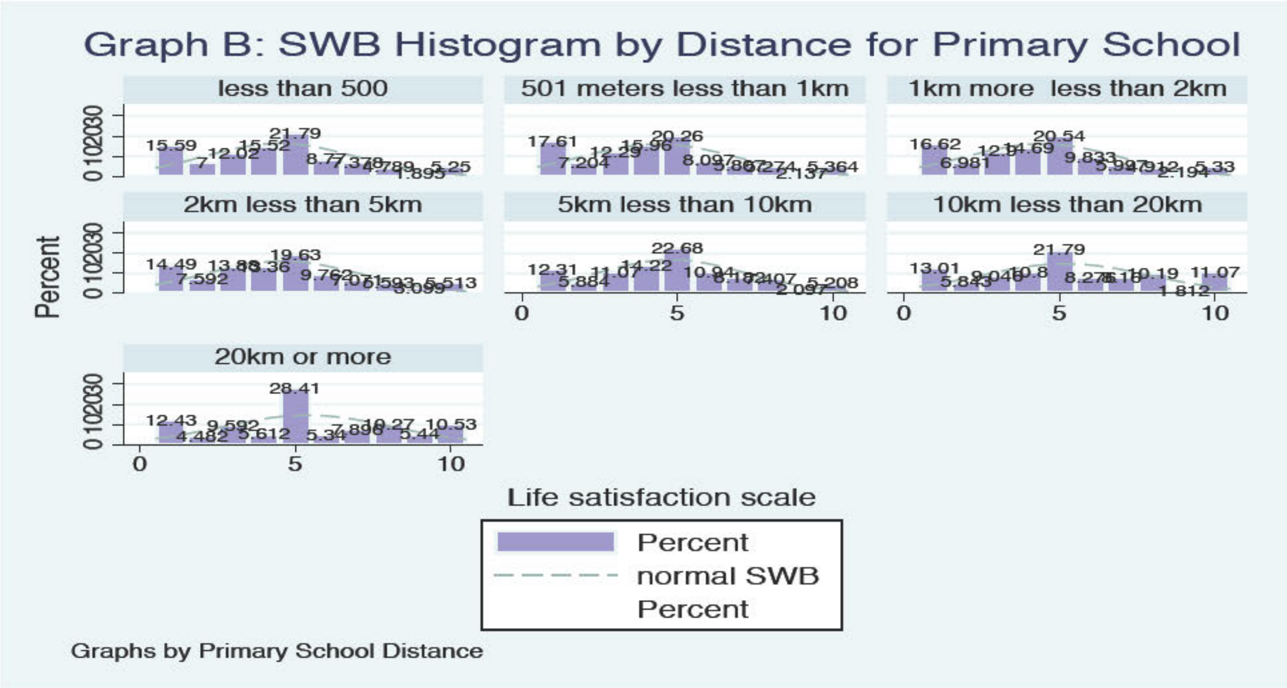

Figure 5-4 continued: SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

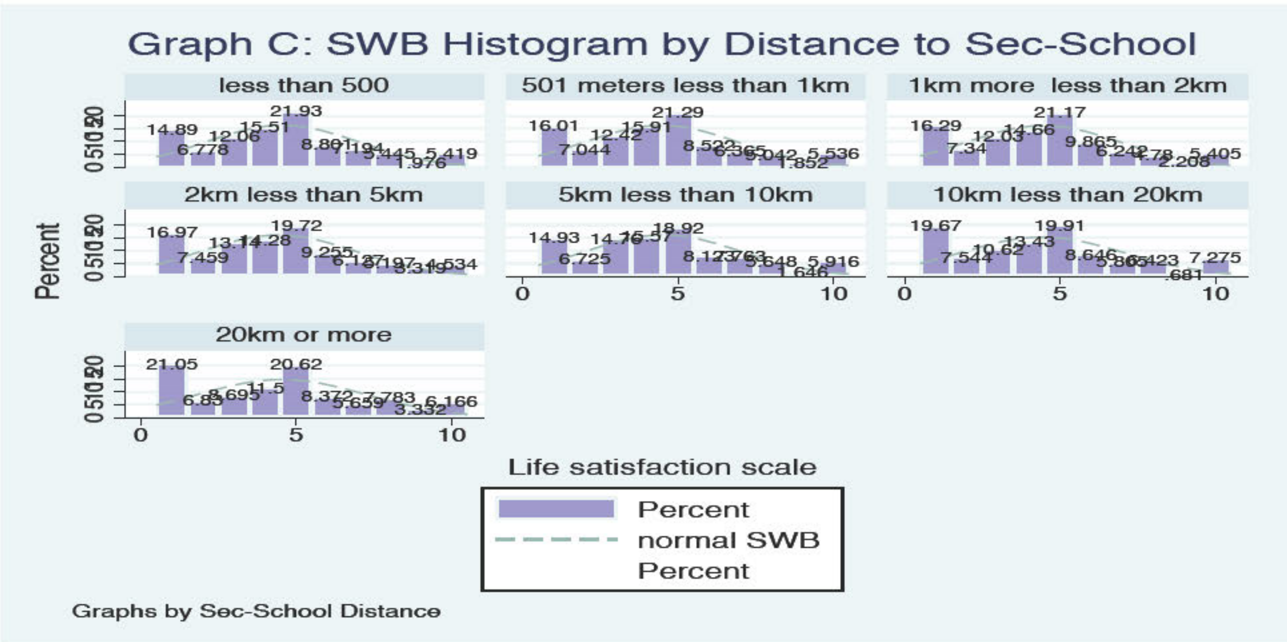

Figure 5-4 continued: SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

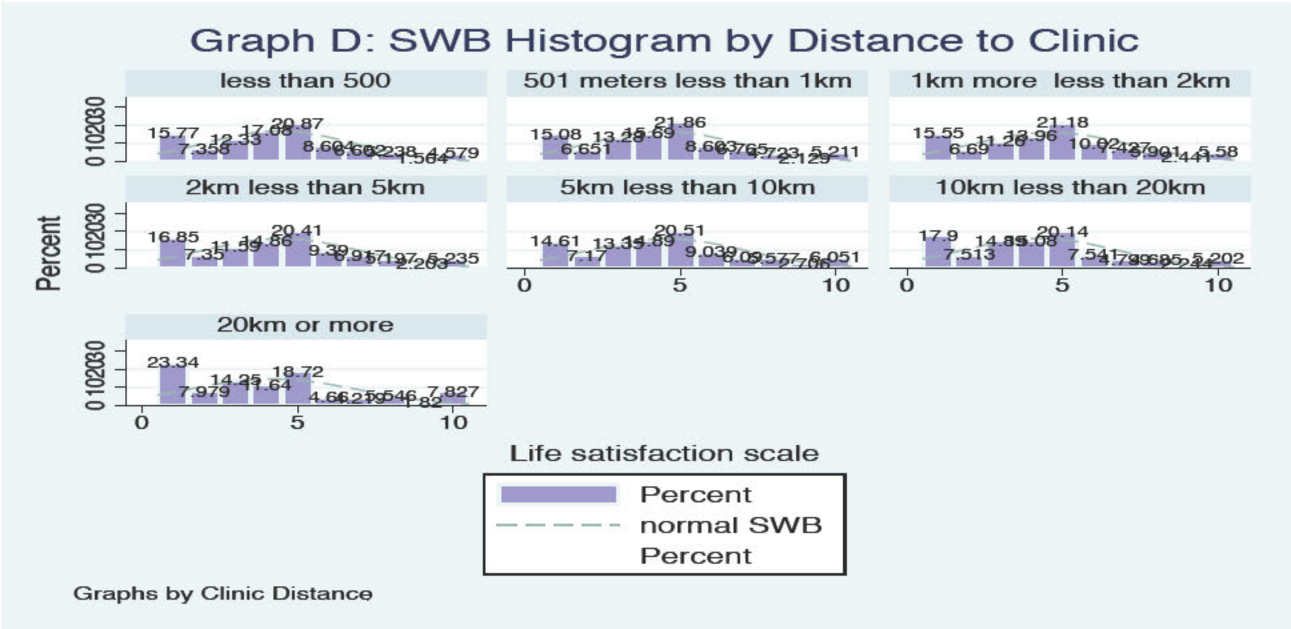

Figure 5-4 continued: SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

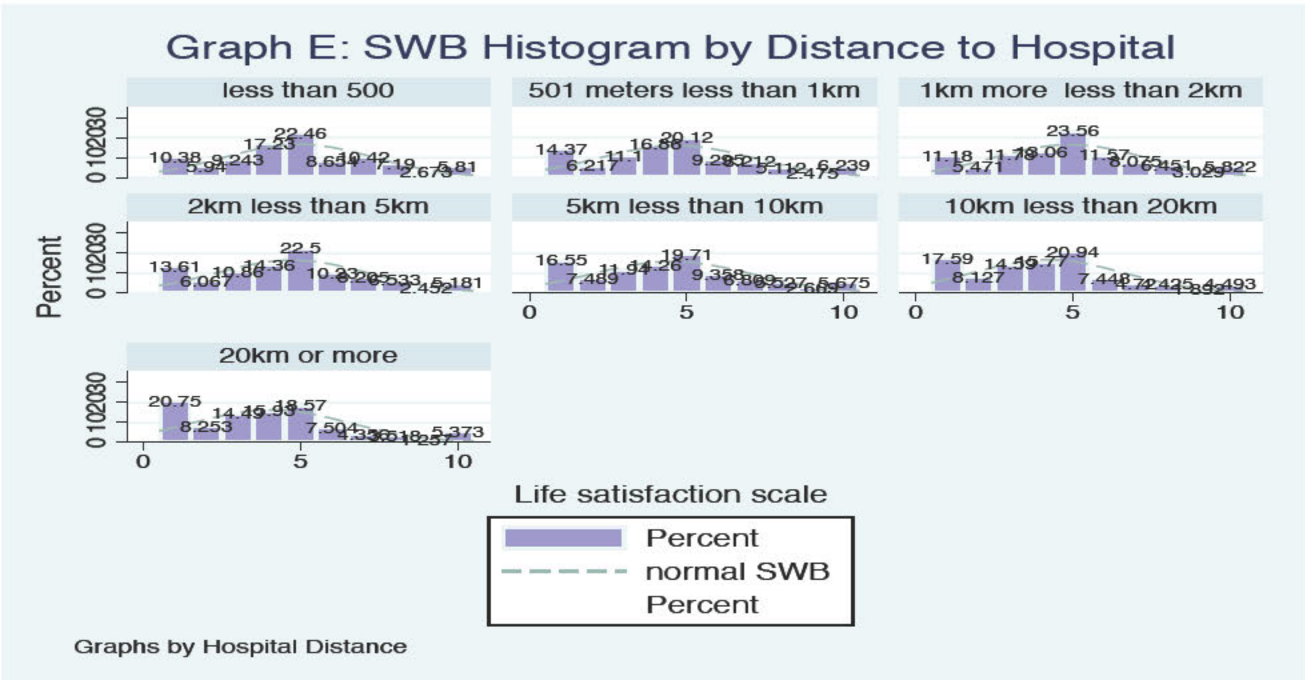

Figure 5-4 continued: SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

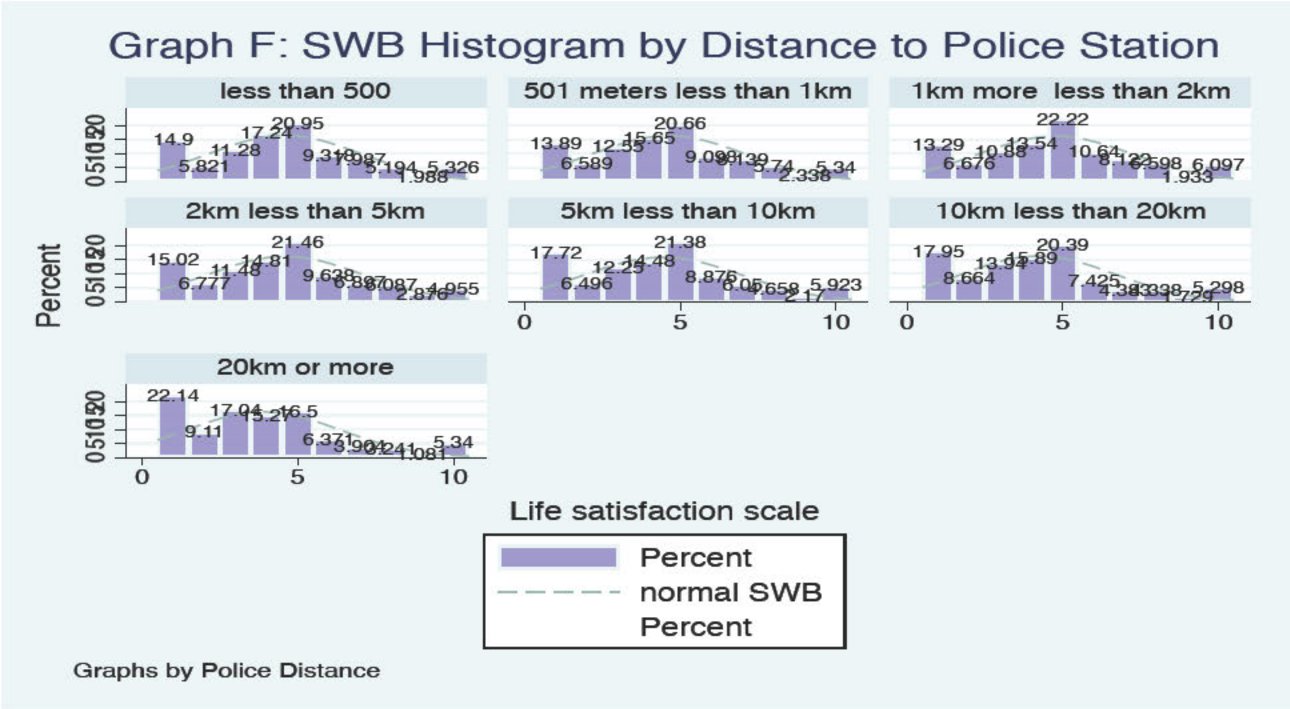

Figure 5-4 continued: SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

In Figure 5-4, most of the SWB histograms for the respective infrastructure facilities are positively skewed, as most values are clustered around the left tail of the distribution. This positive skew suggests that individuals are negatively affected by travelling distances when accessing infrastructure facilities. The depth of the skewness of the histograms varies across the various facilities and the distance categories. Consistent with earlier arguments, the distance that individuals travel to access clinics and hospitals is negatively associated with SWB. The distance travelled to hospitals and police stations follows a normal distribution with an interesting tail at both ends of the distribution reflecting the acceptance of standards and quality of services far beyond the vicinity.

Table 5-2 presents the summary statistics of the main variables of interest. The summary statistics for the distance variables and transportation mode to the respective infrastructure facilities are consistent with the descriptive statistics.

Table 5-2: Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Distance Variables:			
Pre-Primary School	1 if distance is less than 5km; 0 otherwise#	0.954	0.208
Primary School	1 if distance is less than 5km; 0 otherwise#	0.939	0.237
Secondary School	1 if distance is less than 5km; 0 otherwise#	0.867	0.339
Clinic	1 if distance is less than 5km; 0 otherwise#	0.145	0.352
Hospital	1 if distance is less than 5km; 0 otherwise#	0.412	0.492
Police Station	1 if distance is less than 5km; 0 otherwise#	0.597	0.490
Mode of Transportation			
Pre-Primary School:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.816	0.387
Commuting	1 if individual commutes to this facility; 0 otherwise	0.057	0.231
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.126	0.333
Primary School:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.805	0.407
Commuting	1 if individual commutes to this facility; 0 otherwise	0.066	0.445
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.129	0.416
Secondary School:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.805	0.397
Commuting	1 if individual commutes to this facility; 0 otherwise	0.066	0.249
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.129	0.335
Clinics:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.740	0.438
Commuting	1 if individual commutes to this facility; 0 otherwise	0.126	0.332
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.133	0.339
Hospitals:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.538	0.498
Commuting	1 if individual commutes to this facility; 0 otherwise	0.303	0.459
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.159	0.366
Police Stations:			
Walking	1 if individual walks to this facility; 0 otherwise#	0.300	0.458

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015[50].

Note: # Reference categories/The distance variables are converted into dummy variables (less than 5km/more than 5km) for the purpose of the multivariate analysis. In addition, the mode of transportation is also converted into dummy variables (walking, commuting and private vehicle (see Table 5-2A in Appendix C for other variables). All results are weighted.

[50] The distance variables are categorised into a dummy variable that differentiates between those who are within 5 km of the nearest facility and those who travel more than 5 km to the nearest facility.

Table 5-2 (Continued): Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Commuting	1 if individual commutes to this facility; 0 otherwise	0.528	0.499
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.171	0.377
Subjective Well-Being	" Using a scale of 1 to 10 where 1 means "very dissatisfied" and 10 means "very satisfied", How do you feel about your life right now?".	4.48	2.478
Age	Respondents age in years	27.83	19.67
Male	1 if male; 0 otherwise#	0.488	0.499
African	1 if African; 0 otherwise#	0.804	0.397
Coloured	1 if Coloured; 0 otherwise	0.088	0.283
Indian	1 if Indian; 0 otherwise	0.024	0.155
White	1 if White; 0 otherwise	0.082	0.276
Years of Schooling	Number of years invested in education (Dummies for Estimation)	8.286	4.023
Married	1 if married; 0 otherwise	0.191	0.393
Cohabitating	1 if cohabitating; 0 otherwise	0.071	0.256
Divorced or widowed	1 if divorced or widowed; 0 otherwise	0.061	0.238
Never Married	1 if single; 0 otherwise#	0.677	0.467
Health status	1 if health status is excellent/good; 0 otherwise#	0.858	0.349
Working for a wage	1 if working; 0 otherwise#	0.360	0.480
Income from Salaries and Wages	Receive Income from the labour market in SA Rands	0.247	0.431
Urban	1 if household is in urban area; 0 otherwise#	0.635	0.481
Dwelling type: Formal	1 if household is in an informal dwelling; 0 otherwise	0.813	0.389
Dwelling type: Informal	1 if household is in Traditional dwelling; 0 otherwise	0.088	0.284
Dwelling type: Traditional	1 if household is in a formal dwelling; 0 otherwise#	0.097	0.297
Per capita household income	Log per capita of household total monthly income in SA Rands	39025.1	77874.4
Per capita household expenditure	Log per capita of household total monthly expenditure in SA Rands	29143.6	54220.9
Household Saver	1 if household is a saver; 0 otherwise#	0.210	0.407
Household Poorest-Third	1 if household income bracket is poorest; 0 otherwise#	0.273	0.445
Household Middle-Third	1 if household income bracket is middle; 0 otherwise	0.223	0.416
Household Richest-Third	1 if household income bracket is richest; 0 otherwise	0.503	0.499
Piped water on site	1 if household has piped water on site; 0 otherwise#	0.729	0.444
Access to clean water	1 if household has access to clean water; 0 otherwise#	0.893	0.308
Flush toilet	1 if household has access to a flush toilet; 0 otherwise#	0.602	0.489
Electricity Access	1 if household has access to electricity; 0 otherwise#	0.932	0.250
Police visibility	1 if there's police visibility in the area; 0 otherwise#	0.542	0.498
Access to food markets/supermarkets	1 if there's a large supermarket in the area; 0 otherwise#	0.531	0.499

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: # Reference categories. Infrastructure variables: piped water, flush toilet, electricity access, police visibility are converted into dummy variables. See Table 5-2A in Appendix C for other variables.

All results are weighted.

Approximately 80 percent of the respondents travelled less than 5 km to access education, while approximately 60 percent of them travelled more than 5 km to access healthcare and police services. Most respondents walked to access schools, clinics, and police services and commuted to access hospitals. Commuting and walking a long distance when accessing infrastructure facilities comes at the expense of individual SWB because longer journeys and commuting time are correlated with low job and leisure time satisfaction, increased strain, and poorer mental health (Clark et al., 2020).

The summary statistics presented in Table 5-2 also account for other variables of interest. On average, individual respondents reported a SWB score of 5, suggesting that most respondents were moderately satisfied with their lives. The average age was 28, and approximately 48 percent of the respondents were male. Approximately 80 percent of the respondents were Black Africans, consistent with the population group demographics of SA. The average level of education is 8 years, which is equivalent to a below matric level of education. On average, approximately 19 percent of the respondents were married, 7 percent of them were cohabitating, 6 percent were divorced or widowed, and 68 percent were single. Most of the respondents lived in urban areas in formal dwellings and reported their lives to be healthy. The majority of the individuals in the households perceived their income bracket to be between the middle and richest bracket. Most households reported having access to piped water, clean water, electricity, a flush toilet, and supermarkets or food stored in the vicinity of where they lived.

5.4 **Method of Estimation and Strategies**

5.4.1 **Model specification**

This chapter examines the effect of access to infrastructure facilities on individual SWB. The study regresses individual SWB on access variables, measured by the distance individuals travel to access social infrastructure facilities, as well as on demographic and socioeconomic control variables. The infrastructure facilities of interest were education, health, and policing services. The study also controlled for infrastructure variables such as the type of housing, water and sanitation systems, electricity, and the availability of supermarkets in the vicinity. For example, StatsSA (2014) reported that more than half of the households in Gauteng reported electricity and pipe water on site (Goetz & Schaeffler, 2015). This indicates an equitable distribution of infrastructure facilities (Venter & Mohammed, 2013; Van Dijk et al., 2015; Guzman et al., 2017). These variables reflect the effectiveness and state of service delivery and are critical determinants of living conditions (Bookwalter & Dalenberg, 2004; Wanden-Berge & García-Muñoz, 2009; Chakraborty et al., 2012; Popova, 2017). The inclusion of these variables improved the overall power of the model, since service delivery and living conditions are critical predictors of individual SWB (Davern et al., 2017).

Using a multivariate analysis, the regression controls for several individual and household characteristics. For ease of interpretation, the study estimates both the Ordered Probit (OP) model and OLS, using a sequence of models that build on by adding different sets of characteristics successively. Following the work of Adewara et al., (2017), the study estimates the estimation:

$$\boldsymbol{SWB_i} \quad \boldsymbol{\beta_0} + \boldsymbol{\varphi' Inf_i} + \mathbf{P}'^{\boldsymbol{prov_i}} + \boldsymbol{A_i} + \delta' \boldsymbol{W_i} + \gamma' \boldsymbol{Z_i} + \boldsymbol{\varepsilon_i} \ , \tag{1}$$

where $\boldsymbol{SWB_i}$ is the ordinal ranking of individual SWB for individual *i*. The variable $\boldsymbol{Inf_i}$ is a proxy for the availability of infrastructure and is measured by the vector of infrastructure variables (such as the dwelling type, piped water on-site, access to clean water, the existence of a flush toilet, access to electricity, and supermarkets within the vicinity). The variable $\boldsymbol{prov_i}$, is the province dummy variable and the KwaZulu-Natal province is used as a reference category. The inclusion of province dummy variables accounts for regional effects on individual SWB (El-Geneidy & Levinson, 2007). The variable $\boldsymbol{A_i}$ **,** is the accessibility variable that measures the respective distance categories in meters and kilometres that individuals travel to the respective infrastructure facility (Davis et al., 2008). Each of accessibility/distance measures are categorized into dummy variables, where they take on the value of 1 if the individual travels less than 5km to access the respective facilities, and 0 otherwise.

In addition, the study controlled for the mode of transportation, $\boldsymbol{W_i}$, in accessing the various infrastructure facilities[51]. The mode of transportation is categorised into three dummy variables: walking, commuting, or private transportation. These variables take into account the time, effort, and costs associated with accessing the respective facilities. The mode of transport dimension takes into account the time, effort, and costs associated with accessing the respective facilities. The effort, time, and travel costs associated with access enter the decision matrix of the Individual, and they affect whether the Individual can access infrastructure facilities timeously, effectively, and efficiently (Donaldson, 2018). Lastly, $\boldsymbol{Z_i}$ is the vector of individual and household predictors that have been identified as important determinants of SWB (Bookwalter & Dalenberg, 2004; Blaauw & Pretorius, 2013; Jun, 2015; Blaauw et al., 2018; D'Agostino et al., 2019; Diego-Rosell et al., 2018). The idiosyncratic error term, $\boldsymbol{\varepsilon_i}$ is assumed to be random, normally distributed, and with a mean of zero. The assumption is that the errors are clustered at the primary sampling unit level and are robust to heteroskedasticity.

5.4.2 **Model estimation**

The first specification estimates the relationship between SWB and access to infrastructure using distance variables to the various infrastructure facilities. This specification enables the study to measure the direction and magnitude of the effect of accessibility on individual SWB (Iacono et al., 2010; Curl et al., 2011). The accessibility variables are proxied by the distance individuals travel to access education, health, and policing services. The second specification augments the first specification by controlling for the mode of transport used to access the respective infrastructure facilities. The rational for the inclusion of mode of transportation relates to examining the effectiveness of reaching the respective infrastructure facilities and the extent to which commuting, using public/private transportation or walking affects individual SWB (Maharaj & Ramballi, 1998; Laubscher, 2012; Naidoo, 2012; Klein,

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[51] See the First Edition: August 2012 (Reprint: November 2015). The Council for Science and Industrial Research (CSIR) project 51 provides guidelines on the distance threshold in accessing social facilities for South African settlements.

2013). The estimated coefficients on the distance to infrastructure facilities are expected to change respectively, given that the mode of transport to the various infrastructure facilities accounts for some variation in individual SWB (Easterly et al., 2006; Tay & Diener, 2014).

The third specification augments the second by controlling for service delivery variables such as; the dwelling type, piped water on-site, access to clean water, the existence of a flush toilet, access to electricity, and supermarkets within the vicinity. This specification also enables the study to reflect on the depth and the effectiveness of service delivery variables in determining individual SWB. The third specification is estimated in conjunction with permanent income, measured by per-capita total household monthly income. The third specification is estimated in conjunction with province dummy variables. The province dummy variables reflects the area of residence where individuals live and work, which is reflective of all economic activity at the provincial level (Chakraborty, 2012).

The fourth and last specification is the full model that includes a set of individual and household level controls; in particular, those described in the literature section as determinants of individual SWB (see Blaauw & Pretorius, 2013). This specification also takes into account the asset index, which is measured using principal component analysis (Kabudula et al., 2017). The index takes into account the ownership of the following household assets: stove, microwave, freezer, refrigerator, geyser, bed, bedroom furniture, TV, DVD player, stereo, radio, bicycle, motor vehicle, motorcycle, tractor, camera, cell phone, desktop, and generator (Wittenberg & Leibrandt, 2017).

5.5 **Results**

This research aimed to examine the effect of access to infrastructure on individual SWB. The effect of access is measured by the distance individuals travel to the nearest infrastructure facility. In addressing the specific aim, the study makes use of a multivariate analysis, and the estimated coefficients are controlled for in the models augmentatively. Table 5-3 presents the regression estimates for the Ordered Probit Model (OPM), and the Ordinary Least Squares (OLS) estimates are presented in Table 5-4 for the purpose of interpretation.

Table 5-3: SWB – Ordered Probit Regression of SWB

Model Specification	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Pre-Primary School	-0.203***	-0.121***	-0.105**	-0.132**
Primary School	-0.125***	-0.028	0.016	0.014
Secondary School	-0.025	0.062***	0.002	0.001
Clinic	-0.038***	0.037***	-0.026*	-0.024*
Hospital	0.176***	0.085***	0.033**	0.029**
Police Station	0.067***	0.081***	-0.011	-0.001
Mode of Transportation				
Pre-Primary School:				
Commuting		0.061*	0.049	0.023
Private Vehicle		0.259***	0.189***	0.166**
Primary School:				
Commuting		0.085**	-0.004	0.012
Private Vehicle		-0.172**	-0.262***	-0.292***
Secondary School:				
Commuting		-0.023	-0.039*	-0.043**
Private Vehicle		0.181***	0.155**	0.158**
Clinics:				
Commuting		0.032**	0.052***	0.042***
Private Vehicle		0.145***	0.079*	0.093**
Hospitals:				
Commuting		-0.131***	-0.098***	-0.093***
Private Vehicle		0.444***	0.202***	0.189***
Police Stations:				
Commuting		0.023*	0.056***	0.059***
Private Vehicle		-0.005	-0.095**	-0.143***
Infrastructure Variables:				
Dwelling type: Formal			0.196***	0.189***
Dwelling type: Traditional			0.015	0.008
Piped water on site			0.011	-0.001
Access to clean water			0.029*	0.019
Flush toilet			0.020	0.008
Electricity Access			0.179***	0.178***
Police visibility			-0.021*	-0.031***
Access to food markets/supermarkets			0.038***	0.027**
Asset Index			0.039***	0.035***
Log Per Capita Household Monthly Income			0.212***	-0.132**
Other Determinants of SWB	**NO**	**NO**	**NO**	**YES**
Province Dummy Variables	**NO**	**NO**	**YES**	**YES**
Number of Observations	54 425	51 868	46 505	44 891
Pseudo R^2	0.0037	0.0227	0.0425	0.0486
Log-pseudolikelihood	-114898.41	-107375.47	-94397.29	-90461.69
χ^2	861.64	4997.54	8386.41	9233.44

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: Other Determinants of SWB and Province dummies are included as per the specification but reported in Table 5-3A in Appendix C.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Table 5-4: Ordinary Least Squares Regression of SWB

Dependent Variable:	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Distance Variables:				
Pre-Primary School	-0.481***	-0.267***	-0.234***	-0.299***
Primary School	-0.276***	-0.043	0.039	0.041
Secondary School	-0.074*	0.129***	0.008	0.008
Clinic	-0.092***	0.080***	-0.058*	-0.055*
Hospital	0.401***	0.181***	0.062**	0.059**
Police Station	0.286***	0.166***	-0.026	-0.006
Mode of Transportation				
Pre-Primary School:				
Commuting		0.142*	0.101	0.051
Private Vehicle		0.704***	0.531***	0.475***
Primary School:				
Commuting		0.168**	-0.023	0.005
Private Vehicle		-0.462***	-0.653***	-0.702***
Secondary School:				
Commuting		-0.029	-0.052	-0.051
Private Vehicle		0.444***	0.396***	0.428***
Clinics:				
Commuting		0.067**	0.106***	0.091***
Private Vehicle		0.339***	0.182**	0.209**
Hospitals:				
Commuting		-0.278***	-0.197***	-0.201***
Private Vehicle		1.030***	0.488***	0.483***
Police Stations:				
Commuting		0.048***	0.108***	0.123***
Private Vehicle		-0.049***	-0.242**	-0.332***
Infrastructure Variables:				
Dwelling type: Formal			0.396***	0.405***
Dwelling type: Traditional			0.067**	0.079
Piped water on site			0.017	-0.001
Access to clean water			0.067**	0.043
Flush toilet			0.029	0.018
Electricity Access			0.310***	0.307***
Police visibility			-0.044***	-0.064***
Access to food markets/supermarkets			0.080***	0.056**
Asset Index			0.081***	0.074***
Log Per Capita Household Monthly Income			0.449***	0.385***
Other Determinants of SWB	**NO**	**NO**	**NO**	**YES**
Province Dummy Variables	**NO**	**NO**	**YES**	**YES**
Constant	**4.171**	**4.259**	**-0.746**	**-0.188**
R-Squared	**0.0890**	**0.0951**	**0.1645**	**0.1779**

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: Other Determinants of SWB and Province dummies are included as per the specification but Table 5-4A in Appendix C.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

The result estimates presented by Model 1 show that distance to the nearest facility is comparatively decisive and significant in determining individual SWB. The coefficients on education (pre-primary, primary, and secondary) show that individuals who are within 5 km of the nearest school report lower levels of individual SWB than those who travel a distance greater than 5 km to their nearest school.

In developed countries, travel distance negatively affects individual SWB (Clark et al., 2020; Jones et al., 2020). However, as previously observed, the reverse is true for SA, a country that still suffers from high levels of inequality and unemployment (Mukumbang et al., 2020; Oyedemi & Choung, 2020; Wakefield et al., 2022).

In SA, the quality of education (both actual and perceived) and population density vary across regions and, as observed in the descriptive analysis in section 5.3, the variation is shaped by the spatial geography of apartheid. Also, factors such as the school's teacher–pupil ratio, facilities, the school ethos and reputation, the language of instruction, racial composition, and the school's proximity are among the factors that determine the choice of school (although some households do not have the luxury of choice). Hence, households/parents weigh in on such factors, and they often do so with imperfect information. Of course, different families may weigh the same factors differently. The reality is that there is often no clear and obvious reason for the schooling choice and it is also not clear what implications the choice has for the provision of equitable access to quality education.

What is evident from Model 1 is that individuals who are within 5 km of the nearest school report lower levels of SWB on average, as opposed to those who travel more than 5 km to access schools. This is probably because, in the spatial and racial context, most Black-headed households are still confined to townships and rural areas that suffer from poor-quality infrastructure and an unpleasant state of service delivery (Chikulo, 2016); therefore the schools that are within their reach negatively affect their SWB. As a result, most households and parents prefer sending their children to schools that are not in their proximity (not in the townships or rural areas) and this signals their dissatisfaction with the quality and service of the schools that are closest to them. However, since this analysis is cross-sectional, it is also possible that individuals who have lower SWB (because of unobservable characteristics, for example) tend to send their children to schools that are in closer proximity or that unmeasured factors to do with the quality of education are at play. In this analysis, unobservable individual characteristics or other unmeasured factors cannot be controlled for. This result holds true for pre-primary and primary schools, the coefficient on access to the nearest secondary school facility is insignificant for the OP model, but significant for the OLS model.

The expectation was that living close to primary healthcare facilities would improve the individual's SWB, because these facilities are the first point of reference for the individuals in case they are in need of immediate care. However, the results presented in Model 1 suggest that individuals who travel 5km to the nearest healthcare clinic are, on average, less likely to be satisfied with their lives when compared to those who travel beyond 5km when accessing these services. Earlier findings in the descriptive analysis sections suggested that clinics are much closer to where individuals reside because most individuals travel a shorter distance to access healthcare clinics. However, the negative effect on individual SWB of travelling 5 km or less suggests that there are factors beyond travel distance that could explain why individuals are dissatisfied with healthcare facilities that are within 5 km of them. Given the spatial geographical dimension of regions, these factors could be related to inequalities that differentiate the quality and service rendered by public and private healthcare clinics. Also, most healthcare facilities are located in urban areas, and the healthcare service by clinics is worsened by the unequal distribution of skilled healthcare providers and equipment between the private and public sectors (Cramm & Nieboer, 2011). The unequal distribution of healthcare facilities and human capital is coupled with poor quality and service, particularly in public clinics located in townships and in rural areas.

Additionally, public clinics located in townships and rural areas are categorized by poor record-keeping, causing unnecessary delays for patients because folders are missing or lost. In worst case scenarios, patients are turned away from the public healthcare facility, are denied access to healthcare services, or the medical history of the patient is lost, leading to further complications that could result in incorrect diagnosis and, in some cases, the death of the patient (Kama, 2017; Maphumulo & Bhengu, 2019).

Because of these conditions, accessing healthcare clinics in townships or in rural areas that are closer to where the individual resides negatively affect individual SWB.

The coefficient for access to hospitals in model 1 shows that travelling a distance less than 5 km increases individual SWB, as opposed to travelling 5 km or more. As a result, individuals who are less than 5km from the closest hospital facility are more likely to increase their SWB as opposed to those that travel 5km or more. The positive effect of living near hospitals on individual SWB is explained by the convenience, the experience of immediate help in cases of emergencies, and the access to efficient infrastructure services, among other factors (Raval & Rosenbaum, 2021).

The same effect is assumed for individuals who travel shorter distances to access police services. The estimated coefficient on access to police stations shows that individuals who travel less than 5 km to access policing services are 28,6 percentage points and are more likely to increase SWB, compared to individuals who travel 5 km or more. These individuals are more exposed to crime, and it is harder for them to report incidents of crime and life-threatening situations than individuals who are closer to these services. Living closer or travelling less to access a police station reflects the relative visibility of policing and therefore, it there limits the individual's exposure to crime.

The regression estimates for Model 2 include additional controls for the individual's mode of transport when accessing the respective infrastructure facilities as a proxy for the effectiveness of reaching these facilities. The inclusion of these controls changes the coefficients on the parameters of interest that compare the effect of access through travel distance on individual SWB. The coefficients of secondary education and clinics are no longer negative, but they become positive. This implies that, after controlling for the mode of transportation, travelling less than 5 km to access secondary education and health clinics increases individual SWB, as opposed to travelling above 5 km when accessing these services. Living closer to hospitals and police stations still affects SWB, whereas the SWB of individuals who lived far from a hospital decreased.

The considerations of commuting by public transport are closely related to considerations of travel costs because individuals are required to pay a fee when commuting (either by taxi, bus, car, or train). As mentioned above, the effort, and travel costs enter the decision matrix of the individual, and they also affect whether the individual is able to access infrastructure facilities timeously, effectively, and efficiently. Given these constraints, the expectation is that low-income individuals would use facilities that are closer to where they reside, while high-income individuals would consider a variety of factors (quality, preferences, etc) in their decision matrix when choosing where and how to access the respective facilities. The results of assessing the effectiveness of the transport mode when accessing the respective facilities show that individuals who commute or use private cars/vehicles when accessing pre-primary schools and health clinics report higher levels of individual SWB than those reported by individuals who walk to the facilities.

Model 3 adds binary measures of the availability of other household-related social infrastructure facilities. These were the household's dwelling type, whether the household had access to piped water, clean water, flush toilet, electricity, police visibility in the vicinity, supermarkets, and an asset index that reflects the ownership of household assets. This model further controls for the individual's province of residence. All these variables proxy the depth of service delivery, and their inclusion changes the parameters of interest. The estimated findings of Model 3 suggest that household-related social infrastructure facilities are critical determinants of individual SWB.

The inclusion of household-related infrastructure changed the significance levels of the infrastructure variables of interest. For example, after their inclusion, there were no significant differences between individuals who travelled less or more than 5 km when accessing primary and secondary schools and police stations. However, there were some consistencies because individuals who travelled less than 5 km when accessing pre-primary education and clinics still reported lower levels of individual SWB than individuals who travelled more than 5 km. Travelling less than 5 km to access hospitals consistently increased individual SWB, as opposed to individuals living farther from these facilities.

The final regressions for Tables 5-3 and 5-4 include all the other individual and household predictors of SWB that are described in the literature section under the determinants of SWB. Even after controlling for demographic, household, and regional variables, all of which are significant predictors of SWB, individuals who travelled 5 km or less to pre-primary schools and healthcare clinics had lower levels of SWB than those who travelled more than 5 km to access these services. In contrast, living closer to a hospital increased individual SWB as opposed to those who lived far from hospitals.

Overall, distance plays a complex role in mediating access to infrastructure utilisation across the various infrastructure facilities. Even when education, public healthcare, and police services are provided free of charge or on a sliding scale, the monetary and time costs of travel present a salient barrier for the economically vulnerable and deprived population. Nearby infrastructure services that are of convenience and high-quality service positively affects individual SWB, while the use of distant infrastructure reflects the unavailability of infrastructure. The unavailability of infrastructure is associated with dissatisfaction relating to inconveniences because of travel impediments or of poor quality and low state of service delivery.

These challenging propositions present the critical dimensions of basic infrastructure service provision in SA. These dimensions are interrelated with the spatial geographic legacy of apartheid and, in some instances, the governments' incapacity to deliver (make available) and maintain existing infrastructure. The distance dimensions also reflect institutional issues of corruption, maladministration, and mismanagement of funds that that impede the improvement of living standards.

There have been documented cases of infrastructure deficiency because of racial, class-based, and spatial discrimination, buttressed by the discriminatory legacies of apartheid policies (Madlalate, 2019). The existence of these cases implies that deprived and over-populated communities face a considerable discrepancy between demand for better quality and access to infrastructure on the one hand, and the and inadequate provision of such services by the local authorities on the other. It also implies that people from the deprived communities are required to travel long distances to access adequate and efficient infrastructure services. Also, there are cases where funding allocations for infrastructure projects are returned or rolled over to the central treasury because local governments have lacked the capacity to implement these projects (Mamokhere, 2020). A large proportion of service delivery protests relate to governments' failure to roll out and maintain existing infrastructure (Nyatsumba & Pooe, 2023). All these factors contribute to the individual's overall assessment of their life (SWB), because infrastructure services are integral to human sustenance.

Therefore, the findings presented by this study emphasise the importance of basic infrastructure and of access to basic services. Nevertheless, since there is still unacceptable inequality relating to access to basic services, the effect of access to infrastructure on individual SWB differs across the respective infrastructure facilities. SA's population is mostly constituted of Blacks, and theirs remain the lowest-income households in South Africa. Almost thirty years into democracy, access to infrastructure facilities in SA is still racially- and class-based. Although there has been some progress in terms of availability and access to these services, the civil unrest in some communities relating to the lack of access or inequitable access to basic services could be well-founded in townships and rural communities in both absolute and relative terms.

Therefore, there is an urgent need for government to prioritise improving the quality and state of service delivery. This also calls for the direct involvement of communities and local authorities in deciding on the path towards realising improved and sustained provision of infrastructure. The direct cooperation between communities and their local authorities is critical, since communities can play a direct role in shaping public policy. Public policy proposals aimed at redressing these ills should be backed by political commitment in all spheres of government. These policies should aim at reducing the burden of distance while improving the quality and state of these infrastructure facilities for those most in need. Furthermore, the government should prioritise a service delivery model that would redress the substantial unevenness in access to and delivery of basic infrastructure according to the needs of the people, and demographic segmentation (by population group and income level) of the population of SA. To achieve this, robust instruments need to be put in place to concretely measure all the dimensions of progress. Monitoring and evaluation techniques should be incorporated into the relevant policy frameworks for basic infrastructure and economic welfare.

Finally, SA features diverse socio-economic conditions across provinces and district municipalities. This study has taken a holistic cross-sectional approach to discovering the effect of access to basic infrastructure services on individual SWB, looking at the country as a whole. It would also be ideal to conduct a comparative analysis across regions and races over-time.

5.6 **Conclusion**

Access to infrastructure is essential for the creation and ongoing development of communities. Access to infrastructure must be planned for and must be sustained, to ensure adequate and quality provision of social services across the individual's lifespan. The effectiveness of infrastructure in a community influences the "liveability" of the local communities, as well as the well-being of individuals. This study sought to examine the effect of access to infrastructure facilities on individual SWB. Access is measured access by the distance individuals travel to the nearest infrastructure facilities. The scope of the study was limited to the distance individuals travelled to the nearest education, healthcare, and police service facility. The respective infrastructure facilities offer what are considered immediate services that shape human sustenance. The study made use of data from the LCS-2014/2015, and this dataset contains information on the distance that individuals travel to access various infrastructure facilities and the mode of transportation utilised to access the facilities, as well as demographic and household factors.

The findings suggest that the distribution of the infrastructure facilities is still affected by the spatial geographic influences of apartheid policies. Regions that are urbanised, industrialised, and densely populated have a more adequate distribution of infrastructure facilities. As a result, schools, healthcare facilities, and policing services are concentrated in the high-income provinces of GP, KZN, and WC. More than two-thirds of the respondents lived within 2 km of the nearest public schools, two-thirds lived less than 2 km away from clinics, less than one-third lived less than 2 km away from hospitals, and one-third lived less than 2 km from a police station. Although this study does not provide direct evidence, the general understanding is that the availability and easier access to services does not equate to their efficiency and quality - these characteristics vary across regions. Most deprived communities are highly populated and are exposed to poor quality service delivery when compared to wealthier regions. Hence, individuals are willing to travel a long distance from deprived to wealthier regions in order to access adequate, efficient, high-quality public service.

Furthermore, the findings reveal that the effect of access on individual SWB differs across the various infrastructure facilities. Model 1 shows that individuals who are 5km from the nearest public school and clinic report lower levels of individual SWB compared to those that are 5km or more from the nearest school or clinic. However, the nature of the relationship changes after accounting for other critical confounders of SWB. Furthermore, individuals who are within 5 km of hospitals and police services report higher levels of individual SWB than those who travel more than 5 km. Having nearby infrastructure services that offer convenient, and high-quality positively affect individual SWB, and this provides challenges for the economically vulnerable segments of the society. The challenges are reflected by the effectiveness of reaching the respective facilities. Overall, after accounting for all other predictors of SWB, the main conclusion is that longer distances travelled to access public infrastructure facilities negatively affect individual SWB.

The effect of reach in accessing the respective facilities was measured by the mode of transport (walking, commuting, or private vehicle). The findings show that most individuals walked and commuted when accessing the facilities and, in some cases, walking and commuting negatively affected individual SWB. This has implications for public policy.

Education, public healthcare, and police services are provided free of charge or on a sliding scale, but monetary and time costs of travel present a salient barrier for the economically vulnerable and deprived population. For instance, public infrastructure facilities are non-excludable and arguably not depletable, because they are offered freely by the state. However, the time, effort, and financial costs of travelling may hamper physical access to infrastructure services, particularly in townships and rural areas that are home to economically vulnerable segments of society. This is particularly the case in SA, because the country still suffers from the economic and social challenges of high levels of poverty, inequality, and unemployment.

Importantly, more research is needed to inform the overall understanding of the influence of public infrastructure on SWB. This includes an investigation of the influence of spatial infrastructure planning, service delivery, service quality, service capacities, and demographic needs. These factors should be categorised across race and across regions (provinces and municipalities). Research of this type would aid better public policy on infrastructure development, decision-making, and strategic planning across neighbourhoods that support and prioritise effective service and facility planning to ensure better SWB outcomes for all.

Chapter6:
Conclusion

6.1 Conclusion

Many developing nations are grappling with structural vulnerabilities such as persistent poverty and inequalities, coupled with poor living conditions and declining trust in government because of poor service delivery outcomes (Gadenne & Singhal, 2014). These challenges are triggered by synchronous economic downturns, which outweigh the potential gains of economic growth on welfare (Saccone, 2017). SA is no exception, and in 2022 the country faced macroeconomic challenges relating to lacklustre economic growth, poverty, inequalities, and high unemployment. These macroeconomic challenges have been exacerbated by a series of social and economic disruptions, which include the pre-and-post legacies of apartheid, the 2008 financial crisis, and the adverse effects of the Covid-19 pandemic that started as a health crisis but escalated quickly to an economic crisis (Meyer & Habanabakize, 2018; Shikwambana et al., 2021; Visagie & Turok, 2021). Through multiple avenues, such conditions serve to dampen South African's subjective assessment of their social and economic well-being.

This thesis used quantitative data and methods to investigate the role of SWB in predicting social and economic progress in the presence of the social and economic ills currently facing the country. The thesis set out three empirical topics designed to inform policy on the regional disparities in individual SWB, the effect of conspicuous consumption by others on individual SWB, and the influence of access to public infrastructure on individual SWB.

The three distinct econometric and policy scenarios were investigated in separate chapters. Chapter 3 was concerned with examining regional disparities in individual SWB. This topic is important for public policy: persistent individual SWB differences imply predictors of SWB are likely to vary from one region to another, and poor regional performance can fuel discontent and erode social trust and cohesion, enforcing the cycle of regional inequalities and disparities in individual SWB. Although population size or density per hectare is not inevitably correlated with lower SWB, in developed economies and several rapidly developing economies, an increase in population size and density, on average, results in lower levels of individual SWB (Stiglingh-Van Wyk, 2020). Evidence from this chapter is consistent with this assertion because individuals in low-income regions report higher levels of SWB relative to poor regions, and the effect is explained by the underlying conditions relating to social trust and cohesion listed as one of the focus areas in the government's National Development Plan (NDP).

Chapter 4 analysed the effect of conspicuous consumption by others on individual SWB. SA provides a unique setting for this kind of analysis, because the country is still plagued by high levels of inequality, with the top one percent of South African earners taking almost 20 percent of all income in the country, while the top 10 percent take home 65 percent. The remaining 90 percent of South African earners get only 35 percent of total income (Nwosu & Oyenubi, 2021). These inequalities present a class-based hierarchy in the society in which those with more property and wealth are stratified higher, and those without access to the means of wealth are stratified lower in the society (Visagie & Turok, 2021). Therefore, households reside in geographic pockets of affluence or poverty, and these conditions perpetuate positional concerns for status through conspicuous consumption. The fourth chapter sought to obtain a sense of the effect of ostentatious consumption by others on the subjective assessment by SAs of their well-being, in the presence of close and distant reference groups. Evidence from this chapter suggests that conspicuous consumption by others adversely affects individual SWB in distant and anonymous interactions. However, the effect on individual SWB is positive if the consumption is undertaken by a reference group of who live closer to them.

Chapter 5 explored the link between the provision of public infrastructure and individual SWB, since access to facilities is a source of concern for public policy. This is because access to quality and the coverage of public infrastructure facilities both have a major impact on living standards and economic growth (Gregory, 2020). In SA, these gains are still to be realised at optimal levels because the apartheid legacy has left stark racial and spatial divides in access to public infrastructure facilities, despite post-apartheid reforms that also reflect in the NDP. Chapter 5 sought to ascertain whether the distance travelled is a barrier to accessing public infrastructure facilities, and whether the distance travelled affects individual SWB. Evidence reported in this chapter suggests though public infrastructure services are notionally provided ‘free’ of charge, the long distances travelled to access the public infrastructure facilities pose a significant barrier for vulnerable segments of the population.

Overall, the link between the three topics is their contribution to understanding some of the location-specific economic conditions that predict SWB. Each of the three topics is discussed with their contributions in the next section, along with the conclusions drawn together, and where relevant, the study highlights potential future research. Finally, the last section provides some closing remarks.

6.1.1 **Regional economic disparities and subjective well-being in South Africa**

Previous evidence suggests that regional disparities in SA are stark. At the municipal level, previous evidence suggests that both income and multidimensional poverty and inequality vary significantly across SA municipalities (David et al., 2018). These spatial differences at both provincial and municipal levels imply that economic and welfare outcomes are likely to vary from one region to another. At the provincial level, the EC is the most unequal province and the expenditure Gini coefficient in Limpopo is among the lowest in the country (Redders, 2021). These observations suggest that economic inequality is driven by intra-provincial differentials in economic attributes. In turn, inter provincial inequalities are likely to shape interprovincial differences across municipalities.

Chapter 3 examined regional disparities in individual SWB and confirms that individual SWB differs across provinces, municipalities, and between rural and urban areas. After accounting for regional dummy variables, regional disparities in individual SWB are found to reflect long-run spatial inequalities at both the municipal and provincial levels. For this purpose, the study made use of the National Income Dynamics Study (NIDS) waves 1-5. The NIDS enabled the study to account for regional fixed effects variables, and the study accounted for macroeconomic variables (GRP, Unemployment, and Income) measured at the same geographic level (Province and District). The inclusion of macroeconomic variables was influential in estimation, because they predict the depth of the effect of regional disparities on individual SWB. The results in Chapter 3 agree closely with those of other developing countries in revealing individual differences across regions (Chen et al., 2015; Pontarollo et al., 2020; Burger et al., 2022). Conclusions drawn from the estimations suggest that individual SWB differs across the economic regions of SA. Individuals located in urban-based district municipalities and economically thriving provinces reported higher levels of individual SWB relative to individuals located in economically deprived regions.

This chapter further accounted for possible individual and regional endogeneity by estimating fixed effects regression models. More specifically, at the individual level, they included factors such as sadness and introversion, while the regional fixed effects included factors such as regional amenities, justice, and institutional politics.

Lastly, the chapter accounted for the degree of hierarchal clustering in the dataset through a multilevel model, allowing for residual components at each level in the hierarchy. The results suggest that there is a significant degree of clustering in the data and that the difference in the slope coefficient across regions and municipal provinces is attributed to between-household, in-district and province variation. This finding concurred with the notion that most of the variation in individual SWB could be attributed to household-level variations across regions.

Overall, a limitation of this chapter is that the regional disparity in individual SWB is influenced by regional amenities and attributes, which are accounted for in unobserved heterogeneity but adjusted for by the estimation of FE estimation. Future research could provide a better understanding of the disparity by incorporating data with information on regional amenities that cover various environmental and political factors across the regions. Using explicit data on these factors would help justify the relationship of these factors to individual SWB, which is currently controlled for as unobserved heterogeneities. Additionally, it is necessary to examine the extent of the disparity across the Southern African Development Community (SADC). Research on SADC will help improve our understanding of the extent of the impact of regional disparities at a cross-national level in Africa, and will shape policy innovation by aligning public policy that would effectively improve social and economic welfare in Africa.

6.1.2 The effect of conspicuous consumption by others on subjective well-being in South Africa.

Chapter 4 examined the relationship between conspicuous consumption by others on individual SWB. The main aim of the chapter was to explore whether conspicuous consumption directly affects individual SWB when consumed by the individual in question and indirectly if consumed by others. The emphasis was on the latter effect, and conspicuous consumption by others was measured by the average level of conspicuous consumption in the cluster (nearby others) and the district (distant others), excluding the specific household. The measurement of conspicuous consumption by others borrowed from the suggestions by Kingdon & Knight (2007), and this chapter applied the measurement of reference groups in determining conspicuous consumption by others.

The spatial reference groups used in this analysis were defined according to the proximity of those nearby and those far apart. In this case, conspicuous consumption items such as a radio, cookware, television, and costly kitchens are visible only to a narrow peer group, while conspicuous items in distant proximities include items that are portable and easily observable in anonymous interactions, such as clothing and cars. The rationale for the study was based on predicting information on the current state of social cohesion and aspirations in South Africa. In particular, when individuals internalize views on others consumption as indicative of their own ability to consume in future, specifically across racial and geographic borders. In addition, comparisons are also made between individuals of the same age, gender, and race, and hence the study controls for age, gender, and race-specific reference groups both for the cluster and the district.

Chapter 4 used five waves of a nationally representative panel dataset (NIDS) to create the conspicuous-consumption basket. The conspicuous-consumption basket included items identified in previous international studies, and this study broadened the basket by including expenditure items likely to be influential or relevant in the South

African context. The results showed that many individuals engage in conspicuous consumption, though the reasons justifying this action are subjective to the individual perceiving the action. The analysis shows that direct conspicuous consumption positively affects the individual, and the indirect effect of conspicuous consumption by others in close proximities also positively affects SWB. The increase in SWB due to conspicuous consumption in close proximities triggers aspirations that are enhanced by the expenditure of others (Truong, 2010). This implies that the expected level of the individual's future expenditure will increase, thus increasing the individual’s SWB because they expect their socioeconomic position to improve in the future. However, in distant proximities, the negative effect of conspicuous consumption by others on individual SWB implies that envy outweighs progressive expectations of social mobility and cohesion, aspirations, and societal connection.

Chapter 4 notes that the analysis of the effect of conspicuous consumption by others on individual SWB outcomes is partially compromised by multicollinearity that could bias the estimates. A shock to individual SWB also leads respondents to anchor conspicuous consumption, and this action brings reverse causality issues. This is because an individual's consumption will now affect the individual SWB, and individual SWB can affect individual consumption (for example, spending at the moment or spending because one is excited/depressed). The bidirectional causality between SWB and one’s spending implies spending by others will affect SWB, which affects individual spending because individuals spend due to emotions, hence directing their emotions through individual spending. In this case, the pattern implies that others’ spending and individual spending will be correlated. Given the availability of repeated measures over time, a natural solution would be to instrument SWB with social capital (IV regression), as others have done in understanding the effects of social capital on SWB (Wakefield et al., 2017). However, if some errors in assessing the past are correlated over time, even this approach will lead to inconsistent and biased estimates. Given these concerns and that not one estimate can identify the true causal effect of conspicuous consumption by others on individual SWB, future work can investigate how a collection of inconsistent OLS and IV regressions can be used to construct bounds for this effect.

Future research should find reasonable means to examine the effect of social cohesion, capital, and mobility on conspicuous consumption to test whether envy and the fear of depravation outweigh progressive expectations of aspirations, social connection, and motivation.

6.1.3 Evaluating the effect of access to public infrastructure facilities on individual subjective well-being in South Africa.

Measuring the effect of the distance associated with accessing public infrastructure has been a difficult task, since public-policy advocates have started to pursue this line of empirical analysis. The effect of infrastructure on individual SWB is sensitive to the type of infrastructure facility, and the distance dynamic associated with each infrastructure facility reflects access. Chapter 5 of the thesis deals with the effect of public infrastructure facilities and access on individual SWB in SA. In essence, the emphasis is on schools, healthcare (hospitals and clinics), and policing infrastructure. Contributions from this study are important for policymakers in their formulation of policies to improve welfare, because public infrastructure helps in the alleviation of poverty and the reduction of income-distribution inequality. These conditions are fundamental to the enhancement of living standards that reflect the developmental level of the economy (Davern et al., 2017; Das et al., 2020).

Chapter 5 commenced by setting out the general overview of South Africa's policy on development and infrastructure. This discussion was structured in the literature review section, and it highlighted the importance of the governance transition, and policies that were developed in aiding the social and economic ills as a result of the legacies of apartheid. In this regard, Chapter 5 first discussed the pre-and-post apartheid developments of infrastructure, and noted that the Whites are relatively the prosperous race, regardless of gender or geographical dispersal. They are exposed to readily accessible developed economic, social, and physical infrastructure, while the economic and social conditions of marginalised groups (Black, Coloureds, and Indians) remain both unpleasant and enduring (Mhlauli et al., 2015). This discussion was followed by an infrastructure overview, where, based on past evidence, access to infrastructure was defined in terms of its ability to provide and make available the physical framework of facilities. Its linkages to the economy are multiple and complex, but they directly affect consumption and productivity, and it involves large inflow and outflow of expenditure (Lemanski, 2020). Therefore, a lack of infrastructure implies restrictions on economic activity and can decelerate the social development of the country, which negatively affects individual SWB.

Making use of the cross-sectional LCS for the years 2014-2015, the study tested for the existence of the importance of public infrastructure in SA by using an OP and OLS estimation technique to estimate its effect on individual SWB. The aim of this research goes beyond just establishing this relationship between infrastructure facilities and SWB; rather, the scope is extended to take into account the effect of access (measured by distance) to infrastructure facilities on individual SWB. Access to infrastructure is measured by the distance that individuals travel to access infrastructure facilities, and the LCS-2014/2015 reports distance information from the individual's dwelling to the nearest following destinations: food markets, public transport (for example, station or rank), schools (pre-primary, primary and secondary), health (clinics and hospitals), safety and security (police stations), religious organisations, banks, the post office/agent, welfare offices, and multi-purpose community centres.

The emphasis was on three major public infrastructure facilities, namely, education, healthcare, and policing services. The analysis in Chapter 5 suggested that the distribution of the infrastructure facilities is still affected by the spatial geographic influences of apartheid policies. Regions that are urbanised, industrialised, and densely populated have more accessible distribution of infrastructure facilities. As a result, schools, healthcare facilities, and policing services are concentrated in the high-income provinces of GP, KZN, and WC. Therefore, long travel distances in accessing infrastructure facilities were found to have a negative bearing on individual SWB and, as such, infrastructure utilisation and SWB is low for communities with long travel distances when accessing infrastructure facilities.

In terms of the limitations, the study was based on a cross-sectional analysis using the LCS for the years 2014-2015. The study would have benefitted from panel data analysis, which would improve the efficiency of econometric estimates and controlled for unobserved heterogeneity between individuals. Ideally, the study would have made use of all five waves of the NIDS data along with the NIDS confidential data, which contains information relating to primary sampling units, employment codes, and the exact location of the household for each respondent (global positioning system, GPS, coordinates of the household). Both the household and infrastructure coordinates would have been incorporated into ArcGIS software to allow for the geographical measurement of accessibility based on distance. This process was deterred due to constraints in accessing the NIDS secure data amid the Covid-19 pandemic.

Nevertheless, more research is needed to shape the overall understanding of the influence of public infrastructure on SWB. This includes an investigation of the influence of spatial infrastructure planning, service delivery, service quality, service capacities, and demographic needs. These factors should be categorised across races and regions (provinces and municipalities). Research of this type would aid better public policy on infrastructure development, decision-making, and strategic planning across neighbourhoods that support and prioritises effective service and facility planning to ensure better SWB outcomes for all.

6.2 **Final comments and policy implications**

The thesis examined the relevance of SWB by considering some of the in-country economic conditions for a highly unequal developing nation, considering that these location-specific factors possibly outweigh the returns of economic growth. The thesis examines three topics in the broader literature of SWB. The three topics include regional disparities in individual SWB, the effect of conspicuous consumption by others, and access to public infrastructure.

For all three the topics discussed in the thesis, the findings seem to confirm that the in-country economic conditions are persistent across the three studies and notably the effects of apartheid spatial divides remain present in the everyday lives of South Africans. Almost three decades after the end of apartheid, SA remains fragmented in terms of regional disparities that shape individual differences in SWB, inequalities drive positional concerns for status, and the distribution and access to public infrastructure facilities is still shaped by the discriminatory apartheid spatial development policies. Individuals in poor households and staying in marginalised communities in South Africa are less likely to improve their economic status but may remain satisfied because of aspirations, social connection and motivation. Furthermore, in a fragmented society, conspicuous consumption is associated with social standing, and it affects paths of social cohesion and perceptions of economic mobility in distant and anonymous interactions. Lastly, access to infrastructure in South Africa is still defined along racial and spatial lines, and policymakers should therefore focus on dismantling the past spatial imbalances and increasing political will in implementing existing policies to ensure improved equity in access to essential public facilities.

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Appendices

Appendix A

Table 3-4A (Cut-off Points): SWB — Pooled Ordered Probit Regression of Subjective Well-being

Model Specification	Model 1	Model 2	Model 3	Model 4	Model 5
/cut1	-1.146142	-1.326331	-0.2175065	-0.1688245	-4.744926
/cut2	-0.7366006	-0.9196327	0.2209778	0.2671729	-4.308676
/cut3	-0.3272866	-0.514191	0.6639287	0.7073865	-3.867918
/cut4	0.0642612	-0.1272393	1.09197	1.132228	-3.442257
/cut5	0.5455686	0.3478687	1.620487	1.656575	-2.91698
/cut6	0.8770881	0.6752185	1.986129	2.019528	-2.553596
/cut7	1.218849	1.012966	2.358431	2.389623	-2.18319
/cut8	1.626156	1.41635	2.809074	2.838236	-1.734437
/cut9	1.855296	1.643876	3.04863	3.07694	-1.495865

Source Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec Easydata.

*Note significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1*

All results are weighted

Table 3-4B: SWB — Pooled Ordinary Least Squares of Subjective Well-being

Model Specification	Model 1	Model 2	Model 3	Model 4	Model 5
District Municipalities:					
West Coast	2.244***		0.528***		
Cape Winelands	1.579***		0.332**		
Overberg	2.000***		0.373**		
Eden	1.705***		0.269		
Central Karoo	2.319***		1.089***		
City of Cape Town	1.065***		-0.161		
Cacadu	0.723***		-0.088		
Amathole	0.174		-0.334**		
Chris Hani	0.041		-0.462***		
Joe Gqabi	-0.047		-0.417***		
O.R Tambo	0.227*		-0.057		
Alfred Nzo	-0.097		-0.415***		
Buffalo City	1.218***		-0.039		
Nelson Mandela Bay	0.526***		-0.231*		
Namakwa	1.379***		0.477***		

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec Easydata.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-4B (continued): SWB — Pooled Ordinary Least Squares of Subjective Well-being

Model Estimation	Model 1	Model 2	Model 3	Model 4	Model 5
Pixely Ka Seme	2.437***		0.952***		
Siyanda	1.293***		0.307*		
Frances Baard	1.071***		0.367**		
John Taolo Gaetsewe	1.645***		1.137***		
Xhariep	1.188***		0.812***		
Lajweleputswa	0.817***		0.069		
Thabo Mofutsanyane	0.966***		0.326**		
Fezile Dabi	1.157***		0.163		
Mangaung	1.244***		0.543***		
Ugu	0.230*		-0.123		
Umgungundlovu	0.419***		-0.323***		
Uthukela	0.201*		0.176		
Uthungulu	-0.012		-0.226		
Sisonke	0.390**		0.171		
Umzinyathi	0.571***		0.049		
Amajuba	0.470***		0.392***		
Zululand	-0.224*		-0.585***		
iLembe	0.517***		-0.041		
eThekwini	0.546***		-0.221*		
Bojanala	1.153***		0.415***		
Ngaka Madiri Molema	0.799***		0.434***		
Dr Ruth Segomotsi	0.937***		0.859***		
Dr Kenneth Kaunda	1.427***		0.283		
Sedibeng	0.153		-0.319**		
West Rand	1.030***		0.013		
Ekurhuleni	1.167***		-0.116		

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec Easydata.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-4B (Continued): SWB — Pooled Ordinary Least Squares of Subjective Well-being

Model Specification	Model 1	Model 2	Model 3	Model 4	Model 5
City of Johannesburg	0.398***		-0.389***		
City of Tshwane	1.411***		0.318**		
Gert Sibande	0.791***		0.124***		
Nkangala	0.443***		-0.444		
Ehlanzeni	0.405***		-0.016***		
Mopani	-0.103		-0.533***		
Vhembe	0.381**		-0.451***		
Capricorn	0.219		-0.284*		
Waterberg	0.893***		-0.040		
Greater Sekhukhune	0.467***		-0.041		
Provinces:					
Western Cape		0.974***		-0.145**	
Eastern Cape		-0.071		-0.072	
Northern Cape		1.091***		0.726***	
Free State		0.677***		0.413***	
North West		0.686***		0.640***	
Gauteng		0.413***		-0.034	
Mpumalanga		0.144**		0.013	
Limpopo		-0.022		-0.074	
Individual Variables:					
Age			-0.053***	-0.053***	-0.052***
Age-squared			0.0002***	0.0006***	0.0006***
Male			-0.103***	-0.105***	-0.104***
Colored			0.717***	0.733***	0.661***
Indian			1.203***	1.185***	1.316***
White			0.965***	0.993***	0.976***
Primary Education			0.014	-0.044	-0.021
Secondary Education			0.079	0.008	0.047
Matric			0.137*	0.082	0.129*
Tertiary Education			-0.099	0.155	-0.052
Married			0.208***	0.217***	0.193***
Cohabitating			-0.022	0.053	-0.042
Divorced or widowed			0.004	0.0001	-0.002
Good Health			0.309***	0.318***	0.302***
Employment Status					
Employed			0.201***	0.199***	0.195***
Not Economically Active			0.074	-0.092**	-0.076
Household Variables:					
Geographical Type: Urban			-0.215***		-0.301***

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec Easydata.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-4B (Continued): SWB — Pooled Ordinary Least Squares of Subjective Well-being

Model Specification	Model 1	Model 2	Model 3	Model 4	Model 5
Household infrastructure:					
Piped water on site			-0.011	-0.051	0.017
Flushable Toilet			0.069	0.054	0.021
Electricity			-0.304***	-0.013***	-0.302***
Income variables:					
Log of per capita household income			0.300***	0.307***	0.316***
Perceived Relative Economic Position:					
Perceived Middle-Third			0.439***	0.440***	0.438***
Perceived Richest-Third			1.176***	1.200***	1.199***
Perceived Middle Third (2yrs)			0.324***	0.331***	0.327***
Perceived Richest Third (2yrs)			0.526***	0.528***	0.532***
Perceived Middle Third (5yrs)			0.599***	0.591***	0.577***
Perceived Richest Third (5yrs)			0.772***	0.759***	0.738***
Regional Macroeconomic Variables:					
Mean District Income					-0.248
Mean District Unemployment					-0.058
Mean District Regional Domestic Product					0.159**
Mean Provincial Income					1.584***
Mean Provincial Unemployment					-1.301***
Mean Provincial Regional Domestic Product					0.547***
Constant	**4.500**	**4.887**	**2.304**	**2.143**	**12.341**
Wave	**0.026*** **	**0.023** **	**-0.068*** **	**-0.070*** **	**-0.076**
R-Squared	**0.0422**	**0.0220**	**0.1865**	**0.1765**	**0.1781**
Model P-Value	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**
Number of Observations	**71,943**	**71,943**	**60,731**	**60,731**	**60,731**

Source: Own calculations using the National Income Dynamics Study Data (Pooled from 2008 to 2017).

Macroeconomic variables were sourced from Quantec Easydata.

*Note: significance levels - *** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 3-5C: SWB — Hausman Test Results (Fixed effect and Random Effect estimates)

Model Specification	Model 5 (FE)	Model 5 (RE)	Difference	Std. Errors
Individual Variables:				
Age	-0.036	-0.044	0.007	0.009
Age-squared	0.0004	0.0005	-0.0001	0.0001
Primary Education	0.297	0.085	0.213	0.148
Secondary Education	0.268	0.167	0.101	0.159
Matric	0.298	0.175	0.122	0.166
Tertiary Education	0.263	0.434	-0.171	0.221
Married	0.284	0.355	-0.071	0.059
Cohabitating	0.154	0.038	0.116	0.494
Divorced or widowed	0.210	0.091	0.119	0.065
Good Health	0.178	0.286	-0.108	0.023
Employment Status				
Employed	0.067	0.118	-0.051	0.024
Not Economically Active	-0.089	0.028	-0.117	0.022
Household Variables:				
Geographical Type: Urban	-0.159	0.299	0.139	0.068
Household infrastructure:				
Piped water on site	-0.114	-0.043	-0.157	0.032
Flushable Toilet	0.126	0.234	-0.108	0.039
Electricity	0.221	0.180	0.041	0.029
Income variables:				
Log of per capita household income	0.172	0.252	-0.079	0.013
Perceived Relative Economic Position:				
Perceived Middle-Third	0.408	0.497	-0.089	0.016
Perceived Richest-Third	0.828	1.183	-0.356	0.046
Perceived Middle Third (2yrs)	0.317	0.321	-0.003	0.022
Perceived Richest Third (2yrs)	0.568	0.613	-0.045	0.030
Perceived Middle Third (5yrs)	0.616	0.616	0.0005	0.027
Perceived Richest Third (5yrs)	0.820	0.763	0.057	0.030
Regional Macroeconomic Variables:				
Mean District Income	0.263	-0.864	1.126	0.448
Mean District Unemployment	-0.336	0.059	-0.396	0.337
Mean District Regional Domestic Product	-0.086	0.493	-0.579	0.196
Mean Provincial Income	0.379	2.396	-2.017	0.850
Mean Provincial Unemployment	-0.806	2.397	-2.017	0.850
Mean Provincial Regional Domestic Product	0.254	-0.596	0.849	0.701
Chi2(28)	**258.12**			
Prob > Chi2	**0.0000**			

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Macroeconomic variables were sourced from Quantec Easydata.

Appendix B

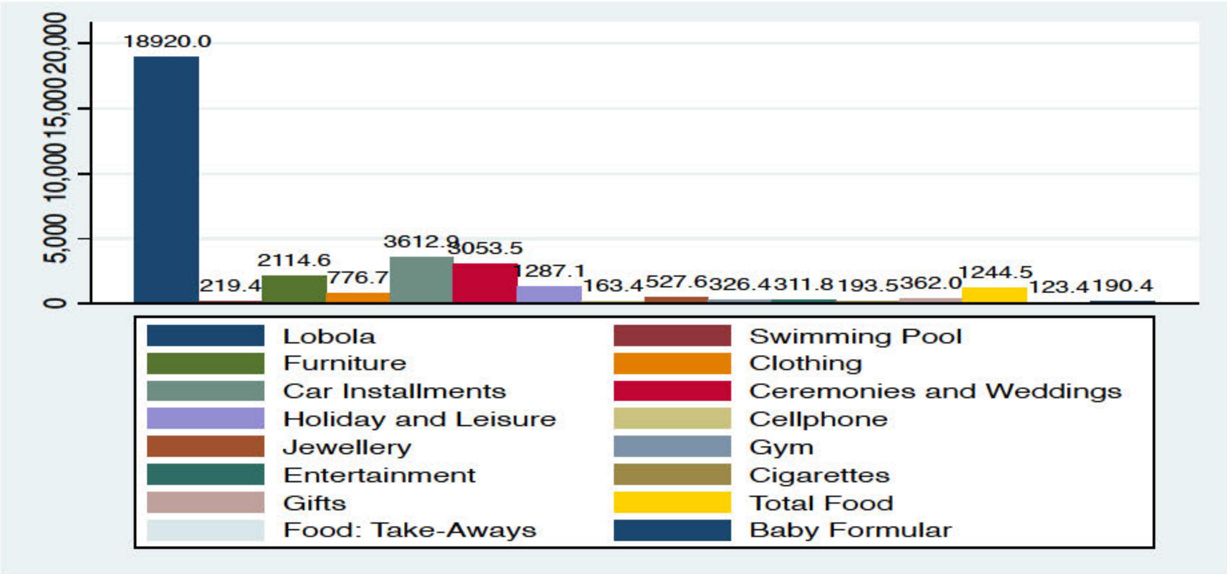
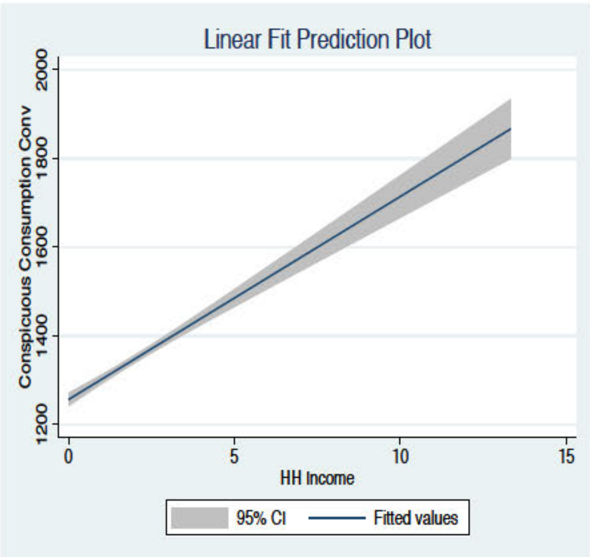
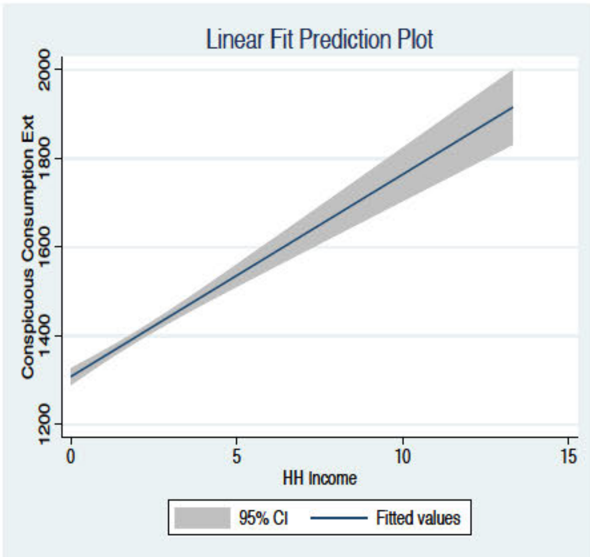


Figure 4-3A Bar graph of Conspicuous Consumption categories.
Note Own calculations from the National Income Dynamics Study (2008 to 2017)





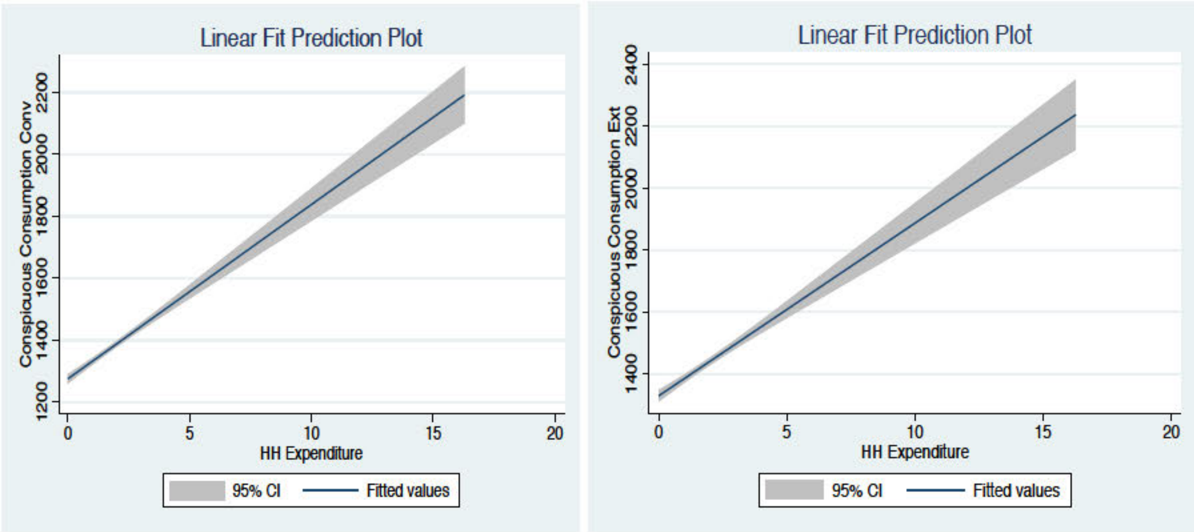


Figure 4-4B Linear Fit Plot: Conspicuous Consumption, Household Income and Expenditure.
Note: Own calculations from the National Income Dynamics Study (2008 to 2017).

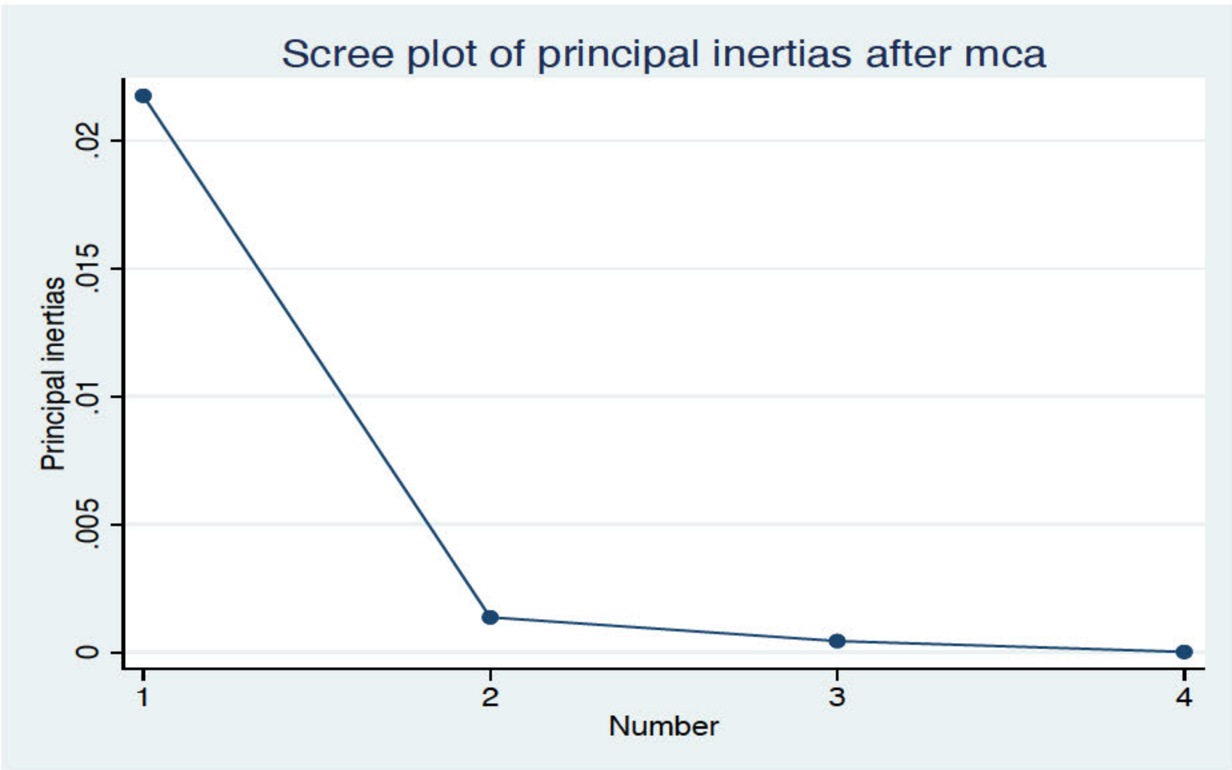


Figure 4-5C: Asset Index Scree plot of the Multiple Correspondence Analysis Index .
Source: Own calculations from the National Income Dynamics Study (2008 to 2017).

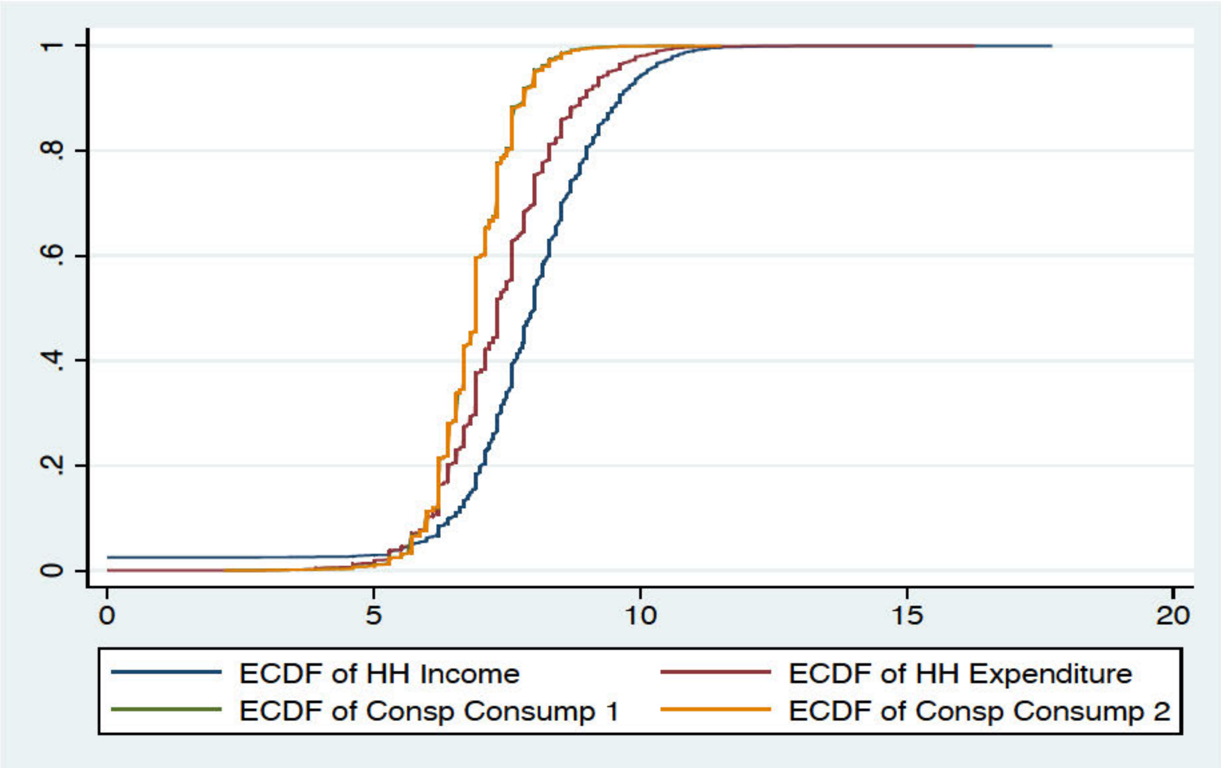


Figure 4-6D: Cumulative Distribution function for household income, expenditure, and conspicuous consumption.
Source: Own calculations from the National Income Dynamics Study (2008 to 2017).

Table 4-5A: SWB — Hausman Test Results (Fixed effect and Random Effect estimates)

Model Specification	Model 1 (FE)	Model 1 (RE)	Difference	Std. Errors
Individual Variables:				
Age	0.0307	-0.0511	0.0819	0.0271
Age-squared	0.0005	0.0006	-0.0001	0.0009
Primary Education	0.2676	0.1717	0.0959	0.1297
Secondary Education	0.3020	0.4129	-0.1109	0.1411
Matric	0.3226	0.6518	-0.3294	0.1456
Tertiary Education	0.2737	0.7966	-0.5228	0.1982
Married	0.3313	0.4467	-0.1153	0.0575
Cohabitating	0.2072	0.0399	0.1672	0.0431
Divorced or widowed	0.2624	0.1519	0.1104	0.0570
Good Health	0.1986	0.3104	-0.1118	0.0192
Employment Status				
Employed	0.2586	0.4099	-0.1514	0.0209
Not Economically Active	-0.0811	0.0944	-0.1756	0.0189
Religion	0.3718	0.5091	-0.1374	0.0216
Wave	-0.0903	0.0933	-0.1837	0.0592

Source: Own calculations using the National Income Dynamics Study Data 2008 to 2017.

Table 4-5A: SWB — Pooled Ordered Probit, OLS, and Fixed Effects Regression of Subjective Well-being

Model Specification	Model 2 (OPM)	Model 2 (POLS)	Model 2 (FE)
District Municipalities:			
West Coast	0.2327***	0.4616***	-0.3255
Cape Winelands	0.1928**	0.3736**	-1.1568*
Overberg	0.1399	0.2545	-0.6082
Eden	0.1354	0.2683	-0.4562
Central Karoo	0.5089***	1.0717***	0.6908
City of Cape Town	-0.0931	-0.2327	-1.0209**
Cacadu	0.0031	-0.0400	-0.9058
Amathole	-0.1058	-0.2901*	-2.0191***
Chris Hani	-0.1953***	-0.4799***	-1.4396***
Joe Gqabi	-0.1902***	-0.5006***	-0.9899*
O.R Tambo	-0.0381	-0.1799	-1.1906***
Alfred Nzo	-0.1589**	-0.4072***	-0.9495**
Buffalo City	-0.1371	-0.3578*	-1.4922**
Nelson Mandela Bay	-0.1330*	-0.3217**	-1.1746*
Namakwa	0.1917**	0.3915**	-1.1583
Pixely Ka Seme	0.4185***	0.8376***	0.7212
Siyanda	0.1563**	0.2755	-1.2553**
Frances Baard	0.1626**	0.2998**	0.2174
John Taolo Gaetsewe	0.4973***	1.0532***	1.0916
Xhariep	0.4103***	0.8347***	-0.7650
Lajweleputswa	0.0017	-0.0332	0.1936
Thabo Mofutsanyane	0.1279*	0.2561	0.8503
Fezile Dabi	0.0505	0.0377	1.2943**
Mangaung	0.2113***	0.4178**	0.3627
Ugu	-0.0075	-0.0826	-0.8052*
Umgungundlovu	-0.1833**	-0.4312***	-0.9016*
Uthukela	0.0751	0.0939	-0.5845
Uthungulu	-0.1117	-0.2707*	-0.9958**
Sisonke	0.0751	0.1169	-0.4276
Umzinyathi	0.0200	-0.0106	-0.0342
Amajuba	0.2072***	0.3777***	-0.1773
Zululand	-0.2649***	-0.6427***	-0.8555*
iLembe	-0.0156	-0.0821	-0.5792
eThekwini	-0.1117*	-0.2889**	-0.7474*
Bojanala	0.1901***	0.3698**	0.2644
Ngaka Madiri Molema	0.2148***	0.4114***	0.0437
Dr Ruth Segomotsi	0.4209***	0.8765***	0.3813
Dr Kenneth Kaunda	0.1127	0.2145	-0.3799
Sedibeng	-0.1195	-0.3014*	-0.4299

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4-5A (continued): SWB — Pooled Ordered Probit, OLS, and Fixed Effects Regression of Subjective Well-being

Model Specification	Model 2 (OPM)	Model 2 (POLS)	Model 2 (FE)
West Rand	-0.0107	-0.0727	-0.6624
Ekurhuleni	-0.0496	-0.1489	-0.9068**
City of Johannesburg	-0.2079***	-0.5025***	-0.8999**
City of Tshwane	0.1193*	0.2189	-0.2320
Gert Sibande	0.0525	0.0564	-0.3726
Nkangala	-0.2072***	-0.4988***	-0.9827**
Ehlanzeni	0.0735	0.1333	-0.2136
Mopani	-0.1709**	-0.4090***	-1.3399***
Vhembe	-0.1570*	-0.3685**	-0.2691
Capricorn	-0.0776	-0.2034	-1.0429**
Waterberg	0.0156	-0.0209	-0.5709
Greater Sekhukhune	0.0061	-0.0371	-0.3287

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4-6A: SWB — Pooled Ordered Probit Regression of Subjective Well-being

	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	(POM)		(POLS)		(FE)	
West Coast	0.4381***	0.2251	0.8609***	0.4473	-0.1396	-2.1874
Cape Winelands	0.0409	-0.5436***	-0.0684	-1.2901***	-1.6856	-1.8392
Overberg	-0.0468	-0.3856*	-0.2324	-0.9296**	0.0485	0.0000
Eden	-0.1421	-0.6845***	-0.3991	-1.4523***	-0.0625	0.0000
Central Karoo	0.7519***	0.2881	1.5188***	0.5481	0.9305	-0.6043
City of Cape Town	0.0276	-0.5632***	-0.0723	-1.2961***	-1.2264	-2.6658
Cacadu	-0.1088	-0.5980***	-0.3786	-1.3503***	-1.8878	-1.5904
Amathole	0.0182	-0.4952**	-0.1579	-1.2051***	-1.9303*	-1.5998
Chris Hani	-0.1302	-0.6185***	-0.4632**	-1.4495***	-1.8188**	-1.2052
Joe Gqabi	-0.2829***	-0.7985***	-0.8065***	-1.8384***	-0.6916	-0.7118
O.R Tambo	0.0442	-0.4102**	-0.1038	-1.0664***	-0.3469	-1.5563
Alfred Nzo	-0.1984*	-0.7567***	-0.6135***	-1.7432***	-0.4227	-4.5063**
Buffalo City	-0.1121	-0.5825**	-0.3609	-1.2875**	-1.6681	-2.8740
Nelson Mandela Bay	-0.3913***	-0.8292***	-0.9979***	-1.8753**	-1.6672	-1.1292
Namakwa	0.1489	-0.1872	0.2384	-0.3966	-2.3915*	-0.3923
Pixely Ka Seme	0.5973***	-0.0169	1.1646***	-0.1699	0.3399	-1.0371
Siyanda	0.4586***	0.2516	0.8646***	0.4925	-2.641**	-4.1303

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4-6A (continued): SWB — Pooled Ordered Probit Regression of Subjective Well-being

Model Specification	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	(POM)		(POLS)		(FE)	
Frances Baard	0.3788***	-0.0365	0.7037***	-0.1387	0.7325	-1.6329
John Taolo Gaetsewe	0.8406***	0.8189***	1.7358***	1.7427***	0.7162	0.5277
Xhariep	0.3184***	-0.2428	0.5539**	-0.6162	-0.6607	0.0285
Lajweleputswa	0.4513***	-0.3160	0.8719***	-0.6409	0.7590	-0.3029
Thabo Mofutsanyane	0.0387	-0.6749***	-0.0331	1.5155***	-1.4414	0.0182
Fezile Dabi	0.0285	-0.4339**	-0.0973	1.0582**	-2.1528*	-2.5338
Mangaung	0.1192	-0.4096*	0.12297**	0.9542**	-0.6478	-0.7990
Ugu	-0.0777	-0.5223***	-0.3539*	-1.2583***	-0.5209	-1.9727
Umgungundlovu	0.0941	-0.4444**	0.0724	-1.0251**	-0.4599	-1.7276
Uthukela	0.0699	-0.4644**	-0.0285	-1.1207***	0.0034	-0.9984
Uthungulu	-0.1190	-0.6429***	-0.4086*	-1.4676***	-0.9557	-1.5674
Sisonke	0.0482	-0.4100	-0.0509	-0.9208	-1.0290	-2.3942
Umzinyathi	0.1753	-0.3496*	0.2168	-0.8914**	-0.1561	-0.6370
Amajuba	0.0849	-0.2334	-0.0099	-0.6590	-0.4291	-0.6909
Zululand	-0.2091	-0.6243***	-0.6869***	-1.5306***	-1.4443**	-2.5348
iLembe	0.1366	-0.1869	0.1325	-0.5275	-1.6055**	-1.4512
eThekwini	0.0236	-0.3142*	-0.1312	-0.8118**	-0.4131	-1.2244
Bojanala	0.1699	-0.0947	0.2239	-0.2754	-0.2302	-0.2402
Ngaka Madiri Molema	0.4989***	-0.0072	0.9392***	-0.1556	-0.1453	-0.3534
Dr Ruth Segomotsi	0.6908***	0.4689*	1.3983***	0.9349	-1.1598	0.8128
Dr Kenneth Kaunda	0.2376	-0.2554	0.4093	-0.5920	-1.4949	-2.4656
Sedibeng	-0.1897	-0.4319**	-0.5817**	-1.0494*	-1.2742	-2.5019
West Rand	-0.0712	-0.3716*	0.0038	-0.8734**	-1.3011	-2.4798
Ekurhuleni	-0.2141**	-0.1515	0.3334	-0.4172	-1.1166	-1.3859
City of Johannesburg	-0.0294	-0.5088***	-0.2269	1.2282***	-0.6966	-1.9193
City of Tshwane	0.1801*	-0.1522	0.2705	0.4203	-0.7489	-1.4353
Gert Sibande	-0.3119***	-1.1258***	-0.8306***	-2.4643***	-1.3443*	-2.0765
Nkangala	-0.1647	-0.8144***	-0.5097**	-1.8234***	-1.1353	-2.0896
Ehlanzeni	0.0416	-0.4747**	0.0121	-1.0632***	-1.6182*	-0.8617
Mopani	-0.1156	-0.4841***	-0.3871*	-1.5654***	-2.0544**	-1.3189
Vhembe	-0.2365*	-0.5428**	-0.6356**	-1.2182**	-0.4486	-0.4094
Capricorn	-0.3063***	-0.8974***	-0.8069***	-2.0396***	-1.3836	-2.9660
Waterberg	0.2255**	-0.4793**	0.3873*	-1.0551**	-0.6416	-1.4678
Greater Sekhukhune	-0.1183	-0.4964**	-0.4182*	-0.1706***	-1.0522	-1.9719

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4.7A: SWB — Pooled Ordered Probit, Ordinary Least Squares, and Fixed Effects Regression of Subjective Well-being

Model Specification	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	(POM)		(POLS)		(FE)	
West Coast	0.4381***	0.2251	0.8609***	0.4473	-0.1396	-2.1874
Cape Winelands	0.0409	-0.5436***	-0.0684	-1.2901***	-1.6856	-1.8392
Overberg	-0.0468	-0.3856*	-0.2324	-0.9296**	0.0485	0.0000
Eden	-0.1421	-0.6845***	-0.3991	-1.4523***	-0.0625	0.0000
Central Karoo	0.7519***	0.2881	1.5188***	0.5481	0.9305	-0.6043
City of Cape Town	0.0276	-0.5632***	-0.0723	-1.2961***	-1.2264	-2.6658
Cacadu	-0.1088	-0.5980***	-0.3786	-1.3503***	-1.8878	-1.5904
Amathole	0.0182	-0.4952**	-0.1579	-1.2051***	-1.9303*	-1.5998
Chris Hani	-0.1302	-0.6185***	-0.4632**	-1.4495***	-1.8188**	-1.2052
Joe Gqabi	-0.2829***	-0.7985***	-0.8065***	-1.8384***	-0.6916	-0.7118
O.R Tambo	0.0442	-0.4102**	-0.1038	-1.0664***	-0.3469	-1.5563
Alfred Nzo	-0.1984*	-0.7567***	-0.6135***	-1.7432***	-0.4227	-4.5063**
Buffalo City	-0.1121	-0.5825**	-0.3609	-1.2875**	-1.6681	-2.8740
Nelson Mandela Bay	-0.3913***	-0.8292***	-0.9979***	-1.8753**	-1.6672	-1.1292
Namakwa	0.1489	-0.1872	0.2384	-0.3966	-2.3915*	-0.3923
Pixely Ka Seme	0.5973***	-0.0169	1.1646***	-0.1699	0.3399	-1.0371
Siyanda	0.4586***	0.2516	0.8646***	0.4925	-2.641**	-4.1303
Frances Baard	0.3788***	-0.0365	0.7037***	-0.1387	0.7325	-1.6329
John Taolo Gaetsewe	0.8406***	0.8189***	1.7358***	1.7427***	0.7162	0.5277
Xhariep	0.3184***	-0.2428	0.5539**	-0.6162	-0.6607	0.0285
Lajweleputswa	0.4513***	-0.3160	0.8719***	-0.6409	0.7590	-0.3029
Thabo Mofutsanyane	0.0387	-0.6749***	-0.0331	1.5155***	-1.4414	0.0182
Fezile Dabi	0.0285	-0.4339**	-0.0973	1.0582**	-2.1528*	-2.5338
Mangaung	0.1192	-0.4096*	0.12297**	0.9542**	-0.6478	-0.7990
Ugu	-0.0777	-0.5223***	-0.3539*	-1.2583***	-0.5209	-1.9727
Umgungundlovu	0.0941	-0.4444**	0.0724	-1.0251**	-0.4599	-1.7276
Uthukela	0.0699	-0.4644**	-0.0285	-1.1207***	0.0034	-0.9984
Uthungulu	-0.1190	-0.6429***	-0.4086*	-1.4676***	-0.9557	-1.5674
Sisonke	0.0482	-0.4100	-0.0509	-0.9208	-1.0290	-2.3942
Umzinyathi	0.1753	-0.3496*	0.2168	-0.8914**	-0.1561	-0.6370
Amajuba	0.0849	-0.2334	-0.0099	-0.6590	-0.4291	-0.6909
Zululand	-0.2091	-0.6243***	-0.6869***	-1.5306***	-1.4443**	-2.5348
iLembe	0.1366	-0.1869	0.1325	-0.5275	-1.6055**	-1.4512
eThekwini	0.0236	-0.3142*	-0.1312	-0.8118**	-0.4131	-1.2244
Bojanala	0.1699	-0.0947	0.2239	-0.2754	-0.2302	-0.2402
Ngaka Madiri Molema	0.4989***	-0.0072	0.9392***	-0.1556	-0.1453	-0.3534
Dr Ruth Segomotsi	0.6908***	0.4689*	1.3983***	0.9349	-1.1598	0.8128
Dr Kenneth Kaunda	0.2376	-0.2554	0.4093	-0.5920	-1.4949	-2.4656

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Table 4.7A (continued): SWB — Pooled Ordered Probit, Ordinary Least Squares, and Fixed Effects Regression of Subjective Well-being

Model Specification	Model 1 (POM)	Model 2 (POM)	Model 1 (POLS)	Model 2 (POLS)	Model 1 (FE)	Model 2 (FE)
Sedibeng	-0.1897	-0.4319**	-0.5817**	-1.0494*	-1.2742	-2.5019
West Rand	-0.0712	-0.3716*	0.0038	-0.8734**	-1.3011	-2.4798
Ekurhuleni	-0.2141**	-0.1515	0.3334	-0.4172	-1.1166	-1.3859
City of Johannesburg	-0.0294	-0.5088***	-0.2269	1.2282***	-0.6966	-1.9193
City of Tshwane	0.1801*	-0.1522	0.2705	0.4203	-0.7489	-1.4353
Gert Sibande	-0.3119***	-1.1258***	-0.8306***	-2.4643***	-1.3443*	-2.0765
Nkangala	-0.1647	-0.8144***	-0.5097**	-1.8234***	-1.1353	-2.0896
Ehlanzeni	0.0416	-0.4747**	0.0121	-1.0632***	-1.6182*	-0.8617
Mopani	-0.1156	-0.4841***	-0.3871*	-1.5654***	-2.0544**	-1.3189
Vhembe	-0.2365*	-0.5428**	-0.6356**	-1.2182**	-0.4486	-0.4094
Capricorn	-0.3063***	-0.8974***	-0.8069***	-2.0396***	-1.3836	-2.9660
Waterberg	0.2255**	-0.4793**	0.3873*	-1.0551**	-0.6416	-1.4678
Greater Sekhukhune	-0.1183	-0.4964**	-0.4182*	-0.1706***	-1.0522	-1.9719

Source: Own calculations using the National Income Dynamics Study Data (2008 to 2017).

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

All results are weighted.

Appendix C

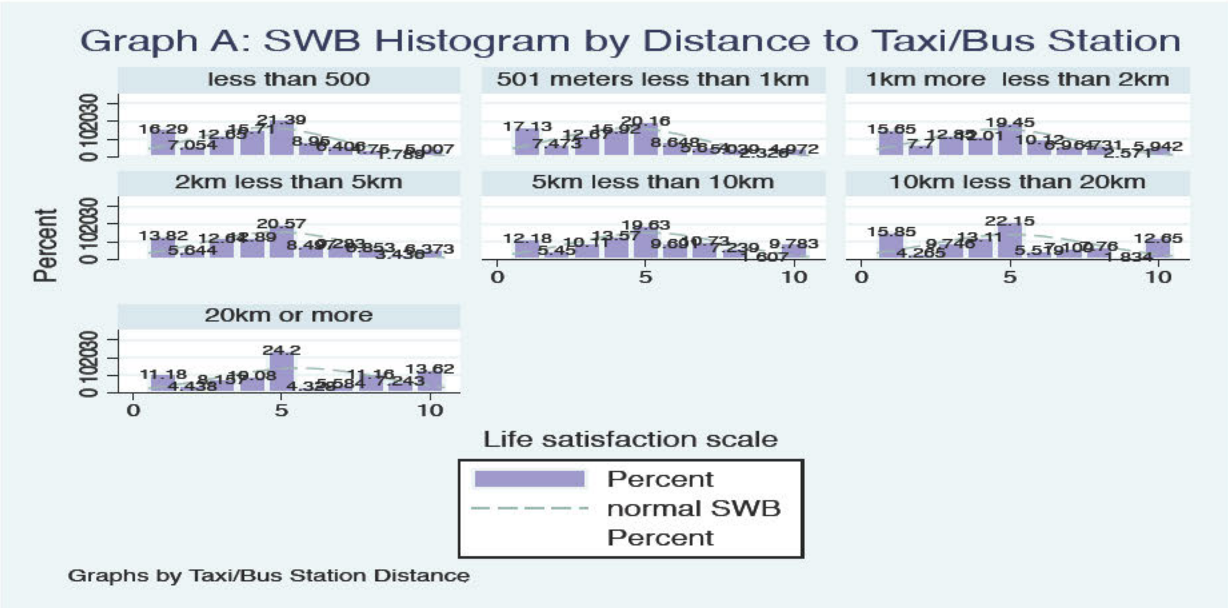


Figure 5-4A(continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

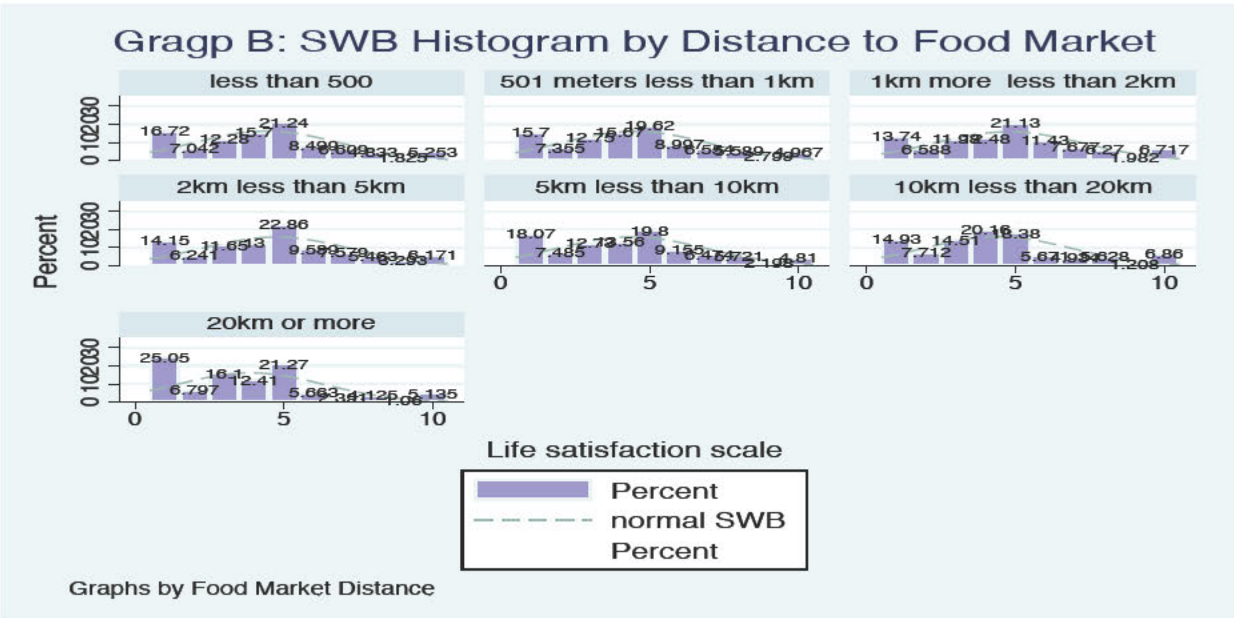


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

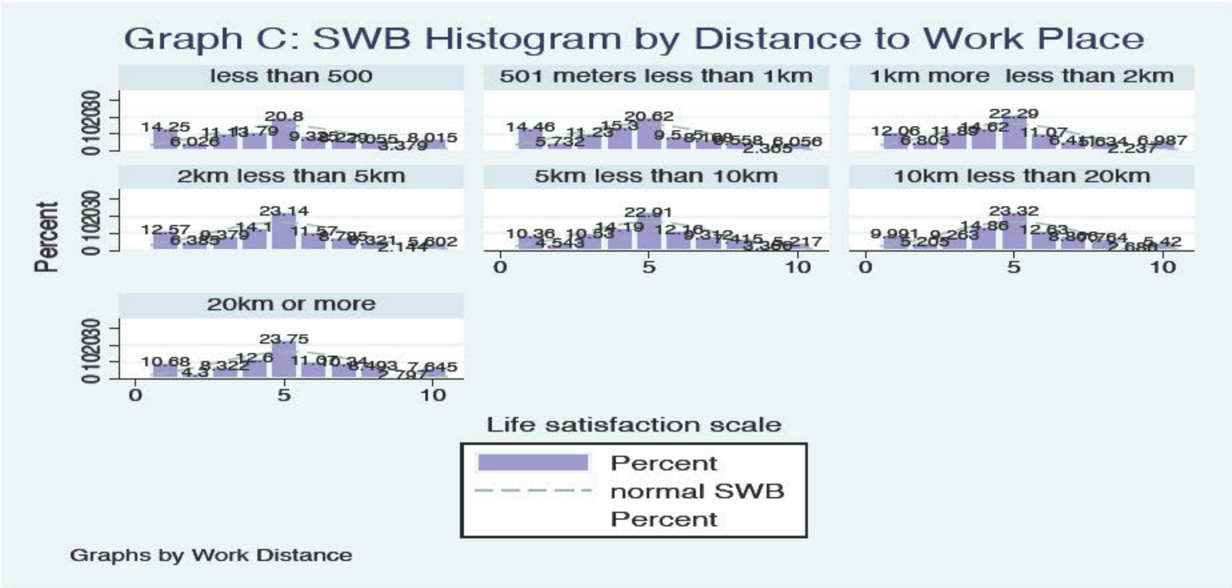


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

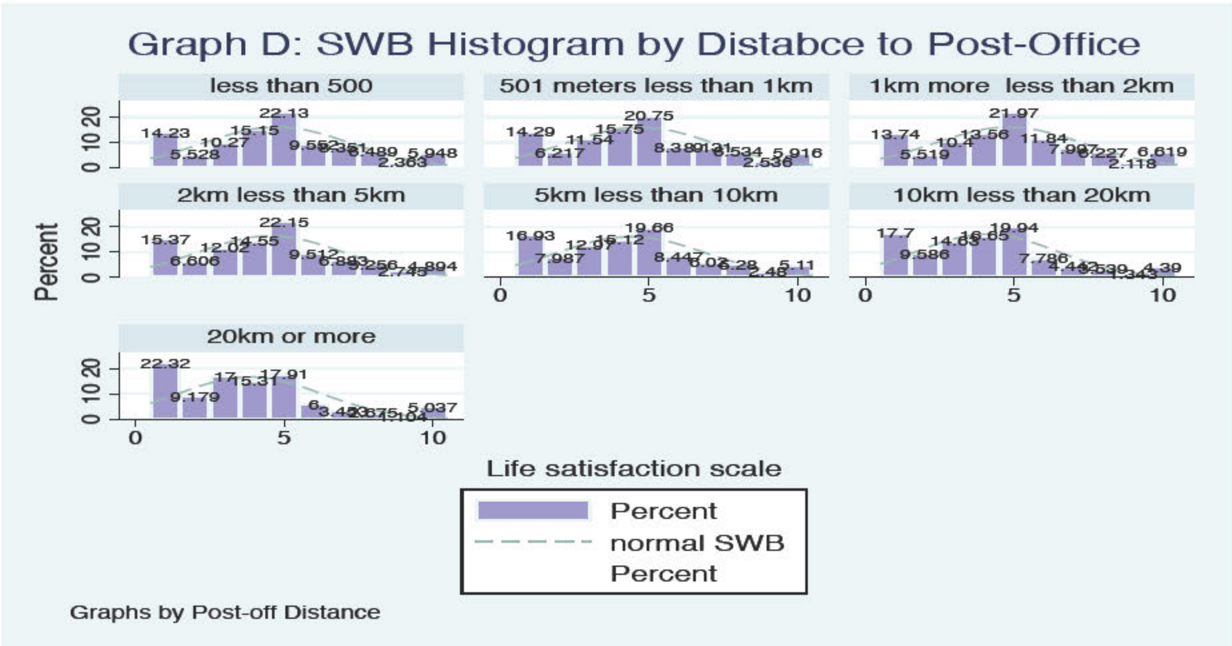


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

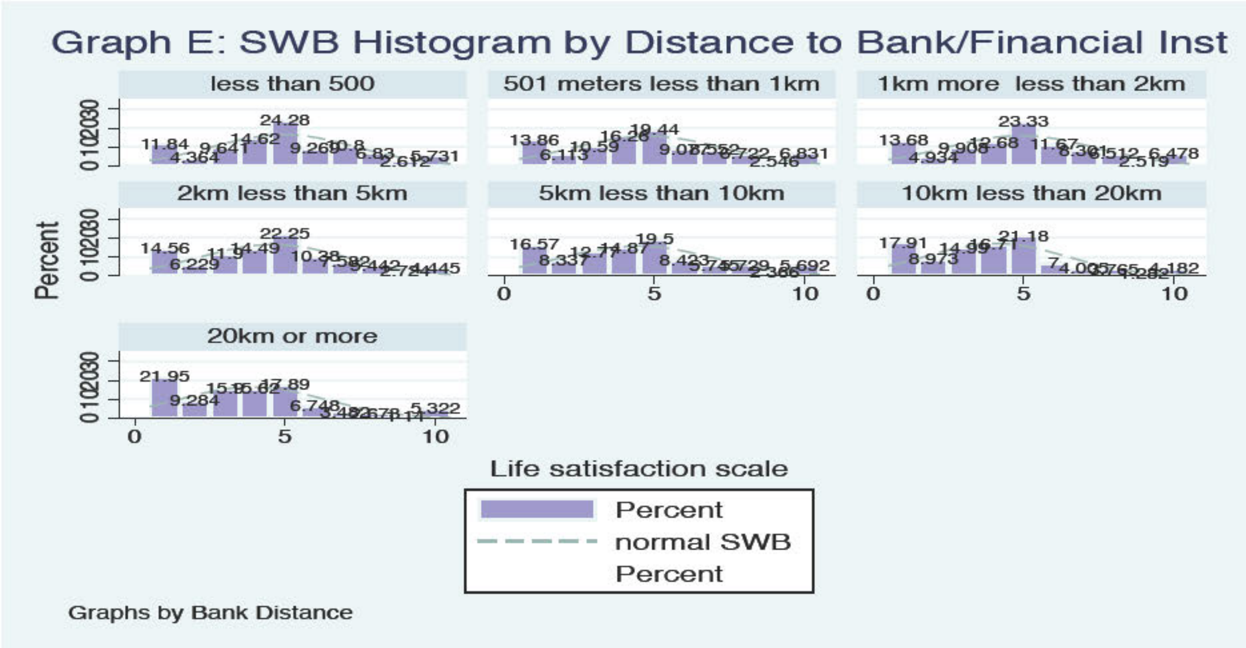


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

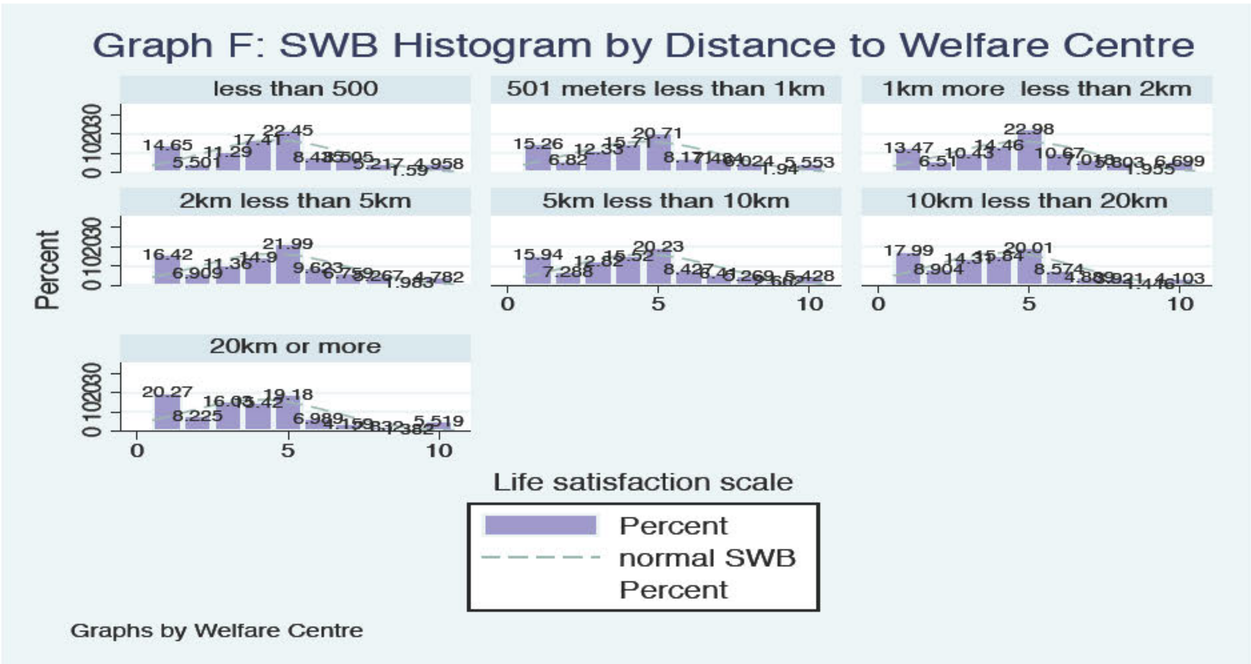


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

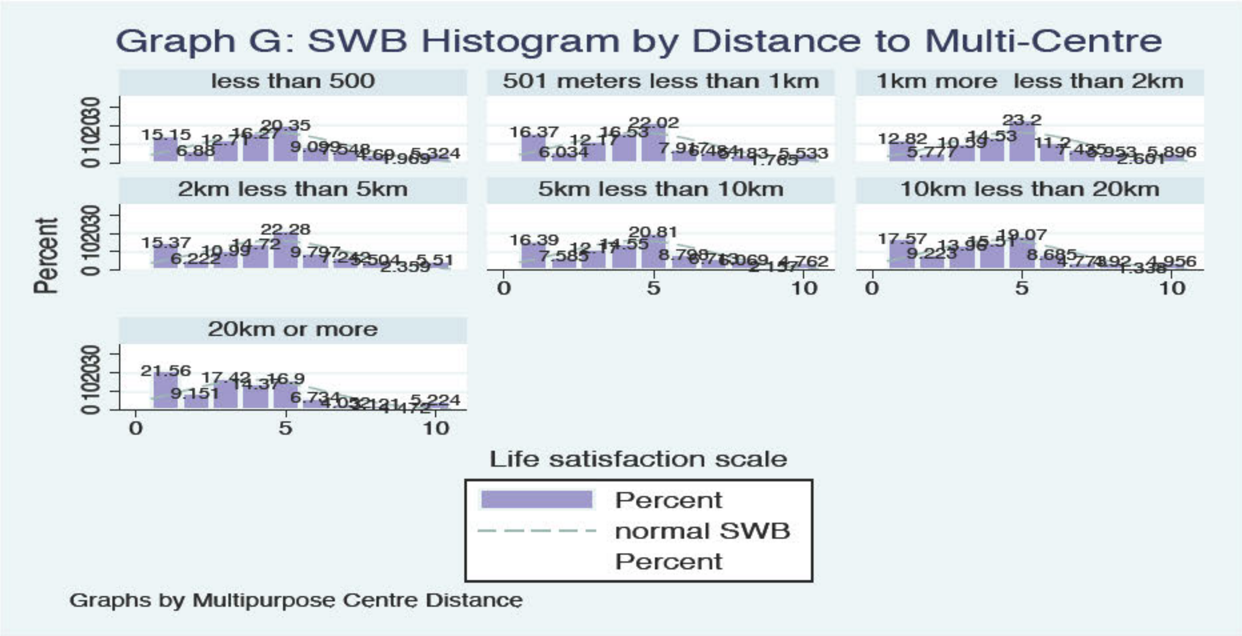


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

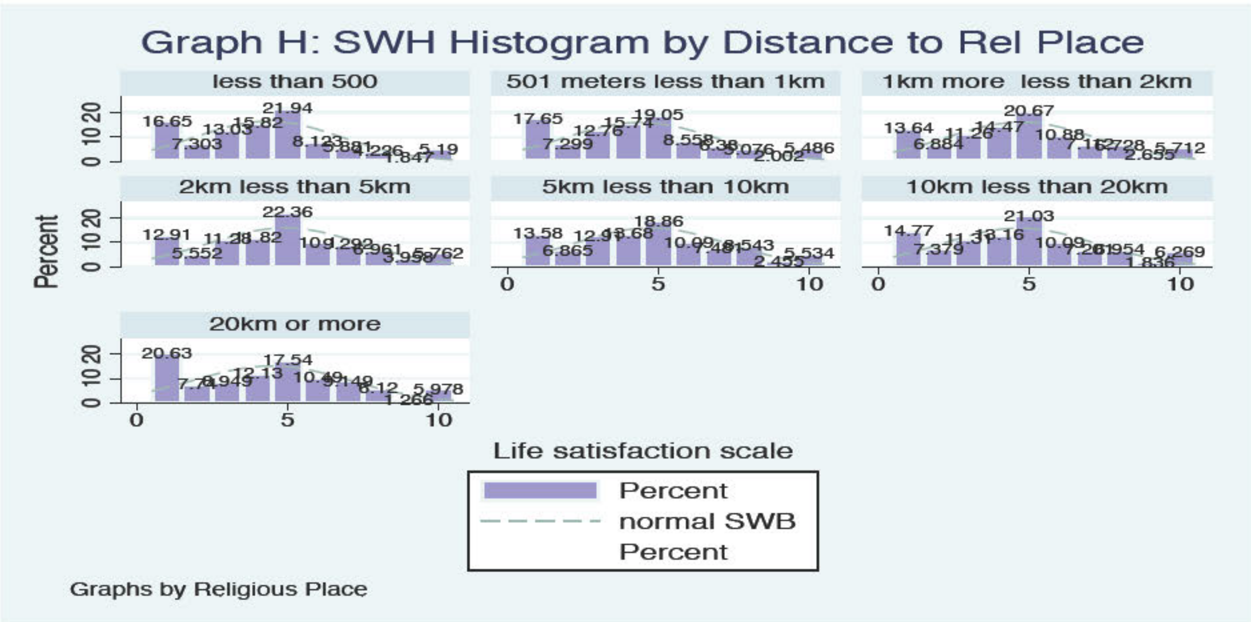


Figure 5-4A (Continued): SWB Histograms by distance to the nearest Public Infrastructure Facility.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: All results are weighted.

Table 5-2A (Continued): Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Transport Ranks/Terminals	1 if distance is less than 5km; 0 otherwise	0.968	0.175
Food markets/supermarkets	1 if distance is less than 5km; 0 otherwise	0.892	0.309
Place of Employment	1 if distance is less than 5km; 0 otherwise	0.478	0.499
Post Office	1 if distance is less than 5km; 0 otherwise	0.612	0.487
Banks and Financial Institutions	1 if distance is less than 5km; 0 otherwise	0.526	0.499
Welfare Centre	1 if distance is less than 5km; 0 otherwise	0.515	0.499
Multipurpose Centre	1 if distance is less than 5km; 0 otherwise	0.638	0.480
Place of Religion	1 if distance is less than 5km; 0 otherwise	0.916	0.277
Transport Ranks/Terminals			
Walking	1 if individual walks to this facility; 0 otherwise	0.851	0.356
Commuting	1 if individual commutes to this facility; 0 otherwise	0.039	0.194
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.109	0.312
Food Markets/Supermarkets			
Walking	1 if individual walks to this facility; 0 otherwise	0.702	0.457
Commuting	1 if individual commutes to this facility; 0 otherwise	0.161	0.368
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.137	0.343
Place of Employment			
Walking	1 if individual walks to this facility; 0 otherwise	0.325	0.469
Commuting	1 if individual commutes to this facility; 0 otherwise	0.387	0.487
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.288	0.452
Post Office			
Walking	1 if individual walks to this facility; 0 otherwise	0.302	0.459
Commuting	1 if individual commutes to this facility; 0 otherwise	0.523	0.499
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.174	0.379
Banks and Financial Institutions			
Walking	1 if individual walks to this facility; 0 otherwise	0.199	0.399
Commuting	1 if individual commutes to this facility; 0 otherwise	0.624	0.484
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.176	0.381
Welfare Centres			
Walking	1 if individual walks to this facility; 0 otherwise	0.235	0.424
Commuting	1 if individual commutes to this facility; 0 otherwise	0.591	0.491
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.174	0.379

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: The distance variables are converted into dummy variables (less than 5km/more than 5km) for the purpose of the multivariate analysis. In addition, the mode of transportation is also converted into dummy variables (walking, commuting and private vehicle).

All results are weighted.

Table 5-2A (Continued): Variable descriptions and summary statistics

Variable	Descriptions	Mean	Stdv
Banks and Financial Institutions			
Walking	1 if individual walks to this facility; 0 otherwise	8.286	4.023
Commuting	1 if individual commutes to this facility; 0 otherwise	0.191	0.393
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.071	0.256
Welfare Centres			
Walking	1 if individual walks to this facility; 0 otherwise	0.677	0.467
Commuting	1 if individual commutes to this facility; 0 otherwise	0.858	0.349
Private Vehicle	1 if individual uses private car to this facility; 0 otherwise	0.360	0.480
Western Cape	1 if individual is from this province; 0 otherwise	0.113	0.316
Eastern Cape	1 if individual is from this province; 0 otherwise	0.125	0.332
Northern Cape	1 if individual is from this province; 0 otherwise	0.021	0.145
Free-Sate	1 if individual is from this province; 0 otherwise	0.051	0.220
KwaZulu Natal	1 if individual is from this province; 0 otherwise	0.199	0.399
North West	1 if individual is from this province; 0 otherwise	0.068	0.250
Gauteng	1 if individual is from this province; 0 otherwise	0.240	0.427
Mpumalanga	1 if individual is from this province; 0 otherwise	0.078	0.268
Limpopo	1 if individual is from this province; 0 otherwise	0.104	0.306

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Note: The distance variables are converted into dummy variables (less than 5km/more than 5km) for the purpose of the multivariate analysis. In addition, the mode of transportation is also converted into dummy variables (walking, commuting and private vehicle).

All results are weighted.

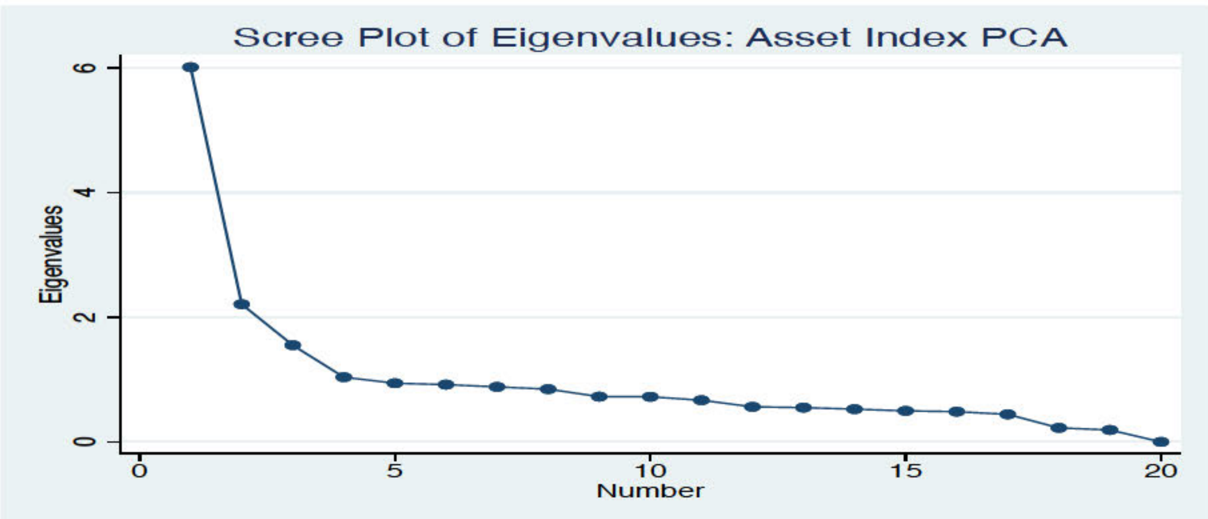


Figure 5-5D: Asset Index Scree plot of the Principal Component Analysis Index.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

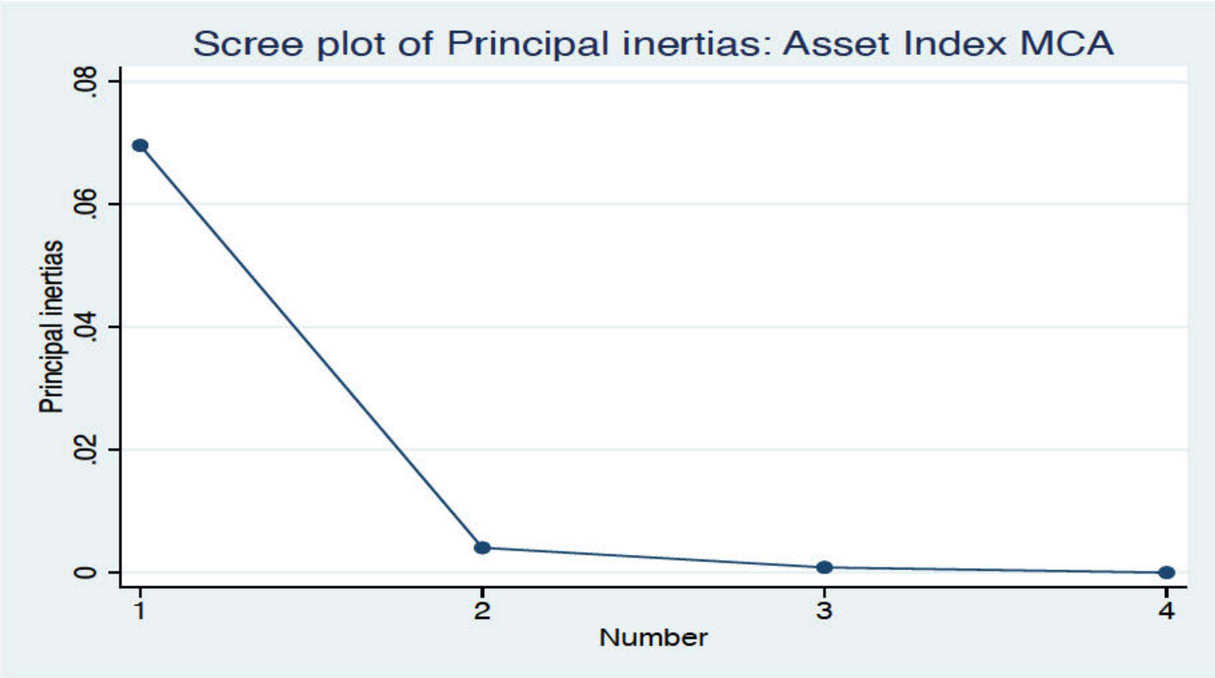


Figure 5-5E: Asset Index Scree plot of the Multiple Correspondence Analysis Index.

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

Table 5-3A: SWB – Ordered Probit Regression of SWB (cut-off points)

Model Specification	Model 1	Model 2	Model 3	Model 4
/cut1	-1.192	-0.994	1.346	0.643
/cut2	-0.928	-0.722	1.634	0.935
/cut3	-0.545	-0.327	2.051	1.358
/cut4	-0.132	0.107	2.511	1.827
/cut5	0.453	0.729	3.164	2.491
/cut6	0.750	1.045	3.496	2.828
/cut7	1.015	1.325	3.789	3.124
/cut8	1.289	1.613	4.092	3.429
/cut9	1.443	1.772	4.249	3.584

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Table 5-3A: SWB – Ordered Probit Regression of SWB

Model Specification	Model 1	Model 2	Model 3	Model 4
Distance Variables:				
Pre-Primary School	-0.203***	-0.121***	-0.105**	-0.132**
Primary School	-0.125***	-0.028	0.016	0.014
Secondary School	-0.025	0.062***	0.002	0.001
Clinic	-0.038***	0.037***	-0.026*	-0.024*
Hospital	0.176***	0.085***	0.033**	0.029**
Police Station	0.067***	0.081***	-0.011	-0.001
Mode of Transportation				
Pre-Primary School:				
Commuting		0.061*	0.049	0.023
Private Vehicle		0.259***	0.189***	0.166**
Primary School:				
Commuting		0.085**	-0.004	0.012
Private Vehicle		-0.172**	-0.262***	-0.292***
Secondary School:				
Commuting		-0.023	-0.039*	-0.043**
Private Vehicle		0.181***	0.155**	0.158**
Clinics:				
Commuting		0.032**	0.052***	0.042***
Private Vehicle		0.145***	0.079*	0.093**
Hospitals:				
Commuting		-0.131***	-0.098***	-0.093***
Private Vehicle		0.444***	0.202***	0.189***
Police Stations:				
Commuting		0.023*	0.056***	0.059***
Private Vehicle		-0.005	-0.095**	-0.143***
Infrastructure Variables:				
Dwelling type: Formal			0.196***	0.189***
Dwelling type: Traditional			0.015	0.008
Piped water on site			0.011	-0.001
Access to clean water			0.029*	0.019
Flush toilet			0.020	0.008
Electricity Access			0.179***	0.178***
Police visibility			-0.021*	-0.031***
Access to food markets/supermarkets			0.038***	0.027**
Asset Index			0.039***	0.035***
Log Per Capita Household Monthly Income			0.212***	0.176***
Other Determinants:				
Age				-0.028***
Age-squared				0.003***
Male				-0.041***
Colored				0.125***

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Table 5-3A (continued): SWB – Ordered Probit Regression of SWB

Model Specification	Model 1	Model 2	Model 3	Model 4
Indian				0.152***
White				0.054***
Primary Education				0.038*
Secondary Education				0.117***
Matric				0.137***
Tertiary Education				0.280***
Married				0.115***
Cohabitating				-0.001
Divorced or widowed				0.031
Good Health				0.187***
Working for a Wage				0.071
Receive Income from Salary and Wages				0.026
Household saver				0.015
Household Income Bracket:				
Middle Income Class				-0.038***
High Income Class				0.199***
Province Dummy Variables:				
Western Cape			0.306***	0.299***
Eastern Cape			0.016	0.0778**
Northern Cape			0.266***	0.321***
Free-Sate			0.056**	0.129***
North West			0.006	0.069***
Gauteng			0.010	0.062***
Mpumalanga			0.099***	0.171***
Limpopo			0.093***	0.131***
/cut1	-1.192	-0.994	1.346	0.643
/cut2	-0.928	-0.722	1.634	0.935
/cut3	-0.545	-0.327	2.051	1.358
/cut4	-0.132	0.107	2.511	1.827
/cut5	0.453	0.729	3.164	2.491
/cut6	0.750	1.045	3.496	2.828
/cut7	1.015	1.325	3.789	3.124
/cut8	1.289	1.613	4.092	3.429
/cut9	1.443	1.772	4.249	3.584
Number of Observations	54 425	51 868	46 505	44 891
Pseudo R^2	0.0037	0.0227	0.0425	0.0486
Log-pseudolikelihood	-114898.41	-107375.47	-94397.29	-90461.69
χ^2	861.64	4997.54	8386.41	9233.44

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Table 5-4A: SWB – Ordinary Least Squares Regression of SWB

Model Specification	Model 1	Model 2	Model 3	Model 4
Private Vehicle		1.030***	0.488***	0.456***
Police Stations:				
Private Vehicle		1.030***	0.488***	0.456***
Police Stations:				
Commuting		0.048***	0.108***	0.115***
Private Vehicle		-0.049***	-0.242**	-0.347***
Infrastructure Variables:				
Dwelling type: Formal			0.396***	0.375***
Dwelling type: Traditional			0.067**	0.056
Piped water on site			0.017	-0.008
Access to clean water			0.067**	0.043
Flush toilet			0.029	0.004
Electricity Access			0.310***	0.307***
Police visibility			-0.044***	-0.066***
Access to food markets/supermarkets			0.080***	0.053**
Asset Index			0.081***	0.072***
Log Per Capita Household Monthly Income			0.449***	0.365***
Other Determinants:				
Age				-0.057***
Age-squared				0.001***
Male				-0.084***
Colored				0.280***
Indian				0.357***
White				0.188***
Primary Education				0.069
Secondary Education				0.215***
Matric				0.241***
Tertiary Education				0.593***
Married				0.243***
Cohabitating				0.002
Divorced or widowed				0.070
Good Health				0.379***
Working for a Wage				0.142
Receive Income from Salary and Wages				0.054
Household saver				0.037
Household Income Bracket:				
Middle Income Class				-0.104***
High Income Class				-0.054***

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Table 5-4A: Continued: SWB – Ordinary Least Squares Regression of SWB

Model Specification	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Provincial Dummy Variables:				
Western Cape			0.695***	0.670***
Eastern Cape			0.029	0.163***
Northern Cape			0.572***	0.685***
Free-Sate			0.139**	0.299***
North West			0.019	0.184***
Gauteng			0.071*	0.182***
Mpumalanga			0.242***	0.401***
Limpopo			0.268***	0.349***
Constant	**4.171**	**4.259**	**-0.746**	**0.8282**
R-Squared	**0.0890**	**0.0951**	**0.1645**	**0.1858**
Model P-Value	**(0.0000)**	**(0.0000)**	**(0.0000)**	**(0.0000)**

Source: Own calculations from the Living Conditions Survey of SA for the years 2014 to 2015.

*Significance levels -*** p \ 0.01; ** p \ 0.05; * p \ 0.1.*

Appendix D

26 July 2021

Mr Sakhile Kieth Mpungose (209516715)
School Of Acc Economics&Fin
Westville

Dear   Mr Sakhile Kieth Mpungose,

Protocol reference number: 00005267
Project title: Wellbeing in South Africa: Regional economic disparities, conspicuous consumption, and the provision of infrastructure.

Exemption from Ethics Review

In response to your application received on 4 February 2020, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted]   26 July 2021 Renewal of EC exemption

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin