Investigating the Relationship Between Income and Subjective Well-being in South Africa

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Abstract

Conventional approaches to the analysis of human well-being use money-metric measures such as income or consumption. However, they are heavily criticised for relying on a limited understanding of well-being. In recent decades, subjective measures of well-being have been increasingly presented as providing a more inclusive and holistic perspective of well-being. Using data from the National Income Dynamics Study (NIDS), this dissertation examines the relationship between income, a common money-metric measure of well-being, and life satisfaction, a key indicator of subjective well-being. The results show that income and life satisfaction exhibit a weak but significant positive relationship, one which is stronger at lower levels of income. In addition to income, the analysis identifies a number of other significant correlates of subjective well-being. Furthermore, several differences in the correlates of income and life satisfaction are detected. These results highlight how subjective well-being measures can include information about people's lived experiences in ways that are not fully captured in objective money-metric measures.

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Chapter 1. Introduction

1.1 Introduction

This dissertation examines the relationship between income and subjective well-being in South Africa. The current chapter provides a background to the research problem and discusses the main contribution of the study. Thereafter, the objectives of the research are outlined, as well as the methods of analysis and the structure of the dissertation.

1.2 Background to the research problem

Improving human well-being is an inherent goal in society. Conventional approaches to the analysis of well-being use measures of income or consumption. While having obvious advantages, there are also major limitations associated with their use. Money-metric measures typically assume that everyone in the household shares the same level of income or consumption and therefore do not detect differences in well-being among household members. Additionally, they are often criticised for relying on a limited understanding of well-being since a measure of income or consumption arguably only captures one aspect of an individual's life.[1]

Over the past three decades, researchers and policymakers have searched for a more inclusive approach to measuring individual well-being, one that takes into account the multi-dimensional nature of an individual's quality of life. Among other developments, there has been increasing interest in the subjective well-being approach, which attempts to measure well-being based on an individual's self-reported assessment of his or her own life.

Within the well-established collection of literature in this area, it is argued that subjective well-being measures are better suited at providing a more inclusive and holistic perspective of well-being and should be combined with conventional approaches for better-informed analysis (Diener, 1994; Kingdon & Knight, 2006b).

[1] See Hulme and Shepherd (2003).

Additionally, the use of subjective assessments places value on individuals' own views about their well-being, rather than favouring external and somewhat arbitrarily selected views from elsewhere, or aggregating measures of well-being across the household, as conventional approaches commonly do (Kahneman, Diener, & Schwarz, 1999; Rojas, 2008). Invariably, well-being analysis requires a value judgement as to what makes a good life or a bad one. Relying on an individual's self-assessed perception of their life to form that value judgement, it is argued, is less imperfect and overcomes some of the deficiencies and arbitrariness of conventional approaches (Hagenaars, 1986).

Subjective well-being is generally understood as "*the level of well-being people experience according to their subjective evaluations of their lives*" (Diener & Ryan, 2009, p. 391). The concepts "happiness", "life satisfaction" and "quality of life" are most commonly used as indicators for subjective well-being (see for example Easterlin, 2001a; Howell & Howell, 2008; Veenhoven, 1991).[2] Data on these indicators are usually derived from single item survey questions of the following sort "How satisfied are you with your life?" or "How happy are you with your life?" with a large number of variations on these (see for example Diener, 1994). These subjective assessments of happiness or life satisfaction have consistently been shown to be empirically robust, reliable and valid accounts of an individual's well-being.[3]

Given the prevailing use of money-metric indicators and the increasing interest in subjective well-being measures, exploring the relationship between the two is a valuable exercise. Indeed, empirical research on this relationship has proliferated over the last three decades. Consistent findings confirm a moderate but significant relationship between income and subjective well-being, which is more pronounced at

[2] Although an argument can be made that "happiness", "life satisfaction" and "quality of life" each have their own specific meaning and should not be viewed as synonyms (Deaton, 2008; Diener, 1994), in this dissertation I adopt the more common view and use these terms interchangeably.

[3] Empirical regularities confirm that individuals are able to give relatively accurate and truthful assessments of their well-being (Diener, 1994, pp. 111-112; Pavot, 2008, p. 132); their replies are stable over time and are appreciably consistent across different situations (Diener, 1984; Diener, Suh, Lucas, & Smith., 1999); and lastly, comparisons of subjective well-being scores are feasible, provided large groups of individuals are being observed (Cantril, 1965; Easterlin, 1974).

lower income levels. However, despite their positive relationship in cross-sectional analyses, several studies show that increases in income over time do not always produce the expected rise in subjective well-being. Additionally, a large proportion of the inter-personal variation in subjective well-being cannot be explained by income variables alone, indicating that other factors are important contributors to individuals' assessment of their lives.[4]

Despite the growth of international literature on the income-subjective well-being relationship, South African research in this area is limited and is largely based on subjective well-being data that was collected at the household level. This dissertation aims to fill this gap in knowledge by examining the relationship between income and subjective well-being, using recent data that provides information on individuals' self-assessed well-being.

1.3 Main contribution of the study

National data on subjective well-being, which have commonly been used in South Africa, come from the Project for Statistics on Living Standards and Development (PSLSD) conducted in 1993. Apart from being outdated, information in the PSLSD on subjective well-being was collected at the household level and required an individual respondent to assess the satisfaction of the household as a whole. While several studies have used PSLSD data to assess subjective well-being in South Africa (Bookwalter & Dalenberg, 2004; Kingdon & Knight, 2006b; Klasen, 2000), the rationale behind using a measure of *household* subjective well-being has been challenged (Posel & Casale, 2011).

A relatively new household survey, the National Income Dynamics Study (NIDS), provides an opportunity to use recent data to explore subjective measures of well-being in South Africa. Its major advantage over the PSLSD is that it asks respondents to report their *own* subjective well-being and not that of the household. All resident adults (age 15+) are asked, "*Using a scale of 1 to 10 where 1 means "very*

[4] For an extensive review of these findings, see Diener and Biswas-Diener (2002) and Frey and Stutzer (2002).

dissatisfied" and 10 means "very satisfied", how do you feel about your life as a whole right now?" In addition to a range of subjective well-being measures, the NIDS survey also collects comprehensive information on income and expenditure; household composition and structure; labour market participation, health status and education; and individual demographic characteristics.

Using the 2008 baseline wave of NIDS (NIDS, 2008), this dissertation seeks to contribute to the literature on individual-level subjective well-being in South Africa. More specifically, it will investigate the relationship between income and individual subjective well-being, exploring the extent of their overlap, the extent to which their correlates differ and whether and how the poor and non-poor differ in the way their subjective well-being is determined. In so doing, the study aims to provide insight into the inter-personal variation in subjective well-being that has not commonly been presented in South African research.

1.4 Objectives of the study

The main objective of this dissertation is to investigate the relationship between income and subjective well-being. This is done by addressing a set of principal research questions:

1. What is the extent of overlap between income and subjective well-being?
2. To what extent does a person's level of income determine the way they assess their well-being?
3. How do the correlates of income and subjective well-being differ and how are they the same?
4. Do the poor and non-poor differ in the way their subjective well-being is determined?

In answering these questions, the interrelation between income and subjective well-being in South Africa is explored, as well as highlighting how subjective well-being measures can provide information about the experiences of human well-being in ways that are not fully captured in objective money-metric measures.

1.5 Methods and outline of the study

To investigate the principal research questions, both descriptive and regression-based methods are used. The descriptive analysis introduces the two measures of well-being with various figures and summary statistics. To show their extent of overlap, a cross-tabulation between income and subjective well-being categories is generated.

The regression analysis includes two identical ordered probit estimations for income and subjective well-being categories to show whether the correlates of income and subjective well-being are associated with these measures in the same direction and with similar intensity. Another subjective well-being regression is run that includes income variables in order to observe the impact of these variables on subjective well-being. The last set of estimations looks at the correlates of subjective well-being separately for respondents above and below the poverty line. This illustrates whether and how the poor differ in the way their subjective well-being is determined.

The remainder of this dissertation is structured as follows. Chapter 2 presents the key findings in the literature on the relationship between income and subjective well-being. Chapter 3 gives an overview of the data available on subjective well-being in South Africa. It then assesses the extent to which the findings on the income-subjective well-being relationship in South Africa are comparable to those observed in developed countries. Lastly, the chapter discusses a handful of South African studies that have used distinctly different methods to explore the relationship between income and subjective well-being. Chapter 4 provides a description of the methodology used as well as the key limitations of the study. Chapter 5 presents some basic descriptive statistics and figures as well as a cross-tabulation of subjective well-being categories and income categories. Chapter 6 describes the multivariate results. Finally, Chapter 7 discusses the results, points out the value of subjective well-being measures in well-being analysis and ends with some concluding comments that highlight the study's key findings.

Chapter 2. Income and subjective well-being: Key findings in the literature

2.1 Introduction

Research on subjective approaches to measuring individual well-being is a relatively new, but burgeoning area of study in the socio-economic domain. For a long time analysis in this area was stationed exclusively in the fields of psychology and, to a lesser extent, sociology and health (see for example Diener, 1984; Veenhoven, 1988). Following groundbreaking work by Easterlin (1974), who pioneered large-scale analyses on the relationship between income and happiness, the use of subjective well-being data in socio-economic research has proliferated over the last four decades.

Much of the economics literature on subjective well-being focuses on the interrelation between income and happiness. A number of generalised findings emerge from inquiry into this relationship, three of which are relevant for this dissertation:[5]

1. Income and subjective well-being exhibit a positive and significant correlation in cross-sectional analysis, which is more pronounced at lower income levels and diminishes as income rises.
2. While income and subjective well-being exhibit a positive and significant correlation in cross-sectional analysis, they appear to have little or no relationship in time-series analysis.
3. Differences in income only explain a small proportion of the variation in subjective well-being, and thus other individual, household and community level variables have been examined as possible determinants of subjective well-being.

The next two sections develop these findings by reviewing evidence from numerous studies and citing relevant theories from prominent researchers in the field.

[5] The first finding is true for both developed and developing countries. It is not possible, however, to apply the second and third finding to developing countries due to the relatively small number of empirical studies carried out.

2.2 Can money buy happiness?

Research on the relationship between income and subjective well-being has provided valuable insight into this age-old question. However, the interrelation between an individual's income and his/her happiness (or satisfaction with life) is not as straightforward as is often assumed. Results from studies investigating this relationship tend to vary according to the unit of analysis employed (whether individual-level or cross-country); the variable scale assumed (whether variables are plotted on equal scales); and the number of time periods observed (whether cross-sectional or time-series).

To start, the overwhelming majority of cross-sectional studies consistently affirm a positive and statistically significant relationship between level of income and subjective well-being. This is true for both developed and developing countries (Easterlin, 1974, 2001a; Herrera, Razafindrakoto, & Roubaud, 2006; Hinks & Davies, 2008; Inkeles, 1960; Powdthavee, 2005a). However, the *extent* of association varies considerably depending on whether averaged cross-country data or individual-level data taken from within a single country is used.

At a given point in time and within a specified country, those with higher incomes tend to report higher subjective well-being (Blanchflower & Oswald, 2004; Di Tella, MacCulloch, & Oswald, 2001; Easterlin, 2001a). However, while the relationship between these two variables is always significant, the size of the effect is relatively small (Diener et al., 1999; Easterlin, 2001a). In contrast, when averaged data are compared across nations, the relationship between income and happiness tends to be much larger (Argyle, 1999; Diener & Biswas-Diener, 2002; Veenhoven, 1991). It is consistently found that countries with higher per capita incomes have significantly greater subjective well-being than those with low per capita incomes (Deaton, 2008; Inglehart & Klingemann, 2000).

While there is considerable variation depending on the unit of analysis used, researchers find that the size of the income-subjective well-being relationship *also* varies at different income levels. When both variables are plotted on equal scales,

income and subjective well-being typically display a curvilinear pattern, with declining increases in happiness for higher income levels. This relationship is consistently observed in cross-country analyses (Diener, Sanvik, Seidlitz, & Diener, 1993; Veenhoven, 1991) and within both developed (Cummins, 2000) and developing nations (Graham & Pettinato, 2002; Hinks & Gruen, 2007; Lever, 2004).

The curvilinear relationship found in these studies suggests that income is subject to the economic law of diminishing returns to happiness: as income rises, each additional unit contributes less additional happiness. Veenhoven (1991) and subsequent researchers have cited Maslow's (1954) hierarchy of needs to explain the diminishing effect of income on happiness. It is proposed that increases in income for poorer groups are instrumental in improving access to basic needs and are therefore also significant in raising happiness. However, beyond a certain income level, where basic needs have already been met, additional gains in income are much less influential for happiness because higher-order needs are generally non-material (Cummins, 2000; Diener & Biswas-Diener, 2002; Diener & Diener, 1995; Veenhoven, 1991).

Irrespective of their particular curvilinear relationship, the most consistent finding in the literature is that income and subjective well-being exhibit a positive and statistically significant correlation. Evidently, at a given point in time, people in rich countries tend to be happier than those in poorer countries and, similarly, within a specified country, individuals with more money are happier than those with less. Does it follow then that more money means more happiness? According to economic utility theory, as people's incomes increase, they gain purchasing power to secure more material goods and services, leading to increased consumption, which in turn promotes higher levels of well-being (Howell & Howell, 2008). Based on this reasoning, we would expect increased income to generate higher levels of happiness.

However, the interpretation of the aforementioned results is not this straight forward. A positive correlation is not enough to establish a causal relationship, let alone indicate the direction of that relationship. Two other explanations are possible. First, it may well be that the observed positive relationship between income and subjective well-being is induced by a third factor. For instance, countries with higher per capita

income tend to have more stable democracies. It could be that the strong democratic principles in a country, rather than higher incomes, are elevating people's sense of well-being. Second, even if a causal relationship were established, the direction of causation is not clear. It cannot be assumed that additional income makes people happier. It is also possible that happy people are just more likely to earn higher incomes. Perhaps happier people enjoy their work and are therefore more industrious; hence their salaries are higher.

To ascertain whether there is a causal relationship that runs from income to happiness, several authors have used time series data. In a pioneering study, Easterlin (1974) observed that, for the United States, increases in income over time were not accompanied by a simultaneous rise in self-reported happiness. While per capita income levels have risen sharply since World War II, aggregate happiness over the same period is essentially unchanged. Subsequent studies have also found an apparent disconnect between income and subjective well-being over time in various other developed countries (Blanchflower & Oswald, 2004; Diener et al., 1993; Easterlin, 1995; Oswald, 1997).[6]

However, overall the evidence on whether income affects happiness is mixed. Several longitudinal and experimental studies indicate that part of the association between income and subjective well-being is due to the influence of income on subjective well-being. For example, Gardner and Oswald (2001) found that respondents who had won the lottery or received an inheritance had higher mental well-being compared to respondents who had not. Other studies, however, show that increases in income have little or no effect on subjective well-being. For example Brickman, Coates and Janoff-Bulman (1978) interviewed 22 winners of the Illinois State Lottery. They found that the sudden and large increase in income improved reported life satisfaction initially but the effects diminished substantially over time, such that lottery winners were ultimately no happier than controls.[7]

[6] Evidence for developing countries is lacking because of the shortage of time series data.

[7] For a review on the causal relationship between income and subjective well-being, see Diener and Biswas-Diener (2002).

The findings presented so far seem to be inconsistent with each other: why is it that at a single point in time income and subjective well-being are positively related to each other but often appear to have little or no relationship when observed over time? Easterlin explains this apparent contradiction by arguing that subjective well-being is influenced more by *relative* economic status than *absolute* economic status (Easterlin, 1974, 1995, 2001a). When forming appraisals of their lives, it is proposed that people compare themselves with others' economic status, with their past economic status and/or with aspirations for higher economic status.

Duesenberry (1949) originally outlined the effect of these comparisons, claiming that people look upwards and, regardless of the comparator, feelings of relative impoverishment are likely to reduce happiness. It is proposed that people compare their economic status with that of relevant others (such as friends or neighbours) or with their own economic status in the past and, upon finding that they are relatively worse off than their comparator, their subjective assessments of happiness or life satisfaction are likely to be lowered by feelings of relative deprivation (Easterlin, 2001a). In terms of aspirations, it is argued that people expect to be happier at higher income levels but when their income does increase they become accustomed to continued consumption at higher levels and they are encouraged to want more (Diener & Biswas-Diener, 2002). Thus their aspirations are raised even higher and, relative to these, people feel less satisfied or happy with their lives.

If subjective well-being is influenced more by relative economic status than absolute economic status it would explain why levels of happiness or life satisfaction do not increase with higher income levels. Even if there is a national rise in income, feelings of relative deprivation or adjusting aspiration levels will moderate or lessen subjective well-being assessments so that, relative to others or to newly formed aspiration levels, income has not essentially changed (Easterlin, 1974, 1995; Kingdon & Knight, 2007b; McBride, 2001).

There is now a great deal of support for the notion that subjective well-being depends to a large extent on relative, rather than absolute, income. It is proposed that when individuals evaluate their happiness or satisfaction, they do so by comparing their own income to the income of a particular reference group or reference time that they

have in mind.[8] The majority of empirical studies have found that relative income has a large and significant effect on subjective well-being (Clark & Oswald, 1996; Copestake, Guillen-Royo, Chou, Hinks, & Velazco, 2009; Kingdon & Knight, 2007b; McBride, 2001). In particular, when an individual's income is low relative to the income of a particular reference group, their subjective well-being will be lower. Conversely, when an individual's income is high relative to the income of a particular reference group, their subjective well-being will be higher.

2.3 Is money enough?

While the relationship between absolute income and subjective well-being is always positive and statistically significant, the *size* of the estimated coefficient is usually relatively small (Frey & Stutzer, 2002). Moreover, the explanatory power of income in a subjective well-being equation is surprisingly weak (Kingdon & Knight, 2006b; Lever, 2004; Rojas, 2008). This limited capacity of income to explain the variation in self-reported individual well-being has led to a ballooning of studies investigating the non-monetary predictors of subjective well-being.

The most common approach in these studies is to estimate subjective well-being functions, with self-reported happiness or satisfaction with life, rated on an ordinal or cardinal scale, as the dependent variable and several other individual, household or regional characteristics, including income, as explanatory or control variables. These estimations have been particularly useful in assessing the relative importance of various life circumstances for individual well-being, the main candidates of which are reviewed below.[9]

[8] There is still much debate as to what constitutes the relevant reference group. See Kingdon and Knight (2007b) for an extensive discussion.

[9] The findings presented below apply mainly to developed countries, however citations are also provided for consistent findings in developing country studies. While the results with regard to subjective well-being determinants have been replicated in developing countries, generalisations must be made with caution due to the small number of studies carried out in these countries.

2.3.1 Unemployment

Perhaps the most consistent finding to emerge from subjective well-being studies is the large negative association between unemployment and happiness or life satisfaction, regardless of the associated loss in income. Compared to being employed, being unemployed is significantly associated with large reductions in subjective well-being scores (Carletto & Zezza, 2006; Clark & Oswald, 1994; Frey & Stutzer, 2002; Oswald, 1997). This effect persists even after controlling for income (Di Tella et al., 2001, p. 19; Helliwell & Wang, 2011; Hinks & Gruen, 2007; Ravallion & Lokshin, 1999); that is to say being unemployed, even when receiving the same income as when employed, is related to notably lower subjective well-being levels.

Inquiry into the causal mechanism behind this relationship has confirmed that joblessness has a large and significant negative effect on self-reported well-being. Using panel data to control for individual fixed effects, several studies have demonstrated that while there is some evidence of unhappy people finding it more difficult to retain employment, it is clear that the main direction of causation runs from unemployment to reduced subjective well-being (Argyle, 1987; Clark & Oswald, 1994; Winkelmann & Winkelmann, 1998).

2.3.2 Race

The exact relationship between race and subjective well-being varies depending on the sample used. The majority of studies done outside of South Africa, however, do not include race as explanatory variables in estimations. Where racial categories are included, the general pattern is that individual evaluations of well-being vary significantly with race (see for example Campbell, 1976; Graham, 2004). Even so, not all studies have found that race is a statistically significant correlate (see for example Clark & Oswald, 1994).

2.3.3 Age

A common belief is that happiness declines with age. However, empirical studies find that subjective well-being is usually U-shaped through the life cycle. In general, reported well-being is found to be significantly higher amongst the young but then declines, reaching a minimum during middle age and then improving significantly thereafter (Blanchflower & Oswald, 2004; Helliwell, 2003; Knight, Song, & Gunatilaka, 2009).

Since happiness cannot affect age, the direction of the causal relationship is clear. What is less certain, however, is why age affects subjective measures of well-being in a U-shaped manner. It could simply be that happy people live longer and therefore the U-shape is indicative of a selection effect. However, this is possibly only a small part of the reason (Blanchflower & Oswald, 2008). Another explanation, supported by empirical evidence, is that older people are better able to self-regulate their emotions and they disproportionately remember positive memories relative to younger adults (Carstensen, Fung, & Charles, 2003).

2.3.4 Education

The relationship between education and subjective well-being is somewhat inconclusive. Highly educated individuals do not always report higher well-being. While select studies demonstrate a strong educational impact independent of income (Blanchflower & Oswald, 2004, p. 1371; Ravallion & Lokshin, 1999, p. 19), others are only able to find a relatively small positive relationship that disappears once other variables are controlled for (Helliwell, 2003, p. 341; Knight et al., 2009, p. 647).

On the one hand, it is suggested that education may contribute to subjective well-being independently of its beneficial effects on income by giving individuals opportunities to fulfil their goals and make them better equipped to adapt to changes in the world around them (Diener et al., 1999). On the other hand, Clark and Oswald (1994, p. 651) found that mental distress is in fact slightly higher among the highly educated in their sample. It is proposed that education raises an individual's expectations and then has a negative effect if these expectations are not met. Since the

results linking education and subjective well-being have been mixed, no unified theory has emerged.

2.3.5 Marital status

Results with regard to marital status are more transparent. In different countries, cultures and time periods, married persons are consistently found to report higher subjective well-being than persons who have never been married or have been divorced, separated or widowed ceteris paribus (Blanchflower & Oswald, 2004; Diener, Gohm, Suh, & Oishi, 2000; Helliwell, 2003; Myers, 1999).

However, the direction of the relationship is less clear. Does marriage make people happy or are happy people more likely to be married? Empirical studies investigating this causal relationship have found evidence that happier singles are more likely to get married than less happy singles (Stutzer & Frey, 2006). However, even after the selection of happy people into marriage is controlled for, there is a large and positive effect of marriage on people's subjective well-being (Stutzer & Frey, 2006). Evidence suggests that this effect is primarily owing to the benefits associated with marriage. These include higher real income, a source of social support and better physical and psychic health (Argyle, 1999; Clark & Oswald, 1994; Frey, 2008)

2.3.6 Self-reported health

Particularly strong associations are found between an individual's self-assessed state of health and subjective well-being. Empirical studies conducted on a variety of samples in developed and developing nations all confirm that reports of poor health are associated with significantly lower levels of subjective well-being and vice versa (Carletto & Zezza, 2006; Clark & Oswald, 1994; Gerdtham & Johannesson, 2001; Veenhoven, 1996). Furthermore, it is often found that health measures are the most significant of all the explanatory variables in a subjective well-being equation (Graham, 2008; Helliwell, 2003). The literature suggests that the causal relationship between self-reported health and subjective well-being may be bidirectional (Diener & Seligman, 2004). There is evidence that high subjective well-being causes better

health as well as evidence that poor health significantly lowers perceived well-being (Diener & Chan, 2011; Dolan, Peasgood, & White, 2008).

2.3.7 Social capital

A relatively new line of enquiry presents evidence of a large and significant link between various measures of social capital and subjective well-being (Bjørnskov, 2008; Helliwell, 2003; Helliwell & Wang, 2011; Yip et al., 2007). Empirical studies utilize a collection of measures to capture social capital at the individual level. As Putnam (2001) argues social capital should be considered a multi-dimensional concept because it manifests in various forms. Two main proxies are generally used to capture the various components of social capital: social trust and sociability.

Social trust is assessed through responses to various statements related to whether other people can generally be trusted. For example respondents may be asked whether they agree or disagree with the proposition "Most people are honest" or they may be asked more specific questions about the likelihood that a lost wallet containing money would be returned if found by various people, such as neighbours, police or strangers. Higher degrees of social trust are consistently shown to be strongly and positively associated with subjective well-being (Bjørnskov, 2008; Helliwell & Wang, 2011; Yip et al., 2007). It is hypothesized that increased levels of social trust improve happiness by promoting increased interaction between strangers, thus making for a safer, more cooperative and less uncertain environment.

Sociability, also referred to as social connectedness, is a measure of the degree to which an individual engages in social activities. This is usually measured by asking respondents to indicate whether they belong to a number of different social groups. Individuals who are involved in more social groups systematically report higher life satisfaction. For example, using data from the World Values Survey, Helliwell (2003, p. 342) reported a positive and significant relationship between subjective well-being and the extent of social connectedness - assessed by an individual's own participation in voluntary organisations. The increased face to face social interactions and exposure to social and community networks offered by regular participation in group activities are said to contribute to happier lives (Bjørnskov, 2008; Yip et al., 2007).

2.3.8 Personality

Lastly, there are consistent findings in the literature that personality explains a relatively large and significant proportion of the variance in individual subjective well-being (Diener & Lucas, 1999; Helliwell & Wang, 2011). Hypothetically, it is reasonable to suppose that an individual's personality would affect the way in which he/she evaluates his/her life and responds to unfolding events. The fact that both personality traits and subjective well-being are consistent over time and across different social situations also suggests that they are likely to be related (Diener & Lucas, 1999). Several personality traits are highly correlated with subjective well-being, the strongest and most consistent being extraversion and neuroticism (Costa & McCrae, 1980; Diener & Lucas, 1999), followed by self-esteem and optimism (Diener & Diener, 1995).

The close relation between personality and subjective well-being has led some to regard subjective well-being as a stable product of personality. It is argued that having a personality that is conducive to happiness leads to successful outcomes in life (e.g. having high income, being employed, healthy and married) (Diener & Lucas, 1999). The implication is that controlling for individual personality effects may reduce the significance of other explanatory variables included in subjective well-being equations. Studies typically find that while the size of estimated relationships may be reduced once there are controls for personality or individual fixed effects, most coefficients remain significant. This confirms the independent relationship between several life circumstances and subjective well-being (Easterlin, 2001a; Helliwell & Wang, 2011).

2.4 Conclusion

Consistent findings in the subjective well-being literature allow for three basic claims to be made about the relationship between income and subjective well-being. First, income and subjective well-being exhibit a positive and significant relationship in cross sectional analysis, although with varying strength depending on whether averaged cross-country or individual-level data are used. However, further

investigation reveals that income is more strongly related to subjective well-being at lower income levels but its effect diminishes as income rises. This can be explained using the theory of need, where income is most effective in raising subjective well-being for poorer groups because they have not had their most basic needs met. Second, several longitudinal and experimental studies indicate that increases in income over time do not always produce the expected rise in subjective well-being, thus challenging the popular belief that money can buy happiness. It is argued that this occurs because subjective well-being reports are influenced by relative economic status and/or changing aspirations rather than absolute economic status.

And lastly, a large and significant portion of the inter-personal variation in subjective well-being cannot be explained by income variables alone. Thus, when forming judgements about their lives, individuals are not as strongly influenced by their monetary circumstances as is commonly assumed. A number of individual, household and community level characteristics have been identified as significant predictors of self-reported well-being. An individual's employment status, race, age, education, marital status and self-reported health status are among some of those characteristics. Additionally, the degree of social trust and social connectedness of an individual is closely associated to his/her perceived well-being. Lastly, a large proportion of the variance in subjective well-being can be explained by an individual's personality.

Chapter 3. Subjective well-being in South Africa

3.1 Introduction

The current chapter reviews various studies that have contributed to our understanding of the relationship between income and subjective well-being in South Africa. First, the sources of data on subjective well-being in South Africa are discussed. Second, the extent to which the income-subjective well-being relationship in South Africa is similar to that observed in developed countries is examined. And lastly, a handful of South African studies that use novel methods to compare income and subjective well-being are reviewed.

3.2 South African data on subjective well-being

Data on subjective well-being in South Africa are somewhat limited, with only four nationally representative household surveys containing information on subjective well-being, two of which collect information on subjective well-being only at the household level. Both the 1993 Project for Statistics on Living Standards and Development (PSLSD), and the 1995-1998 October Household Surveys (OHS) contain an item asking a single respondent about the overall satisfaction of the household.[10] The concern with this household-level question is whether it is appropriate to aggregate the subjective well-being of individual household members into a single measure of the household's subjective well-being. Moreover, instead of reporting the overall well-being of the household, it is possible that the respondent reports only his/her level of well-being.

Results from a recent study by Posel and Casale (2011) call attention to the first concern associated with household measures of well-being. Using individual-level responses in NIDS, they found substantial variation in life satisfaction levels among household members (Posel & Casale, 2011). In this case individual household members were identified according to their relationship with the head of the

[10] See for example, section 1, question 33 of the 1995 OHS, which asks, "*Taking everything into account, how satisfied is this household with the way it lives these days?*"

household. Compared with household heads, spouses and grandchildren reported significantly higher life satisfaction scores while the remaining household members[11] reported significantly lower scores. Since life satisfaction scores vary substantially within the same household, it is unlikely that an aggregated measure of household satisfaction would be a meaningful indicator.

While this particular shortcoming has been largely overlooked by earlier studies, there is evidence that responses to the household-level item offer a reliable representation of the living conditions of the entire household and not just the respondent. Using the 1998 October Household Survey, Bookwalter, Fuller and Dalenberg (2006, p. 405) found that "*the response of household heads is determined largely by factors shared by the entire household – housing, for example – and not by those experienced primarily by the head – individual health status, for example*". Similar results are found using the 1993 PSLSD data (Kingdon & Knight, 2006b, 2007b).

Individual-level responses to life satisfaction are included in both NIDS and the 2002 General Household Survey (GHS). However, in the 2002 GHS only one respondent is drawn from each household, the majority of which are household heads (Møller, 2007). In contrast, NIDS issues questionnaires to each adult in the household, which means that responses more closely reflect the life satisfaction of all South Africans and not just the household heads. Additionally, while the life satisfaction item was discontinued in subsequent General Household Surveys, NIDS is a panel study, with the potential to offer more recent and robust findings on subjective well-being.

Notwithstanding their limitations, a host of studies have used PSLSD and OHS data to develop our understanding of subjective well-being in South Africa. Since NIDS is a recent study, only a limited contribution is available. Other sources of information on subjective well-being in South Africa come from national survey data such as the South African Quality of Life Trends Study, the South African Social Attitudes Survey and the 1995 World Values Study, as well as relatively smaller sample

[11] These included biological children, non-biological children, parents, siblings, in-laws, other family members, and non-family members.

surveys studies like the Durban and Eastern Cape Quality of Life Studies. Studies using the above-mentioned data are reviewed in the following sections.

3.3 The income-subjective well-being relationship in South Africa

To what extent are the findings on the income-subjective well-being relationship in South Africa comparable to those observed in developed countries? The following sub-sections review evidence from various South African studies with regard to the three key findings from developed countries reported in chapter 2.

3.3.1 A positive, concave relationship in cross-sectional analysis

Researchers consistently find a strong and positive link between income and subjective well-being in South Africa. Using the PSLSD data, Powdthavee (2003) presented various ordered probits of subjective well-being, with the log of household monthly income as a significant and positive predictor in all cases. Møller (2007) used data from the 2002 GHS and found that satisfied respondents were significantly more likely to earn more and live in households that spend more than dissatisfied respondents. Comparable results are found in studies using the 1995-1998 OHS (Devey & Møller, 2002) as well as in smaller sample surveys (Cramm, Møller, & Nieboer, 2010; Hinks & Gruen, 2007)

With regard to the curvilinear relationship between income and subjective well-being, there is limited as well as conflicting evidence for South Africa. Both Posel and Casale (2011) and Hinks and Gruen (2007) reported a concavity in the income-subjective well-being relationship. Using the 2008 wave of NIDS, Posel and Casale (2011) presented an ordered probit of subjective well-being, with per capita household income and its square entering significantly and with opposing signs. The income coefficient was positive and its square was negative, indicating a concave association. Comparable results are found in the Durban Quality of Life Studies. Using pooled results from 1999, 2003 and 2004, Hinks and Gruen (2007) reported opposing signs for household income and its square in an ordered probit regression of life satisfaction. However, Kingdon and Knight (2006b) reported a convex relationship between income and subjective well-being. Using the 1993 PSLSD data,

they found that when the natural log of household per capita income and its square were added to the life satisfaction equation, only the coefficient for the squared term was positive and significant.

3.3.2 No clear relationship in time-series analysis

As mentioned in the previous chapter, empirical studies show that the positive relationship between income and subjective well-being does not hold over time. While many economies have witnessed considerable increases in income over time, aggregate happiness levels have remained essentially unchanged. Available evidence for South Africa reveals a more complex pattern. Using data from the South African Quality of Life Study (SAQOL), Møller (2013) reported considerable fluctuations in life satisfaction levels from 1983 – 2010[12] that did not simply correspond to the steady increase in average per capita income experienced during the same period (Leibbrandt, Woolard, Finn, & Argent, 2010). Similar changes in satisfaction levels are registered in other South African studies using different data sources that cover shorter periods.

Based on the percentages in Figure 1, it appears that fluctuations in South Africans' satisfaction correspond closely with significant political and economic changes experienced over this period. During the decade prior to the fall of apartheid, the overall percentage of satisfied individuals was relatively high at 68 percent in 1983 and 64 percent in 1988[13]. However, this was driven mainly by high satisfaction among coloured, Indian and white South Africans, with black South Africans reporting significantly lower levels of satisfaction. The highest percentage of satisfied individuals is observed in the period immediately after the 1994 elections.[14] In particular there is a sharp increase in perceived life satisfaction among black South Africans. However, satisfaction declined sharply in the following year, with the total

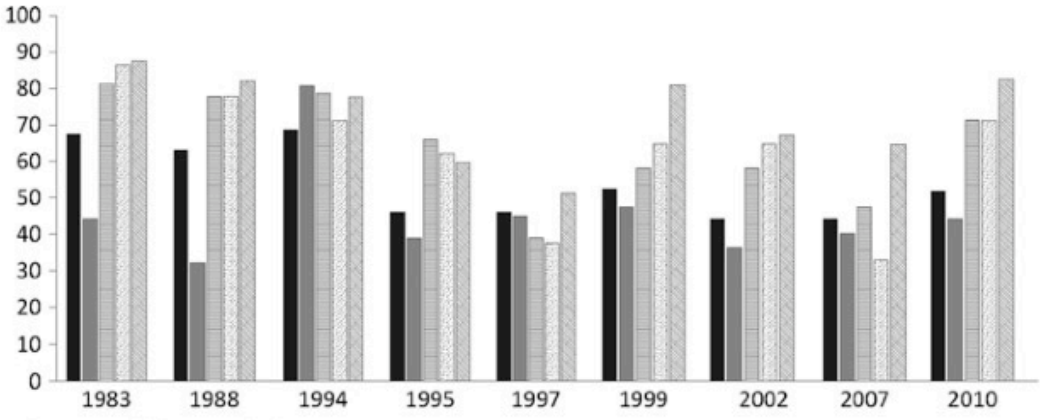
[12] Although cross-sectional data are not strictly comparable, this data is useful to give an overall sense of life satisfaction trends.

[13] Satisfied individuals include those who stated that they were either 'satisfied' or 'very satisfied' with life.

[14] The third wave of the South African Quality of Life Study was conducted 1 month after the 1994 elections (Møller, 2013).

proportion of satisfied individuals moving from 84 percent in 1994 to 53 percent in 1995. It is suggested that the initial excitement from the first open general elections was, in 1995, "*eclipsed by the realities of the challenges facing the new democracy*" (Møller, 2013, p. 924).

Figure 1. Trendline: Satisfaction with life-as-a-whole, 1983–2010



Satisfaction with life-as-a-whole

	1983	1988	1994	1995	1997	1999	2002	2007	2010
Total	68	64	79	46	46	53	44	44	52
Black	44	32	80	39	45	47	37	40	44
Coloured	81	77	78	66	39	58	58	47	71
Indian	88	77	71	63	38	65	65	33	71
White	89	82	78	60	51	81	68	65	83

Source: Møller (2013, p. 293).

Notes: percentages are on the vertical axis; responses to the satisfaction with life measure were coded on a five-point Likert scale (1=very dissatisfied to 5=very satisfied) with a neutral mid-point; Satisfaction percentages were calculated using the two highest responses (i.e. individuals who reported that they were either "satisfied" or "very satisfied" with their lives).

During the second half of the 1990s, South Africans reported an overall increase in life satisfaction (Møller, 2013), along with a steady rise in per capita income (Leibbrandt et al., 2010). Devey and Møller (2002) also reported an increase in satisfaction for the same period using data from the OHS, although here satisfaction was measured at the household level. The authors attribute the rise in satisfied households, from 54.3 percent in 1995 to 61.6 percent in 1998, to improved service delivery for poor South Africans (Devey & Møller, 2002).

Conversely, since 1999 most studies have registered a sharp decline in life satisfaction. Møller (2013) reported a drop in satisfied individuals from 53 percent in 1999 to 44 percent in 2007. Hinks and Gruen (2007) found that respondents in the Durban Quality of Life Study were significantly more satisfied in 1999 than either 2003 or 2004. Posel (2012) reported an overall decline in individual satisfaction from 2008 – 2010 using wave 1 and 2 of NIDS. Thus, while income per capita has increased steadily since the turn of the century, subjective well-being has actually moved in the opposite direction.

As mentioned in the previous chapter, this apparent disconnect can be explained by the notion that subjective well-being depends more on relative rather than absolute income. Consistent with findings from developed countries, various South African studies have shown that relative income is strongly and negatively associated with subjective well-being (Hinks & Gruen, 2007; Kingdon & Knight, 2007b; Posel & Casale, 2011; Powdthavee, 2003). In particular the results show that when an individual's income is low relative to the income of a particular reference group, their subjective well-being is significantly lower.

3.3.3 Other important determinants of subjective well-being

Consistent with the empirical literature, while income is a significant and positive predictor of subjective well-being in South Africa, it only explains a small proportion of its variance (Posel & Casale, 2011; Powdthavee, 2005a). Various studies examine other major determinants of subjective well-being using South African data. In most cases their findings are consistent with those reported in developed countries: subjective well-being is significantly lower among the unemployed (Hinks & Gruen, 2007; Kingdon & Knight, 2007b; Møller, 2007) and those who report poor health (Cramm et al., 2010; Møller, 2007; Posel & Casale, 2011); displays a U-shaped relationship with age (Posel & Casale, 2011; Powdthavee, 2003; Powdthavee, 2005a) and is significantly associated with measures of social capital (Cramm et al., 2010; Posel & Casale, 2011).

In addition, as with developed country studies that include race in their estimations, race is consistently found to predict subjective well-being in South Africa. In all

studies, black South Africans are less satisfied with life compared to other race groups (Ebrahim, Botha, & Snowball, 2013; Kingdon & Knight, 2006b; Powdthavee, 2005a). With regard to educational attainment, South African studies report a significant positive relationship with subjective well-being (Botha, 2013; Cramm et al., 2010; Møller, 2007; Powdthavee, 2005a). This is consistent with findings from developed countries (Campbell, 1976; Cantril, 1965).

One area where findings from South African studies differ from those in developed country studies is marital status. In developed countries, those who are married are consistently more satisfied than those who are single. While some South African studies support this finding (Cramm et al., 2010; Møller, 2007), others find that married people are not significantly more satisfied than single people (Botha & Booysen, 2013b; Ebrahim et al., 2013; Hinks & Gruen, 2007; Posel & Casale, 2011). These results are puzzling and warrant further investigation.

3.4 Novel approaches used in South African studies

A limited range of methods has been employed to investigate the relationship between income and subjective well-being. In developed and developing countries, the majority of studies have made use of simple correlation or single regressions to illustrate their extent of overlap. These methods are also largely adopted in South African studies, although a handful have used different approaches to examine the income-subjective well-being relationship. Three of these are outlined in the studies reviewed below.

Firstly, Kingdon and Knight (2006b) examined the extent of overlap between income and subjective well-being by cross-tabulating household life satisfaction categories with household per capita income categories. Since the distribution of households across life satisfaction categories was uneven, income categories were assigned in such a way that each contained the same amount of households as the corresponding life satisfaction category. The authors found that there was poor correspondence between the two measures. Many of those households that ranked low in terms of income rated themselves relatively higher on the life satisfaction scale and many of those in the higher income categories reported relatively lower life satisfaction levels.

For instance, of those households in the poorest income category, only 29 percent were also in the lowest life satisfaction category. On the other end of the scale, only 11.3 percent of those households in the highest income category were also in the highest life satisfaction category. Kingdon and Knight reported that the overall correlation coefficient between the income and life satisfaction categories was +0.358, indicating a positive relationship that is, nevertheless, imperfect.

Second, Kingdon and Knight (2006b) also investigated the association between income and subjective well-being by comparing the determinants of household per capita income with the determinants of household life satisfaction. Using data from the PSLSD, they ran ordered probit models for the income category and life satisfaction category, each with matching sets of explanatory variables. The results showed that several variables affected both income and life satisfaction in the same way, however to differing extents. For instance, while income and life satisfaction were both significantly negatively affected by the household's unemployment rate, the coefficient on household unemployment was substantially higher in the income equation than in the life satisfaction equation. Similarly, the effect of being African on income was considerably greater than its effect on life satisfaction, although both were significantly negatively associated with being African.

Kingdon and Knight (2006b) also found that certain variables affected income and life satisfaction in opposing directions. For example, living in a metropolitan city was negatively associated with life satisfaction but positively related to income. Conversely, having a high proportion of adult household members between the age of 16 and 25 significantly raised life satisfaction but lowered income. Furthermore, some factors that were significant predictors in one equation were not in the other. For instance, poor health significantly depressed life satisfaction but had no impact on income. Additionally, having more male members in the household was positively and significantly associated with income but was not significantly associated with life satisfaction.

Thirdly, Bookwalter and Dalenberg (2004) examined the relationship between expenditure, another common money-metric indicator, and subjective well-being by splitting their sample into expenditure quartiles and examining whether they differed

in the way their subjective well-being was determined. For a clearer interpretation of the model coefficients, the marginal effects for each expenditure category were presented. The results, derived from the PSLSD data, indicated that important distinctions exist among expenditure groups.

For the lowest quartile, the transportation and housing variables had the largest marginal impact on life satisfaction. Compared to households that walked as their main form of transportation, households that took a bus, train or taxi were significantly less satisfied. Conversely, households that used bicycles as their main form of transportation were significantly more satisfied than households that walked. In terms of housing for the poorest quartile, households that lived in a hostel, hut or outbuilding were significantly more satisfied than households that lived in shacks. The same was true for households that lived in a house or a combination of buildings (Bookwalter & Dalenberg, 2004).

However, for the highest expenditure quartile, transportation and housing had no impact on life satisfaction. Instead, educational attainment and health were significant predictors of life satisfaction for this quartile. Households with more average years of education for household members 16 years and older were significantly more satisfied than those with less average years of education. Interestingly, while the incidence of illness had no effect on life satisfaction in poorer households, it significantly lowered life satisfaction for those in the highest expenditure quartile. The authors explain that this may be because wealthier households tend to be more mindful of minor health problems.

Similarly, two other South African studies split their samples to determine whether subjective well-being predictors differed for the poor and non-poor. Using the PSLSD data, Kingdon and Knight (2007b) compared the determinants of life satisfaction for households above and below a set poverty line. They found that sickness, crime and indebtedness were significant predictors of life satisfaction for poor households, whereas unemployment was significantly more detrimental to the non-poor than to the poor. Based on data from a small sample in the Eastern Cape, Cramm et al. (2010) found that social capital was an important predictor of life satisfaction for both low-income and high-income respondents. However, marital status was only important

within the low-income group and education only improved life satisfaction for the high-income group.

3.5 Conclusion

Empirical studies that contribute to our understanding of subjective well-being in South Africa use data from various surveys conducted over the last three decades. Only four nationally representative household surveys contain data on subjective well-being, two of which offer responses at the household level. Other national and smaller sample surveys also provide information on subjective well-being in South Africa. The findings from studies drawing on these data sources indicate that the income-subjective well-being relationship in South Africa is somewhat comparable to that of developed countries, albeit with a few distinctions. First, like most countries, South Africa exhibits a significant and positive association between income and subjective well-being. However, there are mixed results as to whether the relationship is more pronounced at lower income levels or not. Second, while average per capita income in South Africa has risen steadily over the last three decades, life satisfaction levels have registered significant fluctuations. And third, with the exception of marital status, life satisfaction determinants examined using South African data are consistent with those in developed countries.

As with most international studies, the majority of studies in South Africa use simple correlation or single regressions to examine the relationship between income and subjective well-being. However, a handful of South African studies have adopted different approaches to explore the relationship, three of which are outlined in this chapter. Firstly, Kingdon and Knight (2006b) investigated the relationship between income and subjective well-being with a cross-tabulation of household per capita income categories and household life satisfaction categories. Secondly, Kingdon and Knight (2006b) examined this relationship by comparing the determinants of household per capita income with the determinants of household life satisfaction. Lastly, Bookwalter and Dalenberg (2004) examined whether expenditure groups differed in the way their subjective well-being was determined. Similar exercises were carried out by Kingdon and Knight (2007b) and Cramm et al. (2010).

Chapter 4. Data and methodology

4.1 Introduction

In this chapter, a short description of the data used and main variables under investigation is provided. This is followed by an outline of the basic methodology employed, which is divided into two parts: descriptive analysis and regression analysis. Lastly, the key limitations of the study are presented.

4.2 Data and main variables

This study analyses data from the baseline wave of the National Income Dynamics Study (NIDS), collated in 2008 by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town. NIDS is a nationally representative household survey that follows 7,305 households and more than 28,000 individuals every two years. The NIDS data provides recent and comprehensive information on income and expenditure; household composition and structure; labour market participation, health status and education; and individual demographic characteristics.

Particularly relevant to the current study is the section on well-being and social cohesion, which can be found in the adult questionnaire. The major advantage of NIDS over the majority of previous South African surveys is that it asks respondents to report their *own* subjective well-being and not that of the household. All resident adults (age 15+) are asked, "*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?"* This is the selected measure of subjective well-being used for the current study. The survey yields data on 13,792 adults (15 years and older) for the question after removing non-responses and missing values.

For a money-metric measure of well-being, per capita monthly household income is used. The NIDS data provides a comprehensive measure of total monthly income, which is a derived variable with full imputations for missing values. Per capita

monthly household income is calculated using this measure divided by household size.

The poverty line adopted in this study follows Hoogeveen and Özler (2004) who used a poverty line of R322 (in 2000 prices), which is calculated on a per capita basis and reflects the monetary equivalent of the minimum food requirements for daily energy needs added to essential non-food items. Adjusting this figure to 2008 prices using the relevant Consumer Price Index yields a poverty line of R515. For the purpose of this paper, those respondents who have a per capita monthly household income below R515 are classified as poor and those above as non-poor.

4.3 Methodology

The basic methodology employed in this study is primarily modelled on that advanced by Kingdon and Knight (2006b). Their results, however, are based on data from the 1993 Project for Statistics on Living Standards and Development (PSLSD), which asks a single respondent to report on the satisfaction of the household as a whole. As noted earlier, there are major limitations associated with this approach. By following the methodology of Kingdon and Knight, but using individual level data that are more recent, it is anticipated that the current study will provide important additional knowledge to the understanding of subjective well-being in South Africa.

To investigate the principal research questions, both descriptive and regression based methods are used:

1. Descriptive Analysis

The descriptive section serves as a basis for more systematic regression analyses in the subsequent section. The main task is to introduce the two measures of well-being and illustrate their interaction with each other graphically. First, various figures and summary statistics are presented. Then, as is done in Kingdon and Knight (2006b), a cross-tabulation of life satisfaction categories and per capita income categories together with an overall correlation coefficient, is given. This is intended to illustrate the extent of overlap between income and subjective well-being.

To offer clearer results, the life satisfaction measure is collapsed into 5 categories instead of the original 10, ranging from very dissatisfied (1) to very satisfied (5). Since the distribution of scores across each life satisfaction category is uneven, it would not be meaningful to cross tabulate these scores with per capita income quintiles. Instead, 5 per capita income categories are generated to correspond exactly with the distribution of life satisfaction scores. For instance, 12.44 percent of the sample report a life satisfaction level of 1, therefore the poorest 12.44 percent of the sample - with regards to individuals by per capita income - are allocated to the first income category. In the same way, the next 22.66 percent of individuals - with regard to individuals by per capita income - are assigned to the second income category so that this corresponds to the 22.66 percent of individuals who report a life satisfaction level of 2, and so on (Kingdon & Knight, 2006b).

2. Regression Analysis

To further investigate the relationship between subjective well-being and income, several multivariate regressions are performed. As is done in Kingdon and Knight (2006b), the 5 per capita household income categories and 5 individual subjective well-being categories (introduced in the cross-tabulation above) are used as dependent variables where applicable. Since both are ordinal in nature, taking on five increasing values, the ordered probit model is applied throughout.

Each ordered probit equation includes a set of individual, household and social capital variables, selected according to previous empirical work in the field. Besides their role as control variables, they also serve to illustrate the multi-determinant nature of subjective well-being. A full list and description of these variables is given in the following chapter.

Two sets of estimations are run on the data. The first includes identical ordered probit models for income categories and life satisfaction categories. This allows for comparison of the factors influencing an individual's income with the factors influencing their subjective well-being. The intention is to observe whether the

correlates of income and subjective well-being influence these measures in the same direction and with similar intensity.

Then, since income is generally considered a significant predictor of subjective well-being, an additional ordered probit is run for life satisfaction categories that includes a measure of absolute income as well as relative income. For the first, per capita income and its squared term[15] are used. The relative income measures are constructed by separating respondents into income thirds determined by the household income distribution. Relative income is included in the estimation because there is a large literature suggesting that relative status as well as absolute status is important in determining life satisfaction. The purpose of this last ordered probit is to measure the impact of income variables on subjective well-being and gauge how their inclusion affects the coefficients of other variables in the model.

The second set of estimations compares the correlates of subjective well-being among two sub-samples of adults distinguished by their income poverty status, using the R515 poverty line. A key objective in this study is to discover whether and how the poor and non-poor differ in the way their life satisfaction is determined. In order to aid in this comparison, the marginal effects on the probability that a respondent reports a satisfaction level of 4 or 5 are calculated[16]. With these figures, it is possible to report the relative importance of the explanatory variables for subjective well-being and compare their effect across the poor and non-poor groups.

4.4 Limitations of the study

There are two key limitations to the current study. First, the method and cross-sectional data employed only allow for correlational relationships between subjective well-being and income to be presented. Without the use of panel data and some exogenous change (i.e. the use of instrumental variable analysis), it is not possible to disentangle whether subjective well-being is a cause or effect of income and various

[15] Previous research suggests that the effects of income on subjective well-being is non-linear, thus income is included in its quadratic form.

[16] Or 7-10 for the original life satisfaction variable.

other life circumstances included in the estimations. For example, if per capita income enters as a positive and significant predictor in the subjective well-being ordered probit, this study cannot conclude that a person's income directly affects his/her life satisfaction. It may be that the causal relationship between income and subjective well-being runs in the opposite direction. Perhaps people's level of life satisfaction or happiness has an effect on their level of income by increasing or decreasing their productivity in employment.

Second, without panel data, where the same individuals are re-surveyed over time, it is also possible that a third factor is precipitating the observed positive relationship between subjective well-being and income; an unobservable factor that has not been controlled for in the estimations. The literature suggests that certain individual-level personality traits influence self-assessed well-being. For example, it is likely that individuals with more optimistic personality types will report more favourable valuations of their well-being. These people may also earn higher incomes because their optimism makes them more successful in their job. With the use of panel data it would have been possible to control for individual fixed effects and thus eliminate the possible bias affecting reported well-being levels.

Unfortunately, without a more powerful research design, the current study cannot confirm the existence or direction of causation between dependent and independent variables and it cannot control for unobserved heterogeneity. Thus, the interpretation of the results is expected to be somewhat limited. However, having said that, it is possible to draw on the findings in previous studies from other countries that have used more advanced methods and panel data. While their results are not directly transferable, they can be used to guide discussion and make inferences about the cross-sectional results of the current study.

4.5 Conclusion

This chapter has introduced the NIDS data used in the current study and the two main variables under investigation, namely a money-metric measure of wellbeing, per capita monthly household income, and a subjective well-being measure, overall satisfaction with life. Next, the methodology was outlined for both the descriptive and

regression-based analyses. Lastly, issues of reverse causality and unobserved heterogeneity were recognized as the key limitations of the current study.

Chapter 5. Descriptive statistics

5.1 Introduction

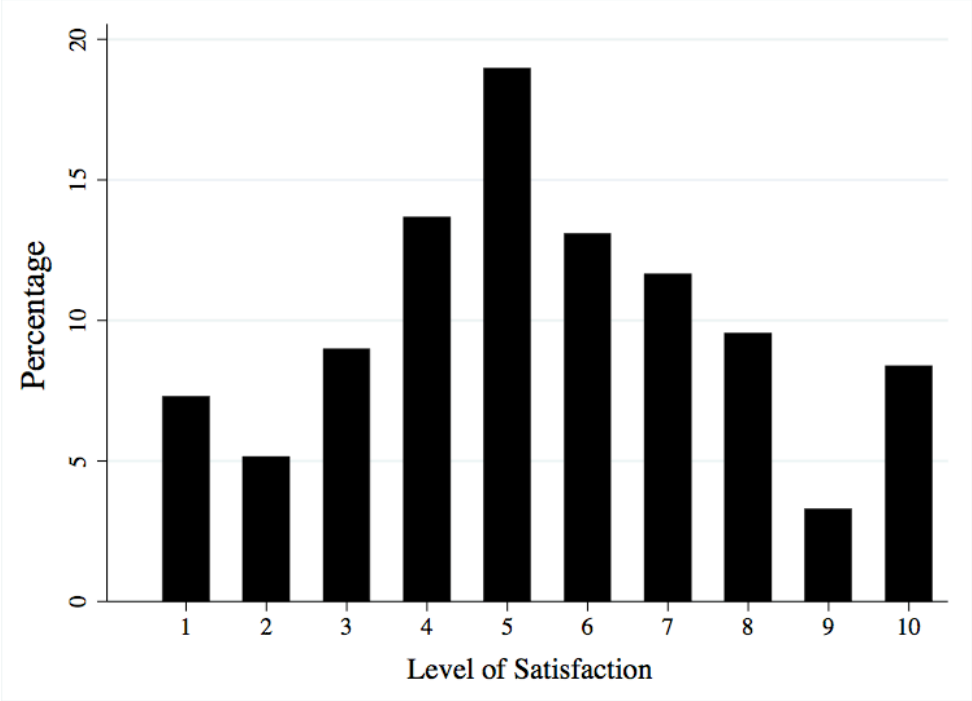
This chapter comprises two sections. The first section reviews the two main variables, per capita monthly household income and reported life satisfaction. Some basic statistics and figures are given to provide a preliminary description of the two variables and their correspondence with each other. This is followed by a cross-tabulation of life satisfaction categories and income categories and, lastly, a discussion of their overall correlation. The second section introduces other likely variables that help explain the variation in subjective well-being among adults. Some descriptive statistics are presented for these individual, household, social capital and income variables, with a particular focus on their dispersion across the poor and non-poor groups.

5.2 The distribution of well-being in South Africa

Figure 2 describes the distribution of life satisfaction responses among the NIDS adult sample.[17] Responses are relatively normally dispersed around the central value of 5, with no real bias left or right. A slightly altered picture is given in Figure 3 when the poor and non-poor groups, who represent 43.68 percent and 56.32 percent of the population respectively, are reviewed separately. Though the modal response is still 5 for both groups, the distribution of responses is slightly skewed to the right for the poor sub-sample and skewed to the left for the sample above the poverty line, indicating a greater prevalence of low scores for the former and high scores for the latter.

[17] This is calculated using the unweighted sample.

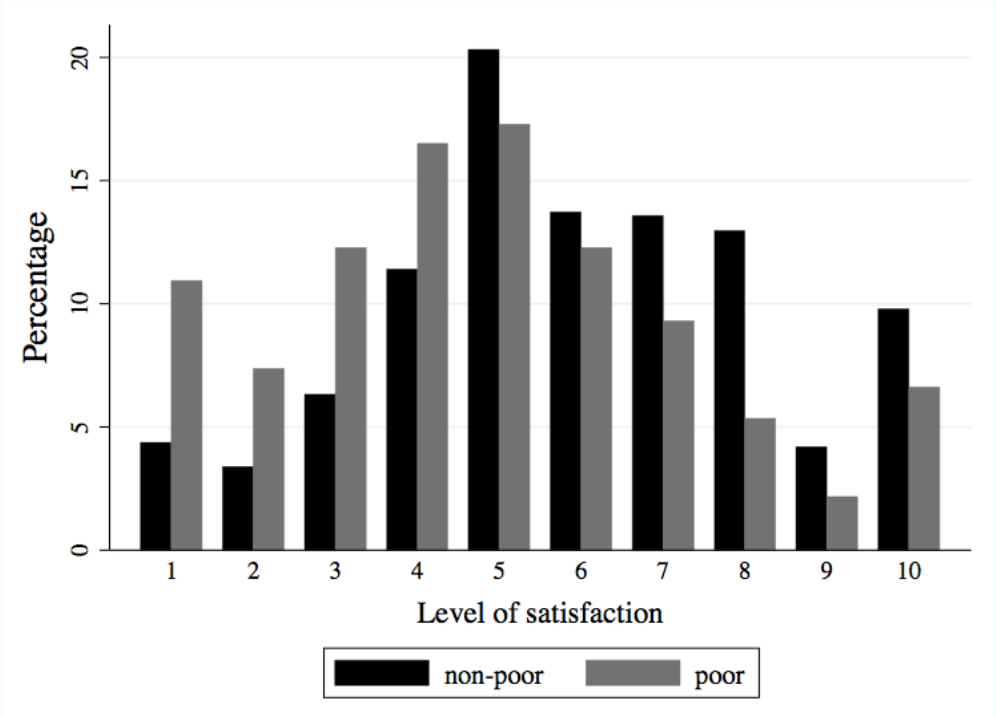
Figure 2. Distribution of life satisfaction among South African adults, 2008



Source: Own calculations, NIDS 2008.

Note: Sample includes adults over the age of 17.

Figure 3. Distribution of life satisfaction among poor and non-poor South African adults, 2008



Source: Own calculations, NIDS 2008.

Note: Sample includes adults over the age of 17.

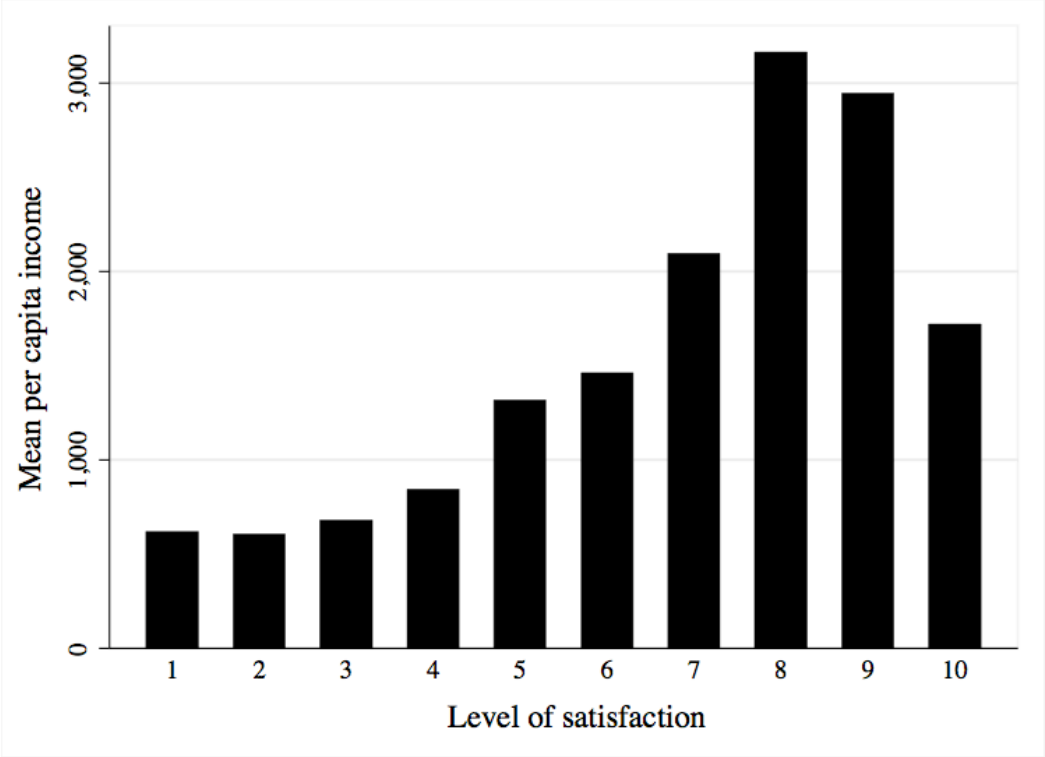
This pattern is confirmed when the respective median satisfaction scores for these sub-samples are considered, with a median of 5 for the poor sub-sample and 6 for the sub-sample of adults who are not poor. Furthermore, the mean score is significantly lower[18] for poor respondents (4.81) compared with non-poor respondents (5.93). Based on these separate distributions of poor and non-poor life satisfaction scores it appears that there is a positive relationship between respondents' income and their life satisfaction.

This relationship is made clearer when average per capita income is reviewed for each level of life satisfaction in Figure 4. Average income is low for respondents who report a lower satisfaction score but rises non-linearly for respondents with a higher satisfaction score. This increase in average income occurs until a turning point is reached at a satisfaction score of 8, beyond which higher satisfaction levels are associated with relatively lower income levels. Clearly, per capita income and life satisfaction are positively associated with each other: on average those with less money report lower satisfaction scores and those with more report higher scores. However, this begs the question: how strong is the correspondence between the two measures? Is it always the case that poor people report low life satisfaction and that rich people report high satisfaction?

To illustrate the degree of overlap, a cross-tabulation of life satisfaction categories and per capita income categories is presented in Table 1. As explained in chapter 4, the income categories are constructed in such a way that the number of respondents in each income category is equal to the number of respondents in the corresponding subjective well-being category. If there was complete agreement between the two measures of well-being, one would expect that the number of respondents in the non-diagonal cells of the row and column percentages in Table 1 would be zero.

[18] At a 95 percent confidence level.

Figure 4. Average per capita income by life satisfaction level among South African adults, 2008



Source: Own calculations, NIDS 2008.

Note: Sample includes adults over the age of 17.

However, the tabulation reveals that there is a poor degree of correspondence between the two measures. Not all people with a low per capita income are dissatisfied with their lives. For instance, of all those individuals in the poorest income category, only 24 percent are in the lowest life satisfaction category and only 53 percent are in the lowest two life satisfaction categories. On the other end of the scale, it is possible to identify respondents who fall into the highest income categories but are reportedly unsatisfied with their lives. Just over 10 percent of those in the 5th income category and 26 percent of those in the 4th income category report satisfaction with life in the lowest two categories. Interestingly, while over 20 percent of those in the lowest income category report satisfaction levels in the two highest subjective well-being categories, only 10 percent of those in the highest income category report satisfaction levels in the two lowest subjective well-being categories.

Table 1. Cross-tabulation of subjective well-being category and income category

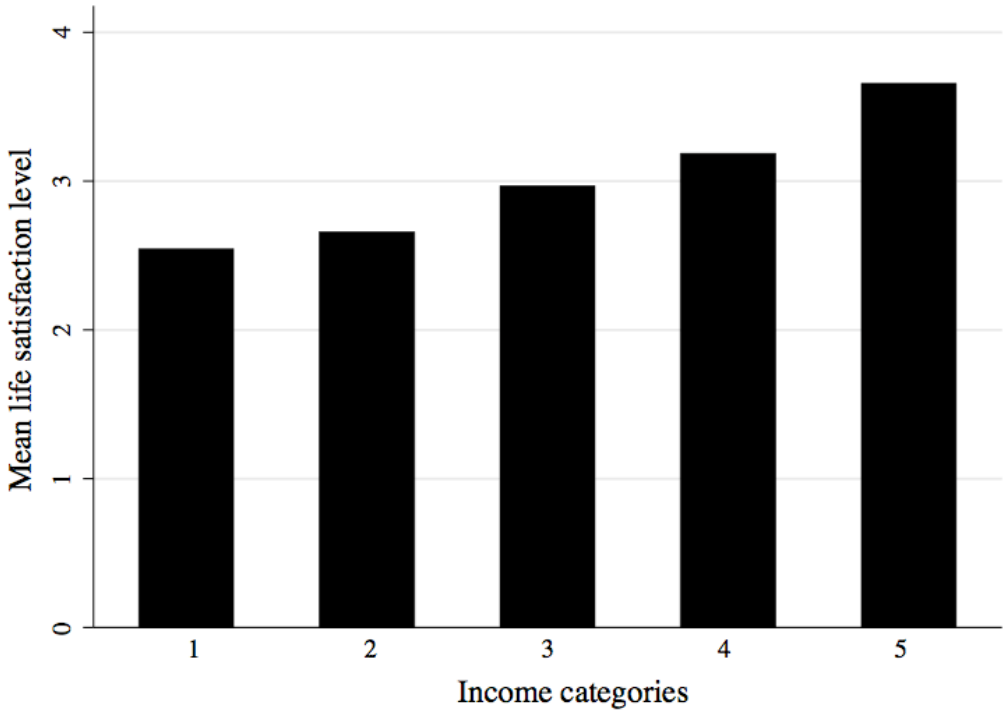
	Subjective well-being category					
Income category	1	2	3	4	5	Total
1	360	448	395	180	144	1,527
	23.58	29.34	25.87	11.79	9.43	100
	23.58	16.12	10.05	6.92	10.07	12.44
2	487	840	807	433	213	2,780
	17.52	30.22	29.03	15.58	7.66	100
	31.89	30.22	20.53	16.64	14.9	22.66
3	434	923	1,396	695	483	3,931
	11.04	23.48	35.51	17.68	12.29	100
	28.42	33.2	35.51	26.71	33.78	32.04
4	208	467	907	676	344	2,602
	7.99	17.95	34.86	25.98	13.22	100
	13.62	16.8	23.07	25.98	24.06	21.21
5	38	102	426	618	246	1,430
	2.66	7.13	29.79	43.22	17.2	100
	2.49	3.67	10.84	23.75	17.2	11.65
Total	1,527	2,780	3,931	2,602	1,430	12,270
	12.44	22.66	32.04	21.21	11.65	100
	100	100	100	100	100	100

Source: Own calculations, NIDS 2008.
Note: Sample includes adults over the age of 17. Estimates are unweighted. The numbers in each cell present the frequency, row percentage, and column percentage respectively.

The highest degree of overlap occurs when considering the intersection between the third column and third set of rows. Of those individuals in the third life satisfaction category, 35.51 percent are also in the third income category. This is the highest cell percentage frequency among all cells in that column, indicating that there is a fair amount of agreement between the two measures at this point. However, this figure is still low and it is clear from the figures in other cells that the overlap between the two measures is limited.

The overall correlation coefficient between life satisfaction categories and income categories is +0.273, slightly lower than that reported by Kingdon and Knight (2006b), who reported a correlation of +0.358. Since the coefficient is positive, one can deduce that increased income is associated with increased life satisfaction. This positive relationship is illustrated in Figure 5, where average life satisfaction level in the first income category is relatively low but rises progressively for each succeeding income category. However, despite a positive association between income and life satisfaction, the size of the correlation coefficient is in fact small and the degree of overlap in the cross-tabulation is modest at best. These results suggest the income-subjective well-being relationship is relatively weak and by no means does income perfectly co-vary with subjective well-being.[19]

Figure 5. Average life satisfaction level by income categories among South African adults, 2008



Source: Own calculations, NIDS 2008.

Note: Sample includes adults over the age of 17.

[19] A possible reason for this relatively weak relationship is that the subjective well-being measure is an individual measure whereas the income measure is a household per capita measure. It could be that there is unequal (or unfair) income sharing in households and thus household per capita income is not an entirely accurate reflection of individual income.

It follows that income is likely to be only one predictor of an individual's life satisfaction. In this study, I consider a range of other factors that are expected to influence individual subjective well-being and compare their effect on life satisfaction and income categories. To further probe the relationship between income and subjective well-being, I examine whether the predictors of life satisfaction differ among individuals according to whether or not they are poor.

5.3 Explanatory variables included in estimations

The various explanatory variables of subjective well-being are grouped as individual, household, social capital and income variables, all of which are included in subsequent ordered probit models that estimate the predictors of well-being. The range and definition of variables used in this paper largely follows Posel and Casale (2011), although with slight variation in the household and social capital controls. Table 2 presents the means and standard errors for all the variables, first for the sample as a whole and then for the poor and non-poor groups. All the figures in this table are calculated using weighted data, where these weights are based on the most recently available Population Census (2001) so that the results are reflective of the South African population. As expected, most variables are unevenly dispersed across the poor and non-poor groups relative to the weighted sample average.

Individual characteristics used in the estimations are race (recoded into four separate binary variables for each of the main race groups), gender, age (separated into six age categories to distinguish younger and older cohorts), whether the individual is the head of the household, years of schooling, marital status (whether married, cohabiting with a partner, divorced/widowed, or never married) and employment status (whether not economically active, unemployed and searching for work, unemployed and not searching or employed). The data also allow for the inclusion of various indicators of the individual's health, namely three binary variables describing self-reported health status as either "excellent"/"very good", "good"/"fair" or "poor", as well as a variable equal to 1 if the individual reports difficulty performing various daily tasks (dressing, bathing, eating or using the toilet).

Table 2. Means and standard errors of relevant variables

	All adults		Poor		Non-poor	
	Mean	*SE*	*Mean*	*SE*	*Mean*	*SE*
Individual characteristics						
African	0.77	0.023	0.93*	0.013	0.66	0.030
Coloured	0.09	0.013	0.06	0.012	0.11	0.016
Asian	0.03	0.010	0.01	0.004	0.04	0.015
White**	0.12	0.017	0.00*	0.002	0.19	0.026
Male	0.44	0.009	0.36*	0.010	0.48	0.012
Age 17 - 25**	0.25	0.008	0.33*	0.010	0.20	0.010
Age 26 - 35	0.27	0.009	0.24	0.010	0.29	0.012
Age 36 - 45	0.18	0.007	0.17	0.008	0.19	0.008
Age 46 - 55	0.14	0.006	0.13	0.007	0.15	0.008
Age 56 - 65	0.09	0.005	0.07	0.006	0.09	0.007
Age 66 and older	0.06	0.004	0.05*	0.004	0.07	0.006
Household head	0.47	0.009	0.4*	0.011	0.51	0.012
Years of schooling completed	9.02	0.118	7.69*	0.115	9.85	0.146
Not economically active	0.31	0.009	0.4*	0.014	0.25	0.011
Unemployed, searching for work	0.15	0.007	0.22*	0.011	0.11	0.008
Unemployed, not searching	0.05	0.004	0.09*	0.006	0.03	0.004
Employed**	0.48	0.011	0.29*	0.012	0.61	0.013
Married	0.34	0.014	0.24*	0.012	0.40	0.017
Cohabiting	0.10	0.007	0.10	0.008	0.09	0.009
Divorced or widowed	0.11	0.005	0.10	0.006	0.11	0.007
Never married*	0.45	0.013	0.56*	0.013	0.39	0.015
Health status is excellent/very good	0.57	0.011	0.53*	0.013	0.60	0.016
Health status is good/fair	0.36	0.012	0.38	0.013	0.35	0.016
Health status is poor**	0.07	0.005	0.09*	0.007	0.05	0.005
Difficulty with daily care	0.03	0.003	0.03	0.004	0.02	0.003
Household characteristics						
Number of household residents	4.54	0.137	6.12*	0.242	3.56	0.107
Number of children < 15 years	1.50	0.063	2.47*	0.113	0.90	0.039
Number of pensioners > 64 years	0.17	0.010	0.18*	0.015	0.17	0.014
Number of durable goods	7.18	0.192	5.00*	0.121	8.52	0.251
Death of a household member	0.11	0.008	0.18*	0.016	0.08	0.007
Urban	0.65	0.024	0.45*	0.037	0.77	0.022
Rural**	0.35	0.024	0.55*	0.037	0.23	0.022
Western Cape**	0.11	0.006	0.05*	0.011	0.15	0.012
Eastern Cape	0.11	0.009	0.16*	0.016	0.08	0.011
Northern Cape	0.02	0.002	0.02	0.003	0.03	0.003
Free State	0.06	0.005	0.06*	0.008	0.07	0.008
KwaZulu-Natal	0.19	0.010	0.28*	0.027	0.13	0.014
North West	0.08	0.009	0.07	0.012	0.08	0.012
Gauteng	0.24	0.016	0.14*	0.022	0.30	0.021
Mpumalanga	0.09	0.009	0.08	0.014	0.09	0.013
Limpopo	0.10	0.008	0.14*	0.017	0.07	0.009
Social capital variables						
Religious activities are important	0.88	0.006	0.87	0.008	0.90	0.008

Member of a group	0.37	0.013	0.36	0.014	0.37	0.017
Owns a cellular telephone	0.69	0.009	0.56*	0.013	0.77	0.010
Neighbours help out	0.59	0.016	0.61	0.020	0.57	0.021
Neighbours are aggressive	0.25	0.013	0.28	0.017	0.24	0.015
Crime in the neighbourhood	0.40	0.015	0.40	0.023	0.40	0.018
Trust neighbour to return wallet	0.27	0.013	0.23*	0.018	0.30	0.017
Trust stranger to return wallet	0.13	0.009	0.13	0.015	0.13	0.009
Income variables						
Per capita monthly household income (Rands)	2168.53	207.62	290.3*	4.12	3331.75	303.51
Poorest third**	0.30	0.014	0.78	0.012	0.00	0.000
Middle third	0.30	0.014	0.22*	0.012	0.35	0.021
Richest third	0.40	0.020	0.00	0.000	0.65	0.021
N (unweighted sample)	10575		4712		5863	

Source: Own calculations, NIDS 2008.
Notes: Sample includes adults over the age of 17. * Differences between poor and non-poor adults are statistically significant at a 95% confidence level. ** Omitted category in the estimations. Estimates are weighted.

As expected, poverty is unevenly distributed across the race groups on South Africa. While African adults represent 77 percent of the full weighted sample, they make up 93 percent of poor adults, which is significantly higher than the 66 percent of African adults in the non-poor group. This can be contrasted with White adults, who constitute 12 percent of the weighted sample but less than 1 percent of the poor group and 19 percent of the group who are not poor. In terms of mean education level (measured in years of schooling), the poor and non-poor groups differ significantly by approximately 2 years, with the full weighted sample average falling more or less in the middle at 9.02 years.

Marital status also differs significantly for those above and below the poverty line. The proportion of poor adults who are married is 24 percent, which is 16 percentage points below that of non-poor adults. This difference in poverty status among the married is statistically significant. In terms of employment status, the percentage of poor adults who are employed is significantly lower than non-poor adults. Only 29 percent of poor adults are employed, compared with 61 percent of non-poor adults and 48 percent in the full weighted sample. Similarly, reported health status is lower in the poor group, with 60 percent of adults who are not poor reporting their health as excellent/very good, compared with only 53 percent of poor adults. Also, 9 percent of

poor adults report that their health status is poor, compared with 5 percent of non-poor adults with poor self-reported health. Both differences are statistically significant.

With regard to household characteristics, three indicators of household composition are used: number of residents, children[20] and pensioners[21]. I also include four additional measures that were not used in Posel and Casale (2011). These are an estimate of household wealth (measured by the number of durable goods owned by the household[22]), a binary variable indicating whether any member of the household died in the last 24 months, urban\rural classifications and binary variables for each of the nine provinces.

The average number of household residents, children and pensioners is 4.54, 1.5 and 0.17 respectively for the full weighted sample. Poor adults have, on average, significantly more residents, more children and more pensioners living in their household compared to adults above the poverty line. The reverse is true for household wealth, with the average number of durable goods owned by the households of poor adults falling significantly below that of adults who are not poor. As expected, the dispersion of rural dwellers across groups is also uneven, with 55 percent of poor adults living in rural areas, compared with only 23 percent of non-poor adults living in rural areas.

Various indicators of social capital are derived from the data. An item asking all adults how important religious activities are in their lives is recoded into a binary variable. The original four response options are collapsed so that a response of 1 or 2 ("not important at all" or "unimportant'") becomes 0 and a response of 3 or 4 ("important" or "very important") becomes 1. A measure of sociability is included using the results of an item that asks all adults whether they belong to a number of social groups (this includes community-based groups, sports groups and recreational groups but excludes church groups, since this is presumably covered by the previous

[20] Defined as those age 14 and younger.

[21] Defined as those age 65 and older.

[22] These include 26 items ranging from kitchen appliances, furniture, cell phones and motor vehicles. For the full list refer to Section F of the household questionnaire.

measure). A value of 1 is assigned to those who belong to one or more groups and 0 otherwise.

Social connectivity is captured with a binary variable that equals 1 if the individual owns a cellular telephone and 0 if otherwise. Then, three items are identified in the household questionnaire that provide information about the nature of social interactions and the existence of crime in the neighbourhood. The variables "Neighbours help out"; "Neighbours are aggressive" and "Crime in the neighbourhood" take on a value of 1 if the response to the corresponding item was "fairly common" or "very common" and 0 otherwise. Finally, two measures of social trust are included that were not used in Posel and Casale (2011). All adults were asked to estimate the likelihood that a lost wallet containing R200 would be returned to them if found by 1) a neighbour or 2) a stranger. Each variable takes on a value of 1 for individuals who considered the return of the wallet to be "very likely" or "somewhat likely" and 0 otherwise.

Table 2 shows that religious activities are important for 88 percent of the weighted sample and these percentages do not differ notably across the poor and non-poor sub-samples. Similarly, in terms of sociability, percentages do not differ significantly for those who are poor compared to those who are not poor, with 37 percent of the full weighted sample belonging to one or more social group. On the other hand, social connectivity is significantly higher for the group of adults above the poverty line, with 77 percent owning a cellular telephone, compared with only 56 percent in the poor group.

For the most part, the remaining measures of social capital do not reveal any statistically significant differences between poor adults and adults who are not poor. The neighbourhood variables indicate that 59 percent of all adults report that neighbours help out, while only 25 percent say their neighbours are aggressive and 40 percent say there is crime in their neighbourhood. Only 13 percent of all adults trust a stranger to return a lost wallet and these percentages do not differ for the poor and non-poor sub-samples. Interestingly, in comparison to adults who are not poor, those who are poor are significantly less likely to report that they trust a neighbour to return a wallet. 30 percent of adults above the poverty line trust a neighbour to return a lost

wallet, whereas only 23 percent of those below the poverty line trust a neighbour to return a lost wallet.

Lastly, certain estimations include a measure of relative income. This is constructed by dividing the distribution of household incomes into thirds: poorest third, middle third or richest third. Respondents are placed in an income third category according to their per capita income level. These are coded as binary variables equal to 1 if a respondent falls in that category and 0 otherwise. Table 2 shows that the majority (78 percent) of those below the poverty line are in the poorest third of the income distribution. Interestingly, the remaining 22 percent of poor adults fall in the middle third of the income distribution. Lastly, those above the poverty line are more evenly distributed across the middle and highest income thirds.

5.4 Conclusion

This chapter began by examining the two main dependent variables, per capita monthly household income and reported life satisfaction, and how they relate to each other. The distribution of life satisfaction scores for the full sample was relatively normal but skewed to the right for poor respondents and to the left for non-poor respondents. Average income was low for respondents who reported lower satisfaction scores but rose steadily and non-linearly for those with higher satisfaction scores, indicating a positive association between the two well-being measures. While the correlation coefficient confirmed this positive relationship, the size of the coefficient was relatively small and the cross-tabulation revealed a poor degree of coincidence between the two measures. Thus, it was concluded that income is likely to be only one predictor of an individual's life satisfaction.

In the section that followed, a range of factors other than income was introduced. These factors are likely to be predictors of individual subjective well-being and are used in later estimations. The means of various individual, household, social capital and income variables were compared for adults above and below the poverty line. Most of the individual and household-level variables were unevenly dispersed across the poor and non-poor groups. Compared to adults who were not poor, poor adults were significantly more likely to: be African; have fewer years of schooling; have

never been married; be unemployed and report lower levels of health. The households they belonged to had significantly more residents, children and pensioners; owned significantly fewer durable goods and were more likely to live in a rural area. Only two of the social capital variables differed significantly across the poor and non-poor groups. Compared to adults who are not poor, poor adults were significantly less likely to own a cell phone and to report that they trust a neighbour to return a wallet.

Chapter 6. Multivariate analysis of income and subjective well-being

6.1. Introduction

This chapter outlines the findings from certain multivariate analyses performed on the data for this dissertation. The first section reviews the interrelationship between income and subjective well-being for the full adult sample. It begins with a step-by-step comparison of the correlates for income and subjective well-being categories using ordered probit models. A third ordered probit is then estimated to monitor the impact of including income variables in the life satisfaction regression. Lastly, as a robustness check, the life satisfaction ordered probit is re-estimated with household cluster fixed effects.

The second section is a comparative analysis of the poor and non-poor respondents. Separate ordered probits are run for each sub-sample with the same set of predictors to ascertain whether subjective well-being is determined differently for these groups. In addition, the marginal effects are calculated for the two highest categories of the dependent variable to illustrate the relative strength of each predictor in determining life satisfaction.

6.2. Results for the full sample

6.2.1 Comparing the correlates of income and subjective well-being

As demonstrated in the previous chapter, although life satisfaction and income are positively correlated, they have a poor degree of coincidence, indicating that there are likely to be other factors that play a role in predicting each measure. Therefore, in this section a range of likely predictors are introduced to determine whether they affect income and life satisfaction in the same way. To do this, identical ordered probit models were run using the 5 per capita household income categories (specification I) and the 5 individual life satisfaction categories (specification II) (introduced in the cross-tabulation in chapter 5) as dependent variables. The estimated coefficients and their standard errors are reported in Table 3.

Table 3. Ordered probits of income and life satisfaction, all adults

	Income category (I)		Subjective well-being category (II)		Subjective well-being category (III)	
	Coefficient	*SE*	*Coefficient*	*SE*	*Coefficient*	*SE*
Individual characteristics						
African	-1.219***	0.070	-0.263***	0.049	-0.185***	0.053
Coloured	-1.049***	0.069	0.231***	0.050	0.294***	0.055
Asian	-0.470***	0.102	0.328***	0.084	0.351***	0.085
Male	0.119***	0.024	0.03	0.024	0.020	0.024
Age 26 - 35	0.167***	0.033	-0.114***	0.033	-0.124***	0.033
Age 36 - 45	0.131***	0.039	-0.092*	0.038	-0.102**	0.038
Age 46 - 55	0.156***	0.044	-0.095*	0.042	-0.109**	0.042
Age 56 - 65	0.380***	0.050	0.043	0.048	0.014	0.048
Age 66 and older	0.508***	0.060	0.203**	0.063	0.166**	0.063
Household head	-0.083**	0.029	-0.056*	0.027	-0.048	0.027
Years of schooling completed	0.046***	0.004	0.013***	0.003	0.010**	0.003
Not economically active	-0.550***	0.029	-0.012	0.027	0.031	0.028
Unemployed, searching for work	-0.730***	0.036	-0.213***	0.035	-0.156***	0.036
Unemployed, not searching	-0.728***	0.046	-0.188***	0.044	-0.130**	0.044
Married	0.103***	0.031	0.074*	0.030	0.066*	0.030
Cohabiting	-0.145***	0.039	0.026	0.039	0.033	0.039
Divorced or widowed	0.157***	0.044	-0.004	0.042	-0.016	0.042
Health status is excellent/very good	0.083	0.043	0.377***	0.044	0.374***	0.044
Health status is good/fair	0.043	0.041	0.229***	0.042	0.226***	0.042
Difficulty with daily care	0.016	0.060	-0.235***	0.062	-0.241***	0.062
Household characteristics						
Number of household residents	-0.065***	0.008	0.008	0.007	0.014	0.007
Number of children < 15 years	-0.178***	0.012	0.002	0.012	0.018	0.012
Number of pensioners > 64 years	0.213***	0.023	0.015	0.026	0.000	0.026
Number of durable goods	0.097***	0.004	0.040***	0.003	0.032***	0.004
Death of household member	-0.146***	0.033	-0.05	0.033	-0.036	0.033
Urban	0.242***	0.028	0.043	0.027	0.022	0.027
Social capital variables						
Religious activities are important	-0.039	0.037	0.064	0.035	0.068	0.036
Member of a group	0.074**	0.023	0.095***	0.023	0.089***	0.023
Owns a cellular telephone	0.076**	0.025	0.147***	0.024	0.140***	0.024
Neighbours help out	0	0.023	0.148***	0.022	0.149***	0.022
Neighbours are aggressive	-0.119***	0.027	-0.047	0.028	-0.038	0.028
Crime in the neighbourhood	-0.015	0.025	-0.057*	0.024	-0.058*	0.024
Trust neighbour to return wallet	0.127***	0.029	0.125***	0.028	0.115***	0.028
Trust stranger to return wallet	0.013	0.038	-0.024	0.037	-0.029	0.037
Income variables						
Per capita household income					0.000***	0.000
(Per capita household income)^2					-0.000*	0.000
Richest third					0.229***	0.038
Middle third					0.200***	0.028
Cut 1	-2.363***	0.106	-0.717***	0.095	-0.513***	0.098

Cut 2	-1.284***	0.104	0.158	0.095	0.366***	0.099
Cut 3	-0.023	0.104	1.140***	0.096	1.354***	0.100
Cut 4	1.311***	0.104	2.000***	0.097	2.217***	0.101
Number of observations	10575		10575		10575	
Pseudo R^2	0.2521		0.0744		0.0770	
Log-pseudolikelihood	-12155.120		-14999.510		-14956.020	

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults over the age of 17. Province dummies are included but not reported. *** Significant at 0.1%, ** Significant at 1%, * Significant at 5%. Omitted categories are: white, age 17-25, never married, employed, health staus is poor, rural, Western Cape, poorest third.

The subsequent analysis is structured with the following three key questions in mind:

1. *Do the factors that raise income also raise life satisfaction? Which ones do not?*
2. *Are there any variables that work in opposite directions?*
3. *Where the same factors raise both income and life satisfaction, is the extent of association the same in the two regressions?*

In Table 3, both income and life satisfaction categories are significantly correlated with race. For African adults, the relationship is negative in both models. Compared with White adults, African adults report significantly lower levels of life satisfaction as well as having significantly lower income. However, the negative association of being African with income rank is much greater than its association with life satisfaction rank. Notice the African coefficient is much larger in specification I compared with specification II. For Coloured and Asian adults, the associations with income and life satisfaction have opposing signs. Compared with White adults, Coloured and Asian adults are significantly more likely to have lower incomes but higher life satisfaction.

Gender is significantly correlated with income but has no association with life satisfaction. For income, the expected relationship is found, with males significantly more likely to be in a higher income category than females. For life satisfaction, while the coefficient for males is positive, the effect is not significant. In other words, males and females are not significantly more or less satisfied with their lives than the other,

which is consistent with findings from other studies (Hinks & Gruen, 2007; Ravallion & Lokshin, 1999; Yip et al., 2007).

The results with regard to age are also consistent with those found in the empirical literature. The relationship between age and income is significant and positive: income rank increases with age, as illustrated by the increasing size of the coefficients for age categories. The association between age and life satisfaction is notably different. The data reveals a strong and significant U-shaped relationship, similar to that found in previous studies (Blanchflower & Oswald, 2000; Blanchflower & Oswald, 2004; Helliwell, 2003; Posel & Casale, 2011). Life satisfaction is evidently higher for the base category, which comprises those aged 17-25, compared to those in the next three age groups, as indicated by the negative and significant coefficients on the first three age variables included in the subjective well-being model (II). After dropping to low levels however, life satisfaction scores lift back up again so that those aged 56-65 report similar well-being scores to the base category and those aged 66 and above are significantly more satisfied.

Education, measured in years of schooling, enters both models positively and significantly. However, the extent of association between income and education is greater, with a larger coefficient in the income estimation compared with the subjective well-being estimation. Similarly, marital status appears to be more strongly associated with income than life satisfaction. While those who are married, relative to respondents who have never been married, have significantly higher incomes and are significantly more satisfied with their lives, the *extent* of association between marriage and income is greater.

Like education and marital status, the association of employment status with income is much greater than its association with life satisfaction. As expected, the unemployed, both searching and non-searching, have systematically lower income and are significantly more likely to report low levels of life satisfaction compared with respondents who are employed. However, the negative coefficients on both unemployment variables are larger in the income equation than in the subjective well-being equation.

Notably different results are observed for the health variables. While self-reported health and daily functioning have no significant relationship with income, the estimated coefficients for life satisfaction are large and highly significant. Compared with those who report poor health, respondents who perceive their health as anything from fair to excellent, have significantly higher levels of life satisfaction. Additionally, relative to those who have no difficulty with daily care, those who do have difficulty report significantly reduced levels of life satisfaction.

With regard to household characteristics, all are significant predictors of income but only the durable goods count is significantly associated with life satisfaction. Higher numbers of household residents, children and household member deaths depresses income significantly but has no impact on perceived well-being. Also, having more pensioners in a household and living in an urban area is significantly associated with higher income but has no notable effect on life satisfaction. Lastly, while the durable goods count in a household significantly raises both income and life satisfaction, the positive coefficient for this variable is much larger in the income equation than in the life satisfaction equation.

The results with respect to variables that measure the impact of social capital are strikingly similar across the income and subjective well-being models. All of the coefficients for these variables, with the exception of those that are not significantly different from zero, have the same signs when comparing the regressions. Trust of neighbours and group membership are positively and significantly associated with both income and life satisfaction rank and the extent of association is similar. Trust of strangers and indicating that religious activities are important has no significant association with either dependent variable. And lastly owning a cellular telephone is a positive and significant predictor in both models, although it is more strongly associated with life satisfaction.

There are, however, certain social capital variables that are significantly associated with one dependent variable but not the other. For instance, those living in households reporting that it is common for neighbours to help each other out systematically report higher life satisfaction scores but are no more likely to have higher incomes. Similarly, reporting crime as common in the neighbourhood is significantly associated

with reduced life satisfaction but has no significant impact on income. Conversely, reporting neighbours as frequently aggressive has a significant negative association with income but does not attract a significant coefficient for life satisfaction.

Lastly, an important difference between the income and subjective well-being models concerns the amount of explained variation. Based on the pseudo R-square values, the same set of variables explains 25 percent of the variation in income categories but only 7.4 percent of the variation in subjective well-being categories. A quick glance over the two models confirms that the variables included are more relevant for explaining individual income than they are for explaining individual life satisfaction. With the exception of the health variables and certain social capital variables, per capita household income category is significantly correlated with the variables included in the model. For subjective well-being category, however, considerably fewer variables are significant correlates.

6.2.2 Income variables included in the subjective well-being equation

For comparative purposes the subjective well-being equation (II) did not include any measure of income. However, since income is recognised as a common determinant of subjective well-being, a third life satisfaction equation (III) is run, which includes per capita income and its square as well as a measure of relative income. Other than observing the effect of these income variables on life satisfaction, the intention is also to monitor whether there are any changes in the coefficients of the other explanatory variables. It is possible that selected variables included in the equation have an indirect relationship with life satisfaction via their effect on income.

In specification III, both income and its square attract significant coefficients but have opposing signs. The income coefficient is positive and its square is negative, indicating a concave relationship between income and life satisfaction, as is commonly found in the empirical literature (Cummins, 2000; Graham & Pettinato, 2002; Veenhoven, 1991). The relative income variables are also significantly associated with life satisfaction. Respondents in the richest and middle income thirds are significantly more likely to report higher life satisfaction scores compared with those in the poorest income third. These results confirm the notable impact of relative

income on life satisfaction, consistent with other studies (Ferrer-i-Carbonell, 2005; McBride, 2001).

With regard to the other explanatory variables, the inclusion of income measures affects the size of their estimated coefficients but not their significance. In particular, race, years of education, employment status and marital status all remain significant predictors of life satisfaction but their *extent* of association is reduced once the income measures are added. This suggests that at least some of their association with life satisfaction is due to an indirect correlation with income.

While African adults remain significantly less satisfied than white adults, the size of the coefficient drops from -0.263 to -0.185, indicating that a considerable portion of the effect in specification III is due to the reduced income levels associated with being African. Conversely, the effects of both education and marriage on life satisfaction are relatively robust to income differences. When income is controlled for, the education coefficient only falls slightly from 0.013 to 0.010. Similarly, the married coefficient only drops from 0.074 to 0.066. Both coefficients hold their significance. Thus, it appears that education and marriage contribute to life satisfaction independently of their positive relationship with income, consistent with findings from other studies (Blanchflower & Oswald, 2004; Ravallion & Lokshin, 1999).

The negative association between unemployment and life satisfaction is maintained when the income variables are included. On the one hand, the coefficients of both unemployment variables do drop slightly, indicating that part of their effect in specification II was due to the loss in income associated with being unemployed. On the other hand, however, the unemployment coefficients remain relatively large and significant, thus confirming previous findings that joblessness is directly associated with reduced levels of life satisfaction, above and beyond the reduction in income associated with being unemployed (Clark & Oswald, 1994; Di Tella et al., 2001).

With the exception of the durable goods count, none of the household-level characteristics included in the model are significant predictors of life satisfaction, both before and after differences in income are controlled for. Since the durable goods count is a proxy for household wealth, which is closely associated with income, one

would expect its significance to decrease when income is accounted for. While the size of the coefficient drops slightly from 0.04 to 0.032, it remains a significant predictor of life satisfaction.

As with the other variables, those social capital variables that were significant in the previous specification (II) remain significant when income variables are included. Their strength of association with life satisfaction is virtually unchanged, with coefficients either increasing or decreasing by negligible amounts, suggesting that income differences do not play a role in the effect of various social capital indicators on perceived satisfaction with life.

6.2.3 Correlates of subjective well-being with cluster fixed effects

As a robustness check, the subjective well-being equation (III) is re-estimated with cluster fixed effects. The coefficients and standard errors for both models, with and without cluster dummies, are presented in Table A in the Appendix. To produce meaningful results, variables that do not vary within clusters (rural/urban and province dummies) are excluded from the model.

Three changes are appreciable when cluster dummies are included. First, according to the pseudo R squared values, the amount of explained variation almost doubles from 7.7 percent to 12 percent. This increase in explanatory power is evidence that there are other factors strongly related to location that are instrumental in shaping self-assessed well-being. Second, with the exception of race, the coefficients of other variables are relatively unaffected by the inclusion of cluster dummies, indicating that their effects are robust to differences in local area characteristics.

Third, the race coefficients reduce dramatically in size and lose significance when cluster fixed effects are included in the estimation. This suggests that race in itself is not associated with individual life satisfaction. Instead there are other unobserved local factors that impact life satisfaction and also differ across race groups. These three findings are consistent with those reported in Kingdon and Knight (2006b) and Posel and Casale (2011).

Finally, even with a broad set of explanatory variables and the inclusion of income variables and cluster fixed effects, there is still a large amount of variation in individual life satisfaction that remains unexplained. The highest R-squared value recorded in the subjective well-being models is 0.12 in Table A. Part of the reason why this value is relatively small is that differences in life satisfaction could also be explained by unobservable factors. Previous research has shown that a major candidate for these unobserved factors is personality traits. Personality differences have consistently been shown to have an impact on individuals' assessments of well-being (Diener & Lucas, 1999). Thus, it is likely that the limited explanatory power of the subjective well-being models presented in this paper is due, in part, to the lack of personality measures.

6.3 Differences in subjective well-being factors according to poverty status

To further probe the relationship between income and subjective well-being, I examine whether the income poor and non-poor differ in the way their life satisfaction is determined. As explained previously, separate ordered probit regressions are estimated for the poor and non-poor groups, based on a poverty line of R515. The estimated coefficients and their standard errors are presented in Table 4. The table also includes marginal effects on the probability that a respondent reports a satisfaction level of 7 or higher. [23]

The results reveal a number of notable differences in how the life satisfaction of the poor and non-poor is determined.[24] Certain variables that are important predictors of life satisfaction for poor respondents have no impact on the life satisfaction of non-poor respondents. For example, compared to poor female respondents, poor male respondents are significantly more satisfied with their life, whereas gender has no effect on life satisfaction for non-poor respondents. Similarly, life satisfaction is significantly higher for poor respondents who are married or cohabiting and have

[23] Since the original life satisfaction measure was collapsed from 10 categories into 5 categories, a satisfaction level of 7 or higher would actually be 4 or 5.

[24] Since there are effectively no white respondents below the poverty line (n=11), the observed difference in the effect of race is meaningless.

Table 4. Ordered probits of subjective well-being by poverty status

	All			Poor			Non-poor		
	Coefficient	*SE*	*ME*	*Coefficient*	*SE*	*ME*	*Coefficient*	*SE*	*ME*
Individual characteristics									
African	-0.185***	0.053	-0.087	-0.369*	0.166	-0.136	-0.195**	0.061	-0.092
Coloured	0.294***	0.055	0.070	0.019	0.178	-0.027	0.305***	0.062	0.079
Asian	0.351***	0.085	0.132	0.212	0.278	0.054	0.340***	0.095	0.137
Male	0.020	0.024	0.004	0.083*	0.036	0.024	-0.045	0.032	-0.019
Age 26 - 35	-0.124***	0.033	-0.038	-0.152**	0.048	-0.044	-0.105*	0.047	-0.034
Age 36 - 45	-0.102**	0.038	-0.026	-0.1	0.057	-0.025	-0.114*	0.051	-0.032
Age 46 - 55	-0.109**	0.042	-0.033	-0.146*	0.065	-0.039	-0.092	0.057	-0.030
Age 56 - 65	0.014	0.048	0.007	-0.026	0.076	-0.007	0.015	0.064	0.008
Age 66 and older	0.166**	0.063	0.060	0.096	0.097	0.035	0.171*	0.086	0.061
Household head	-0.048	0.027	-0.016	-0.081*	0.04	-0.020	-0.01	0.037	-0.008
Years of schooling completed	0.010**	0.003	0.003	0.005	0.005	0.002	0.013**	0.005	0.005
Not economically active	0.031	0.028	0.013	0.046	0.041	0.017	0.051	0.039	0.021
Unemployed, searching for work	-0.156***	0.036	-0.045	-0.096	0.05	-0.022	-0.184***	0.054	-0.062
Unemployed, not searching	-0.130**	0.044	-0.040	-0.077	0.057	-0.015	-0.155*	0.075	-0.066
Married	0.066*	0.030	0.027	0.119*	0.047	0.037	0.033	0.039	0.017
Cohabiting	0.033	0.039	0.010	0.143**	0.055	0.039	-0.083	0.054	-0.028
Divorced or widowed	-0.016	0.042	-0.006	0.009	0.064	0.001	-0.037	0.056	-0.014
Health status is excellent/very good	0.374***	0.044	0.126	0.325***	0.062	0.096	0.436***	0.064	0.157
Health status is good/fair	0.226***	0.042	0.073	0.142*	0.058	0.040	0.318***	0.061	0.110
Difficulty with daily care	-0.241***	0.062	-0.068	-0.299**	0.096	-0.088	-0.201*	0.082	-0.054
Household characteristics									
Number of household residents	0.014	0.007	0.004	0.011	0.009	0.003	0.014	0.011	0.004
Number of children < 15 years	0.018	0.012	0.006	0.029*	0.014	0.009	0.003	0.02	0.001
Number of pensioners > 64 years	0.000	0.026	0.002	-0.014	0.038	-0.002	0.002	0.037	0.003
Number of durable goods	0.032***	0.004	0.010	0.035***	0.006	0.010	0.031***	0.005	0.010

Death of a household member	-0.036	0.033	-0.016	-0.01	0.042	-0.005	-0.096	0.052	-0.042
Urban	0.022	0.027	0.009	-0.055	0.043	-0.019	0.069	0.036	0.030
Social capital variables									
Religious activities are important	0.068	0.036	0.027	0.04	0.051	0.015	0.112*	0.049	0.046
Member of a group	0.089***	0.023	0.025	0.123***	0.036	0.036	0.057	0.031	0.012
Owns a cellular telephone	0.140***	0.024	0.043	0.124***	0.034	0.037	0.161***	0.034	0.050
Neighbours help out	0.149***	0.022	0.044	0.153***	0.034	0.044	0.152***	0.029	0.045
Neighbours are aggressive	-0.038	0.028	-0.020	-0.101*	0.04	-0.040	0.015	0.038	0.002
Crime in the neighbourhood	-0.058*	0.024	-0.022	-0.02	0.036	-0.007	-0.084**	0.032	-0.035
Trust neighbour to return wallet	0.115***	0.028	0.036	0.124**	0.046	0.028	0.112**	0.036	0.044
Trust stranger to return wallet	-0.029	0.037	-0.014	-0.082	0.058	-0.031	0.003	0.047	0.001
Income variables									
Per capita monthly household income	0.000***	0.000	0.000	0.001	0.001	0.000	0.000***	0.000	0.000
(Per capita monthly household income)^2	-0.000*	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
Richest third	0.229***	0.038	0.068	.	.	.	0.02	0.036	.
Middle third	0.200***	0.028	0.054	0.099	0.076	0.026	.	.	.
Cut 1	-0.513***	0.098		-0.619**	0.225		-0.661***	0.125	
Cut 2	0.366***	0.099		0.295	0.225		0.197	0.126	
Cut 3	1.354***	0.100		1.211***	0.227		1.256***	0.127	
Cut 4	2.217***	0.101		1.931***	0.228		2.202***	0.129	
Number of observations	10575			4712			5863		
Pseudo R^2	0.0770			0.0515			0.0732		
Log-pseudolikelihood	-14956.020			-6757.532			-8112.972		

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults over the age of 17. Province dummies are included but not reported. *** Significant at 0.1%, ** Significant at 1%, * Significant at 5%

more children in their households. Additionally, for those below the poverty line, being a member of a group significantly improves life satisfaction and having neighbours that are aggressive significantly lowers life satisfaction. The marginal impacts for the variables mentioned above are relatively small, ranging from 2.4 percent to 4 percent.

There are also several factors that are important in determining the life satisfaction of the non-poor that have no effect on the poor. For example, unemployment is a significant predictor of life satisfaction for non-poor respondents, whereas it is unrelated to the life satisfaction of poor respondents. These results are similar to those found in Kingdon and Knight (2007b). The estimated marginal effects for the non-poor show that moving from being employed to being unemployed (searching or not searching) decreases the probability of reporting high satisfaction by roughly 6 percentage points[25]. With regards to the social capital variables, life satisfaction is significantly lower for non-poor respondents who report crime in their neighbourhood, compared to non-poor respondents who do not. However, poor respondents who report neighbourhood crime are no less satisfied than poor respondents who do not.

Consistent with evidence from Bookwalter and Dalenberg (2004) and Cramm et al. (2010), education is a significant predictor of life satisfaction for the wealthier group but not for the poor. Even so, the estimated marginal effects are extremely small, indicating that the beneficial effects associated with increased education may have been captured by other variables with which education is correlated such as employment and health. It is possible that the main contribution of education to life satisfaction levels is through its effect on these other variables, thus the independent effect of education appears small when other variables are held constant.

A handful of variables are significant predictors of life satisfaction for both the poor and non-poor sample. The health variables are a case in point. Reporting good/ fair or excellent/very good health significantly increases the life satisfaction of respondents

[25] For the remainder of this paper high satisfaction is defined by a score of 7 or higher on the original life satisfaction measure.

above and below the poverty line. This is where the highest marginal impacts are observed. For the full sample, compared to individuals who report poor health, those who report excellent/very good or good/fair health are 12.6 percent and 7.3 percent respectively, more likely to report high life satisfaction. However, similar to findings reported in Bookwalter and Dalenberg (2004), when the sample is split it appears that reported health has a greater impact on life satisfaction among the non-poor, although the marginal effects are relatively high for both groups. For the non-poor, moving from poor health to good/fair or excellent/very good health increases the probability of reporting high satisfaction by 15.7 and 11 percentage points respectively. Conversely, these percentage points are 9.6 and 4 for the poor.

Certain social capital variables also significantly predict life satisfaction for both poor and non-poor respondents. Compared to those who do not own cellular telephones, poor and non-poor respondents who own cellular telephones report significantly higher life satisfaction. Based on the marginal effects, cellular telephone ownership is slightly more influential in raising life satisfaction for the non-poor than for the poor. This is also true for trust of neighbours, with greater marginal impacts in the non-poor sample compared to the poor sample. Non-poor respondents who trust neighbours are 4.4 percentage points more likely to report high satisfaction, whereas poor respondents who trust neighbours are only 2.8 percentage points more likely to report high satisfaction.

Turning to the results on absolute income, the separate estimations for poor and non-poor sub-samples reveal an interesting pattern in the way individual life satisfaction is affected at different levels of income. While per capita income and its square are significant predictors of life satisfaction for the full sample, when the sample is split, only income retains its significance in the non-poor regression. To explore the possible differences in the income-life satisfaction relationship for poor and non-poor respondents, several reduced regressions were run. Interestingly, when the variable "number of durable goods" is excluded from the non-poor regression, both income terms become significant – with a positive income coefficient and a negative income squared coefficient, indicating a concave relationship. However, excluding variables from the poor regression does not attract significance for income and its square. Rather, when the squared term is removed from the poor regression, per capita

income becomes significant. These results suggest that life satisfaction is linear in income among the poor and non-linear for those above the poverty line. Although the results for the full sample indicate a concave relationship between income and life satisfaction, it appears that diminishing returns to income may only set in after a certain point above the poverty threshold.

Lastly, it is not possible to determine the effect of relative income for these sub-samples because of the lack of respondents in certain relative income categories when the sample is split. However, the marginal effects calculated for the full sample confirm the strong association between relative income and life satisfaction. Compared to individuals in the poorest third, those in the richest and middle thirds are 6.8 percent and 5.4 percent more likely to report high satisfaction respectively. These results support the finding in previous studies that relative income is an important predictor of subjective well-being (Clark & Oswald, 1996; Easterlin, 2001a; Graham & Pettinato, 2002; Kingdon & Knight, 2007b).

6.4 Conclusion

The results presented in this chapter have helped to elucidate the relationship between income and subjective well-being. The comparison of income and life satisfaction correlates allow for three global observations to be made about this relationship. First, not all the factors or conditions that raise income also raise life satisfaction and vice versa. For example, living in an urban area is positively associated with higher income but has no impact on life satisfaction. Second, certain variables actually have opposing effects on income and life satisfaction levels. For instance, Coloureds and Asians have significantly lower levels of income than Whites but report significantly higher levels of life satisfaction. Third, while several factors affect both income and life satisfaction, the extent of association is often greater for one measure. For example, while unemployment is a significant correlate of both income and life satisfaction, its association with income is much greater than its association with life satisfaction. Similarly, owning a cellular telephone is more strongly associated with increased life satisfaction than it is with higher income.

The inclusion of income variables in the subjective well-being equation reveals three more prominent features about the income-subjective well-being relationship. First, income and life satisfaction exhibit a concave relationship, indicating that marginal returns to life satisfaction decline as income rises. Second, relative income is significantly associated with life satisfaction, supporting the notion that relative perceptions of how we rank compared to others play an important role in determining subjective well-being. Third, the significant effect of other explanatory variables in the model is relatively robust to the inclusion of income, suggesting that these variables contribute to life satisfaction independently of their potential association with income.

When cluster fixed effects are included in the subjective well-being model, the substantial increase in explained variance indicates that there are local level characteristics that are instrumental in shaping self-assessed well-being. Moreover, the dramatic reduction in size and loss of significance for the race variables suggests that unobservable local factors that matter to life satisfaction differ across race groups in ways that are not being captured by the observable characteristics controlled for in the regressions. However, even with the increase in explained variance, there is still a large amount of variation in individual life satisfaction that remains unexplained. It was suggested that this is partly due to the lack of personality measures in the model.

Lastly, the comparison of subjective well-being correlates for the split sample demonstrated that several factors matter more to the poor than they do to the non-poor and vice versa. Gender, headship, marriage, children, group membership and having aggressive neighbours are all significant in predicting life satisfaction among the poor but have no impact on the non-poor. Conversely, education, unemployment, having crime in the neighbourhood and regarding religious activities as important all have significant effects on the life satisfaction of the non-poor but not the poor. While health, cellular telephone ownership and stating that a neighbour would return a lost wallet are significant predictors of life satisfaction in both groups, they have a greater impact in the non-poor group. Finally, the results for the split sample suggest that life satisfaction is linear in income among the poor and non-linear among the non-poor.

Chapter 7. Discussion and conclusions

7.1 Introduction

The results presented in this dissertation point to an imperfect, though complex, relationship between objective and subjective well-being in South Africa. The first section of this chapter discusses the finding that subjective well-being is positively associated with income. This section also explores why the income-subjective well-being relationship is stronger for people with less money and diminishes as one ascends the income ladder. The second section considers the value of subjective well-being measures in providing important information about the experience of human well-being. The results with regard to health, unemployment and social capital are used to illustrate the importance of including subjective well-being measures in analyses of human well-being.

7.2 Money and happiness

The results in this dissertation confirm a positive relationship between individual life satisfaction and per capita monthly household income. According to the figures presented in Chapter 5, life satisfaction scores are significantly lower among poor individuals compared to non-poor individuals and average income is low for those who report lower satisfaction scores but rises for those with higher satisfaction scores. Thus, it appears that, on average, those with less money are less satisfied with their lives.

Indeed, those with less money or those who live in poverty tend to experience many negative outcomes in life. The descriptive statistics of the variables included in the estimations showed that those living below the poverty line are significantly less likely to be employed or married and have, on average, less years of schooling. Poor individuals are also more likely to say that they are in poor health and their households report significantly more deaths. Additionally, according to previous research, poverty is associated with higher rates of childhood deaths (Wagstaff, 2000) and infant mortality (Schell, Reilly, Rosling, Peterson, & Ekström, 2007). Poor people

are also more likely to develop mental illnesses (Saraceno & Barbui, 1997) and to be victims of violent crime (Dixon, Reed, Rogers, & Stone, 2006).

Given the myriad of negative factors that are commonly associated with poverty, it would be reasonable to assume that people with low incomes will be fairly dissatisfied with their lives. However, the results in this dissertation indicate that, on average, income is not a strong predictor of life satisfaction. The small positive correlation coefficient between income and life satisfaction suggests a relatively weak relationship. The cross-tabulation between income and life satisfaction categories further elucidates the poor degree of correspondence between these two measures. Not all of those with low per capita incomes are dissatisfied with their lives. For example, over 20 percent of those in the lowest income category report satisfaction levels in the two highest subjective well-being categories. Conversely, not all of those in high per capita income categories are highly satisfied with their lives. For example, just over 10 percent of those in the highest income category and 26 percent of those in the second highest income category report satisfaction with life in the lowest two categories.

These results are somewhat puzzling. Why would some poor people enjoy relatively high levels of life satisfaction? And why would some rich people feel dissatisfied with their lives? To answer the first question, Biswas-Diener and Diener (2001) conducted a study on the life satisfaction of slum dwellers in Calcutta. They found that good social relationships (family, friendships and romantic relationships) played a key role in respondents' overall perceptions of well-being and they concluded that "*to the extent that the poor can utilize their strong social relationships, the negative effects of poverty are counterbalanced*" (Biswas-Diener & Diener, 2001, p. 347). Other studies also confirm the key role of social relationships in enhancing subjective well-being in the United States (Diener & Seligman, 2002), South Africa (Botha & Booysen, 2013a) and Bangladesh (Camfield, Choudhury, & Devine, 2009).

The importance of social relationships for subjective well-being may also explain why several respondents in high income categories have low perceptions of life satisfaction. To earn lots of money, wealthy people often have to spend the majority of their time and energy working. Thus they have less time to do other valued things

such as spending time with their friends or family and building meaningful relationships. Additionally, individuals with higher incomes tend to work in high-responsibility jobs, which can be particularly stressful. The pressure to work long hours and continue earning high salaries also means that many wealthy people also have less time for leisure and are prone to adverse mental health outcomes (Spurgeon, Malcolm Harrington, & Cooper, 1997). There is evidence that wealthier people are more likely to be tax audited (Hasset, 2013) and have an impaired ability to savour everyday positive emotions and experiences (Quoidbach, Dunn, Petrides, & Mikolajczak, 2010). There is also evidence that the material aspirations that arise from increased wealth are likely to give rise to negative outcomes such as lower self-esteem, greater narcissism, less intrinsic motivation and more conflictual relationships (Diener & Seligman, 2004).

In sum, the close link between social relationships and subjective well-being, as well as the negative outcomes associated with wealth, offer a viable explanation for the paradoxical results that some poor individuals are highly satisfied with their lives and some rich individuals are highly dissatisfied with their lives. It could be that the highly satisfied poor people in the NIDS sample derive their satisfaction with life from meaningful social relationships with their friends, families and/or romantic partners and thus, despite their limited income, they feel highly satisfied with their lives. Conversely, the highly dissatisfied wealthy individuals in the NIDS sample may have a lack, or scarcity of meaningful relationships due to their demanding jobs and they may experience one or more of the negative outcomes associated with wealth. Thus, despite the material resources available to them they feel unhappy.

While there are these cases of dissonance, the overall relationship between income and life satisfaction, as demonstrated by the correlation coefficient, is positive. Thus, low income individuals are, on average, less satisfied with their lives than high income individuals.

The multivariate regressions, which estimate the correlates of life satisfaction, confirm this positive relationship but also indicate that the strength of association varies at different levels of income. The inclusion of income variables in the subjective well-being regression shows a concave relationship between per capita

household income and individual life satisfaction, with declining increases in life satisfaction as one ascends to higher levels of income. Additionally, when the sample is split into poor and non-poor groups, the concave relationship between income and life satisfaction is only evident in the non-poor sample. For the poor, life satisfaction and income exhibits a linear relationship. Thus, it appears that income is more strongly associated with life satisfaction at lower levels of income.

These findings give support to the idea of a needs hierarchy in which income becomes relatively less important to people once their basic needs are met. According to Maslow's (1954) hierarchy of needs theory there are certain universal human needs that appear in a specific order. The most basic physiological needs (e.g. food, water, air) and the need for safety and security emerge first. Only when these two basic level needs are satisfied can a person be concerned with higher order needs such as love, esteem and self-actualisation needs.

As mentioned in chapter 2, Veenhoven (1991) and subsequent researchers borrow from Maslow's hierarchy of human needs to explain why income increases subjective well-being at a decreasing rate. These researchers argue that for the poor, life satisfaction or happiness depends heavily on the fulfillment of basic level needs. Since money is instrumental in securing access to goods and services that can gratify these basic needs, it has a direct bearing on individual subjective well-being. In other words, income will facilitate subjective well-being to the extent that it allows people to meet their basic human needs. However, once these needs are met, income accrues diminishing marginal returns for people's subjective well-being, ostensibly because higher-order needs are non-material and cannot be procured with money.

Apart from the results presented in this dissertation, various other findings fit with this basic needs perspective. There is consistent empirical evidence that within-country correlations between income and subjective well-being are stronger in poorer than in more well off nations (Veenhoven, 1991). For example, Biswas-Diener and Diener (2001) reported a correlation of 0.45 between income and life satisfaction for slum dwellers in Calcutta, India, whereas Lachman and Weaver (1998) found that this correlation was only 0.18 in the United States. At the individual level, there is also evidence that income is more strongly associated with subjective well-being in poorer

than in wealthier income groups (Cummins, 2000; Diener et al., 1993; Sengupta et al., 2012). These findings are consistent with the basic needs perspective because in poorer nations or groups, where basic needs have not been fully met, income is crucial for securing the goods and services that can satisfy these needs and thus income and subjective well-being are more strongly correlated in these cases.

The results of a recent study in New Zealand also lend support to the basic needs perspective. Sengupta et al. (2012) found that New Zealanders' perception of their ability to meet everyday needs had a significant positive and linear relationship with their happiness. They also tested whether people's perceived ability to meet their everyday needs mediated the association between income and happiness. According to their analysis, the log of household income had a significant indirect effect on happiness via perceived ability to meet everyday needs. In other words, increased income increased people's belief that they could meet their everyday necessities, which in turn enhanced their subjective well-being. These results are consistent with the basic needs approach, which claims that income enhances subjective well-being largely to the extent that it helps people meet their basic physiological needs.

In South Africa, 44 percent of adults live below the poverty line[26]. Thus, millions of people still lack the goods and services that are required to meet their basic needs. According to Hoosain et al. (2013) 26 percent of South African households are food insecure and even where there is a regular supply of food, many suffer from nutritional deficiencies. Approximately 1.3 million households have absolutely no access to piped water, 5.8 million do not have access to a flush toilet and nearly 1.8 million households live in informal dwellings (Statistics South Africa, 2011). South Africa has one of the highest homicide and rape rates in the world, with a daily average of 43 murders recorded in the 2011/12 financial year (Gould, Burger, & Newham, 2012) and an estimated 3700 rapes committed daily (Craven, 2013).

To test whether access to basic needs mediates the relationship between income and subjective well-being, an additional life satisfaction estimation was run that included basic service variables (access to piped water and electricity as well as housing and

[26] Own calculations, NIDS 2008.

toilet type). Indeed, the estimated coefficients on income and income squared drop slightly when these variables are added to the equation, especially in the poor sub-sample.[27] These results suggest that some of the relationship between subjective well-being and income is explained by the role of income in allowing people to meet their basic needs, thereby offering support to the basic needs approach.

But what happens to the income-subjective well-being relationship once basic needs are met? The regression analysis presented in Chapter 6 indicates that income is still associated with life satisfaction at higher levels of income. The split sample results show that income is still a significant determinant of life satisfaction for those above the poverty line, albeit with diminishing strength. Additionally, the figure on average life satisfaction by income category presented in Chapter 5 shows that average life satisfaction is higher in the highest income category than in the second highest income category, suggesting that money still matters to subjective well-being even among those who are relatively well off.

Results from previous studies also confirm the continued relationship between income and subjective well-being at higher income levels. Easterlin (2001b) found that a higher proportion of those in the richest income category reported that they were "very happy" compared those in the second-richest income category. Moreover, previous correlational studies show that even wealthy nations such as Switzerland (Frey & Stutzer, 2000), New Zealand (Sengupta et al., 2012) and the United States (Lachman & Weaver, 1998) – where, presumably, basic needs have largely already been met – yield positive relationships between income and subjective well-being. Taken together, these results demonstrate that income is still related to subjective well-being even beyond the level of meeting basic human needs and thus they do not fully support the basic needs perspective.

Why might money still matter to those who are relatively well-off? Diener et al. (1993) suggest that perhaps even higher order needs can be increasingly fulfilled at

[27] Clearly these basic service variables do not cover all basic needs. It is possible that the coefficients on income and income squared would have dropped more substantially had a full set of basic needs variables been included in the estimation.

higher levels of income. For example, the need to experience something new might be met by travelling abroad, buying a fast car or doing an adventure sport, but these would also require a large amount of money. Similarly, esteem needs like status and prestige might follow from being wealthy. Having more money can also allow people to avoid certain types of stress and thus free up time to pursue self-actualisation needs. For example more affluent people can afford to hire domestic workers and gardeners and can install advanced security systems to meet their safety needs.

Diener et al. (1993) also propose that greater wealth is still associated with subjective well-being because modern society generates perceived needs in people that can only be fulfilled if one possesses enough money. For example the need to be continuously connected to communication networks can be fulfilled by purchasing a cellular telephone or a laptop. Also, meeting one's need for recreation might involve plane tickets, a summerhouse and a yacht, all of which require a considerable amount of money.

These explanations for the continued association of income with subjective well-being at higher income levels are plausible but they do not explain why the strength of the relationship diminishes as one ascends the income ladder. The concave relationship between income and subjective well-being suggests that income is subject to the law of diminishing returns: as income rises, each additional rand contributes less to subjective well-being. One reason for this might be that the negative outcomes associated with higher income (mentioned earlier in the chapter) temper the positive effects of wealth. Another explanation is that rising income creates inflated aspirations. In time, people who are relatively well off become accustomed to living prosperously and their aspirations escalate so that they are no longer satisfied with their current circumstances. In effect, their aspirations catch up with their incomes and to some degree cancel the benefits of higher incomes (Easterlin, 1995).

Taken together, the results discussed so far suggest that on average, regardless of the diminishing strength of association, those with more money are more satisfied with their lives and this association persists even beyond the fulfilment of basic needs. Does this mean that money can buy happiness? Does more income make people

happier? Such a causal inference cannot be made based on the current cross-sectional results. However, based on evidence from various other studies, it appears that the relationship is bidirectional. That is, money affects happiness, but happiness also influences how much income one has. Several studies have shown that indeed, part of the association between income and subjective well-being is due to the effect of income on subjective well-being. However, there is also evidence that high subjective well-being leads to increasing income.[28]

7.3 The value of subjective well-being measures

In addition to income, the regression analysis presented in Chapter 6 identifies a number of other significant correlates of subjective well-being. Furthermore, there are several important differences between the correlates of income and life satisfaction. These results indicate how subjective well-being measures include information about the experiences of human well-being in ways that are not fully captured in objective money-metric measures. In the following sub-sections, three sets of correlates in particular are discussed.

7.3.1 Self-reported health

The results of this dissertation point to a strong empirical relationship between subjective well-being and self-reported health. In all the subjective well-being regressions reported in Chapter 6, the estimated coefficients of the health variables for life satisfaction are large and highly significant. Compared with those who report poor health, respondents who perceive their health as anything from fair to excellent have significantly higher levels of life satisfaction. Additionally, when the income variables are added, the coefficients of the self-reported health variables only drop by negligible amounts, indicating that the association of self-reported health with life satisfaction is robust to income differences. The importance of self-reported health for life satisfaction is confirmed by their large marginal effects. In fact these are the highest marginal impacts of all the explanatory variables. Compared with individuals who report poor health, those who report excellent/very good or good/fair health are

[28] For a review, see Diener and Seligman (2004).

12.6 percent and 7.3 percent more likely to report high satisfaction (a score of 7 or higher).

In sharp contrast, the regression estimating income correlates indicates that self-reported health status is unrelated to income. In other words, respondents who reported excellent/very good or good/fair health are no more likely to be in a higher income category than those who reported poor health. Kingdon and Knight (2006b) also find that poor health is not correlated with income but is significantly associated with lower subjective well-being.

In sum, self-reported health, which is a key component of well-being more generally, is not a significant predictor of income, but it is a large and significant predictor of life satisfaction. These results demonstrate that income is an incomplete measure of well-being and that subjective well-being captures a far wider range of influences on lived experience than income does.

One caveat, however, is that the true extent of association between health and life satisfaction is likely to be overstated in these results because both self-reported health and self-assessed well-being are *self*-reported measures and are thus typically influenced in the same direction by personality differences. For example, optimistic individuals are likely to give more positive valuations of their health as well as their well-being compared to those who tend to have a cynical outlook on life.[29]

The split sample results on self-reported health illustrate the value of using subjective well-being measures in well-being analyses. The split-sample results in Chapter 6 show that self-reported health has a greater impact on life satisfaction among the non-poor than among the poor. For the non-poor, moving from poor health to good/fair or excellent/very good health increases the probability of reporting high satisfaction by 15.7 and 11 percentage points respectively. In contrast, these percentage points are 9.6 and 4 for the poor. Bookwalter and Dalenberg (2004) report similar results. They suggest that health appears to be more important in determining life satisfaction for wealthier households because these households tend to be more mindful of minor

[29] For more, see Scheier and Carver (1987).

health problems. In this way, subjective well-being measures can be a useful channel to provide insight into people's attitude toward health.

7.3.2 Unemployment

Given very high unemployment rates in South Africa, understanding the underlying reasons for joblessness has been at the forefront of many policy debates. In particular, much attention has been given to investigating whether unemployment is voluntary. Do the majority of unemployed South Africans choose not to work? Or is unemployment predominantly involuntary? One view is that the unemployed choose to be jobless because the burden of work and the associated wage are less appealing compared to having more leisure time and living off government grants. However, it could be that being without a job is unwelcome and undesirable but the unemployed have difficulty finding employment due to various structural barriers in the economy (Kingdon & Knight, 2006a, 2007a).

Subjective well-being research is particularly informative in providing insight into the voluntariness of unemployment. Arguably, given the disutility of work, some people might choose to have more time for leisure, even though it may mean that they would have less money available to them. Thus, one cannot say that people with low incomes are necessarily forced to be unemployed. However, it is hypothesised that if these people are voluntarily unemployed, they should be more, or equally, satisfied with their lives than the employed (Clark & Oswald, 1994; Kingdon & Knight, 2004). Yet, the results of various subjective well-being studies have shown that, ceteris paribus, the unemployed are significantly less satisfied than the employed, suggesting that unemployment is not voluntary.

The findings of this dissertation also provide support for the notion that people do not choose to be unemployed. Based on the subjective well-being regressions in Chapter 6, unemployment (both searching and not searching) is associated with significantly lower life satisfaction and this association remains even after income differences are controlled for. These results are at odds with the idea that unemployment in South Africa is voluntary. It would seem that joblessness does not simply involve a trade-off between working (perhaps at a low wage) and not working (and perhaps receiving

government benefits). Rather, individuals face a very substantial and significant loss in well-being from being unemployed, over and above the presumed income loss.

Further insight into unemployment can be gained through the split sample results. Table 4 shows that while unemployment is significantly associated with decreased life satisfaction among the non-poor, unemployment is not a significant predictor of life satisfaction among the poor. These results seem counterintuitive. Why would the life satisfaction of the poor be unrelated to their employment status? A possible explanation is that the poor generally live in areas where unemployment is high, and thus, they are less affected by being unemployed because a high proportion of people around them are also jobless. Indeed, various studies have tested this explanation and found that the unemployed are less dissatisfied in high unemployment areas (Clark & Oswald, 1994; Kingdon & Knight, 2007b; Powdthavee, 2005b).

The above findings on unemployment illustrate how subjective well-being measures can point to alternative perspectives that can enrich policy debates and provide additional information that may not have been apparent from objective money-metric measures.

7.3.3 Social capital

The results in this dissertation show that various indicators of social capital are strongly related to both subjective well-being and income. The multivariate regressions in Chapter 6 indicate that the social capital variables are, for the most part, similarly associated with income and life satisfaction. All of the coefficients for these variables, with the exception of those that are not significantly different from zero, have the same signs when comparing the regressions. There are, however, two social capital variables that are significantly associated with life satisfaction but unrelated to income. Reporting neighbours as helpful and stating that there is crime in the neighbourhood are not significantly correlated with income, whereas they are significant predictors of life satisfaction. Additionally, while being a member of a group and owning a cellular telephone are significant correlates of both income and life satisfaction, the extent of their association with life satisfaction is greater.

Thus, although the social capital variables are not completely unaccounted for in the income equation, they certainly feature more prominently in the subjective well-being equation. This finding points to the value of subjective well-being measures in highlighting indicators of social capital that may not have been fully captured by objective well-being measures.

The results on reported neighbourhood crime are particularly noteworthy, given the exceptionally high crime rates in South Africa. Respondents who report crime as common in their neighbourhood are significantly less satisfied with their lives than respondents who say crime is uncommon. The explanation for this could be two fold. First, those living in high crime areas are more likely to have been victims of crime and this experience may have lowered their life satisfaction. Second, living in high crime areas also raises the likelihood of becoming a victim and thus fosters heightened levels of fear and anxiety, which in turn could lower life satisfaction.

The findings of various South African studies appear to support this explanation. Powdthavee (2005a) found that victims of crime had significantly lower levels of life satisfaction compared to non-victims. He also showed that nonvictimized respondents living in areas with higher crime rates reported significantly lower life satisfaction than those living in low crime areas. Moreover, Møller (2005) reported that 'fear of crime' and concerns about 'personal safety' were negatively associated with life satisfaction. Interestingly, she found that these perceptions of crime had a greater influence on life satisfaction than actual victimisation.

In the context of South Africa, crime and perceptions of crime are important to understanding well-being and informing crime reduction strategies. The above results on crime demonstrate how subjective well-being measures can be used to provide insight into people's experiences of crime.

7.4 Conclusions

This dissertation has investigated the relationship between income and subjective well-being using the 2008 baseline wave of NIDS. The descriptive results confirm that an individual's per capita monthly household income is positively and

significantly related to his/her satisfaction with life. However, this relationship is relatively weak, indicating that income is not a strong predictor of life satisfaction. Indeed, some poor respondents indicate that they are highly satisfied with their lives. Conversely, some wealthy respondents are extremely dissatisfied with their lives. These results suggest that income is not the only predictor of life satisfaction. Moreover, it is possible that income is correlated with other circumstances that negatively affect life satisfaction.

The multivariate results show that income is more strongly related to life satisfaction at lower levels of income. This finding is consistent with the notion that income enhances subjective well-being largely to the extent that it helps people meet their basic physiological needs. However, the results also indicate that income is still associated with life satisfaction at higher levels of income. This could be because even higher-order needs can be increasingly fulfilled at higher levels of income. In addition, the decreasing association of income and life satisfaction as one climbs the income ladder can be explained by the negative outcomes and ever increasing aspirations associated with wealth.

In addition to income, the multivariate results identify a number of other significant correlates of life satisfaction. Furthermore, there are several important differences between the correlates of income and life satisfaction. These results highlight the fact that subjective well-being measures capture a far wider range of influences on lived experiences than income does. The results for health, unemployment and social capital are particularly informative in this regard. Self-reported health, which is a key component of well-being more generally, is not a significant predictor of income, but it is a large and significant predictor of life satisfaction. Unemployment also affects well-being in ways that are not captured by income alone; and social capital is more consistently correlated with life satisfaction than with income. Thus, it can be concluded that measures of subjective well-being provide information about the experiences of human well-being in ways that are not fully captured in objective money-metric measures.

Improving human well-being is an inherent goal in our nation. Indeed it is a central concern expressed in the preamble of the South African Constitution: "*We, the people*

of South Africa… adopt this Constitution as the supreme law of the Republic so as to… improve the quality of life of all citizens"[30]. According to the Heisenberg principle, what a society measures shapes what a society pursues (Heisenberg, 1949). If a society is primarily concerned with monitoring objective money-metric indicators, people in that society will focus on pursing objective money-metric outcomes, perhaps at the expense of other important objectives.

Current organisational, corporate and governmental polices in South Africa are heavily centred on objective money-metric outcomes. However, based on the results of this dissertation, it is clear that subjective well-being measures capture a far wider range of influences on lived experiences than money-metric indicators do. Thus, greater attention should be given to assessing subjective measures of well-being so that, in turn, people will pursue objectives that are better-informed at improving well-being in our country.

A possible extension of this dissertation would be to take advantage of the panel data available in NIDS. With cross-sectional data it is not possible to establish causal relationships between variables. Is subjective well-being a cause or effect of income? The relationship could run in both directions or it could be that a third variable is precipitating the observed relationship between income and subjective well-being; personality traits or other unobservable characteristics that have not been controlled for in the estimations. Without controlling for these factors, the cross-sectional results are likely to be biased in some way. However, using the panel data available in NIDS, it would be possible to control for non-observed heterogeneity, and thus eliminate some of the bias associated with unobserved factors as well as reveal causal relationships between certain variables.

[30] Constitution of the Republic of South Africa, Act no. 108 of 1996, p. 1243.

References

Argyle, M. (1987). *The Psychology of Happiness*. New York: Methuen & Co.

Argyle, M. (1999). Causes and Correlates of Happiness. In D. Kahneman, E. Diener & N. Schwarz (Eds.), *Well-Being: The Foundations of Hedonic Psychology* (pp. 353-373). New York: Russell Sage Foundation.

Biswas-Diener, R., & Diener, E. (2001). Making the Best of a Bad Situation: Satisfaction in the Slums of Calcutta. *Social Indicators Research, 55*(3), 329-352.

Bjørnskov, C. (2008). Social Capital and Happiness in the United States. *Applied Research in Quality of Life, 3*, 43-62.

Blanchflower, D. G., & Oswald, A. (2008). Is Well-Being U-Shaped over the Life Cycle? *Social Science & Medicine, 66*(8), 1733-1749.

Blanchflower, D. G., & Oswald, A. J. (2000). Well-Being over Time in Britain and the USA. National Bureau of Economic Research. NBER Working Paper No. 7487.

Blanchflower, D. G., & Oswald, A. J. (2004). Well-Being over Time in Britain and the USA. *Journal of Public Economics, 88*(7/8), 1359-1386.

Bookwalter, J. T., & Dalenberg, D. (2004). Subjective Well-Being and Household Factors in South Africa. *Social Indicators Research, 65*(3), 333-353.

Bookwalter, J. T., Fuller, B. S., & Dalenberg, D. (2006). Do Household Heads Speak for the Household? A Research Note. *Social Indicators Research, 79*, 405-419.

Botha, F. (2013). Life Satisfaction and Education in South Africa: Investigating the Role of Attainment and the Likelihood of Education as a Positional Good. *Social Indicators Research*, doi:10.1007/s11205-11013-10452-11202.

Botha, F., & Booysen, F. (2013a). Family Functioning and Life Satisfaction and Happiness in South African Households. *Social Indicators Research*, doi: 10.1007/s11205-11013-10485-11206.

Botha, F., & Booysen, F. (2013b). The Relationship between Marital Status and Life Satisfaction among South African Adults. *Acta Academia, 45*(2), 150-178.

Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery Winners and Accident Victims: Is Happiness Relative? *Journal of Personality and Social Psychology, 36*(8), 917-927.

Camfield, L., Choudhury, K., & Devine, J. (2009). Well-Being, Happiness and Why Relationships Matter: Evidence from Bangladesh. *Journal of Happiness Studies, 10*, 71-91.

Campbell, A. (1976). Subjective Measures of Well-Being. *American Psychologist, 31*, 117-124.

Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick: Rutgers University Press.

Carletto, G., & Zezza, A. (2006). Being Poor, Feeling Poor: Combining Objective and Subjective Measures of Welfare in Albania. *Journal of Development Studies, 42*(4), 739-760.

Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional Selectivity Theory and the Regulation of Emotion in the Second Half of Life. *Motivation and Emotion, 27*(2), 103-123.

Clark, A. E., & Oswald, A. J. (1994). Unhappiness and Unemployment. *The Economic Journal, 104*(424), 648-659

Clark, A. E., & Oswald, A. J. (1996). Satisfaction and Comparison Income. *Journal of Public Economics, 61*, 359-381.

Copestake, J., Guillen-Royo, M., Chou, W., Hinks, T., & Velazco, J. (2009). The Relationship between Economic and Subjective Well-Being Indicators in Peru. *Applied Research in Quality of Life, 4*, 155-177.

Costa, P. T., & McCrae, R. R. (1980). Influence of Extraversion and Neuroticism on Subjective Well-Being: Happy and Unhappy People. *Journal of Personality and Social Psychology, 1*(38), 668-678.

Cramm, J. M., Møller, V., & Nieboer, A. P. (2010). Improving Subjective Well-Being of the Poor in the Eastern Cape. *Journal of Health Psychology, 15*(7), 1012-1019.

Craven, S. (2013). Rape in South Africa - a Call to Action. *South African Medical Journal, 103*(4), 210.

Cummins, R. A. (2000). Personal Income and Subjective Well-Being: A Review. *Journal of Happiness Studies, 1*(2), 133-158.

Deaton, A. (2008). Income, Health, and Well-Being around the World: Evidence from the Gallup World Poll. *Journal of Economic Perspectives, 22*(2), 53-72.

Devey, R., & Møller, V. (2002). Closing the Gap between Rich and Poor in South Africa: Trends in Objective and Subjective Indicators of Quality of Life in the

October Household Study. In W. Glatzer (Ed.), *Rich and Poor: Disparities, Perceptions, Concomitants* (pp. 105-122). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Di Tella, R., MacCulloch, R. J., & Oswald, A. J. (2001). Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness. *American Economic Review, 91*(1), 335–341.

Diener, E. (1984). Subjective Well-Being. *Psychological Bulletin, 95*, 542-575.

Diener, E. (1994). Assessing Subjective Well-Being: Progress and Opportunities. *Social Indicators Research, 31*(2), 103-157.

Diener, E., & Biswas-Diener, R. (2002). Will Money Increase Subjective Well-Being? *Social Indicators Research, 57*, 119-169.

Diener, E., & Chan, M. Y. (2011). Happy People Live Longer: Subjective Well-Being Contributes to Health and Longevity. *Applied Psychology: Health and Well-Being, 3*(1), 1-43.

Diener, E., & Diener, M. (1995). Cross Cultural Correlates of Life Satisfaction and Self-Esteem. *Journal of Personality and Social Psychology, 68*, 653-663.

Diener, E., Gohm, C. L., Suh, E. M., & Oishi, S. (2000). Similarity of the Relations between Marital Status and Subjective Well-Being across Cultures. *Journal of Cross Cultural Psychology, 31*(4), 419-436.

Diener, E., & Lucas, R. E. (1999). Personality and Subjective Well-Being. In D. Kahneman, E. Diener & N. Schwarz (Eds.), *Well-Being: The Foundations of Hedonic Psychology* (pp. 213-229). New York: Russell Sage Foundation.

Diener, E., & Ryan, K. (2009). Subjective Well-Being: A General Overview. *South African Journal of Psychology, 39*(4), 391-406.

Diener, E., Sanvik, E., Seidlitz, L., & Diener, M. (1993). The Relationship between Income and Subjective Well-Being: Relative or Absolute? *Social Indicators Research, 28*, 195-223.

Diener, E., & Seligman, M. (2004). Beyond Money toward an Economy of Well-Being. *Psychological science in the public interest, 5*(1), 1-31.

Diener, E., & Seligman, M. E. P. (2002). Very Happy People. *Psychological Science, 13*, 80-83.

Diener, E., Suh, E., Lucas, R. E., & Smith., H. L. (1999). Subjective Well-Being: Three Decades of Progress *Psychological Bulletin, 125*, 276-302.

Dixon, M., Reed, H., Rogers, B., & Stone, L. (2006). *Crimeshare: The Unequal Impact of Crime*. London: Institute for Public Policy Research.

Dolan, P., Peasgood, T., & White, M. (2008). Do We Really Know What Makes Us Happy? A Review of the Economic Literature on the Factors Associated with Subjective Well-Being. *Journal of Economic Psychology, 29*(1), 94-122.

Duesenberry, J. (1949). *Income, Saving, and the Theory of Consumer Behavior*. Cambridge, MA: Harvard University Press.

Easterlin, R. (1974). Does Economic Growth Improve the Human Lot? Some Empirical Evidence. In P. A. David & M. W. Reder (Eds.), *Nations and Households in Economic Growth: Essays in Honor of Moses Abramowitz* (pp. 89-125). New York: Academic Press.

Easterlin, R. (1995). Will Raising the Incomes of All Increase the Happiness of All. *Journal of Economic Behaviour and Organization, 27*, 35-47.

Easterlin, R. (2001a). Income and Happiness: Towards a Unified Theory. *The Economic Journal, 111*, 465-484.

Easterlin, R. (2001b). Life Cycle Welfare: Evidence and Conjecture. *Journal of Socio-Economics, 30*(1), 31-61.

Ebrahim, A., Botha, F., & Snowball, J. D. (2013). Determinants of Life Satisfaction among Race Groups in South Africa. *Development Southern Africa, 30*(2), 168-185.

Ferrer-i-Carbonell, A. (2005). Income and Well-Being: An Empirical Analysis of the Comparison Income Effect. *Journal of Public Economics, 89*, 997-1019.

Frey, B. (2008). *Happiness: A Revolution in Economics*. Cambridge, Massachusetts: The MIT Press.

Frey, B., & Stutzer, A. (2000). Happiness, Economy and Institutions. *The Economic Journal, 110*, 918-938.

Frey, B., & Stutzer, A. (2002). What Can Economists Learn from Happiness Research? *Journal of Economic Literature, 40*(2), 402-435.

Gardner, J., & Oswald, A. (2001). Does Money Buy Happiness? A Longitudinal Study Using Data on Windfalls. Paper presented at the Royal Economic Society Annual Conference 2002.

Gerdtham, U., & Johannesson, M. (2001). The Relationship between Happiness, Health, and Socioeconomic Factors: Results Based on Swedish Micro Data. *Journal of Socio-Economics, 30*, 553-557.

Gould, C., Burger, J., & Newham, G. (2012). The Saps Crime Statistics: What They Tell Us - and What They Don't. *SA Crime Quarterly, 42*, 1-12.

Graham, C. (2004). *Globalisation, Poverty, Inequality and Insecurity: Some Insights from the Economics of Happiness*. Paper presented at the UNU/WIDER Conference on The Impact of Globalisation on the World's Poor.

Graham, C. (2008). Measuring Quality of Life in Latin America: What Happiness Research Can (and Cannot) Contribute. Inter-American Development Bank Research Department Working Paper 652.

Graham, C., & Pettinato, S. (2002). Frustrated Achievers: Winners, Losers and Subjective Well-Being in New Market Economies. *Journal of Development Studies, 38*(4), 100-140.

Hagenaars, A. J. M. (1986). *The Perception of Poverty*. Amsterdam: North Holland Publishing Company.

Hasset, K. A. (2013). The Rich Get More (Audits). *National Review, 65*(11), 8-8.

Heisenberg, W. (1949). *The Physical Principles of the Quantum Theory* (C. Eckart & F. C. Hayt, Trans.). Mineola: Dover Publications, Inc.

Helliwell, J. F. (2003). How's Life? Combining Individual and National Variables to Explain Subjective Well-Being. *Economic Modelling, 20*, 331-360.

Helliwell, J. F., & Wang, S. (2011). Trust and Wellbeing. *International Journal of Wellbeing, 1*(1), 42-78.

Herrera, J., Razafindrakoto, M., & Roubaud, F. (2006). The Determinants of Subjective Poverty: A Comparative Analysis in Madagascar and Peru. DIAL (Développement, Institutions & Analyses de Long terme). No DT/2006/01.

Hinks, T., & Davies, S. (2008). Life Satisfaction in Malawi and the Importance of Relative Consumption, Polygamy and Religion. *Journal of International Development, 20*(7), 888-904.

Hinks, T., & Gruen, C. (2007). What Is the Structure of South African Happiness Equations? Evidence from Quality of Life Surveys. *Social Indicators Research, 82*(2), 311-336.

Hoogeveen, J. G., & Özler, B. (2004). Not Separate, Not Equal: Poverty and Inequality in Post-Apartheid South Africa. William Davidson Institute Working Paper No. 739.

Hoosain, E., Dwane, N., Reddy, P., Jacobs, L., Shisana, O., Labadarios, D., et al. (2013). *South African National Health and Nutrition Examination Survey*. Pretoria: Human Sciences Research Council.

Howell, R. T., & Howell, C. J. (2008). The Relation of Economic Status to Subjective Well-Being in Developing Countries: A Meta-Analysis. *Psychological Bulletin, 134*(4), 536-560.

Hulme, D., & Shepherd, A. (2003). Conceptualizing Chronic Poverty. *World Development, 21*(3), 403-425.

Inglehart, R., & Klingemann, H. D. (2000). Genes, Culture, and Happiness. In E. Diener & E. M. Suh (Eds.), *Subjective Well-Being across Cultures*. Cambridge,MA: MIT Press.

Inkeles, A. (1960). Industrial Man: The Relation of Status to Experience, Perception, and Value. *American Journal of Sociology, 66*, 1-31.

Kahneman, D., Diener, E., & Schwarz, N. (Eds.). (1999). *Well-Being: The Foundations of Hedonic Psychology* New York: Russel Sage Foundation.

Kingdon, G., & Knight, J. (2004). Unemployment in South Africa: The Nature of the Beast. *World Development, 32*(3), 391-408.

Kingdon, G., & Knight, J. (2006a). The Measurement of Unemployment When Unemployment Is High. *Labour Economics, 13*(3), 219-315.

Kingdon, G., & Knight, J. (2007a). Unemployment in South Africa, 1995-2003: Causes, Problems and Policies. *Journal of African Economies, 16*(5), 813-848.

Kingdon, G. G., & Knight, J. (2006b). Subjective Well-Being Poverty Vs. Income Poverty and Capabilities Poverty? *Journal of Development Studies, 42*(7), 1199-1224.

Kingdon, G. G., & Knight, J. (2007b). Community, Comparisons and Subjective Well-Being in a Divided Society. *Journal of Economic Behaviour and Organization, 64*, 69-90.

Klasen, S. (2000). Measuring Poverty and Deprivation in South Africa. *Review of Income and Wealth, 46*(1), 34-58.

Knight, J., Song, L., & Gunatilaka, R. (2009). Subjective Well-Being and Its Determinants in Rural China. *China Economic Review, 20*(4), 635-649.

Lachman, M. E., & Weaver, S. L. (1998). The Sense of Control as a Moderator of Social Class Differences in Health and Well-Being. *Journal of Personality and Social Psychology, 74*, 763-773.

Leibbrandt, M., Woolard, I., Finn, A., & Argent, J. (2010). Trends in South African Income Distribution and Poverty since the Fall of Apartheid. OECD Social, Employment and Migration Working Papers. OECD.

Lever, J. (2004). Poverty and Subjective Well-Being in Mexico. *Social Indicators Research, 68*, 1-33.

Maslow, A. H. (1954). *Motivation and Personality*. New York: Harper & Row.

McBride, M. (2001). Relative-Income Effects on Subjective Well-Being in the Cross-Section. *Journal of Economic Behavior & Organization, 45*, 251-278.

Møller, V. (2005). Resilient or Resigned? Criminal Victimisation and Quality of Life in South Africa. *Social Indicators Research, 72*(3), 263-317.

Møller, V. (2007). Satisfied and Dissatisfied South Africans: Results from the General Household Survey in International Comparison. *Social Indicators Research, 81*(2), 389-415.

Møller, V. (2013). South African Quality of Life Trends over Three Decades, 1980–2010. *Social Indicators Research, 113*, 915-940.

Myers, D. G. (1999). Close Relationship and Quality of Life. In D. Kahneman, E. Diener & N. Schwarz (Eds.), *Well-Being: The Foundations of Hedonic Psychology* (pp. 374–391). New York: Russel Sage Foundation.

NIDS. (2008). *National Income Dynamics Study, Wave 1*. Cape Town: University of Cape Town, South African Labour and Development Research Unit.

Oswald, A. J. (1997). Happiness and Economic Performance. *Economic Journal, 107*(445), 1815-1831.

Pavot, W. (2008). The Assessment of Subjective Well-Being: Successes and Shortfalls. In M. Eid & R. J. Larsen (Eds.), *The Science of Subjective Well-Being*. New York: Guilford Press.

Posel, D. (2012). Self-Assessed Well-Being: Analysis of the Nids Wave 1 and 2 Datasets. SALDRU, University of Cape Town. SALDRU Working Paper Number 79 / NIDS Discussion Paper 2012/2.

Posel, D., & Casale, D. (2011). Relative Standing and Subjective Well-Being in South Africa: The Role of Perceptions, Expectations and Income Mobility. *Social Indicators Research, 104*(2), 195-223.

Powdthavee, N. (2003). Is the Structure of Happiness Equations the Same in Poor and Rich Countries? The Case of South Africa. The Warwick Economics Research Paper Series. Department of Economics: University of Warwick.

Powdthavee, N. (2005a). Unhappiness and Crime: Evidence from South Africa. *Economica, 72*, 531-547.

Powdthavee, N. S. (2005b). *Are There Regional Variations in the Psychological Cost of Unemployment in South Africa? Evidence from Saldru93.* Chapter of Ph.D. Thesis. Department of Economics: University of Warwick.

Putnam, R. (2001). Social Capital: Measurement and Consequences. *Canadian Journal of Policy Research, 2*(1), 41-51.

Quoidbach, J., Dunn, E. W., Petrides, K. V., & Mikolajczak, M. (2010). Money Giveth, Money Taketh Away: The Dual Effect of Wealth on Happiness. *Psychological Science, 21*(6), 759–763.

Ravallion, M., & Lokshin, M. (1999). Subjective Economic Welfare. World Bank. World Bank Policy Research Working Paper WPS2106.

Rojas, M. (2008). Experienced Poverty and Income Poverty in Mexico: A Subjective Well-Being Approach. *World Development, 36*(6), 1078-1093.

Saraceno, B., & Barbui, C. (1997). Poverty and Mental Illness. *Canadian Journal of Psychiatry, 42*(3), 285-290.

Scheier, M. F., & Carver, C. S. (1987). Dispositional Optimism and Physical Well-Being: The Influence of Generalized Expectancies on Health. *Journal of Personality, 55*, 169-210.

Schell, C. O., Reilly, M., Rosling, H., Peterson, S., & Ekström, A. M. (2007). Socioeconomic Determinants of Infant Mortality: A Worldwide Study of 152 Low-, Middle-, and High-Income Countries. *Scandinavian Journal of Public Health, 35*(3), 288-297.

Sengupta, N. K., Osborne, D., Houkamau, C. A., Hoverd, W. J., Wilson, M. S., & Greaves, L. M. (2012). How Much Happiness Does Money Buy? Income and Subjective Well-Being in New Zealand. *New Zealand Journal of Psychology, 41*(2), 21-34.

Spurgeon, A., Malcolm Harrington, J., & Cooper, C. (1997). Health and Safety Problems Associated with Long Working Hours: A Review of the Current Position. *Occupational and Environmental Medicine, 54*, 367-375.

Statistics South Africa. (2011). *General Household Survey, 2011*. Pretoria: Statistics South Africa.

Stutzer, A., & Frey, B. (2006). Does Marriage Make People Happy or Do Happy People Get Married? *The Journal of Socio-Economics, 35*, 326-347.

Veenhoven, R. (1988). The Utility of Happiness. *Social Indicators Research, 20*, 333-354.

Veenhoven, R. (1991). Is Happiness Relative? *Social Indicators Research, 24*, 1-34.

Veenhoven, R. (1996). Happy Life Expectancy: A Comprehensive Measure of Quality-of-Life in Nations. *Social Indicators Research, 39*(1), 1-58.

Wagstaff, A. (2000). Socioeconomic Inequalities in Child Mortality: Comparisons across Nine Developing Countries. *Bulletin of the World Health Organization, 78*(1), 19-29.

Winkelmann, L., & Winkelmann, R. (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica, 65*(257), 1-15.

Yip, W., Subramanian, S. V., Mitchell, A. D., Lee, D. T., Wang, J., & Kawachi, I. (2007). Does Social Capital Enhance Health and Well-Being? Evidence from Rural China. *Social Science & Medicine, 64*, 35-49.

Appendix

Table A. Ordered probits of subjective well-being with cluster fixed effects

	Subjective well-being category (I)		Subjective well-being category (II)	
	Coefficient	*SE*	*Coefficient*	*SE*
Individual characteristics				
African	-0.185***	0.053	-0.088	0.075
Coloured	0.294***	0.055	0.039	0.082
Asian	0.351***	0.085	0.000	0.128
Male	0.020	0.024	0.001	0.025
Age 26 - 35	-0.124***	0.033	-0.151***	0.035
Age 36 - 45	-0.102**	0.038	-0.120**	0.039
Age 46 - 55	-0.109**	0.042	-0.142**	0.044
Age 56 - 65	0.014	0.048	0.008	0.050
Age 66 and older	0.166**	0.063	0.158*	0.066
Household head	-0.048	0.027	-0.024	0.028
Years of schooling completed	0.010**	0.003	0.014***	0.004
Not economically active	0.031	0.028	0.043	0.030
Unemployed, searching for work	-0.156***	0.036	-0.184***	0.038
Unemployed, not searching	-0.130**	0.044	-0.173***	0.047
Married	0.066*	0.030	0.075*	0.031
Cohabiting	0.033	0.039	0.028	0.041
Divorced or widowed	-0.016	0.042	-0.036	0.043
Health status is excellent/very good	0.374***	0.044	0.370***	0.047
Health status is good/fair	0.226***	0.042	0.263***	0.044
Difficulty with daily care	-0.241***	0.062	-0.213**	0.067
Household characteristics				
Number of household residents	0.014	0.007	0.016*	0.008
Number of children < 15 years	0.018	0.012	0.013	0.013
Number of pensioners > 64 years	0.000	0.026	0.009	0.028
Number of durable goods	0.032***	0.004	0.034***	0.004
Death of a household member	-0.036	0.033	-0.049	0.035
Urban	0.022	0.027		
Social capital variables				
Religious activities are important	0.068	0.036	0.049	0.038
Member of a group	0.089***	0.023	0.062*	0.025
Owns a cellular telephone	0.140***	0.024	0.157***	0.025
Neighbours help out	0.149***	0.022	0.135***	0.024
Neighbours are aggressive	-0.038	0.028	-0.019	0.030
Crime in the neighbourhood	-0.058*	0.024	-0.030	0.027
Trust neighbour to return wallet	0.115***	0.028	0.234***	0.032
Trust stranger to return wallet	-0.029	0.037	-0.125**	0.038
Income variables				
Per capita monthly household income	0.000***	0.000	0.000***	0.000
(Per capita monthly household income)^2	-0.000*	0.000	-0.000	0.000
Richest third	0.229***	0.038	0.223***	0.042
Middle third	0.200***	0.028	0.198***	0.030
Cluster dummies	No		Yes	

Number of observations	10575	10575
Pseudo R^2	0.0770	0.1200
Log-pseudolikelihood	-14956.02	-14259.22

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults over the age of 17. Province dummies are included but not reported. *** Significant at 0.1%, ** Significant at 1%, * Significant at 5%