Influence of capital elements on happiness in South Africa

Fathima Danka

216003570

2024

School of Accounting, Economics and Finance

Supervisors: Prof. Darma Mahadea and Dr. Ralitza Dobreva

This dissertation is submitted in fulfilment of the requirements of the Master of Commerce degree in Economics

Declaration

I, Fathima Danka, declare that:

(i) The research reported in this dissertation, except where otherwise indicated, is my original research.

(ii) This dissertation has not been submitted for any degree or examination at any other university.

(iii) This dissertation does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

(iv) This dissertation does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:

a) their words have been re-written but the general information attributed to them has been referenced:
b) where their exact words have been used, their writing has been placed inside quotation marks, and referenced.

(v) This dissertation does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the dissertation/thesis and in the References sections.

Signature: 

Date: 12 July 2024

Supervisor's permission to submit for examination

Student name: Fathima Danka
Student no: 216003570

Dissertation Title: **Influence of capital elements on happiness in South Africa**

As the candidate's supervisors, we agree to the submission of this dissertation for examination. Based on the Turnitin report and to the best of our knowledge, the dissertation is primarily the student's work, and she has acknowledged all the sources she has used.

Names of Supervisors: Darma Mahadea Ralitza Dobreva

Signatures:  

Date: 12 July 2024

Acknowledgements

I am immensely grateful to the Almighty for blessing me with the opportunity to pursue this degree and for granting me the courage and strength to complete this dissertation.

I am deeply indebted to my supervisors, Professor Darma Mahadea and Dr Ralitza Dobreva, whose vast knowledge, experience, and continuous guidance played an essential role in the writing and completion of this dissertation. I truly appreciate their time, patience, kindness, and constructive feedback at every stage of this study. They went the extra mile by motivating and helping me to overcome the challenges I have faced during this long and difficult journey. The level of commitment and understanding exhibited by both of them is exemplary. I am blessed and privileged to have had the opportunity to work under their supervision and learn from them.

I would like to express my heartfelt gratitude to Professor Claire Vermaak for her consistent guidance and support. She went out of her way to organise research cohort sessions and conduct workshops for Masters in Economics students. She has also always been ready to assist with any data-related, or administrative queries. I sincerely appreciate how she selflessly provided her time whenever I required her assistance.

I am also grateful for the valuable insights that I received at the research cohort sessions. The constructive criticism, supportive comments, and suggestions have contributed to the refinement of this study.

I am not capable of articulating my gratitude to my mother for her unwavering love, support, understanding, endless sacrifices, and prayers throughout my academic journey. She instilled in me the value of education, hard work, and determination. She always encouraged me to give off my best in everything I do and relentlessly pursue my goals, and dreams.

I would also like to extend my gratitude to my siblings for: their tireless support, always lending an ear when needed, and having staunch faith in me and my capabilities. I will forever be grateful.

A special mention to my late father (may the Almighty grant him the highest stages in Paradise), whose memory serves as a source of inspiration, motivation and strength.

Abstract

Happiness is a universal goal sought after by individuals and policymakers. Most studies on happiness have been conducted in developed countries and have examined life satisfaction primarily from the perspective of financial wealth. However, not many studies have been conducted in developing countries and in the economic context of a broader capital set. Hence, this study investigates the influence of financial, human, and social and spiritual capital on happiness, in the context of South Africa, as a post-apartheid developing economy. South African nationally representative data pertaining to capital elements and individuals' socio-economic attributes are extracted from the second wave of the National Income Dynamics Study (NIDS), conducted in 2010/2011.

The study initially uses Principal Component Analysis (PCA) to measure financial, human, and social and spiritual capital as latent variables. After assessing the reliability of the capital factors and the model fit, a measure for each of the three types of capital is generated based on the PCA results. An ordered probit model is then adopted to determine the influence of the diverse capital elements on happiness, controlling for age, race, gender, employment status, type of region where the individual resides, and the number of children under 7 years of age, who live in the individual's household.

The PCA results show that the financial capital index is closely related to household income per capita, household expenditure per capita, and the ownership of durable assets. The human capital index is strongly linked to literacy in English, educational attainment, and computer literacy, while the social and spiritual capital index is rooted in the relations inside and outside the household, reflected in experiences of violence and crime in the neighbourhood, as well as in trust.

The ordered probit regression results indicate that statistically significant positive relationships exist between all capital elements and happiness. Human capital has the strongest relationship with happiness, followed by financial, and social and spiritual capital. Overall, the results suggest that all diverse capital elements can make a difference in enhancing people's happiness.

Keywords: capital elements, happiness, principal component analysis, ordered probit regression

Contents

List of Tables

List of Figures

List of Abbreviations

GDP - Gross Domestic Product

KMO - Kaiser-Meyer-Olkin measure of sampling adequacy

NIDS - National Income Dynamics Study

OLS - Ordinary Least Squares

PCA - Principal Component Analysis

PWI - Personal Wellbeing Index

SDGs - Sustainable Development Goals

SWB - Subjective Well-Being

VIF - Variance Inflation Factor

Chapter 1: Introduction

1.1 Background

The pursuit of happiness is a universal and fundamental human goal (United Nations, 2015). Everyone wants to be happy and lead a flourishing life (Mahadea and Kaseeram, 2020). However, not all of us are happy in South Africa, despite an increase in personal income resulting from real gross domestic product (GDP) expansions over time, since democracy in 1994 (Mahadea and Kaseeram, 2020). In the past, happiness has been studied by economic philosophers, like Socrates, Plato, and Jeremy Bentham, and by psychologists, like Martin Seligman (Schultz, 2017; Awaludin, 2017). It has also attracted the attention of Behavioural Economists, including Nobel Prize winners in Economics, such as Amartya Sen and Daniel Kahneman (Sen, 1993; Kahneman, 2000). The search for life satisfaction is expanding. The quality of relationships that people have and their interactions with others in a given environment, as well as materialism in terms of income, asset acquisition, GDP expansion, and employment or unemployment, have a bearing on life satisfaction (Lane, 2000; Putman, 2001; Schoon *et al.,* 2005; Graham, 2008; Mahadea and Rawat, 2008; Møller and Radloff, 2010; Layard, 2011; Posel and Casale, 2011; Howell *et al.,* 2013; Mahadea, 2013; Mankiw, 2015). While the influences on people's happiness are complex and multi-causal, one is interested in understanding the differentiating aspects of capital on happiness in South Africa. This is an area that has not been addressed in previous South African studies.

1.1.1 What is happiness?

Happiness is a construct that is not reduced to a single definition or meaning (Dutt and Radcliff, 2009). It is somewhat like an individual's temperature that is consistently there and fluctuates, irrespective of whether the individual thinks about it or not (Layard, 2011). Happiness means that an individual feels good, enjoys life, and wants the feeling to prolong (Layard, 2011).

Some economists view happiness as a concept that is not distinct from satisfaction or welfare (Bruni and Porta, 2007). Oswald (1997) defined happiness as pleasure and satisfaction. Easterlin (2001) uses the following terms interchangeably for happiness: satisfaction, subjective well-being (SWB), well-being, utility, and welfare. Ng (2006)

regards happiness as ‘welfare’. Dolan (2015) asserts that happiness is the experience of pleasure and purpose over time. Empirically happiness is measured by means of questionnaires where people are asked to evaluate their life satisfaction, and self-rate their happiness (Layard, 2011). Individuals who claim that they are happy or unhappy are the best judge of their own happiness. Consistent with the literature, this approach would be taken in the current study; accordingly, the terms ‘life satisfaction’ and ‘SWB’ would be used interchangeably for happiness. As Layard and Ward (2020, p. 25) put it, “life satisfaction is ‘happiness’, but by all means think of it as ‘wellbeing’, or ‘quality of life’”. If one wants to build a happier South African society, one needs to know how happiness is experienced, partly through some form of self-rating measurement, and how to produce creators of happiness. Life satisfaction and well-being is often driven, not simply by moral behaviour but also, by the acquisition of wealth and capital elements. This study will probe some of the capital elements as predictors, that may allow us to live happier lives.

1.1.2 What are the capital elements?

Although, historically, economists considered capital to include financial flows or assets, Becker (1975) expanded the concept of capital to incorporate human capital. Other authors have broadened it further to encompass social and spiritual capital (Bourdieu, 1986; Coleman, 1990; Putnam, 2000; Layard, 2011).

Capital, in the form of income, is earned from employment when labour receives a wage or salary for their contribution to productivity, and when the self-employed individuals earn a reward for their entrepreneurial efforts. This is an aspect of financial capital. Going by the productivity and empowerment theories, more income is likely to be earned if one is educated and skilled and one has greater capabilities than others. This is an aspect of human capital (Becker, 1975; Sen, 2010; Todaro and Smith, 2020). The income earned enables individuals to spend on goods and services, from which they gain utility and satisfaction. Labour works in a firm, and when not at work, he consumes leisure in the midst of family relationships, friends, and community participation. These relationships within the family-community and at work within the firm, as well as the ethical or moral aspects of one’s conduct constitute the social and spiritual capital, which has a bearing on individual happiness (Layard, 2011).

The significance of research on happiness will be discussed in the next section.

1.2 Significance of happiness research

In 2015, South Africa and 192 other countries (all 193 member states of the United Nations) adopted the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs), and 169 targets (Statistics South Africa, 2019; United Nations, 2022; United Nations Development Programme, 2024). It is worth noting that only approximately 1.026% of the countries in the world did not adopt the 2030 Agenda for Sustainable Development (Worldometer, 2024). The SDGs are a universal call to action to end poverty and hunger, protect the planet by confronting the climate crisis, and ensuring that everyone enjoys peace and prosperity within the next ten years (United Nations, 2022; United Nations Development Programme, 2024). The search for happiness embodies the spirit of the 2030 Agenda (United Nations, 2015).

Research on happiness is beneficial, as it enables policymakers to assess whether people are living a more contented life over time, with annual GDP expansions and policy measures in support of economic development. They need to evaluate the success of previous policies and goal attainments and develop policy interventions that are intended to increase society's happiness, to ultimately improve people's lives (Veenhoven, 2002; Helliwell, 2003). Indeed, as Bernanke (2012) asserted "the ultimate purpose of economics, of course, is to understand and promote the enhancement of well-being."

The motivation for this study will be discussed in the next section.

1.3 Motivation for the study

Although it is generally accepted that the elements of capital all have a bearing on happiness, most previous studies only looked at material aspects of well-being (Clark and Oswald, 1994; Kenny, 2005; Rule, 2007; Posel and Casale, 2011; Mahadea, 2013; Ebrahim *et al.,* 2013; Botha, 2014; Kollamparambil, 2020). The relative strengths of the links between the different elements of capital and happiness were not probed, and are therefore not well understood. Hence, this study focuses on capital elements at the individual level and investigates which aspects of capital are more important in generating happiness.

Understanding the generation and impact of each capital element can help a firm (as mentioned previously, the relationships one has at work within the firm also have a bearing on individual happiness) and policymakers to design appropriate measures to improve citizens' life satisfaction. Separating factors that are significant from those which are not, can help policymakers to channel resources into factors that are significant, and not waste them, given the scarcity of resources. Furthermore, factors with a stronger influence may overshadow those with a weaker influence and mislead interpretation of the results. Hence, there is a need to evaluate different elements of capital on happiness separately.

Veenhoven (1988) provides the following reasons as to why a society with happy citizens is likely to prosper to a greater extent in contrast to a society with unhappy citizens: (1) politically, happy citizens are more concerned about social issues and zealous in their stance, (2) economically, happy citizens tend to be healthier, productive and diligent, and (3) socially, happy citizens have healthy family relationships, consequently laying the foundation for a sane and progressive society. Further, the experience of belonging and bonding in a safe environment are critical for a happy life (Layard and Ward, 2020).

Hopefully, a nation with happier citizens can have fewer crimes, more harmonious relationships in society and within the firm, and better value-adding to GDP. This is much needed for income and employment generation in post COVID-19 South Africa.

The research problem will be presented in the next section.

1.4 Research Problem

According to the most recent data, South Africa's Gini coefficient stands at 0.67, making it the most unequal country in the world (World Bank, 2022a; World Bank, 2022b; World Bank, 2024a). Except for 2009 (recession period) and 2020 (COVID-19 period), the country has consistently experienced positive economic growth rates since the end of apartheid in 1994. With this democratic dividend and output expansion, there has also been an increase in real per capita income, from R42849 in 1994 to over R56000 in 2020 (Mahadea and Kaseeram, 2018; Mahadea and Kabange, 2022). The rising income has enabled people to buy more consumable and durable assets, consume more goods and services, enjoy a better quality of life, and

increase their happiness, particularly for those in employment. However, with the increased wealth, South Africa has also seen a rise in income inequality (World Bank, 2022c). People are less happy in countries with greater income inequalities (Ingram, 2013).

The World Happiness Report, published by the United Nations Sustainable Development Solutions Network is a landmark survey of the state of global happiness (Helliwell *et al.,* 2018; 2019; 2020). It ranks countries by how happy their citizens perceive themselves to be (Helliwell *et al.,* 2019; 2022). In terms of global rank on life satisfaction, South Africa's position has increased from 96 to 83 (Table 1.1) during the 2013-2023 period (Helliwell *et al.,* 2013; 2024).

Table 1.1. South Africa's Ranking of Happiness

Year	Ranking
2013	96
2024	83

Source: Own compilation from Helliwell *et al.,* 2013; Helliwell *et al.,* 2024

Notes:

Country Rankings of Happiness according to the World Happiness Report 2013 can be found in Appendix A (see Table A.1).

Country Rankings of Happiness according to the World Happiness Report 2024 can be found in Appendix A (see Table A.2).

As the goal of development is to enhance the quality of life and the SWB of individuals in any society, it is imperative to look at how individuals can be happier in the current economic context. Happiness is important for human flourishing. This study investigates whether a possession of broad capital elements can make a difference to enhancing individual happiness, and which elements of capital have a greater influence in generating individual happiness. This will guide individuals and policymakers on how to allocate and use capital resources to enhance happiness.

The aims and overall objectives of this study will be discussed in the next section.

1.5 Overall Objective and aim

In light of the above discussion, the overall objective of this study is to examine the relationship between capital elements and subjective happiness in South Africa. This study aims to answer the following question:

1. What is the relationship between capital elements (i.e. financial capital, human capital, social capital, and spiritual capital) and happiness in South Africa?

Finally, the organisation of this study is presented in the next section.

1.6 Organisation of the study

After the introductory chapter, Chapter 2 will cover a review of the literature on the different schools of thought on happiness, with a focus on the economics school. Chapter 3 will discuss the empirical literature, covering the key methods and findings of some empirical studies that are relevant to the relationship between capital elements (financial capital, human capital, social capital, and spiritual capital) and happiness. Chapter 4 will present a description of the National Income Dynamics Study (NIDS) Wave 2 dataset utilised in this study, followed by the data collection and sample, variables extraction and methods of analysis, and descriptive statistics. Chapter 5 will present a description and justification of Principal Component Analysis (PCA), followed by the presentation and discussion of the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) test and PCA results for each capital element. Chapter 6 will cover the ordered probit regression model, a justification for its use, followed by the presentation and discussion of the ordered probit regression and marginal effects results, predicted probabilities results, and detection of multicollinearity results. Chapter 7 concludes this study with a discussion of the overall findings and policy implications regarding the enhancement of happiness. A brief discussion of the study's limitations and suggestions for future research will also be presented.

Chapter 2: Views of different schools of thought on happiness

Introduction

Happiness is a multi-disciplinary component of one's life. It has attracted the interest of researchers in economics and other disciplines, such as psychology and philosophy. In the past, philosophers had a major research interest in the nature of happiness because of their moral concerns for human flourishing (Bruni and Porta, 2007; Coyle, 2012). In recent times, the 'science of happiness' has gained interest among neuroscientists, social scientists, politicians, and the public (Bruni and Porta 2007; Dutt and Raddcliff, 2009; Layard, 2011; Mahadea, 2014). As the study is on economics, happiness, anchored in the economics school of thought, is the focus of this chapter.

This chapter consists of six sections. The first two sections will briefly discuss the philosophical school (Aristotle, Socrates and Plato) and the psychological school of thought (positive psychology and set point theory) on happiness. The third section will discuss the economics school of thought (including the ideas of Adam Smith, John Maynard Keynes, and Richard Easterlin) on happiness. The fourth section will discuss the utilitarian school of thought on happiness. The fifth section will present a synthesis, and the last section will conclude the chapter.

2.1 Philosophical

2.1.1 Aristotle

The pursuit of happiness is a universal human goal; hence, Aristotle asserts that women and men pursue happiness above everything (Csikszentmilalyi, 1997). While we pursue happiness for its own sake, we also desire and value other goals, such as health, power, and money, because we expect that they will contribute to our happiness (Csikszentmilalyi,1997; Ahuvia, 2008). Aristotle's thesis on happiness is known as *eudaimonia*, a process of doing good or virtuous activities for human flourishing as an ultimate goal of happiness (Crespo and Mesurado, 2015). Happiness in a *eudaimonic* perspective is a matter of trying to live our lives well by expanding our capabilities for a worthwhile goal (Annas, 2011). Aristotle's reasoning is that every human activity is done with the aim of attaining the highest good - happiness (Leonard, 2019).

According to Dolan (2015), a good life is viewed as meaningful and well-lived if it is associated with the attainment of personal objectives, contentment, pleasure, and other positive feelings. These positive feelings constitute a hedonic aspect of life, described by Layard (2011), as enjoying life, feeling good and wanting the good feeling to be maintained. At a broader level, a person is labelled as a hedonist if he prefers pleasure rather than meaning (Dolan, 2015). However, according to Aristotle, hedonism does not lead to enduring happiness and fulfilling lives (Layard, 2011). Aristotle states that individuals will be on the path to virtue and happiness when they find greater pleasure in giving than selfishness (O'Toole, 2005).

2.1.2 Socrates and Plato

Socrates believes that the soul, afterlife, virtues, and moral realism influence happiness (Beebe, 2003). Socrates and his student Plato, a classical Greek philosopher, perceived happiness as "secure enjoyment of what is good and beautiful" (Plato, 1999, p. 80; Weil, 2011; Craig, 2019).

To Plato, the best life is the one whereby an individual is chasing the pleasure of exercising intellectual virtues (Craig, 2019). Socrates (viewed through the lens of Plato) promotes the following ideas concerning happiness:

- every individual naturally yearns for happiness,
- happiness can be obtained and taught through human effort,
- happiness is directive and not addictive since it does not depend on external goods, but it depends on how we use the external goods (i.e. wisely/unwisely),
- happiness is dependent on the "education of desire" by which the soul discovers how to harmonise its desires by redirecting its gaze away from physical pleasures to the love of knowledge and virtue,
- it is impossible to have happiness without having virtue and vice versa,
- the pleasure that is obtained from pursuing knowledge and virtue are of a higher quality than the pleasures that are obtained from satisfying meagre animal desires, and
- pleasure is an essential aspect of exercising virtue in life; therefore, it is not the aim of existence (Pursuit of Happiness, 2024a).

According to Plato there is a “hierarchy of virtues”, and truly ‘excellent’ individuals possess many virtues that contribute to their happiness (Malloch, 2010). However, virtue-oriented thinkers recognise that they may not be able to see their best ideas, plans or rules through, without possessing the personal character to persevere until the end (Malloch, 2010).

Socrates believes that no one can cause any real harm to you besides yourself, since you have control over becoming either evil or virtuous (Beebe, 2003). When someone harms you, they are harming themselves (their souls) more since they are doing something evil whereas you, the person that they are harming, retain all your virtues (Beebe, 2003).

2.2 Psychological

2.2.1 Positive psychology

Martin Seligman, a pioneer of positive psychology, asserts that happiness has three dimensions that can be developed through:

1. the pleasant life - a life that effectively pursues positive emotions about the past, present and future,
2. the good life - a life where one uses his/her “signature strengths” to acquire abundant gratification in the main realms of his/her life, and
3. the meaningful life - a life where one uses his/her “signature strengths” and virtues in the service of something much bigger than they are (Pursuit of Happiness, 2024b).

Seligman argues that of the three dimensions, the pleasant life is the least significant, even though it is human nature to pursue pleasure (Mahadea and Kaseeram, 2020). According to Seligman one may live a meaningful life even when their pleasant feelings are low, and although one may experience many pleasant feelings one may not necessarily experience lasting happiness (Diener and Biswas-Diener, 2008).

Seligman found that the most content and optimistic individuals were those who had discovered and exploited their distinctive combination of “signature strengths”, such as perseverance, temperance, and humanity (Pursuit of Happiness, 2024b). Other studies have shown that the happiest individuals are those who dedicate their lives to serving humanity rather than only caring about themselves (Weil, 2011). Seligman

asserts that living an engaged and meaningful life may not always make us feel happy in the short run; however, it will bring lasting happiness in the long run (Diener and Biswas-Diener, 2008).

2.2.2 Set point theory

Psychologists believe that every person has a “setpoint of happiness” determined by personality and genetics (Easterlin, 2003; Easterlin, 2004). A person may deflect above or below their “setpoint of happiness”, due to life events, such as loss of a loved one or marriage, but over time they will return to the initial level (Easterlin, 2003). This adjustment process is known as “hedonic adaptation” (Easterlin, 2003; Easterlin, 2004).

The set point theory implies that social or economic policy may be futile if the aim is to increase the level of happiness (Easterlin, 2003). Thus, measures taken to improve social or economic conditions will only have a temporary effect on happiness, because each person will eventually return to their “setpoint of happiness” (Diener and Lucas, 1999; Easterlin, 2003).

2.3 Economics

2.3.1 Adam Smith

Adam Smith argues that an individual’s happiness depends on circumstantial and internal influences (Mueller, 2015). Circumstantial factors relate to “what can be added to the happiness of the man who is in health, who is out of debt, and has a clear conscience” (Smith, 1759, p. 45). Smith suggests that once an individual meets these three conditions, any addition to their happiness would be relatively small compared to what they already have (Mueller, 2015). Internal factors relate to tranquillity. Tranquillity means having a conscience and peaceful state of mind where one’s happiness is relatively independent of one’s circumstances. Therefore, one can be happy when morally one acts correctly (Mueller, 2015).

Adam Smith asserts that without internal “tranquillity” it is almost impossible to derive happiness from anything, including consumption (Mueller, 2017). He states that people’s relentless desires, constant anxiety and fear prevent them from attaining tranquillity, which are significant elements of unhappiness (Rasmussen, 2006). Smith

believes that individuals will constantly want more than they have, because their primary desire is social status (Rasmussen, 2006). However, economic theory has recognized the limitation of the “the more we have the better off we are” view, since having more of something generally does not provide more happiness (Jackson, 2010).

Adam Smith states that “all constitutions of government, however, are valued only in proportion as they tend to promote the happiness of those who live under them” (Smith, 1759, p. 185). Therefore, he judges a government by the extent to which it promotes its people’s happiness (Rasmussen, 2006). Smith proposed that leaders should play a role by securing the internal tranquillity and happiness of their fellow-citizens (Mahadea and Kaseeram, 2020).

Taking a moral stance to happiness, Adam Smith holds that it is necessary for everyone to develop the following three virtues: (1) prudence - taking care of ourselves by not eating and drinking excessively and making wise choices in all areas of our lives, (2) justice - not to hurt others, for example, by gossiping and lying, and (3) beneficence - being kind to other people (Irwin, 2014). Smith argues that happy individuals have internal tranquillity, moral and virtuous behaviour, rewarding relationships with friends and family, and they are prudent, as they take care of themselves and do not harm others (Rasmussen, 2006; Mueller, 2017).

2.3.1.1 Adam Smith on wealth and happiness

Adam Smith in “*The Wealth of Nations*” reasoned that having more wealth contributes to happiness and encouraged individuals to pursue wealth ethically so that they may improve their conditions in a commercial society with division of labour (Mahadea, 2013; Matson, 2021). However, in “*The Theory of Moral Sentiments*” Smith repeatedly connects the pursuit of wealth with unhappiness, moral corruption, and self-deception (Matson, 2021). He argued that individuals have limited ability to attain happiness by obtaining material wealth through endless toil and anxiety (Rasmussen, 2006; Lee, 2006). However, like Aristotle, Smith added that wealth creation, with altruism can increase one’s likelihood of being happy, whereas gluttonous pursuits, such as fame, money, and status, eventually leave many individuals at risk of feeling lonely, unloved, and unhappy (Thiran, 2017).

Furthermore, when Smith spoke of the virtue of humanity in *"The Theory of Moral Sentiments"*, he stated that "the man who is himself at ease can best attend to the distress of others" (Smith, 1759, p. 153). This means that consumption and wealth are important, not only to improve one's own happiness, but also to enhance the happiness of other people through virtuous actions of sharing and altruism (Mueller, 2017). Adam Smith believes that poverty has a negative effect on happiness because poor individuals have insufficient income to meet their basic needs.

2.3.1.2 Adam Smith on consumption and happiness

In the Classical school, the purpose of production (supply) is consumption (demand), Further, in accordance with Say's law of markets, the processes involved in producing goods generate enough income for goods to be bought, and from which people derive utility and happiness. Smith argued that the enjoyment derived from producing and consuming within prudence and moderation, promotes happiness (Mueller, 2017). Furthermore, Smith criticises consumption that promotes "pleasures of vanity and superiority" instead of "tranquillity and enjoyment" because it does not promote happiness (Mueller, 2017).

<u>Consumption externality</u>

Some people engage in conspicuous consumption of Veblen goods – exclusive or expensive products that are purchased to impress other people (Mahadea, 2017). Their needs are dependent on the possessions that other people have; therefore, their needs grow when they are in the presence of other people who have more material possessions than them (Frank, 1997). However, when everyone increases their spending level, the higher spending level becomes the norm (Frank, 1997). These individuals toil and sacrifice the pleasures of leisure and family life, so they can earn and spend additional money on material possessions. However, since others do the same, their relative position does not change, and their level of happiness does not increase (Mahadea, 2017). Therefore, an individual's happiness is affected by the income or flashy consumption of other people (a form of negative externality or pollution) (Layard, 2006). The polluting activity is apparently related to poor people toiling excessively long hours at great risks to their health and relationships, so that they can purchase Veblen and positional goods, a consumption pattern in their quest to emulate the 'rich neighbours' (Mahadea, 2017). Frank (1997) argues that the same

resources that are used to produce luxurious or positional goods, such as exorbitantly priced cars and jewellery, should rather be used in alternative ways that bring about lasting increases in overall happiness.

2.3.2 John Maynard Keynes

Keynes's view on happiness is associated with the ethics of virtues (Carabelli, 2019). He drew a distinction between speculative ethics (good in itself) and practical ethics (good as instrument) (Carabelli, 2019). Keynes asserts that speculative ethics deals with 'final ends' (such as happiness) and intrinsically good values, whereas practical ethics concerns 'means' such as economics (Carabelli, 2019). Solving the economic problem (the fulfilment of an individual's basic needs) is merely a 'means' (a precondition) for addressing the 'real' ethical issues, which for Keynes, relates to the attainment of happiness (Carabelli, 2019).

According to Keynes, consumption is a function of income. People earn an income from work and spend it on consumption of goods and services, from which they derive utility. Since utility and happiness go together, more consumption expenditure tends to increase utility. A rational household who chooses to maximise utility can also maximise happiness. However, human desire for goods and services for consumption is boundless, and some needs can be insatiable (Mahadea, 2017). Keynes recognised this, adding that income matters for happiness, but to the extent that pressing material (absolute) needs remain unmet. Basic needs are independent of what other assets and goods other people have. Keynes thought that relative needs, rooted in a desire for superiority or status may be insatiable. Hence, like Aristotle, Keynes argued that people may not have lasting happiness from wealth or income inequalities unless there is virtuosity and ethicality in their conduct (Mahadea and Kaseeram, 2020).

2.3.3 Richard Easterlin

2.3.3.1 Easterlin Paradox

Sustainable economic growth tends to increase human welfare in various ways - it generates employment, income, output, and tax revenue for the state, that in turn facilitates redistribution (Department for International Development, 2008). Countries whose income are growing rapidly, like India and China now, can support the poorest

more generously than countries experiencing meagre growth. Does economic or income growth contribute to life satisfaction? The empirical results are mixed.

Richard Easterlin is perhaps the first modern economist who empirically examined the relationship between economic growth and nations' happiness, in the early 1970's (Graham, 2005). Easterlin's 1974 paper titled *"Does Economic Growth Improve the Human Lot?"* used time series and cross-sectional data for a number of countries to examine the relationship between real GDP per capita and self-reported happiness (Castriota, 2006). The comparison of statistically significant cross-sectional findings with statistically insignificant time series and cross-country findings brought about the Easterlin paradox (Stevenson and Wolfers, 2008). Easterlin reached the following findings: (1) there was a weak correlation between real GDP per capita and self-reported happiness across rich and poor countries, therefore average self-reported happiness across rich and poor countries appears to be the same, and (2) there was growth in national income; however average well-being remained almost the same, therefore economic growth does not raise well-being (Castriota, 2006; Abounoori and Asgarizadeh, 2013). This unexpected finding is known as the Easterlin paradox (Castriota, 2006). In short, the Easterlin Paradox states "that at a point in time happiness varies directly with income both among and within nations, but over time happiness does not trend upward as income continues to grow" (Economic and Social Research Council, 2022).

Easterlin in his 1974 paper claimed that people compare their income with compatriots to evaluate their lives (Diener *et al.,* 2009; Veenhoven, 2013). Based on this claim, he argues that happiness is relative - it depends on comparative standards rather than absolute living conditions; hence, differences in income between nations do not bring about differences in happiness (Diener *et al.,* 2009; Veenhoven, 2013). On the other hand, he states that individuals seem to primarily compare their own standards with other individuals in their home country and not in the richest countries in the world (Headey and Wearing, 1992). Therefore, the view that "well-being depends on material standards of living" is to a reasonable degree true (Headey and Wearing, 1992).

Furthermore, Easterlin argued that if economic prosperity contributes to happiness, then one would assume that there is an association with economic growth (Veenhoven, 2013). He showed that within countries income has a positive influence

on happiness, but economic growth in developed countries has not been accompanied by an increase in the level of happiness over time (Posel and Casale, 2011). Easterlin uses this observation as an additional argument for his claim that “happiness is essentially relative” (Veenhoven, 2013). The link between relative income and well-being was also highlighted by Posel and Casale (2011). The general finding from the happiness studies is that absolute income does matter; however, Posel and Casale (2011) found that relative income, compared to other people, has a more important influence on happiness. The conclusion that absolute income does not have a significant influence on happiness has extensive policy implications (Stevenson and Wolfers, 2008). Accordingly, Easterlin (1974) suggested that economic growth should not be government’s main policy goal if it does not have a significant positive impact on social welfare.

2.3.3.1.1 Critiques of the Easterlin paradox

Graham (2005, p. 47) noted that “a common interpretation of the Easterlin paradox is that humans are on a ‘hedonic treadmill’: aspirations increase along with income, and after basic needs are met, relative rather than absolute levels of income matter to well-being.” This hypothesis suggests that public policies and people will not be able to deliver long-term happiness gains because individual happiness inevitably returns to his/her “set point of happiness” (Stevenson and Wolfers, 2008). This hypothesis in its strong form and the Easterlin paradox have been refuted by other researchers, for instance by Stevenson and Wolfers (2008). Their study reassessed the paradox and found the following:

1. people who enjoy better material circumstances also enjoy greater happiness,
2. ongoing rises in standards of living have brought about a higher level of happiness,
3. happiness within a country increased during periods of economic growth and most rapidly increased during periods of more rapid economic growth, and
4. absolute income has a significant influence on rising happiness and relative income has a lesser influence on rising happiness (than what was previously hypothesised) (Stevenson and Wolfers, 2008). Therefore, there is a merit in economic growth and growth of income or capital for individuals’ and countries’ happiness in the long term (Stevenson and Wolfers, 2008).

2.3.3.1.2 Does the Easterlin paradox exist in South Africa?

The Easterlin paradox does not exist within a developing country context such as South Africa, which has the highest level of inequality in the world (World Bank, 2022c). Investigating happiness at the aggregate and individual levels in South Africa, using four waves of the NIDS, Kollamparambil (2020) confirmed that the happiness-income paradox does not exist in South Africa. If this is the case, there is seemingly a relationship between income growth and happiness. This invalidates Easterlin's idea that there is no relationship between the economic development of a society and its average level of happiness (Castriota, 2006; Stevenson and Wolfers, 2008; Abounoori and Asgarizadeh, 2013).

2.3.4 Does money buy happiness?

The matter regarding whether "money buys happiness" or not is highly debatable (Headey and Wearing, 1992). Easterlin (1974) claimed that there is no relationship between the wealth of a country and its people's level of happiness. However, within one country, the rich people tended to have a higher level of happiness than the poor people (Headey and Wearing, 1992). As mentioned previously, Easterlin explains that this is due to people comparing themselves to others in their home country and therefore not making comparisons between countries (Headey and Wearing, 1992).

Individuals only anticipate happiness changing as their income increases (Ahuvia, 2008). Their psychological bias prevents them from anticipating their aspirations changing as their income increases; however, time after time, their aspirations change when their income increases (Ahuvia, 2008). Income growth generates equivalent growth in material goals (Easterlin, 2001). Income growth does not lead to an increase in the happiness level because the positive effect of income growth on happiness is offset by the negative effect of equivalent growth in material goals (Easterlin, 2001). Therefore, Easterlin argues that having more money will not make people happier (Ahuvia, 2008). Unlike in developing countries, it does not seem that a higher level of income will "buy" significantly more happiness in developed economies over time once a threshold income level is attained (Mahadea, 2013).

2.3.5 Richard Easterlin's 1995 paper

Easterlin updated his initial 1974 work on happiness in 1995 (Di Tella *et al.,* 2003). In his 1995 article, Easterlin disputed the assumed relationship between individual happiness and economic conditions and the degree to which economic conditions are of importance (Guo and Hu, 2011).

Happiness generally varies directly with one's income and inversely with other people's income (Easterlin, 1995). Easterlin recognizes that individuals who earn a higher income, on average, have a higher level of happiness; however, increasing everyone's level of income will not increase everyone's level of happiness, "because the material norms on which judgments of well-being are based increase in the same proportion as the actual income of the society" (Easterlin, 1995, p. 44). The negative effect of higher living levels resulting from the growth in incomes generally offsets the positive effect of higher income on happiness (Easterlin, 1995).

2.3.6 Richard Easterlin's 2001 paper

Relationship between income and happiness

Generally, empirical studies have found a statistically significant relationship between income and happiness; therefore, high-income earners are happier than low-income earners (Mahadea, 2017). Higher income levels may be used as a proxy for happiness since an increase in economic growth should bring about an increase in real income per capita (Mahadea, 2017). Therefore, more income and economic growth contribute to happiness. Economist Ng (1997), in the Economic Journal, writes we want more money, not for its own sake, but for what it can bring us in terms of happiness.

Table 2.1 below shows South Africa's GDP growth (annual %) and GDP per capita (current US$) according to the World Bank. South Africa's annual GDP growth increased from almost 0% in 1986 to 0.6% in 2023 and GDP per capita increased from 2,103.2 (current US$) in 1986 to 6,253.2 (current US$) in 2023 (World Bank, 2024b; World Bank, 2024c). This means that real income per head increased by 4150 (current US$) over the 37-year period. Therefore, economic growth increases an individual's real income and possibly happiness over time, assuming that other things are held constant (Mahadea, 2017). However, this may not always be the case when considering a greater time span (Mahadea, 2017). The relationship between growth in

income, material aspiration level and happiness varies over the life cycle (Easterlin, 2001; Mahadea; 2017).

Table 2.1. South Africa's GDP growth (annual %) and GDP per capita (current US$) according to the World Bank

Year	GDP growth (annual %)	GDP per capita (current US$)
1986	0	2,103.2
1991	-1	3,304.8
1996	4.3	3,654.9
2001	2.7	2,867.5
2006	5.6	6,139.6
2011	3.2	8,737
2016	0.7	5,735.1
2021	4.7	7,073.6
2023	0.6	6,253.2

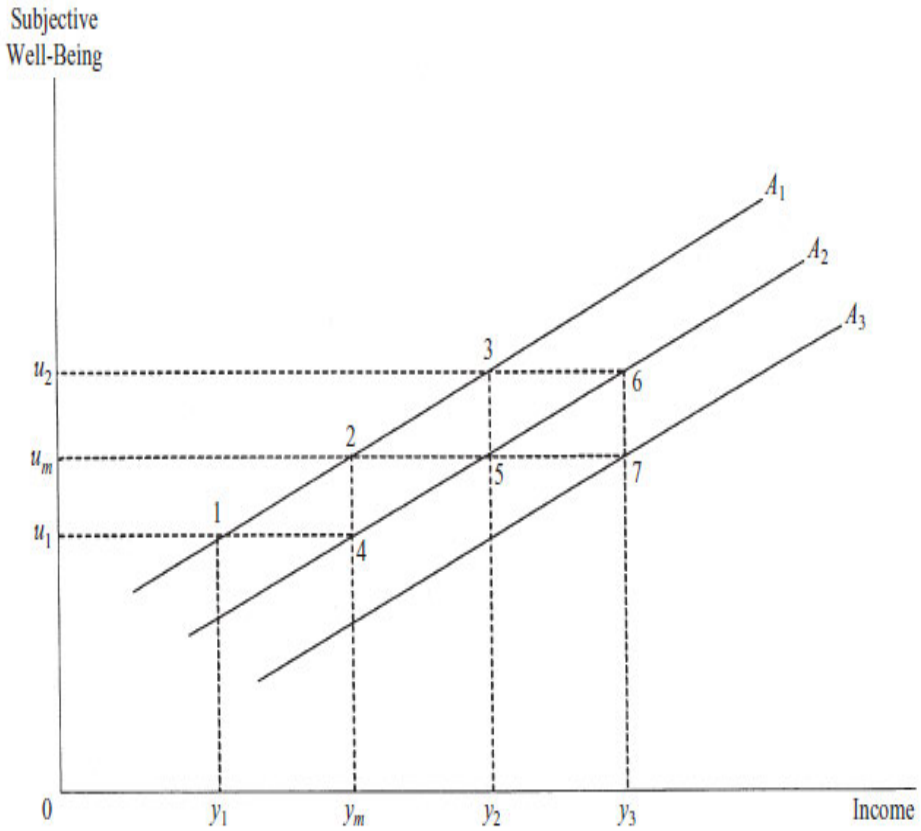
Source: Own compilation from the World Bank (World Bank, 2024b; World Bank, 2024c)

Easterlin's 2001 happiness economics literature survey showed that at the beginning of the adult life cycle, everyone has relatively similar material goals, however over the life cycle, people's material goals increase in proportion to income and the utility function shifts inversely with material goals (Easterlin, 2001; Abounoori and Asgarizadeh, 2013). At the beginning of the adult life cycle, everyone has relatively similar material goals, therefore individuals with higher income have a higher level of happiness and are more capable of fulfilling their goals (Easterlin, 2001). Income growth generates equivalent growth in material goals (Easterlin, 2001). Income growth does not cause the happiness level to rise for all individuals because the positive effect of income growth on happiness is offset by the negative effect of equivalent growth in material goals (Easterlin, 2001).

Easterlin reported that social class has a significant impact on individual happiness; however individual income increasing over the life cycle does not increase individual happiness (Ahuvia, 2008). This is possibly because variables other than one's consumption level, such as single-parent families and crime, may decrease the happiness level of poorer individuals (Ahuvia, 2008).

Figure 2.1 below considers how income and material aspirations vary at a point in time as well as over time (Easterlin, 2001).

Figure 2.1. Subjective Well-Being (u) as a function of Income (y) and Aspiration Level (A)



Source: Easterlin, 2001, p. 473

Subjective Well-Being (u) as a Function of Income (y) and Aspiration Level (A) is presented in Figure 2.1 above. Following Easterlin's reasoning, assume that at the beginning of the adult life cycle, individuals with their different income levels have a relatively similar material aspiration level, for instance, A1 (Easterlin, 2001; Mahadea, 2017). High-income earners would be more capable of fulfilling their aspirations and, ceteris paribus, will, in general, feel happier (Easterlin, 2001).

If an individual's income level rises and material aspiration level remains constant, for instance from y_m to y_2, then they will move from point 2 to point 3 and experience a higher level of happiness from u_m to u_2 (Easterlin, 2001; Mahadea, 2017).

On the other hand, if an individual's income level remains constant and material aspiration level rises, for instance from A_1 to A_2, then the level of happiness associated with a given income level diminishes (Easterlin, 2001; Mahadea, 2017). An individual with income level for instance, y_m, and a higher aspirational level, A_2 (point 4) would experience a lower level of happiness, u_1, whereas an individual with income level y_m and a lower aspirational level, A_1 (point 2) would experience a higher level of happiness u_m (Easterlin, 2001; Mahadea, 2017).

Easterlin (2001, p. 473) conjectured that "material aspirations change over the life cycle roughly in proportion to income." Therefore, individual's generally move from point 2 to point 5, since both the income and aspirations level rise, and there are offsetting effects on happiness (Easterlin, 2001). Therefore, rising income does not cause an individual's level of happiness to permanently rise, because it brings about equivalent growth in material aspirations (Mahadea, 2017).

2.3.7 Richard Easterlin's 2003 paper

Easterlin's 2003 study found the following:

1. the happiness level of individuals who enter into marriage is significantly higher than individuals who are not married,
2. the happiness level of married individuals (continuously married or remarried) remains significantly higher than others throughout the life cycle,
3. dissolution of marriage or divorce has a negative impact on happiness,
4. the mean happiness of unmarried women is significantly lower than those who are married, and
5. widowed, separated, or divorced individuals are significantly less happy than individuals who never enter into marriage (Easterlin, 2003). The same results were found by many other researchers too (Layard, 2011).

Marriage contributes to happiness by giving one an opportunity to escape the pressure and stress in other aspects of one's life (particularly work), providing one with support from their partner, and making one feel less depressed and lonely (Stutzer and Frey, 2006). Therefore, married individuals have better psychological and physical health compared to single individuals (Stutzer and Frey, 2006).

2.3.8 Richard Easterlin's 2005 paper

Easterlin's 2005 article accentuates that, based solely on social comparison of relative income, the rich have a higher level of happiness than the poor (Easterlin 2005a; Ahuvia, 2008). Easterlin also reviewed evidence that proposed that generally longitudinal data shows that happiness levels in the majority of the countries are effectively flat over time (Ahuvia, 2008). He concluded that "if national income is really generating a growth in happiness, why is it that countries with quite similar rates of economic growth have quite disparate trends in happiness, and that significant positive cases tend to be the exception, not the rule in countries with similar economic growth" (Easterlin, 2005b, p. 14). Easterlin suggested that instead of trying to feed the illusion that focusing on economic growth will create happiness, one must develop an "empirically tested causal model" that contains multiple influences of happiness such as health and relationships, not only material goods (Easterlin, 2005b, p. 15). Easterlin maintains that having insight of the sources of happiness will allow one to recommend effective policies (Easterlin, 2005b).

2.4 Utilitarianism

Jeremy Bentham, the pioneer of "utilitarianism", associates happiness with the moral and hedonic quality of human actions. He regards happiness as the "sum of pleasures and pains" (Veenhoven, 2010, p. 606). Bentham reasoned that pleasure is associated with good feelings for an individual and pain is associated with bad feelings (Layard, 2011; Dolan, 2015). Therefore, individuals are happy when generally they experience pleasure most of the time and infrequently experience pain (Dolan, 2015). According to Bentham, any policy or human action should be judged by its consequences on human happiness (Veenhoven, 2010). Accordingly, the Benthamine normative goal is the pursuit of the "greatest happiness for the greatest number" (Veenhoven, 2010, p. 606). Thus, when utilitarianism is applied to public policy, the principle holds that institutions, laws, and social measures should focus on advancing happiness, i.e. minimising pains, and maximising pleasures for society (Veenhoven, 2010; Layard, 2011). Utilitarian philosophers further emphasised that enabling the greatest possible freedom, without limiting any other person's freedom, paves the way to the "greatest happiness principle" (Veenhoven, 2013).

2.5 Synthesis

Happiness has been studied by different schools of thought. The ideas on happiness have also emanated from classical economists (for instance Adam Smith) to modern economists (for instance, Richard Easterlin and Richard Layard).

Easterlin's 1974 paper titled *"Does Economic Growth Improve the Human Lot?"* examined the relationship between real GDP per capita and self-reported happiness. The comparison of statistically significant cross-sectional findings with statistically insignificant time series and cross-country findings brought about the Easterlin paradox (Stevenson and Wolfers, 2008). In short, the Easterlin Paradox states "that at a point in time happiness varies directly with income both among and within nations, but over time happiness does not trend upward as income continues to grow" (Economic and Social Research Council, 2022). The Easterlin paradox has been refuted by other researchers, for instance, Stevenson and Wolfers (2008). Their study reassessed the paradox and found that there is merit in economic growth and growth of income or capital for individuals' and countries' happiness in the long term.

Concluding Remarks

This chapter provided valuable insights into the views of the philosophical, psychological, and economic schools of thought on happiness. As mentioned previously, the study is on economics, therefore happiness, anchored in the economics school of thought, is the focus of this chapter. Income, as a form of capital, is generally found to be a critical determinant of happiness in various settings. However, happiness is multi-causal and extends beyond just one form of capital. Furthermore, the relationship between economic growth and real income per capita in South Africa was briefly explored to provide context for this study.

The next chapter will discuss the empirical literature, methods, and findings of some empirical studies on the relationship between capital elements and happiness.

Chapter 3: Relationship between capital elements and happiness

Introduction

The previous chapter covered a review of the literature on the views of the different schools of thought on happiness. The purpose of this chapter is to discuss some empirical studies that investigated the relationship between capital elements (financial capital, human capital, social capital, and spiritual capital) and happiness.

This chapter consists of seven sections. The first section will discuss the literature and key methods and findings of some empirical studies on the relationship between financial capital and happiness. The second section discusses some studies on the relationship between human capital and happiness. The third and fourth sections discuss the same in relation to social capital and spiritual capital, and happiness. The fifth section discusses other happiness studies that are relevant to the relationship between capital elements and happiness. The sixth and seventh sections present the synthesis and conceptual framework respectively, and the last section will conclude the chapter.

Whilst there are no South African studies that specifically investigated the influence of capital elements separately on happiness, many have, however, probed into the material aspects of well-being. These are perhaps useful in complementing the relationship between capital elements and happiness, because the material aspects of well-being are possible sources of the different capital elements.

3.1 Relationship between Financial capital and happiness

Financial capital is defined as the credit, money and other forms of funding that creates wealth (Amadeo, 2021). Economic theory postulates that income, as a form of financial capital, has a significant impact on happiness, allowing people to gratify their needs, and feel satisfied with their life (Veenhoven, 1991). Individuals earning low levels of income may not be in a position to satisfy all their needs. Thus, for people suffering from relative poverty, earning additional income through ethical means can enable them to afford more goods and services, enhance their utility, and increase their happiness (Mahadea and Kaseerem, 2020).

Individuals with higher income generally have better mental and physical health, lower infant mortality rates, and encounter fewer stressful life events in contrast to individuals with lower income (Wilson *et al.,* 1995; Mayer, 1997a; Smith *et al.,* 1997; Diener and Biswas-Diener, 2002). Further, their children have a lower probability of becoming school dropouts or pregnant during their teenage years (Mayer, 1997b; Diener and Biswas-Diener, 2002).

Higher income is an economic variable that has a positive influence on happiness, but not much in the long term as people's aspirations change (Frey and Stutzer, 2002). Growth in income does not always guarantee a higher level of happiness in high-income countries, because people's aspirations change as they become richer. As their material wants and goals change over time, they need more income to meet their rising needs and 'keep up with the Jones' to be happy (Easterlin, 1995). Absolute income has an impact on happiness, but when basic needs are satisfied, relative income has a greater impact on happiness (Posel and Casale, 2011). The general finding is that absolute income has a small positive effect on happiness, whereas relative income has a large negative effect on happiness, as individual happiness is lower when the income of others is relatively higher (Posel and Casale, 2011).

Consumption is a function of income. However, according to Spilerman (2000) wealth could be a better indicator of a person's long-term consumption potential than current income. Needs theory claims that wealth increases SWB by enabling an individual to better satisfy his/her basic and higher-order needs (Howell *et al.,* 2013). People with more wealth may own more assets, such as cars, houses, household durable items, shares, and property. Asset ownership in turn may influence life satisfaction.

Christoph (2010) found that the relationship between wealth and happiness is stronger than the relationship between income and happiness. This is consistent with Heady *et al.* (2005) who concluded that wealth affects happiness more than income.

Wealthy individuals who have an overload of choice would be hesitant to give up any options. Holding on to all the available choices can contribute to anxiety, bad decisions, disappointment, stress, and unhealthy social comparisons, which ultimately decreases happiness (Easterlin, 2013; Schwartz, 2016). This is referred to as the paradox of choice (Schwartz, 2016; Mahadea and Kaseeram, 2020). Specifically,

people who have an abundance of choices change their consumption patterns for the purpose of social comparison and tend to become less happy as others purchase superior or similar items (Mahadea and Kaseeram, 2020). They tend to derive less happiness and feel more regret about the item that they purchased when others in their reference group have a superior item (Mahadea and Kaseeram, 2020).

Adam Smith argued that wealth creation with altruism increases the likelihood of being happy (Thiran, 2017). Similarly, Aristotle argues that an individual on the path of virtue and caring concern for others derives greater happiness and pleasure from giving than from selfish taking (O'Toole, 2005). To Aristotle, eudaimonic happiness, resulting from virtuosity and good ethical activities, has a more lasting effect on well-being than hedonic happiness, which is transitory. Hedonic enjoyment of life events ends once a product, for example, an ice cream, is consumed, or the joyous feeling from using a new product, for example, a new dress or new car, fades away soon after the novelty experience is over (Mahadea and Kaseeram, 2020).

The key methods and findings of some empirical studies that examined the relationship between financial capital and happiness will be discussed below. The first one is the study of Headey and Wooden (2004).

1.

Title, author(s), and year: Headey and Wooden (2004) examined "the effects of wealth and income on subjective well-being and ill-being"

Sampling frame: Data from the second wave of the Household, Income and Labour Dynamics in Australia (HILDA) Survey, conducted in 2002, was used (Headey and Wooden, 2004).

Methods of analysis: The authors used ordinary least squares (OLS) regression to analyse the data (Headey and Wooden, 2004).

Results: Wealth appears to matter to well-being and ill-being no less than income (Headey and Wooden, 2004). Overall, the results from their study suggest that wealth is more significant than income for well-being (Headey and Wooden, 2004).

2.

Title, author(s), and year: Kenny (2005) conducted a study titled “Does development make you happy? Subjective wellbeing and economic growth in developing countries”.

Sampling frame: The author empirically tested two of Ahuvia and Friedman’s (1998) arguments that suggested that there is a strong relationship between SWB and economic growth in less developed countries (Kenny, 2005). Results from surveys in India, Russia and Tanzania and studies that were conducted globally regarding the relationship between income and quality of life were used (Kenny, 2005). Thereafter data from Veenhoven (1999) was used to examine the relationship further, using a different (within rather than across the country) method than has been used previously to study the relationship between SWB and growth in developing countries (Kenny, 2005).

Methods of analysis: Firstly, correlation coefficients within a single country were calculated by using the average Gross National Product per capita and SWB scores for different years within that country (Kenny, 2005). Secondly, OLS regression analysis was used to examine the relationship between growth (independent variable) and SWB (dependent variable) (Kenny, 2005).

Results: (1) In the middle income countries, there is strong evidence of an association between economic growth and SWB, (2) in poorer countries there is at least some association between increases in income and increases in SWB, and (3) in all the low-income countries in the sample, there is a positive relationship between income and SWB - despite not being able to accurately test the influence of non-income factors due to the sparse data (Kenny, 2005).

3.

Title, author(s), and year: Mahadea and Rawat (2008) study titled “Economic growth, Income and Happiness: An exploratory study”

Sampling frame: The study involved a survey with the aid of a questionnaire, for data collection. The survey was conducted in the Pietermaritzburg area. The sample size was 200 employed individuals, aged 18 and above (Mahadea and Rawat, 2008). The questionnaire contained information related to respondents’ demographic data, their income level, happiness level, and perceived sources of individual happiness (Mahadea and Rawat, 2008).

Methods of analysis: Statistical Package for Social Sciences (SPSS) was used to analyse the data. Regression analysis, correlation, and ANOVA were used to examine the relationship between reported happiness and income (Mahadea and Rawat, 2008).

Results: (1) There is a significant and positive relationship between a higher level of absolute income and happiness, (2) males appear to have a slightly higher level of happiness compared to females, (3) an individual's level of happiness tends to increase as they age, (4) married individuals appear to have a higher level of happiness compared to divorced, single, and widowed individuals, (5) individuals who have better family relationships, and friendships have a high level of happiness, (6) there is a positive relationship between an individual's job environment and happiness, (7) there is an insignificant negative relationship between happiness and number of children, (8) there is an insignificant positive correlation between happiness and education level, and (9) there is a significant positive correlation between income and education level (Mahadea and Rawat, 2008).

The next section will discuss the literature and key methods and findings of some empirical studies that examined the relationship between human capital and happiness.

3.2 Relationship between Human capital and happiness

In Economics, the notion of human capital goes back to the times of Adam Smith and Irving Fisher in 1897 (Goldin, 2016). Individual human capital is the education, training, abilities, skills, and health of individual workers, whereas human capital of the economy is an aggregate, which is determined by national educational standards (Becker, 1975; Malloch, 2010; Goldin, 2016; Pettinger, 2019). The well-being of modern society depends on traditional capital, labour, knowledge, and ideas that individuals possess and apply to generate income, output, and wealth (Crocker, 2002).

Education is the primary source of human capital. The influence of human capital, in the form of education on happiness is rather mixed. There are two strands of literature regarding the influence of education on happiness (Botha, 2014). One strand suggests that generally education increases happiness, and the second argues that education,

particularly after a certain threshold level, may decrease happiness, as expectations may be unrealised (Botha, 2014).

Individuals who have higher education and skills, and more work experience, tend to have greater competencies. They are generally more productive, earn a higher income, are likely to purchase more, enjoy more consumption and utility, and are subjectively happier relative to those with less education or fewer skills (Sen, 2010; Mahadea and Ramroop, 2015). While income and education are directly related, education indirectly raises happiness through its impact on people's ability to earn (Layard, 2011).

According to Castriota (2006), education may increase an individual's level of happiness due to the following reasons: (1) they can appear in public without feeling any shame, (2) their expertise provides them with direct utility whereas the prestige of being educated provides them with indirect utility, (3) their acquired skills increase their probability of finding secured employment, and earning a good salary, (4) they can adapt better to changing work environments, and (5) they are able to adopt healthy life-style habits, which in turn positively influence their health and life satisfaction. This is consistent with Michalos's (2017) view that education is a worthwhile investment that can reduce long-term health care costs and permit the attainment of both health status and healthy lifestyles.

In a fast-growing economy, education increases earnings, opportunities, consumption, expectations, and aspirations. However, the impact of education on happiness depends on the comparison of the increase of real opportunities to individuals' aspirations (Ferrante, 2009; Salinas-Jiménez *et al.,* 2011). There may be a negative relationship between education and happiness due to the aspiration bias induced by education. Ferrante (2009) argues that education may generate regret when an individual's aspirations are greater than the opportunities. Furthermore, some highly educated individuals may be forced to take up low-paying employment because of lack of opportunities. Higher educational attainment thus decreases job satisfaction when talented people end up in jobs where they cannot apply all their skills productively (Clark, 1997; Ferrer-i-Carbonell and Frijters, 2004; Ferrante, 2009).

Peiró (2006) study titled "Happiness, satisfaction and socioeconomic conditions: some international evidence" used the World Values Survey conducted in 1995-96 to

investigate the self-reported happiness, financial satisfaction, and life satisfaction of individuals from fifteen countries (Argentina, Australia, Chile, China, Dominican Republic, Finland, Japan, Nigeria, Peru, Russia, Spain, Sweden, Taiwan, USA, and Venezuela). The author found an insignificant relationship between the level of education and the level of happiness. This occurs when an individual's aspirations are not affected by current income (Botha, 2014). Furthermore, when variables such as income are controlled, the influence of education on happiness decreases (Powdthavee, 2003; Peiró, 2006; Botha, 2014).

Health is another source of human capital. The World Health Organization (2024) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

The general assumption is that happiness improves an individual's physical health, and protects him from getting ill (Veenhoven, 2008). Common experience reveals that an individual's capacity for happiness decreases when they are in pain or suffer from a serious illness (Steptoe, 2019). On the other hand, positive emotions are associated with lower pain and higher pain tolerance (Pressman and Cohen, 2005; Diener and Chan, 2011). Furthermore, happy people tend to have a longer lifespan (Solan, 2021). Happiness safeguards health, which is probably the reason why happy individuals have a longer lifespan (Veenhoven, 2008). If that is the case, policies aimed at greater happiness of a greater number can advance public health (Veenhoven, 2008).

The key methods and findings of some empirical studies that examined the relationship between human capital and happiness will be discussed below.

1.

Title, author(s), and year: Clark and Oswald (1994) study titled "Unhappiness and Unemployment"

Sampling frame: Mental well-being scores from the General Health Questionnaire section of the British Household Panel Study were used to assess whether unemployed individuals were relatively unhappy or happy in the 1990s (Clark and Oswald, 1994).

Methods of analysis: Elementary methods and an ordered probit model were used, wherein individuals' levels of well-being were regressed on a set of personal

characteristics (Clark and Oswald, 1994). With regard to the elementary methods, the authors calculated so-called ‘Caseness scores’ (also referred to as measures of mental distress) (Clark and Oswald, 1994). Furthermore, they analysed the following: (1) the mean mental distress scores, (2) the association between unemployment and mental distress for each age-band (age less than 30, age 30-49, age over 50), (3) the utility penalty attached to joblessness, (4) the association between the utility penalty and the proportion of unemployed people, (5) the graph showing the relationship between the regional unemployment rate and the utility gap between working and not working, and (6) the spread of different well-being levels in the population (Clark and Oswald, 1994).

Results: (1) In 1991 unemployed individuals in Great Britain had a significantly lower level of mental well-being than employed individuals, (2) there is less distress from joblessness among young individuals and workers who are employed in areas that have high unemployment rates, and (3) the long-term unemployed show less distress than the short-term unemployed; so in this sense the long-term unemployed are to some extent ‘happier’ than the short-term unemployed (Clark and Oswald, 1994).

2.

Title, author(s), and year: Hinks and Gruen (2007) paper titled “What is the structure of South African happiness equations? Evidence from quality of life surveys”

Sampling frame: The analysis used “three of the Durban Quality of Life Studies” (Hinks and Gruen, 2007, p. 311).

Methods of analysis: The three data series were pooled, and various covariates (age, marital status, employment status, household income, and relative household income) were tested for their significance on happiness (Hinks and Gruen, 2007). Thereafter, the authors estimated yearly cross-sectional models to test for consistency in the structure of the equation and to see whether the findings were consistent with previous findings across the period considered (Hinks and Gruen, 2007).

Results: (1) Age and marital status appear to have no influence on the likelihood of happiness, (2) unemployment, size of household income, relative household income and living in a formal dwelling, all have a significant negative impact on happiness, and (3) self-employment or temporary employment has a negative impact on

happiness (Hinks and Gruen, 2007). These findings are not consistent with those in developed countries, by other researchers, such as Blanchflower and Oswald (2004). The structure of happiness equations in South Africa is thus slightly different than those in developed countries (Hinks and Gruen, 2007).

3.

Title, author(s), and year: Botha (2014) conducted a study titled “Life satisfaction and education in South Africa: Investigating the role of attainment and the likelihood of education as a positional good”

Sampling frame: The study used the NIDS 2008 adult questionnaire (Botha, 2014).

Methods of analysis: The author used ordered probit regressions for the entire sample and separate regressions for each racial and gender group (Botha, 2014). The probit regressions determined the relationship between life satisfaction and relative education, while the other regressions determined the different relationships of education with life satisfaction among racial and gender groups (Botha, 2014).

Results: (1) There is a strong positive association between educational attainment and individual life satisfaction for women and men, (2) the positive association is significant for Coloured and Black individuals; however, it does not hold for Asian and White individuals, (3) education is perceived as a positional good, since individuals who possess more than the average level of education in their applicable group have a significantly higher level of life satisfaction, in contrast to individuals who possess less than the average level of education, (4) there is a positive relationship between additional education and life satisfaction, and (5) individuals who are not educated have the lowest level of life satisfaction (Botha, 2014).

4.

Title, author(s), and year: Biyase and Zwane (2015) paper titled “Does education pay in South Africa? Estimating returns to education using Two Stage Least Squares approach”

Sampling frame: The first three waves of the NIDS dataset were used to examine the labour market returns to education in South Africa (Biyase and Zwane, 2015).

Methods of analysis: The study used panel data, which permitted the authors to control for unobservable individual characteristics. The Fixed effect (to account for the heterogeneity problem) and Two-Stage Least Squares estimation (to tackle the potential endogeneity between wages and educational attainment) methods were used to empirically investigate the relationship between education and earnings in South Africa (Biyase and Zwane, 2015).

Results: An additional year of schooling is found to increase labour market earnings by 47%, which is consistent with many international studies (such as Angrist and Krueger, 1991; Duflo, 2001 and Fang *et al.,* 2012), suggesting that private investment in higher education is a valuable investment (Biyase and Zwane, 2015). As mentioned previously, the income earned enables individuals to spend on goods and services, from which they gain utility and satisfaction.

5.

Title, author(s), and year: Tiliouine (2009) study titled “Health and subjective wellbeing in Algeria: A developing country in transition”

Sampling frame: The study involved a survey utilising the 2005 Personal Wellbeing Index (PWI). The sample size was 2909 Algerian individuals, aged 18 and above (Tiliouine, 2009). It should be noted that the PWI does not only apply to Algeria. More countries are included in the PWI.

Methods of analysis: The participants were divided into either the healthy or unhealthy group. Thereafter, the participants scores were compared for the PWI, objective self-report health questions and additional items related to environment, culture, and social networks (Tiliouine, 2009).

The authors used correlational and regression analyses to investigate the relationship between health status, health measures and SWB (Tiliouine, 2009).

Results: (1) The healthier group were significantly more satisfied with their family, friends, spouses, and physical appearance, (2) the unhealthy group reported higher levels of anxiety and physical pain, lower amounts of daily sleep, and lower levels of satisfaction with health, family, friends, and spouse, (3) there is a significant negative correlation between life satisfaction and both anxiety and pain levels in the unhealthy and healthy groups, (4) the strongest positive correlation is between life satisfaction

and total PWI scores for unhealthy and healthy groups, followed by the correlation between life satisfaction and standard of life, (5) there is a significantly lower correlation between life satisfaction and sleep, and between life satisfaction and scientific, literary/artistic, or religious culture, and (6) in the healthy group, the level of anxiety and normal sleep have a significantly greater influence on life satisfaction, demonstrating the importance of good health to life satisfaction (Tiliouine, 2009).

The next section covers some empirical studies that linked social capital to happiness. Social and Spiritual capital is one of the independent variables that will be used in the regression model in this study.

Social capital

There is still no commonly accepted definition of the term social capital, even though many definitions and theories have emerged over the years (Bhandari and Yasunobu, 2009; Rodríguez-Pose and von Berlepsch, 2014).

A comparative summary of a few social capital definitions is presented in a tabular form (Table 3.1) below.

Table 3.1. Comparative summary of a few social capital definitions

Source/s	Definition
World Bank (1985)	Social capital is "the norms and social relations embedded in social structures that enable people to coordinate action to achieve desired goals" (World Bank 1985, p.29).
Bourdieu (1986)	"Social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition - or in other words, to membership in a group - which provides each of its members with the backing of the collectively owned capital, a 'credential' which entitles them to credit, in the various senses of the word" (Bourdieu 1986, p. 248).
Coleman (1990)	"Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common. They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure" (Coleman 1990, p. 302).

Source/s	Definition
Woolcock (1998)	Social capital is "a broad term encompassing the norms and networks facilitating collective action for mutual benefit" (Woolcock 1998, p.155).
Putnam (2000)	"Social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam 2000, p.19).

Source: Own compilation from World Bank, 1985; Bourdieu, 1986; Coleman, 1990; Woolcock, 1998; Putnam, 2000

Robert Putman has eminently expounded the concept of social capital. He assessed the effect of both informal (interaction with friends and family) and formal (civic, political, or work-related) associational engagement on societal development and personal well-being (Rodríguez-Pose and von Berlepsch, 2014). Putnam posits that a strong network of associations (irrespective of the form) fosters benefits to society such as economic growth, governmental efficiency, stability, and trust (Putnam, 2000; Rodríguez-Pose and von Berlepsch, 2014).

Types of Social capital

There are three basic types of social capital: (1) bonding social capital – it relates to connections that occur within a homogenous group (i.e. strong ties that connect people of for instance the same gender, race, socio-economic status, occupation), (2) bridging social capital – it relates to connections that occur within a heterogenous group (i.e. weak ties that connect people from for instance different ethnic and occupational backgrounds, including informal or formal social participation, and (3) linking social capital – it is similar to bridging social capital, but includes the difference in power that exist in some networks or relations (such as hierarchical relations) (Islam *et al.,* 2006; Lau and Ataguba, 2015).

3.3 Relationship between Social capital and happiness

Trust is one of the most commonly investigated factors of social capital (Rodríguez-Pose and von Berlepsch, 2014). Research indicates that in environments where individuals can trust others among whom they live or work, and are able to trust others in leadership positions, there is a higher level of happiness relative to areas where this trust level is low (Helliwell and Putman, 2004). Social capital, embedded in trust, personal networks, and a sense of community or team spirit plays a fundamental role

for an organisation to thrive because without them high productivity in the workplace will not be possible (Malloch, 2010).

Attending religious institutions is a form of community level social capital (Helliwell and Putnam, 2004; Rodríguez-Pose and von Berlepsch, 2014). Frequently attending religious institutions builds trust among others, which will further increase social capital, and therefore, happiness (Rodríguez-Pose and von Berlepsch, 2014). For instance, Church attendance regulates people's moral behaviour and conditions them to ethical actions to do good to others and avoid wrongful or sinful actions. This is linked to religiosity.

Helliwell and Wang's (2010) study titled "Trust and wellbeing" is based mainly on data from cycle 17 of the Canadian General Social Survey (GSS17) and the Gallup World Poll. Their results suggest that individuals who are unrealistically negative regarding the trustworthiness of others may decrease their level of happiness and prevent increased social interactions that are crucial in building and maintaining a reliable social fabric (Helliwell and Wang, 2010).

Maintaining a harmonious relationship, with a positive attitude, at work, in the family and in the community is a strong pillar of social capital and human togetherness. These social relationships have an impact on happiness (Saphire-Bernstein and Taylor, 2013). People who are not involved in community associations tend to be lonely, socially unconnected, and have less social capital or relationships, and hence are less happy. People who are married are happier than others who are unmarried (Easterlin, 2003; Layard, 2011).

Social capital is a public good because of its nonexcludable property – all community members can benefit from it, since it does not have limited access (Kawachi *et al.,* 1997). Therefore, socially isolated individuals may benefit if they interact actively in communities that have abundant social capital (Kawachi *et al.,* 1997). However, if individuals reside in communities with limited social capital, they may have a low probability of building strong relationships and a high probability of mental health afflictions, and these may have a bearing on their life-satisfaction (Kawachi *et al.,* 1999).

The key methods and findings of some empirical studies that examined the relationship between social capital and happiness will be discussed below.

1.

Title, author(s), and year: Walen and Lachman (2000) study titled “Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood”

Sampling frame: The sample contained 2348 married or cohabitating adults aged 25 to 75 years from the Midlife in the United States Survey (MIDUS) (Walen and Lachman, 2000).

Methods of analysis: Firstly, MANOVAs were used to determine the differences and interactions of age and sex in the predictor and outcome variables (Walen and Lachman, 2000). Secondly, Post-hoc Newman–Keuls tests, using a harmonic mean for unequal sample sizes, were performed when significant interactions were found (Walen and Lachman, 2000). Thirdly, regression analyses using the TEST method were performed to determine the differential effects of support and strain on well-being and health (Walen and Lachman, 2000). Lastly, to answer the remaining research questions, hierarchical regression analyses were used (Walen and Lachman, 2000).

Results: (1) Positive and negative social exchanges had a stronger relationship with psychological well-being than health, (2) for both men and women, family support and partner support and strain were predictive of well-being measures (i.e. life satisfaction, positive mood and negative mood), (3) partner strain was moreover predictive of health problems, (4) family strain was more often predictive of well-being and health outcomes for women than men, (5) family and friends more often served a buffering role for women than men, and (6) middle-aged, and younger adults were more negatively affected by strained friendships than older adults (Walen and Lachman, 2000).

2.

Title, author(s), and year: Haller and Hadler’s (2006) paper titled “How social relations and structures can produce happiness and unhappiness: An international comparative analysis.”

Sampling frame: The authors analysed happiness in 41 nations globally using the World Values Survey 1995-1997 (Haller and Hadler, 2006).

Methods of analysis: The authors used multivariate, multilevel regression analysis (Haller and Hadler, 2006).

Results: (1) Macrosocial institutional conditions, such as a welfare state and political freedom, have a significant impact on life satisfaction, (2) individuals who are married, individuals who have children, and individuals who are actively participating in social and religious activities are to a greater degree happier than individuals who are divorced or unemployed, and (3) richer countries and countries with a more equal income distribution have a higher level of happiness and life satisfaction (Haller and Hadler, 2006).

3.

Title, author(s), and year: Adedeji *et al.* (2023) paper titled "Socioeconomic status and social capital as predictors of happiness: evidence and gender differences"

Sampling frame: Cross-sectional data from 1062 South Africans on happiness, socioeconomic status, social capital and demographic characteristics were collected using an online questionnaire between January 2021 and September 2021 (Adedeji *et al.*, 2023).

It is important to note that the authors removed 13 cases with extensive missing data from the dataset (1062-13=1049) (Adedeji *et al.*, 2023). Furthermore, data from participants who identified as "other" or preferred not to disclose their gender was removed from the analysis due to the importance of gender as a central variable for the analysis (Adedeji *et al.*, 2023). Therefore, the final sample size was 1000 South African individuals (Adedeji *et al.*, 2023).

Methods of analysis: The authors computed a correlation matrix to explore the bivariate associations between components of socioeconomic status, social capital variables, and happiness (Adedeji *et al.*, 2023). Furthermore, they used hierarchical regression statistics to examine the predictive influence of socioeconomic status and social capital indices (community solidarity, locus of control, and generalised trust) on happiness and the gender differential in these relationships (Adedeji *et al.*, 2023).

Results: (1) Socioeconomic status and all social capital indices (except generalised trust) were positively associated with happiness, (2) generalised trust was negatively associated with happiness, (3) the model, including socioeconomic status and social capital (community solidarity, locus of control and generalised trust) accounted for 25% of the variance in happiness, and (4) the influence of socioeconomic status and social capital indices (except locus of control) on happiness varied by gender (Adedeji *et al.*, 2023).

The next section presents the literature and findings of some empirical studies that examined the relationship between spiritual capital and happiness.

3.4 Relationship between Spiritual capital and happiness

Spiritual capital comes from one's connection with God (Malloch, 2010). It is associated with "beliefs, examples, and commitments that are transmitted from generation to generation through a religious, moral or spiritual tradition" (Malloch 2017, p. xv). Religiosity, spirituality, and happiness tend to go together.

Spirituality does not mean the same thing for everyone. As Egan *et al.* (2011, p. 321) stated, "Spirituality may include (a search for): one's ultimate beliefs and values; a sense of meaning and purpose in life; a sense of connectedness; identity and awareness; and for some people, religion." Having a pure mind, heart and soul and God consciousness is the essence of spirituality (Kashani, 2012; Abidi and Majeed, 2019).

The faithonomics model claims that spirituality is one of the vital factors which matters for happiness and well-being (Brekke, 2016; Abidi and Majeed, 2019). There is a significant correlation between spirituality and happiness, optimism, hope, meaning in life, mental health indicators of happiness and self-esteem (Emmons, 1999; Reave, 2005).

The positive relationship between religiosity and happiness is a well-established finding (Witter *et al.,* 1985; Ellison *et al.,* 1989; Lim and Putnam, 2010; Lim, 2016). Globally, numerous studies have found that individuals who participate in religious practices rate their level of happiness higher in surveys in contrast to those who do not (Ellison, 1991; Krause and Wulff, 2005; Lim, 2016).

Religion provides meaning to our lives, particularly during difficult times (Deaton and Stone, 2013). Religiosity has a positive impact on well-being and happiness through mechanisms such as a healthy lifestyle, social relationships, support, and use of religious practices such as prayer to cope in difficult situations (Stavrova *et al.,* 2013). Religious individuals who frequently attend religious services may be happier due to the social networks built within their congregations (Lim and Putnam, 2010). The Almighty compensates for the lack of personal relationships in an individual's life or supplements their existing relationships (Stavrova *et al.,* 2013). Religious beliefs and practices can prevent mental illness, such as anxiety and depression and help to cope with tragedy, loss, and loneliness (Rosmarin and Koenig, 1998; Kirkpatrick et al., 1999). Integrating religious and secular therapies can maximise (mental and physical) health and healing (Rosmarin and Koenig, 1998; Stark and Maier, 2008). However, belonging to a religion without being devoted to the religion decreases an individual's level of happiness (Fidrmuc and Tunali, 2015). It is the intensity of religious attachment, not the tangible benefits from belonging to a religion, that increases a religious individual's level of happiness (Fidrmuc and Tunali, 2015).

Strongly religious individuals understand the moral principles that they must live by (Adjibolosoo, 2013). Imbued by moral values of a higher order and fear of the Supreme, they refrain from doing harm to other people and are driven by activities in the mode of goodness (Mahadea, 2013). A principle-centered life enhances happiness. Spiritual principles empower individuals to live a life of compassion, forgiveness, grace, integrity, and unconditional love (Adjibolosoo, 2013). These individuals feel happy from espousing their spiritual values and may enjoy better mental and physical health relative to those who live purely for materialism or sensual pleasures (Rule, 2007; Stark and Maier, 2008; Pilling, 2019).

Rego and Cunha (2008) developed the concept of workplace spirituality by extending happiness and spirituality to the workplace environment. The authors argue that happiness characterised by spirituality exists among individuals in a workplace when there is a sense of belonging among employees, aligned organisational and employee spiritual values, when leaders in the organisation are concerned about the welfare of their employees and community, when employees experience happiness at work, and receive opportunities for inner peace (Rego and Cunha, 2008; Mousa, 2020).

Encouraging workplace spirituality may lead to an increased sense of belonging, loyalty, trust, commitment, and efficiency among the workers which will improve employee happiness and organisational performance (Krishnakumar and Neck, 2002; Abidi and Majeed, 2019; Mousa, 2020).

The findings of some studies that relate to spiritual capital and happiness is presented below.

1.

Title, author(s), and year: Rule (2007) investigated “Religiosity and quality of life in South Africa”

Sampling frame: The authors used the 2004 South African Social Attitudes Survey (Rule, 2007).

Methods of analysis: The authors used descriptive statistics, correlation analysis, and factor analysis.

It is worth noting that the author used the following religiosity indicators: ”frequency of attendance at religious services or meetings, and orthodoxy of beliefs in relation to Biblical teachings and religious denomination” (Rule, 2007, p. 417). Furthermore, he used the following Quality of life (QoL) measures: ”household access to modern conveniences, self-assessed life satisfaction and level of satisfaction with government institutions” (Rule, 2007, p. 417).

Results: (1) There is a statistically significant, but not very strong relationship between religiosity and quality of life, (2) generally there is a higher self-assessed life satisfaction among individuals who hold views that are very closely associated to that of the Bible and Church, (3) there tends to be a higher self-assessed life satisfaction among individuals who claim to belong to a religious group, in contrast to those who do not belong to a religious group, (4) Pentecostal/Charismatic Christian Church members report the highest level of life satisfaction whereas members of African Independent Churches (AICs) and ‘other’ Christians report fairly lower levels of life satisfaction, but it is higher than those who do not belong to any religion or did not reveal their religion, (5) religious individuals are generally (materially) well-off than non-religious individuals, (6) individuals who hold the most orthodox views and

regularly attend religious meetings tend to have access to more modern conveniences (such as a microwave and dishwasher) and are happier and (7) individuals who either do not attend religious meetings/services or do not attend frequently are the least content with government institutions, in contrast to those who attend occasionally (Rule, 2007). Overall, there is a positive relationship between religiosity and both quality of life and life satisfaction in South Africa (Rule, 2007).

2.

Title, author(s), and year: Tay *et al.* (2014) paper titled "Religiosity and subjective well-being: An international perspective"

Sampling frame: The authors reviewed empirical studies on religiosity and SWB published in the last decade from both Western and non-Western nations (Tay *et al.,* 2014).

Methods of analysis: The authors discussed findings on religiosity and SWB from Western and international nations (Tay *et al.,* 2014).

Results: Overall, the authors found good evidence at both individual and national level which shows that religiosity contributes to higher SWB, *ceteris paribus* (Tay *et al.,* 2014).

3.

Title, author(s), and year: Rizvi and Hossain (2017) study titled "Relationship between religious belief and happiness: A Systematic Literature Review"

Sampling frame: The authors analysed studies that were conducted in the previous two decades to understand the relationship between religious belief and happiness (Rizvi and Hossain, 2017).

Methods of analysis: The authors conducted a systematic literature review (SLR) which was divided into the following steps: (1) planning: the latest literature (1996-2015) was selected from various publications and resources, (2) conducting: after screening, 77 of the 115 research papers obtained were used, and (3) reporting: 77 research papers (73 surveys + 4 reviews) were studied well (Rizvi and Hossain, 2017).

Results: (1) The study reinforces the claim that religiosity ultimately leads to happiness - this is proven to be true in the vast majority of surveys regardless of

gender, nationality, religion, or race, and (2) analysis of the data has shown that people in the Middle East are the happiest because they live in the most religious nation (Rizvi and Hossain, 2017).

4.

Title, author(s), and year: Villani *et al.* (2019) examined “The role of spirituality and religiosity in subjective well-being of individuals with different religious status”

Sampling frame: Data were collected from an online survey completed by 267 Italian adults aged 18–77 (Villani *et al.,* 2019).

Methods of analysis: Two path analysis models were run (one for each predictor) to test the role of spirituality and religiosity in SWB (Villani *et al.,* 2019). Two multi-group models were run to test the invariance of the two models across the individuals’ religious status (Villani *et al.,* 2019).

Results: (1) The models regarding spirituality were tested on the entire sample and found that spirituality has a positive influence on SWB and the relationship is not influenced by an individual’s religious status, (2) the models regarding religiosity were tested only on religious and uncertain individuals and found that the relationship between religiosity and SWB does not remain the same across religious status (Villani *et al.,* 2019). Religious individuals were satisfied with life in contrast to individuals who were uncertain (Villani *et al.,* 2019).

A summary of the findings of a few South African studies on happiness is presented below.

3.5 Other happiness studies

1.

Title, author(s), and year: Ebrahim *et al.* (2013) study titled “Determinants of life satisfaction among race groups in South Africa”

Sampling frame: The authors used the 2008 NIDS data (Ebrahim *et al.,* 2013).

Methods of analysis: The authors applied analysis of variance and ordered probit regression in their study (Ebrahim *et al.,* 2013).

Results: (1) Reported life satisfaction varies considerably among race groups in South Africa, with Black people being the least content group, (2) higher educational attainment levels increased life satisfaction for the entire sample, (3) generally women (specifically black women) have lower levels of life satisfaction than men, (4) unemployed individuals are less satisfied than employed individuals, even when holding income and relative income constant, and (5) physical health matters greatly for White people; Black people attach greater importance to employment status and absolute income; positional status (as measured by relative income) is a vital determinant of life satisfaction for Black and Coloured people; and religious involvement significantly contributes to the well-being of Indian South Africans (Ebrahim *et al.,* 2013).

2.

Title, author(s), and year: Blaauw and Pretorius (2013) paper titled "The determinants of subjective well-being in South Africa – An exploratory enquiry"

Sampling frame: The authors used the NIDS Wave 1 dataset (Blaauw and Pretorius, 2013).

Methods of analysis: The authors estimated OLS and ordered probit models (Blaauw and Pretorius, 2013).

Results: (1) Age, gender, level of income, marital status, number of children, race, and years of education explain varying levels of SWB; (2) respondents' health, residence in urban areas, and height do not explain SWB; and (3) provincial location and religion have a significant influence in determining SWB in South Africa (Blaauw and Pretorius, 2013).

3.

Title, author(s), and year: Kollamparambil (2020) study titled "Happiness, Happiness Inequality and Income Dynamics in South Africa"

Sampling frame: The author used the first four waves of the NIDS data (Kollamparambil, 2020).

Methods of analysis: Firstly, a robust pooled OLS regression at individual and district levels was used to explore the determinants of happiness, secondly panel data

estimations of random and fixed effects model were undertaken (because the OLS regression may be biased due to unobservable effects), thirdly, a Recentred Influence Function (RIF) regression was used to estimate the determinants of happiness inequality at the individual level, and lastly a district council level pooled OLS and panel data estimation was undertaken (Kollamparambil, 2020).

Results: (1) Happiness inequality in South Africa has been decreasing despite an increase in the country's income inequality, (2) income determines both happiness level and happiness inequality at the individual and aggregate level, (3) the happiness-income paradox does not seem to exist in South Africa because the findings are similar at both individual and aggregate levels (Kollamparambil, 2020). At the aggregate level, income inequality has a significant positive effect on happiness inequality and a significant negative effect on happiness levels (Kollamparambil, 2020). This study's finding of increasing levels of happiness and decreasing happiness inequality in the context of increasing income inequality indicates that the absolute effect of income rather than the relative effect of income influences the level of happiness and happiness inequality in South Africa (Kollamparambil, 2020).

3.6 Synthesis

A synthesis of the relationship between each capital element and happiness will be presented in the following subsections.

Relationship between Financial capital and happiness

Economic theory postulates that individuals who have wealth, and higher income are happier. However, growth in income does not always guarantee a higher level of happiness in high-income countries, because people's aspirations change as they become richer. As their material wants and goals change over time, they need more income to meet their rising needs and 'keep up with the Jones' to be happy (Easterlin, 1995). Furthermore, wealthy individuals who have an abundance of choices may hold on to all available choices which can contribute to stress, and unhealthy social comparisons, which ultimately decreases happiness (Easterlin, 2013; Schwartz, 2016).

Relationship between Human capital and happiness

Individuals who have higher education and skills, and more work experience are subjectively happier relative to those with less education or fewer skills (Sen, 2010;

Mahadea and Ramroop, 2015). In line with this, South African research has also found that there is a positive relationship between additional education and life satisfaction, and individuals who are not educated have the lowest level of life satisfaction (Botha, 2014). However, educated individuals tend to set higher goals; therefore, they may experience disappointment and frustration when they are unable to fulfil them (Castriota, 2006; Salinas-Jiménez *et al.,* 2011). Furthermore, the dispersion of incomes increases as individuals attain higher levels of education (Castriota, 2006). Comparison with others who have the same level of education, but a higher salary can decrease an individual's level of happiness (Castriota, 2006). Health is another source of human capital. Common experience reveals that an individual's capacity for happiness decreases when he is in pain or suffers from a serious illness (Steptoe, 2019). Contrastingly, those with better health tend to be happier and enjoy longer years of happy life.

Relationship between Social capital and happiness

People who are involved in community associations, have intimate social relationships, and are married, tend to be happier (Saphire-Bernstein and Taylor, 2013). Frequently attending religious institutions builds trust among others, which will further increase social capital, and therefore, happiness (Rodríguez-Pose and von Berlepsch, 2014). In line with this, international research has also found that individuals who are married, have children and are actively participating in social and religious activities are happier than individuals who are divorced or unemployed (Haller and Hadler, 2006).

Relationship between Spiritual capital and happiness

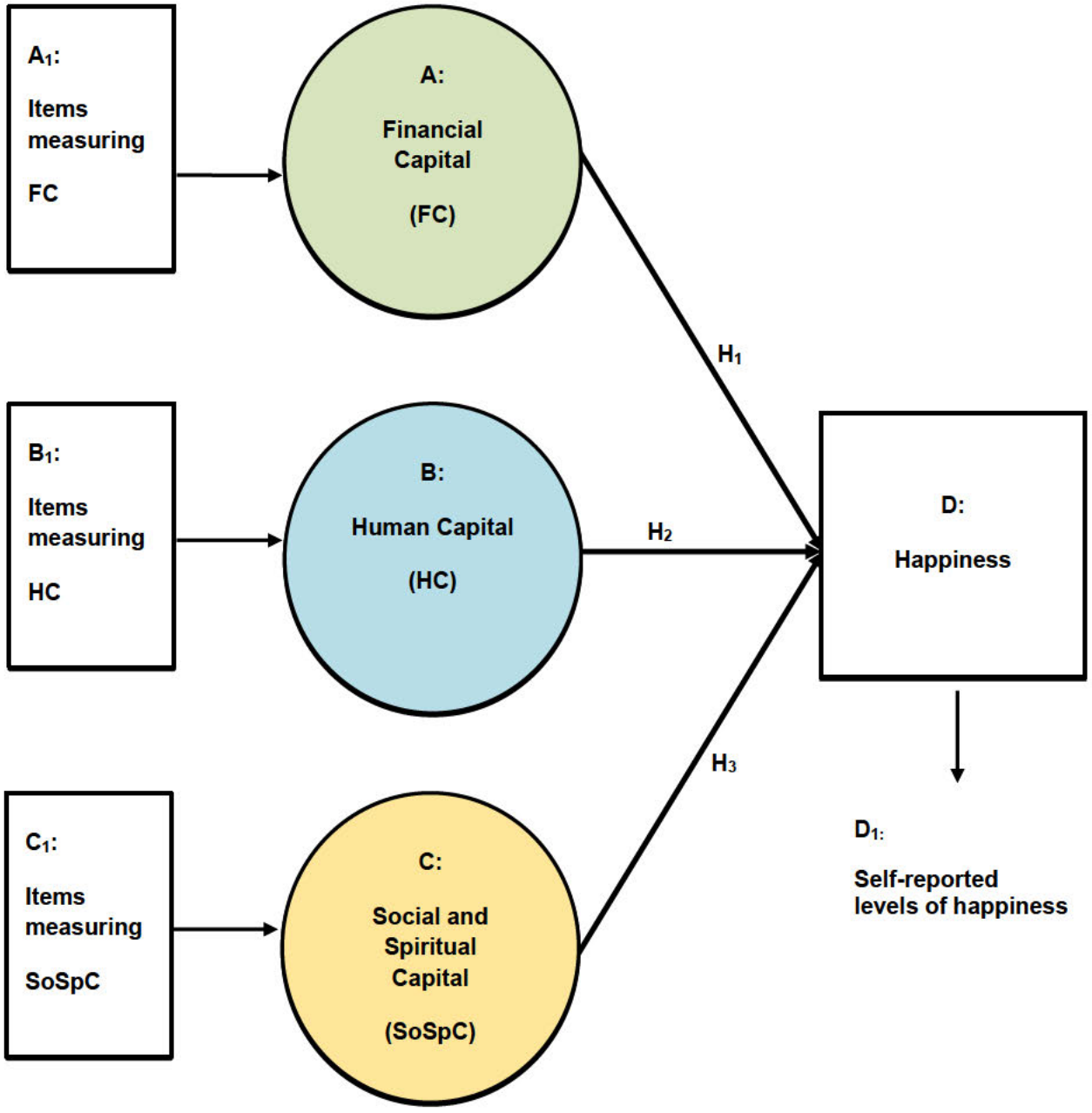
The faithonomics model claims that spirituality is one of the vital factors that matter for happiness and well-being (Brekke, 2016; Abidi and Majeed, 2019). Globally, numerous studies have found that individuals who participate in religious practices rate their level of happiness higher in surveys in contrast to those who do not (Ellison, 1991; Krause and Wulff, 2005; Lim, 2016). In line with this, South African research has also found a positive relationship between religiosity and quality of life and life satisfaction (Rule, 2007). However, belonging to a religion without being devoted to the religion decreases an individual's level of happiness (Fidrmuc and Tunali, 2015). It is the intensity of religious attachment and moral conduct of a person, not the

tangible benefits from belonging to a religion, that increase a religious individual's level of happiness (Fidrmuc and Tunali, 2015).

3.7 Conceptual Framework

In light of the synthesis above, a conceptual framework is presented in Figure 3.1 below, linking happiness to various capital elements, A to C.

Figure 3.1. Conceptual framework of the influence of various forms of capital on happiness



Source: Own compilation

A summary of the capital elements is presented in a tabular form below.

Table 3.2. Factors that influence happiness grouped into different categories of capital

Financial Capital	Human Capital	Social and Spiritual Capital
Household income	Computer literacy	Crime
Household expenditure	Driver's license	Marital status
Household wealth (net worth)	Education	Memberships in community groups
Personal (asset) ownership	English proficiency	Neighbourhood environment
Personal debt	Health	Trust
		Religion

Source: Own compilation

This study will use the conceptual framework above as a platform for the analysis and to address the research problem.

Based on literature and empirical studies, a gap in our understanding seems to exist. Although it is generally accepted that various elements of capital have a bearing on happiness, most previous studies only looked at material aspects of well-being (Clark and Oswald, 1994; Kenny, 2005; Rule, 2007; Posel and Casale, 2011; Mahadea, 2013; Ebrahim *et al.,* 2013; Botha, 2014; Kollamparambil, 2020). Hence, this dissertation intends to investigate an apparent 'gap' in the relationship between certain capital elements (financial capital, human capital, and social and spiritual capital) and happiness.

Financial capital is captured by factors such as household income, household expenditure, household wealth (net worth), personal (asset) ownership, and personal debt.

Human capital is captured by factors such as computer literacy, driver's license, education, English proficiency, and health.

Social and Spiritual capital is captured by factors such as crime, marital status, memberships in community groups, neighbourhood environment, trust, and religion.

From this dissertation, it is hoped that understanding the generation and impact of each capital element will help a firm and policymakers to design appropriate measures to improve citizens' life satisfaction. Data relating to capital elements is sourced from the National Income Dynamics Study (NIDS). This will be explained further in the next chapter.

Concluding Remarks

It is worth noting that firstly Adedeji *et al.* (2023) study titled “Socioeconomic status and social capital as predictors of happiness: evidence and gender differences” (discussed above) examined the predictive influence of only three aspects of social capital (community solidarity, locus of control and generalised trust) on happiness, whereas this study includes other aspects of social capital (this will be discussed in the next chapter). Secondly, this study combines social and spiritual capital as an integrated capital factor (this will be discussed in the next chapter), whereas Adedeji *et al.* (2023) did not combine social and spiritual capital as an integrated capital factor. Thirdly, this study is conducted in the economic context of a broader capital set, whereas Adedeji *et al.* (2023) only examined the predictive influence of socioeconomic status and social capital indices on happiness and the gender differential in these relationships. Lastly, the NIDS sample size used for this study’s purposes is considerably larger (this will be discussed in the next chapter) in contrast to the sample size (1000) used in Adedeji *et al.* (2023).

There are no recent South African studies that investigated the influence of capital elements on happiness. Therefore, there is a definite need to broaden the scope of South African literature on happiness by moving beyond the traditional focus on material aspects of well-being, and delving into the economic context, within a broader capital set. This dissertation aims to meet this need by using PCA and ordered probit regression analysis to data collected from the NIDS. The next chapter will present a description of the NIDS Wave 2 dataset utilised in this study for data collection and statistical analyses.

Chapter 4: Data, variables, descriptive statistics and research methodology

Introduction

The previous chapters covered a review of the literature and empirical aspects of the economics of happiness. While happiness is a subjective phenomenon, its sources are varied, partly driven by locational, environmental, personal, and capital influences. This study seeks to examine the influence of capital elements on happiness. Unlike many studies that use a primary data collection approach, through the use of an administered questionnaire, this study used data from a previous national survey, NIDS. Part of the research methodology used for this study is covered in this chapter. This chapter presents a description of the NIDS Wave 2 dataset utilised in this study for data collection. Details regarding the sample, methods of analysis, variables used, as well as the descriptive statistics in this study are also covered.

4.1 Data

This study utilised a nationally representative sample to investigate the relationship between three types of capital (financial capital, human capital, and social and spiritual capital) and happiness. The source of the data is Wave 2 of NIDS, which was implemented by the Southern Africa Labour and Development Research Unit (SALDRU) based at the University of Cape Town's School of Economics (National Income Dynamics Study, 2020b; Southern Africa Labour and Development Research Unit, 2024). Furthermore, NIDS is an initiative of the Department of Planning, Monitoring & Evaluation and has been designed to facilitate the development of evidence-based policy making (National Income Dynamics Study, 2020a). This survey has been employed in previous South African studies on happiness (Posel and Casale, 2011; Ebrahim *et al.,* 2013; Botha and Booysen, 2013; Botha, 2014; Kollamparambil, 2020). Owing to data limitations relating to spiritual capital from NIDS Wave 2, social and spiritual capital were combined as an integrated capital factor, thus reducing the capital set from four to three variables.

NIDS examines more than 28000 individuals in 7300 households across the country and investigates their livelihoods over time (Ebrahim *et al.,* 2013; National Income Dynamics Study, 2020a; National Income Dynamics Study, 2020b). The study provides information about changes in the following broad themes: poverty, well-being

and inequality, education, fertility and mortality, health, household composition and structure, human capital formation, labour market participation and economic activity, migration, vulnerability and social capital (National Income Dynamics Study, 2020a). For instance, NIDS provides information regarding how households cope with negative or positive shocks, such as the loss of a family member or an unemployed relative acquiring a job (Ebrahim *et al.,* 2013; National Income Dynamics Study, 2020a). The survey is distinctive among nearly all other nationally representative surveys in South Africa, because of its broad definition of household membership (Hatch, 2018). Moreover, key areas of socio-economic enquiry are explored, and a measure of wealth and happiness are available in the NIDS study, in contrast to previous national household surveys that have tended to focus on a specific area, such as health or labour market participation (Casale and Posel, 2011).

As mentioned above, for this study, data are obtained from the second wave of NIDS which was conducted in 2010/2011 (DataFirst, 2018). The data are particularly useful as the NIDS Wave 2 instrument marked the first time in South Africa that a nationally representative household survey obtained sufficient information to calculate individual and household net worth (Casale and Posel, 2011; Daniels *et al.,* 2012). The NIDS Wave 2 dataset itself contains a lot of valuable information on concepts related to wealth, such as income, expenditure, debt, and savings as well as household assets, which comprise another gauge for wealth (Daniels *et al.,* 2012). Furthermore, the data has the necessary variables that are required to construct the capital measures for this study. These characteristics make the NIDS Wave 2 dataset particularly suitable for answering the research question of this study.

4.1.1 Data collection, sample, and methods of analysis

In the NIDS survey, happiness is measured by asking respondents to rate their level of life satisfaction, at the point of being interviewed, on an ordinal scale (“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?”) (Kannemeyer, 2016; National Income Dynamics Study, 2016).

The NIDS questionnaire includes questions related to the three types of capital, as described in Table 3.2 in the previous chapter. The survey also contains information

on the demographic characteristics of respondents and their households, such as age, race, gender, employment status, occupation, and location (traditional, farms, urban (including formal and informal)) which are additional factors that influence happiness.

Field (2009) recommends that for factor analysis to be undertaken, a study should have at least 300 cases. As the NIDS sample size used for this study's purposes consists of 20,608 adults aged 18 and over with complete responses for the variables of interest, it is large enough to permit a Principal Component Analysis (Pallant, 2016). The sample used in this study is restricted to adults aged 18 and older because they are more likely to have accumulated some financial capital, human capital, and social and spiritual capital. The questions chosen for this study from NIDS Wave 2 can be found in Appendix B. Data was analysed using version 18 of Stata (Stata 18).

The study will use a multivariate regression analysis, specifically an ordered probit model to estimate the relationships between happiness, as an ordinal (ordered outcome) dependent variable and a set of independent variables, that include three sets of capital and seven demographic and socioeconomic factors, as control variables. The outcome factor (happiness) is proxied by levels of satisfaction. Each set of capital consists of various variables. Financial capital, for instance, consists of 29 variables, while social and spiritual capital consists of 9 variables. Not all of them may load significantly to happiness. Accordingly, the capital elements, as explanatory factors, drawn from the NIDS Wave 2 survey, would be subject to a PCA in order to create a measure of an underlying latent (unobservable) variable, for which there are multiple proxies. Following the Kaiser's criterion and scree plot, only components with an eigenvalue greater than 1 would be considered for selection for further analysis. Thereafter, an ordered probit regression analysis would be undertaken to isolate the influence of the key capital predictors on happiness. Further motivation and details related to the PCA, and the regression methodology are presented in chapters 5 and 6, respectively.

As mentioned above, all data was analysed using version 18 of Stata (Stata 18).

4.2 Variables

The variables chosen for this study from the NIDS Wave 2 dataset have been grouped into different categories of capital. Accordingly, drawing on the literature, 29 variables

were grouped into the financial capital category, 6 variables were grouped into the human capital category and 9 variables were grouped into the social and spiritual capital category.

The dependant variable, variables for financial capital, human capital, social and spiritual capital, and demographic and socioeconomic control variables, are described in Table 4.1, Table 4.2, Table 4.3, Table 4.4, and Table 4.5, respectively.

It should be noted that observations have been coded as "missing" where respondents answered, "don't know" or refused to answer the question or where the respondent was "not asked the question in phase 2 of Wave 2" (Brown *et al.,* 2012; Botha and Booysen, 2013). Therefore, all missing observations in the variables of interest are excluded from the analysis (Botha and Booysen, 2013). Happiness is measured in terms of a 10-point life satisfaction level, ranging from a low 1 to a high 10.

Table 4.1. Dependant variable

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
1	happiness[1]	M5	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?	Current satisfaction level of life	Satisfaction level 1#	1
					Satisfaction level 2	2
					Satisfaction level 3	3
					Satisfaction level 4	4
					Satisfaction level 5	5
					Satisfaction level 6	6
					Satisfaction level 7	7
					Satisfaction level 8	8
					Satisfaction level 9	9
					Satisfaction level 10	10

Source: Own compilation from NIDS Wave 2 Questionnaire

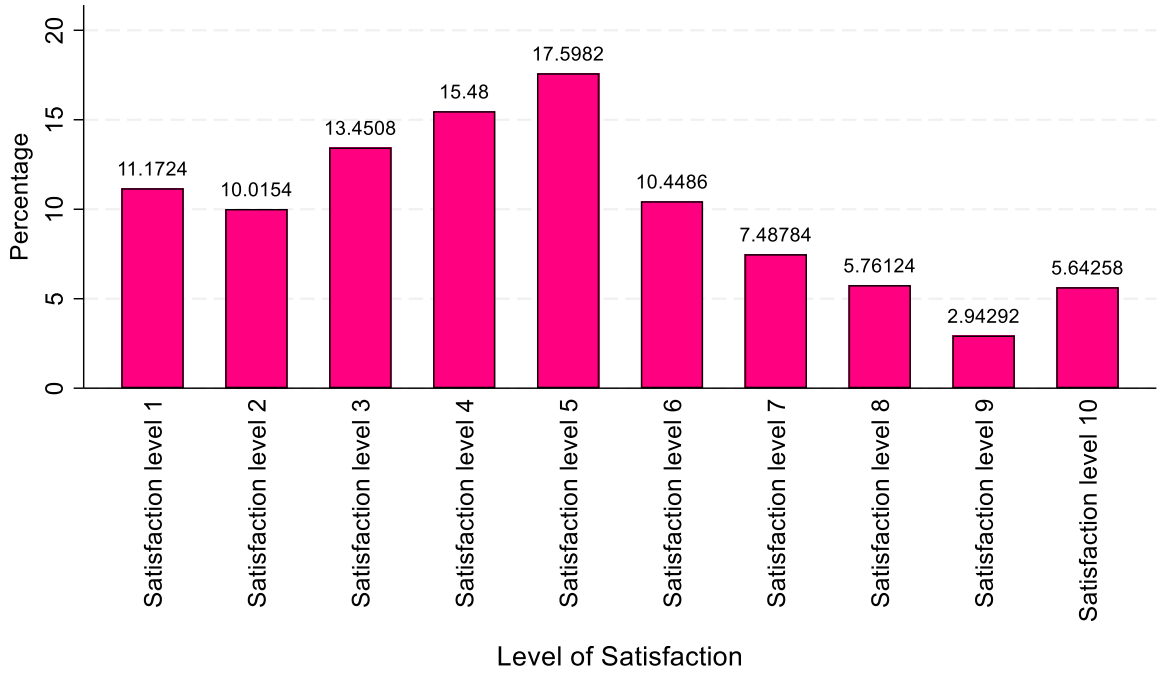
Notes:

[1] The dependent variable "happiness" is treated as an ordered categorical variable throughout the study.

# denotes the base category for the categorical variable.

Figure 4.1 below presents a summary of the distribution of the life satisfaction levels, as per NIDS Wave 2, 2010-2011 data.

Figure 4.1. Distribution of life satisfaction among South African adults aged 18 and over, 2010-2011



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.1 reveals a distribution that seems to be positively skewed (i.e., indicating a greater prevalence of low satisfaction level scores and not symmetrical) with an interesting tail at the highest satisfaction level of 10. Furthermore, it shows that most of the respondents reported satisfaction level 5 of life (approximately 17.598%) and satisfaction level 4 of life (15.48%), while approximately 14.347% reported satisfaction level 8 of life or higher.

As mentioned previously, the variables for financial capital, measured in terms of 29 factors, ranging from income to financial assets, are shown in Table 4.2 below.

Table 4.2. Variables grouped into the financial capital category

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
1	logpchhincome[1]	Imputed values of household income		Log household income per capita		
2	logpchhexp[2]	Imputed values of household expenditure		Log household expenditure per capita		
3	wealth[3]	Imputed values of household net worth		Household net worth per capita		
4	ownradio	G1	Do you personally own at least one radio in good working order?	Ownership of at least one radio in good working order?	No[#]	1
					Yes	2
5	ownhifi	G2	Do you personally own at least one Hi-Fi Stereo, CD player, MP3 player in good working order?	Ownership of at least one Hi-Fi Stereo, CD player, MP3 player in good working order?	No[#]	1
					Yes	2
6	ownsew	G3	Do you personally own at least one sewing/knitting machine in good working order?	Ownership of at least one sewing/knitting machine in good working order?	No[#]	1
					Yes	2
7	ownvehicle	G4	Do you personally own at least one motor vehicle (private) in running condition in good working order?	Ownership of at least one motor vehicle (private) in running condition in good working order?	No[#]	1
					Yes	2

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
8	owncomvehicle	G5	Do you personally own at least one bakkie or truck in running condition in good working order?	Ownership of at least one bakkie or truck in running condition in good working order?	No#	1
					Yes	2
9	ownmot	G6	Do you personally own at least one motorcycle/scooter in good working order?	Ownership of at least one motorcycle/scooter in good working order?	No#	1
					Yes	2
10	ownbic	G7	Do you personally own at least one bicycle in good working order?	Ownership of at least one bicycle in good working order?	No#	1
					Yes	2
11	owncom	G8	Do you personally own at least one computer in good working order?	Ownership of at least one computer in good working order?	No#	1
					Yes	2
12	owncam	G9	Do you personally own at least one camera in good working order?	Ownership of at least one camera in good working order?	No#	1
					Yes	2
13	owncel	G10	Do you personally own at least one cell phone in good working order?	Ownership of at least one cell phone in good working order?	No#	1
					Yes	2
14	ownbond	G11	Do you personally have a Home loan/bond?	Respondent has a home loan/bond?	No#	1
					Yes	2
15	ownloan	G12	Do you personally have a personal loan from a bank?	Respondent has a personal loan from a bank?	No#	1
					Yes	2

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
16	ownmicroloan	G13	Do you personally have a personal loan from a micro-lender?	Respondent has a personal loan from a microlender?	No#	1
					Yes	2
17	ownmshloan	G14	Do you personally have a loan with a Mashonisa?	Respondent has a loan with a Mashonisa?	No#	1
					Yes	2
18	ownstudloan	G15	Do you personally have a study loan with a bank?	Respondent has a study loan with a bank?	No#	1
					Yes	2
19	ownstuother	G16	Do you personally have a study loan with an institution other than a bank?	Respondent has a study loan with an institution other than a bank?	No#	1
					Yes	2
20	owncarloan	G17	Do you personally have a vehicle finance (car payment)?	Respondent has vehicle finance (car payment)?	No#	1
					Yes	2
21	owncreditcard	G18	Do you personally have a credit card?	Respondent has a credit card?	No#	1
					Yes	2
22	ownstorecard	G19	Do you personally have a store card (for example, Edgars, Foschini or Woolworths store card)?	Respondent has a store card?	No#	1
					Yes	2
23	ownhp	G20	Do you personally have a hire purchase agreement?	Respondent has a hire purchase agreement?	No#	1
					Yes	2
24	ownfamilyloan	G21	Do you personally have a loan from a family member?	Respondent has a loan from a family member?	No#	1
					Yes	2
25	ownfriendloan	G22	Do you personally have loans from friends?	Respondent has loans from friends?	No#	1
					Yes	2

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
26	ownemploan	G23	Do you personally have loans from an employer?	Respondent has loans from an employer?	No#	1
					Yes	2
27	ownunptax	G24	Do you personally have unpaid tax including PAYE, property taxes and VAT if a personal debt?	Respondent has unpaid tax including PAYE, property taxes and VAT if a personal debt?	No#	1
					Yes	2
28	ownarrears	G25	Do you personally have arrears in service and other monthly bills?	Respondent has arrears in service and other monthly bills?	No#	1
					Yes	2
29	ownfinassets	G30	Do you personally have unit trusts, stocks and shares?	Respondent has unit trusts, stocks and shares?	No#	1
					Yes	2

Source: Own compilation from NIDS Wave 2 Questionnaires

Notes:

# denotes the base category for categorical variables.

It is important to note that variables with a high percentage of missing values have been excluded from the financial capital category.

[1] A per capita household level income variable has been created from the NIDS Wave 2 data. The NIDS Wave 2 data provides a household monthly income variable with full imputations, that aggregates household income from all available sources of income (for example, income from self-employment and primary occupations; government grants; other income from the government such as Unemployment Insurance Fund; investments and remittances) (Brown *et al.,* 2012). This variable was transformed into a per capita household level variable by dividing the household monthly income – full imputations by household size. This variable used in the analysis of this study is in log form due to the typical skewed distribution of income evident in South Africa (Blaauw and Pretorius, 2013; Mdingi and Ho, 2023). Furthermore, relative changes (i.e. percentage changes) in income are likely to be more important to building financial capital than absolute changes.

[2] A per capita household level expenditure variable has been created from the NIDS Wave 2 data. The NIDS Wave 2 data provides a total household monthly expenditure variable with imputations. This variable was transformed into a per capita household level variable by dividing the total household monthly expenditure – imputations by household size.

[3] A per capita household level net worth variable has been created from the NIDS Wave 2 data. The NIDS Wave 2 data provides a total household net worth variable with imputations. This variable was transformed into a per capita household level variable by dividing the total household net worth by household size.

It should be noted that it is particularly challenging to measure wealth in household interview surveys due to its social sensitivity and the challenges encountered in obtaining accurate estimates of the market value of financial or physical assets (Brown *et al.,* 2012). However, the NIDS Wave 2 survey made a good attempt to measure individual and household net worth.

It is worth noting that *log household income per capita, log household expenditure per capita and wealth* are continuous variables. The rest of the financial capital variables are categorical variables.

The variables relating to human capital are shown in Table 4.3 below. These range from the respondents' years of schooling completed to their perceived health status.

Table 4.3. Variables grouped into the human capital category

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
1	yrschool	best_edu	Best education	Years of schooling completed – derived	No education	0
					Grade 1 (previously Sub A/Class 1)	1
					Grade 2 (previously Sub B/Class 2)	2
					Grade 3 (Std 1)	3
					Grade 4 (Std 2)	4
					Grade 5 (Std 3)	5
					Grade 6 (Std 4)	6

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
					Grade 7 (Std 5)	7
					Grade 8 (Std 6/Form 1)	8
					Grade 9 (Std 7/Form 2)	9
					Grade 10 (Std 8/Form 3), NTC 1	10
					Grade 11 (Std 9/Form 4), NTC 2, Certificate with less than Grade 12/Std 10, Diploma with less than a Grade 12/Std 10	11
					Grade 12 (Std 10/Matric/Senior Certificate), NTC 3	12
					Certificate with Grade 12/Std 10	13
					Diploma with Grade 12/Std 10	14
					Bachelor's Degree	15
					Bachelor's Degree and diploma, Honours Degree	16
					Higher Degree (Masters, Doctorate)	18
2	complit	H32	Are you computer literate?	Respondent is computer literate?	No#	1
					Yes basic use	2
					Yes highly literate	3
3	driverslic	H33	Do you have a driver's license?	Respondent has a driver's license?	No#	1
					Yes	2

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories	
4	readeng	H37	How well can you read in English?	Respondent's reading level in English	Not at all#	1
					Not well	2
					Fair	3
					Very well	4
5	writeeng	H38	How well can you write in English?	Respondent's writing level in English	Not at all#	1
					Not well	2
					Fair	3
					Very well	4
6	health	J1	How would you describe your health at present? Would you say it is excellent, very good, good, fair, or poor?	Perceived health status	Poor#	1
					Fair	2
					Good	3
					Very good	4
					Excellent	5

Source: Own compilation from NIDS Wave 2 Questionnaire

Notes:

# denotes the base category for categorical variables.

It should be noted that *years of schooling completed – derived* is a continuous variable. The rest of the human capital variables are categorical variables.

The variables for social and spiritual capital are shown in Table 4.4 below. A set of 6 factors constitutes social and spiritual capital, ranging from the respondents' residential location preference to the importance of religious activities in their lives.

Table 4.4. Variables grouped into the social and spiritual capital category

		Original NIDS variable			Recoded variable		
	Name	Section and question number or derived variable	Question		Definition	Categories/values	
1	staypref	M1	Think about the area (village or suburb) in which you live. How strong is your preference to continue living in this area?		Preference to continue living in current area	Strong preference to leave#	1
						Moderate preference to leave	2
						Unsure (no strong preference to stay or leave)	3
						Moderate preference to stay	4
						Strong preference to stay	5
2	comgroupstot[1]	M9	Please indicate if you belong to any of the following groups?		Number of memberships in community groups	0 to 17	
				Yes			
			1. Stokvel	1			
			2. Burial Society	1			
			3. Community Garden group	1			
			4. Farmer's Association	1			
			5. Sewing group	1			
			6. Sports group	1			
			7. Study group	1			
			8. Singing or music group	1			
			9. Youth Group	1			
			10. Informal trader's group	1			
			11. Men's association	1			
			12. Women's association	1			
			13. School Committee	1			
			14. Water Committee	1			
			15. Development	1			

		Original NIDS variable				Recoded variable		
	Name	Section and question number or derived variable	Question			Definition	Categories/values	
			Committee					
			16. Tribal Authority	1	2			
			17. Other (specify)	1	2			
3	trust1[2]	M10	Imagine you lost a wallet or purse that contained R200 and it was found by someone who lives close by. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?			Likelihood of neighbour returning wallet or purse containing R200	Not likely at all[#]	1
							Somewhat likely	2
							Very likely	3
4	trust2[2]	M11	Imagine you lost a wallet or purse that contained R200 and it was found by a complete stranger. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?"			Likelihood of complete stranger returning wallet or purse containing R200	Not likely at all[#]	1
							Somewhat likely	2
							Very likely	3
5	crime1	D41.1	How common are burglaries, muggings or thefts in your neighbourhood?			Frequency of burglaries, muggings or thefts in the neighbourhood	Very common[#]	1
							Fairly common	2
							Not common	3
							Very Rare	4
							Never happens	5
6	crime2	D41.2	How common is there violence between members of the same household in your neighbourhood?			Frequency of violence between members of the same household in the neighbourhood	Very common[#]	1
							Fairly common	2
							Not common	3
							Very Rare	4
							Never happens	5

		Original NIDS variable		Recoded variable		
	Name	Section and question number or derived variable	Question	Definition	Categories/values	
7	crime3	D41.3	How common is there violence between members of different households in your neighbourhood?	Frequency of violence between members of the different household in the neighbourhood	Very common#	1
					Fairly common	2
					Not common	3
					Very Rare	4
					Never happens	5
8	maritalstatus	B10	What is […]'s current marital status?	Marital status	Never married#	1
					Married/cohabiting	2
					Formerly married	3
9	arelnb	M7	How important are religious activities in your life?	Importance of religious activities in life	Very important#	1
					Important	2
					Unimportant	3
					Not important at all	4

Source: Own compilation from NIDS Wave 2 Questionnaires

Note:

# denotes the base category for categorical variables.

[1] A categorical variable for number of memberships in community groups: "comgroupstot" has been created by adding up the number of memberships for each individual. It should be noted that all of the original categories (1 to 17) have been used, in order to utilise all the available information.

It should also be noted that *number of memberships in community groups* is treated as a continuous variable since it varies between 0 and 17. The rest of the social and spiritual capital variables are categorical variables.

[2] The framing of the questions on trust in NIDS Wave 2 offers the following advantages over the standard survey questions on trust (for instance from the World Values Survey): (1) it allows for respondents to rank their expectations of trust and does not represent trust as binary categories, (2) it distinguishes between trusting someone who lives close by/a neighbour and trusting complete strangers, (3) the questions do not require respondents to report on the general concept of trust, but instead provides a specific context (i.e. the likelihood of returning a lost wallet or purse containing R200) (Posel and Hinks, 2013).

Apart from capital elements, the influences of demographic and socioeconomic factors were also considered in the study, as control variables. These variables, ranging from age to number children under 7 years of age residing in the household, are presented in Table 4.5 below.

Table 4.5. Demographic and socioeconomic control variables

		Original NIDS variable		Recoded variable		
	Name	Section or derived variable	Question	Definition	Categories	
1	age[1]	best_age_yrs	Best age in years	Adults aged 18 and over		
2	agesquared[2]			Age squared divided by 100		
3	race	best_race	Best race	Population group	African[#]	1
					Coloured	2
					Asian/Indian	3
					White	4
4	gender[3]	best_gen	Best gender	Gender	Female[#]	0
					Male	1
5	emplostatus	empl_stat	Employment status – Adult only	Employment status	Not Economically Active[#]	0
					Unemployed	1
					Employed	2

		Original NIDS variable		Recoded variable		
	Name	Section or derived variable	Question	Definition	Categories	
6	GeoType2011[4]	geo2011	Sampled GeoType (2011 Census)	Type of region where the individual resides	Urban#	1
					Traditional	2
					Farms	3
7	numchild[5]	Household roster		Number of children under 7 years of age residing in the household		

Source: Own compilation from NIDS Wave 2 Questionnaire

Note:

# denotes the base category for categorical variables.

Consistent with the literature on happiness, the demographic and socioeconomic control variables included in the analysis are age, age squared (divided by 100), race, gender, employment status, type of region where the individual resides, and the number of children under 7 years of age, who live in the individual's household.

[1] The "age" variable has been created based on the derived variable "best age in years", available in NIDS and is restricted to adults aged 18 and over. Therefore, all observations of this variable that are less than 18 have been coded as "missing" and excluded from the analysis.

[2] In line with the literature on happiness, age squared divided by 100 has been included as one of the control variables to test for non-linearity in the relationship between age and level of happiness (Botha and Booysen, 2013; Ebrahim *et al.,* 2013). Generally, the relationship between age and happiness is U-shaped and non-linear (Blanchflower and Oswald, 2000; Ferrer-i-Carbonell and Gowdy, 2007; Ebrahim *et al.,* 2013; Ng, 2022). This suggests that the level of satisfaction is high at a young age, declines over time until it reaches the lowest level of satisfaction (between the age of 30 and 50), and then increases again (between the age of 60 and 70) (Realo and Dobewall, 2011; Ebrahim *et al.,* 2013; Blanchflower and Oswald, 2017; Beja, 2018; Ng, 2022). For South Africa, Clark *et al.* (1996); Gerdtham and Johannesson (2001); Powdthavee (2003, 2005); and Ebrahim *et al.* (2013) found a U-shaped relationship between age and happiness. Caporale *et al.* (2009) examined nineteen European countries (Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Ireland, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom) from Wave 1 (2003) and Wave 2 (2004) of the European Social Survey (ESS), and concluded that there is a U-shaped relationship between age and life satisfaction.

[3] The “gender” variable has been created based on the derived variable “best gender”, available in NIDS. It is worth noting that it reflects the individual’s self-reported gender and is a dummy variable.

[4] The 2011 geographical variables in the NIDS dataset are based on the 2011 Census boundaries that Stats SA made publicly available in late 2013 (National Income Dynamics Study, 2014; National Income Dynamics Study, 2020b). NIDS circulated these variables based on the 2001 Census boundaries prior to the public release of the Census 2011 data (National Income Dynamics Study, 2014; National Income Dynamics Study, 2020b).

Table 4.6 below provides a description of each geographical type classification.

Table 4.6. Description of each geographical type classification

Geographical type classification	Description
Urban	Built-up cities, towns, small towns, ‘townships’, and hamlets.
Traditional	Villages on communally-owned land under the authority of traditional leaders.
Farms	Commercial farming areas.

Source: Own compilation from Chinhema *et al.,* 2016; Brophy *et al.,* 2018; Dobreva and Posel, 2023

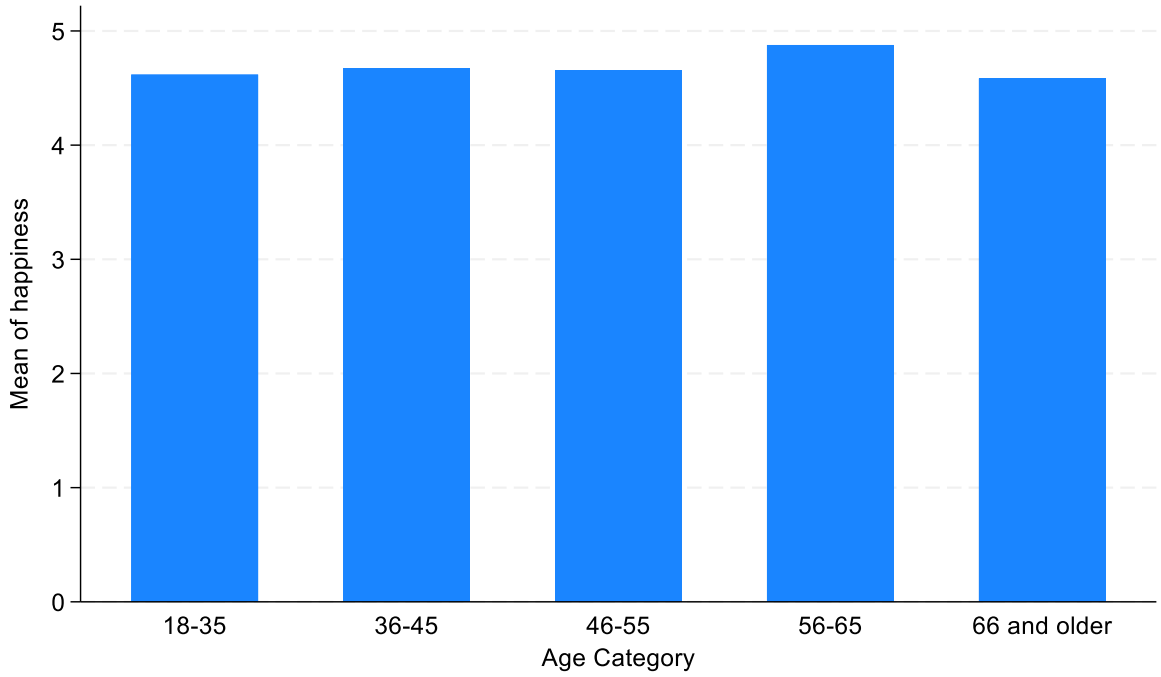
[5] The “numchild” variable was created after the “age” variable was created, but before any respondents were dropped from the dataset.

It should be noted that *age, age squared divided by 100 and number of children under 7 years of age residing in the household* are continuous variables. The rest of the control variables are categorical variables.

Figure 4.2 to Figure 4.7 below show how mean happiness varies according to the control variables (age, race, gender, employment status, type of region where the individual resides, and number of children under 7 years of age residing in the household).

The figure below shows that average happiness varies according to the age of the respondents. Adults aged 56-65 have the highest average happiness level (4.877).

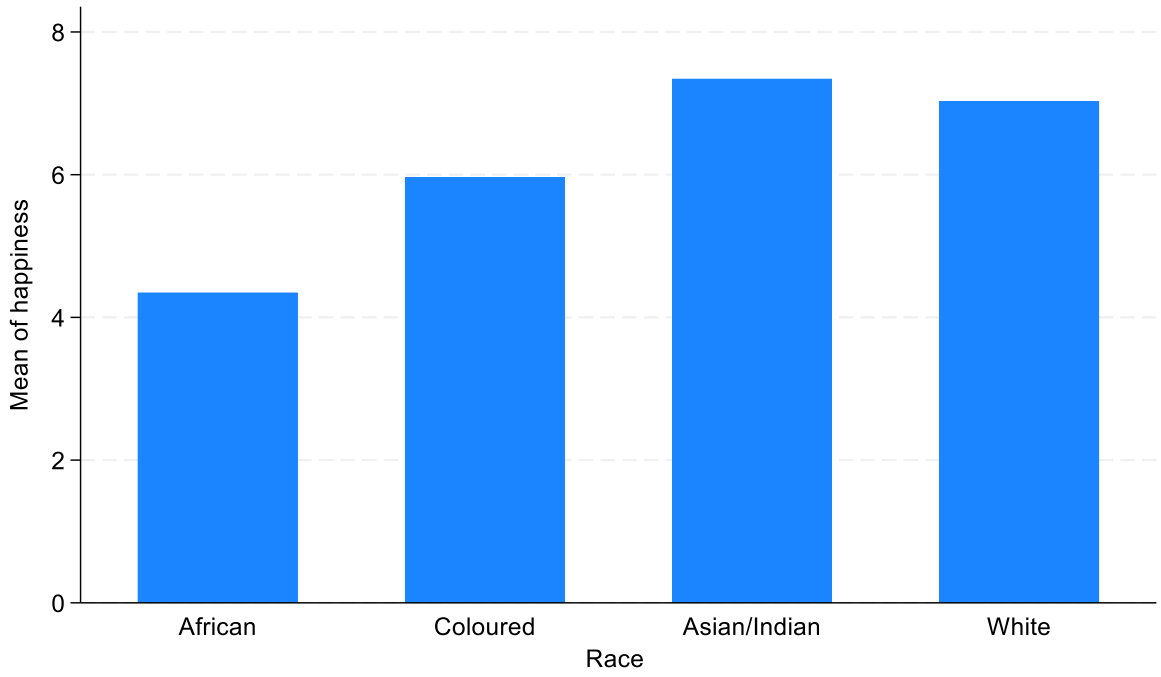
Figure 4.2. Bar Graph showing average happiness by age groups



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.3 below shows that average happiness varies according to the race of the respondents. The distribution reveals that Asian/Indian people, on average, are most happy with life, followed by White, Coloured, and African people. The finding that African people have the lowest level of average happiness compared to the other race groups is consistent with the findings of international studies such as Graham (2008) and South African studies such as Hinks and Gruen (2007); Ebrahim *et al.* (2013); and Botha (2014).

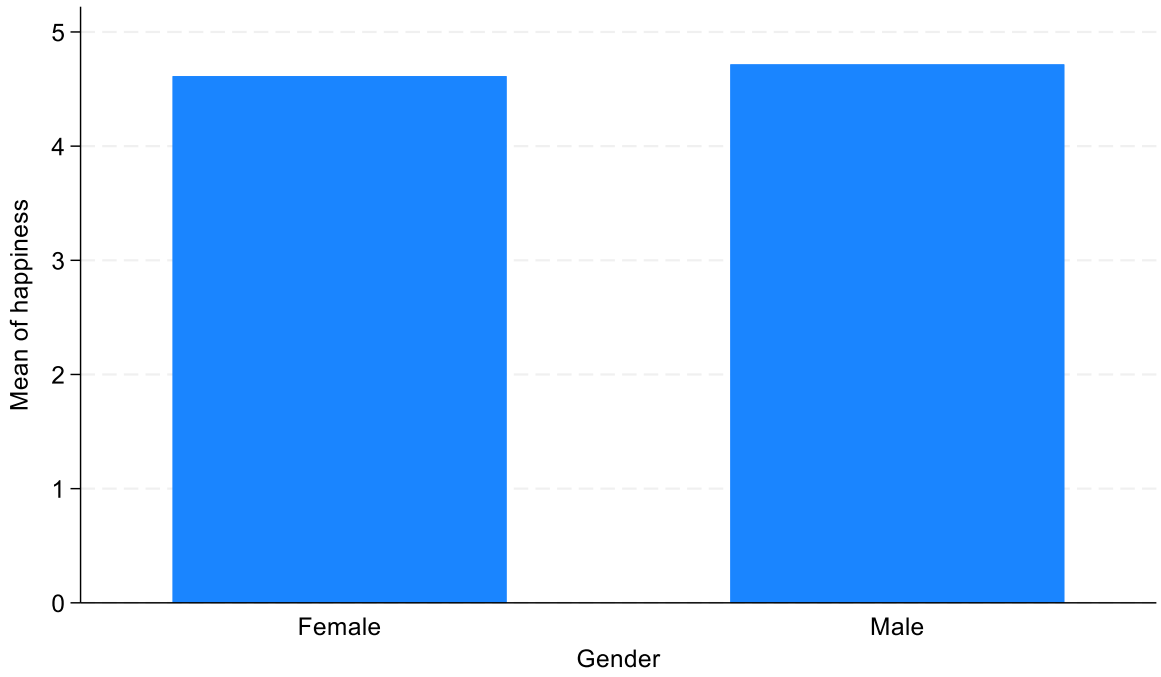
Figure 4.3. Bar Graph showing average happiness by race groups



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.4 below shows that average happiness varies according to the gender of the respondents. Males have a marginally higher average level of happiness than females. This finding is consistent with the findings of international studies such as Stevenson and Wolfers (2009). In contrast, international studies such as Blanchflower and Oswald (2000) found that women are happier than men, and Graham (2008) found no significant differences in happiness among men and women in Latin America. Furthermore, South African studies such as Mahadea and Rawat (2008) also found no significant happiness differences among men and women.

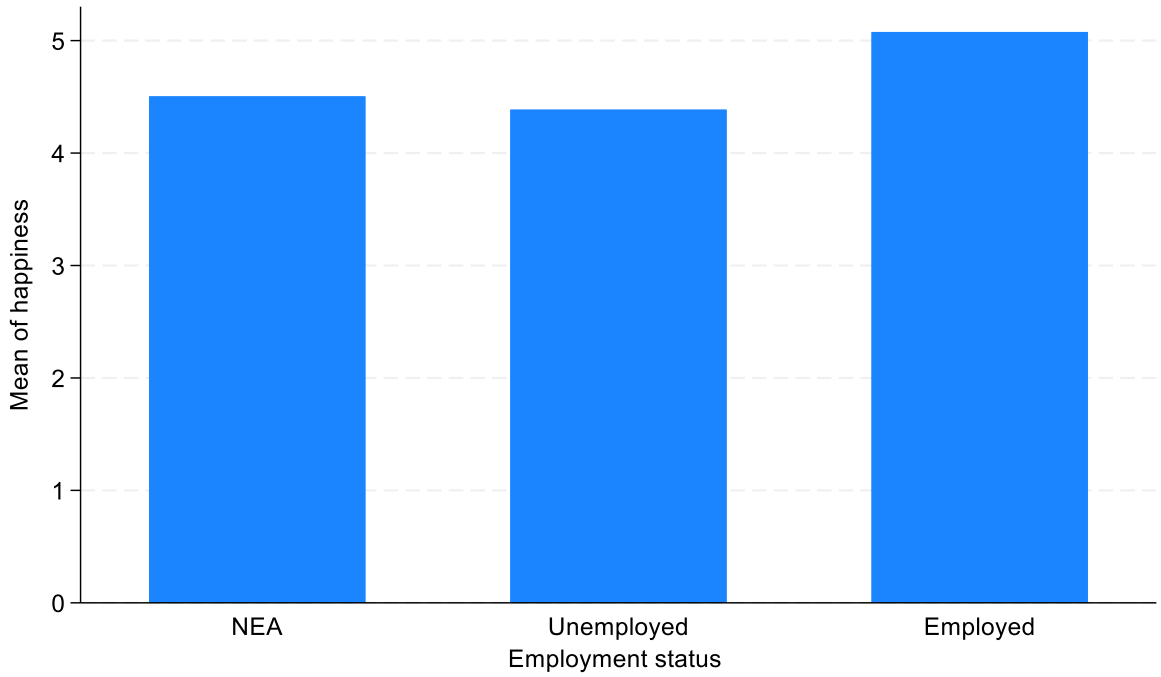
Figure 4.4. Bar Graph showing average happiness by gender



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.5 below shows that average happiness varies according to the employment status of the respondents. Employed people have the highest average level of happiness (5.077), followed by people who are Not Economically Active (NEA). As expected, unemployed people have the lowest mean happiness level (4.386). This finding is consistent with the findings of international studies such as Oswald (1997) who found that unemployed people feel much less satisfied with life compared to people who are employed. Similarly, South African studies such as Botha (2014) also found that unemployed people have the lowest mean happiness level.

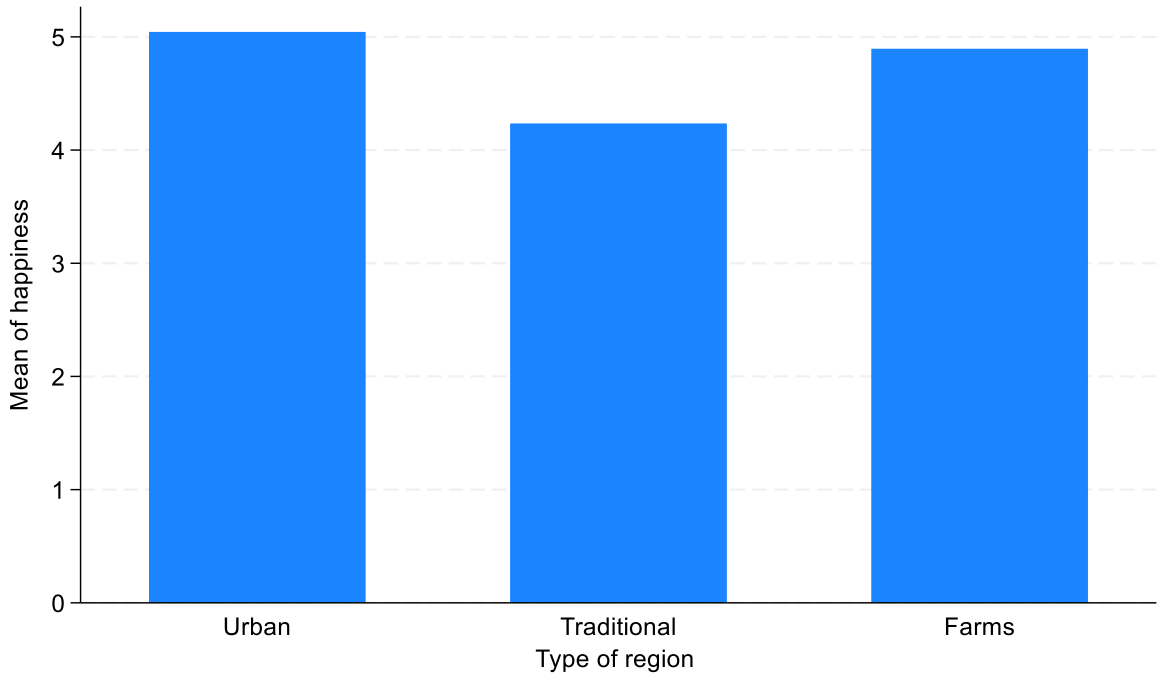
Figure 4.5. Bar Graph showing average happiness by employment status



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.6 below shows that average happiness varies according to the type of region where the individual resides. People who live in an urban area have the highest average level of happiness (5.043), followed by those who live on commercial farms (4.894). People who live in a traditional area have the lowest mean happiness level (4.233), possibly because of a lack of adequate amenities and infrastructure there. Similarly, South African studies such as Møller (2001) found that people living in informal areas and townships are less satisfied with their lives than people living in urban areas.

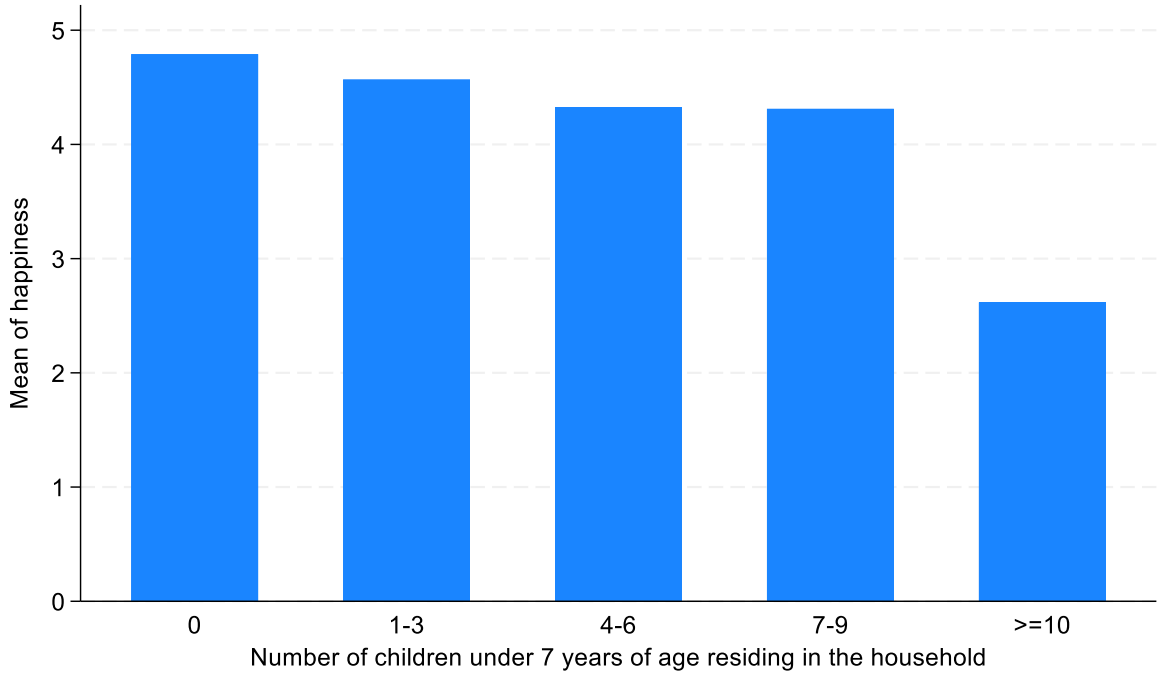
Figure 4.6. Bar Graph showing average happiness by geographical type



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 4.7 below shows that average happiness varies according to the number of children under 7 years of age residing in the household. The average level of happiness is the highest (4.790) when there are no children residing in the household. On the other hand, the average level of happiness is the lowest (2.617) when there are ten or more children residing in the household. Similarly, international studies such as Galay (2007) observed that couples with children in the household reported a lower average level of happiness than couples with no children in the household.

Figure 4.7. Bar Graph showing average happiness by the number of children under 7 years of age residing in the household



Source: Own calculations using NIDS data from 2010-2011, Wave 2

4.3 Weighting

This study makes use of survey weights because the dataset is cross-sectional. The survey prefix command (svy) adjusts the estimates according to the survey design and makes provision for the standard errors and confidence intervals to take into account the NIDS stratification and clustering (Branson and Wittenberg, 2018).

4.4 Descriptive Statistics

The weighted descriptive statistics for the happiness variable are presented in Table 4.7. The weighted descriptive statistics for the demographic and socioeconomic control variables, variables for the financial capital index, variables for the human capital index, and variables for the social and spiritual capital index, used in the analysis are presented in Table 4.8, Table 4.9, Table 4.10, and Table 4.11 respectively.

As shown in Table 4.7 below, the respondents' current satisfaction levels of life are not uniform, with some having a lower level and others having a better one. In effect,

9.1% of the respondents had the lowest current satisfaction level of life, while 3.1% had almost the highest level of life satisfaction (satisfaction level 9).

Most of the respondents reported satisfaction level 5 of life (17.8%) and satisfaction level 4 of life (13.6%), while 18.1% (8.5% + 3.1% + 6.5%) of the respondents reported satisfaction level 8 of life or higher.

Table 4.7. Happiness variable: Satisfaction levels descriptions and summary statistics

Variable	Definition		Proportion
happiness	Current satisfaction level of life	Satisfaction level 1#	0.091
			(0.011)
		Satisfaction level 2	0.074
			(0.007)
		Satisfaction level 3	0.114
			(0.007)
		Satisfaction level 4	0.136
			(0.008)
		Satisfaction level 5	0.178
			(0.009)
		Satisfaction level 6	0.122
			(0.007)
		Satisfaction level 7	0.103
			(0.008)
		Satisfaction level 8	0.085
			(0.008)
		Satisfaction level 9	0.031
			(0.004)
		Satisfaction level 10	0.065
			(0.008)
Sample			11851
Population			22521704

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:

# denotes the base category for the categorical variables
Standard errors in parentheses
Results are weighted using the cross-sectional survey weights.

As mentioned previously, the descriptive statistics for the demographic and socioeconomic control variables are presented in Table 4.8 below.

Table 4.8. Summary statistics for the demographic and socioeconomic control variables

Variable	Definition		Mean or Proportion
race	Population group	African#	0.776
			(0.029)
		Coloured	0.094
			(0.021)
		Asian/Indian	0.026
			(0.012)
		White	0.104
			(0.018)
gender		Female#	0.532
			(0.008)
		Male	0.468
			(0.008)
emplostatus	Employment status	Not Economically Active#	0.462
			(0.013)
		Unemployed	0.152
			(0.009)
		Employed	0.386
			(0.012)
GeoType2011	Type of region where the individual resides	Urban#	0.651
			(0.028)
		Traditional	0.298
			(0.027)
		Farms	0.052
			(0.013)
age	Adults aged 18 and over		38.263
			(0.339)
numchild	Number of children under 7 years of age residing in the household		0.784
			(0.034)
Sample			11851
Population			22521704

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:
# denotes the base category for the categorical variables
Standard errors in parentheses
Results are weighted using the cross-sectional survey weights.

The average age of the respondents is 38.263 years. There are more White respondents (10.4%) than Coloured (9.4%) and Asian/Indian (2.6%) respondents, and more than half of the respondents are women (53.2%). There are more employed respondents (38.6%) than unemployed respondents (15.2%), most of the respondents live in an urban area (65.1%), more respondents live in a traditional area (29.8%) than

on a farm (5.2%), and the average number of children under 7 years of age residing in the household is 0.784.

As mentioned previously, the descriptive statistics for the variables included in the financial capital category are presented in Table 4.9 below.

Table 4.9. Summary statistics for the variables included in the financial capital category

Variable	Definition		Mean or Proportion
ownradio	Ownership of at least one radio in good working order?	No#	0.688
			(0.012)
		Yes	0.312
			(0.012)
ownhifi	Ownership of at least one Hi-Fi Stereo, CD player, MP3 player in good working order?	No#	0.787
			(0.013)
		Yes	0.213
			(0.013)
ownsew	Ownership of at least one sewing/knitting machine in good working order?	No#	0.960
			(0.005)
		Yes	0.040
			(0.005)
ownvehicle	Ownership of at least one motor vehicle (private) in running condition in good working order?	No#	0.883
			(0.014)
		Yes	0.117
			(0.014)
owncomvehicle	Ownership of at least one bakkie or truck in running condition in good working order?	No#	0.972
			(0.004)
		Yes	0.028
			(0.004)
ownmot	Ownership of at least one motorcycle/scooter in good working order?	No#	0.991
			(0.003)
		Yes	0.009
			(0.003)
ownbic	Ownership of at least one bicycle in good working order?	No#	0.974
			(0.004)
		Yes	0.026
			(0.004)

Variable	Definition		Mean or Proportion
owncom	Ownership of at least one computer in good working order?	No#	0.897
			(0.012)
		Yes	0.103
			(0.012)
owncam	Ownership of at least one camera in good working order?	No#	0.931
			(0.010)
		Yes	0.069
			(0.010)
owncel	Ownership of at least one cell phone in good working order?	No#	0.282
			(0.010)
		Yes	0.718
			(0.010)
ownbond	Respondent has a home loan/bond?	No#	0.955
			(0.008)
		Yes	0.045
			(0.008)
ownloan	Respondent has a personal loan from a bank?	No#	0.963
			(0.004)
		Yes	0.037
			(0.004)
ownmicroloan	Respondent has a personal loan from a microlender?	No#	0.995
			(0.002)
		Yes	0.005
			(0.002)
ownmshloan	Respondent has a loan with a Mashonisa?	No#	0.991
			(0.002)
		Yes	0.009
			(0.002)
ownstudloan	Respondent has a study loan with a bank?	No#	0.996
			(0.001)
		Yes	0.004
			(0.001)
ownstuother	Respondent has a study loan with an institution other than a bank?	No#	0.997
			(0.001)
		Yes	0.003
			(0.001)
owncarloan	Respondent has vehicle finance (car payment)?	No#	0.974
			(0.005)
		Yes	0.026
			(0.005)
owncreditcard	Respondent has a credit card?	No#	0.956
			(0.006)
		Yes	0.044
			(0.006)
ownstorecard	Respondent has a store card?	No#	0.908
			(0.007)
		Yes	0.092

Variable	Definition		Mean or Proportion
			(0.007)
ownhp	Respondent has a hire purchase agreement?	No#	0.980
			(0.003)
		Yes	0.020
			(0.003)
ownfamilyloan	Respondent has a loan from a family member?	No#	0.992
			(0.002)
		Yes	0.008
			(0.002)
ownfriendloan	Respondent has loans from friends?	No#	0.992
			(0.001)
		Yes	0.008
			(0.001)
ownemploan	Respondent has loans from an employer?	No#	0.998
			(0.001)
		Yes	0.002
			(0.001)
ownunptax	Respondent has unpaid tax including PAYE, property taxes and VAT if a personal debt?	No#	0.999
			(0.000)
		Yes	0.001
			(0.000)
ownarrears	Respondent has arrears in service and other monthly bills?	No#	0.990
			(0.002)
		Yes	0.010
			(0.002)
ownfinassets	Respondent has unit trusts, stocks and shares?	No#	0.986
			(0.004)
		Yes	0.014
			(0.004)
logpchhincome	Log household income per capita		0.023
			(0.065)
logpchhexp	Log household expenditure per capita		6.639
			(0.071)
wealth	Household net worth per capita		171.742
			(39.806)
Sample			11851
Population			22521704

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:
# denotes the base category for the categorical variables
Standard errors in parentheses
Results are weighted using the cross-sectional survey weights.

Household income per capita, household expenditure per capita and household net worth per capita

The unlogged values for per capita household income, per capita household expenditure and per capita household net worth is R2,507.497; R2,090.090, and R171.742 respectively.

Personal ownership variables

Most of the respondents do not own at least one of the following durable assets in good working order: Hi-Fi Stereo, CD player, MP3 player, sewing/knitting machine, motor vehicle (private) in running condition, bakkie or truck in running condition, motorcycle/scooter, bicycle, computer, and camera. On the other hand, most of the respondents own at least one cell phone in good working order (Table 4.9).

Personal debt variables

Most of the respondents do not have a home loan/bond, a personal loan from a bank, a loan from a microlender, a loan with a Mashonisa, a study loan with a bank, a study loan with an institution other than a bank, a vehicle finance (car payment), a credit card, a store card (for example, Edgars, Foschini or Woolworths store card), a hire purchase agreement, a loan from a family member, loans from friends, loans from an employer, unpaid tax including PAYE, property taxes and VAT if a personal debt, arrears in service and other monthly bills and unit trusts, stocks and shares (Table 4.9).

As mentioned previously, the descriptive statistics for the variables included in the human capital category are presented in Table 4.10 below.

Table 4.10. Summary statistics for the variables included in the human capital category

Variable	Definition		Mean or Proportion
complit	Respondent is computer literate?	No#	0.644
			(0.016)
		Yes basic use	0.206
			(0.009)
		Yes highly literate	0.150
			(0.012)
driverslic	Respondent has a driver's license?	No#	0.774
			(0.017)
		Yes	0.226
			(0.017)
readeng	Respondent's reading level in English	Not at all#	0.061
			(0.005)
		Not well	0.125
			(0.007)
		Fair	0.257

Variable	Definition		Mean or Proportion
			(0.011)
		Very well	0.557
			(0.016)
writeeng	Respondent's writing level in English	Not at all#	0.068
			(0.005)
		Not well	0.120
			(0.006)
		Fair	0.261
			(0.011)
		Very well	0.550
			(0.016)
health	Perceived health status	Poor#	0.023
			(0.003)
		Fair	0.057
			(0.004)
		Good	0.182
			(0.009)
		Very good	0.303
			(0.011)
		Excellent	0.434
			(0.013)
yrschool	Years of schooling completed – derived		9.491
			(0.117)
Sample			11851
Population			22521704

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:
# denotes the base category for the categorical variables
Standard errors in parentheses
Results are weighted using the cross-sectional survey weights.

The average years of schooling completed is 9.491 years (Table 4.10). This indicates that the average South African individual completed slightly more than Grade 9 (Std 7/Form 2). As mentioned in Chapter 1, South Africa's Gini coefficient stands at 0.67, making it the most unequal country in the world (World Bank, 2022a; World Bank, 2022b; World Bank, 2024a). Increasing average years of schooling decreases income inequality (especially in developing and emerging economies), which ultimately increases happiness (Coady and Dizioli, 2017). Furthermore, as mentioned in Chapter 3, South African research has found that there is a positive relationship between additional education and life satisfaction (Botha, 2014).

Most of the respondents (64.4%) reported that they are not computer literate. This may be due to the following reasons: (1) most of the respondents reported that they do not personally own at least one computer in good working order, (2) 17.2% and 16.4% of the South African population did not have access to electricity in 2010 and 2011

respectively, and (3) South Africa's mobile cellular and broadband internet tariffs are extremely high. In 2011, the country ranked 102nd and 79th in terms of mobile cellular, and fixed broadband internet tariffs, respectively (World Economic Forum, 2011; World Bank, 2024d). Furthermore, the fact that there is a lack of access to the internet and computers at schools as well as within rural and disadvantaged communities in South Africa, could also be a reason why there is a deficit of computer skills in the country (Merkofer and Murphy, 2009). Poor skills and a lack of essential skills (such as computer literacy) limit people in South Africa from accessing rewarding and well-paying jobs, which ultimately affects their level of happiness (World Economic Forum, 2017).

More than three-quarters of the respondents (77.4%) reported that they do not have a driver's license. More than half of the respondents (55.7%) reported that they can read very well in English, and a similar proportion (55%) reported that they can write very well in English. International studies such as Dávila and Mora (2000), Chiswick and Miller (2003), and Chakraborty and Bakshi (2016) found that English proficiency improves an individual's income satisfaction. Similarly, for South Africa, Levinsohn (2007) confirmed the positive effect of speaking English on individual income satisfaction. An increase in individual income satisfaction due to English proficiency enhances an individual's happiness by enabling them to gratify their needs and wants and feel satisfied with their life.

Most of the respondents (73.7%) described their health at present as either very good or excellent. Health is a vital aspect of an individual's daily functioning and quality of life (Khan and Raeside, 2014; Dobreva and Posel, 2023). The absence of good health makes it challenging for individuals to participate in society and lead fulfilling lives (Dobreva and Posel, 2023). Contrastingly, those with better health tend to be happier and enjoy longer years of a happy life.

The descriptive statistics for the variables included in the social and spiritual capital category are presented in Table 4.11 below.

Table 4.11. Summary statistics for the variables included in the social and spiritual capital category

Variable	Definition		Mean or Proportion
staypref	Preference to continue living in current area	Strong preference to leave[#]	0.054
			(0.006)
		Moderate preference to leave	0.046
			(0.005)
		Unsure (no strong preference to stay or leave)	0.147
			(0.009)
		Moderate preference to stay	0.147
			(0.009)
		Strong preference to stay	0.605
			(0.017)
trust1	Likelihood of neighbour returning wallet or purse containing R200	Not likely at all[#]	0.647
			(0.015)
		Somewhat likely	0.168
			(0.010)
		Very likely	0.185
			(0.014)
trust2	Likelihood of complete stranger returning wallet or purse containing R200	Not likely at all[#]	0.817
			(0.011)
		Somewhat likely	0.092
			(0.006)
		Very likely	0.091
			(0.008)
crime1	Frequency of burglaries, muggings or thefts in the neighbourhood	Very common[#]	0.201
			(0.016)
		Fairly common	0.163
			(0.012)
		Not common	0.190
			(0.013)
		Very Rare	0.254
			(0.014)
		Never happens	0.192
			(0.021)
crime2	Frequency of violence between members of the same household in the neighbourhood	Very common[#]	0.106
			(0.011)
		Fairly common	0.131
			(0.010)
		Not common	0.236
			(0.013)
		Very Rare	0.276
			(0.013)

Variable	Definition		Mean or Proportion
		Never happens	0.251
			(0.018)
crime3	Frequency of violence between members of the different household in the neighbourhood	Very common#	0.110
			(0.013)
		Fairly common	0.140
			(0.012)
		Not common	0.234
			(0.013)
		Very Rare	0.268
			(0.013)
		Never happens	0.249
			(0.021)
maritalstatus	Marital status	Never married#	0.567
			(0.015)
		Married/cohabiting	0.361
			(0.014)
		Formerly married	0.072
			(0.005)
arelnb	Importance of religious activities in life	Very important#	0.474
			(0.017)
		Important	0.432
			(0.016)
		Unimportant	0.056
			(0.007)
		Not important at all	0.038
			(0.005)
comgroupstot	Number of memberships in community groups		0.464
			(0.023)
Sample			11851
Population			22521704

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:
# denotes the base category for the categorical variables
Standard errors in parentheses
Results are weighted using the cross-sectional survey weights

Being never married is the modal current marital status – 56.7% of the respondents reported that they have never married (Table 4.11). Most of the respondents (64.7%) reported that it is not likely at all for someone who lives close by to return a wallet or purse containing R200. Similarly, 81.7% of the respondents reported that it is not likely at all for a complete stranger to return a wallet or purse containing R200. This supports the data from Wave 6 (2010-2014) of the World Values Survey which estimated that only 23,3% of South Africans believe that most people can be trusted (World Values Survey, 2020). The respondents may have reported very low levels of trust due to the history of racial discrimination and high rates of crime, unemployment, poverty, and

inequality in South Africa (Posel and Hinks, 2013). It is worth noting that respondents are more likely to report trusting someone who lives close by/a neighbour than a complete stranger. In other words, the level of trust decreases as the radius of trust widens (Posel and Hinks, 2013). This finding is consistent with the findings of South African studies such as Posel and Hinks (2013) and international studies such as Welch *et al.* (2007) and Etang (2010). One possible explanation for this finding is that neighbourhoods foster relations of trust by providing a context wherein repeated social interactions between neighbours or individuals who live close by can occur (Posel and Hinks, 2013). Another possible explanation for this finding is that South African neighbourhoods are highly segregated along racial and socio-economic lines. Hence, the higher likelihood of trusting someone who lives close by/a neighbour than a complete stranger may reflect people's tendency to extend trust more readily to others with similar characteristics (Posel and Hinks, 2013). Despite the low levels of trust, most respondents (60,5%) reported a strong preference to continue living in the area (village or suburb) in which they live. Most of the respondents (63,6%) reported that burglaries, muggings or thefts are either not common, very rare or never happens in their neighbourhood. This is a surprising finding due to the high crime rate in South Africa. Most of the respondents (76,3%) reported that violence between members of the same household is either not common, very rare or never happens in their neighbourhood. Most of the respondents (75,1%) also reported that violence between members of different households is either not common, very rare or never happens in their neighbourhood. On average, the number of memberships in community groups is 0.464. Most of the respondents (90,6%) regard religious activities as either very important or important in their lives. Therefore, the constitutional right to freedom of religion is a fundamental one and deserves the protection that the constitution has afforded to it (Blaauw and Pretorius, 2013).

Concluding Remarks

This chapter described the data and research design used in the study. The descriptive statistics indicate that the respondents' modal response is satisfaction level 5 and only 18.1% of them reported satisfaction level 8 of life or higher. As expected, there are more employed respondents than unemployed respondents, most of the respondents live in an urban area, more respondents live in a traditional area than on

a farm, and the average number of children under 7 years of age residing in the household is approximately 0.784. In terms of the variables included in the financial capital category, besides owning at least one cell phone in good working order, most of the respondents do not own at least one durable asset and do not have personal debt. Regarding the variables included in the human capital category, the average educational attainment of a South African individual is slightly more than Grade 9 (Std 7/Form 2). Moreover, most of the respondents are not computer literate and do not have a driver's license, more than half of the respondents are proficient in English, and most of the respondents described their health at present as either very good or excellent. Lastly, with reference to the variables included in the social and spiritual capital category, more than half of the respondents were never married. Most of the respondents reported that they have low levels of trust towards both neighbours and strangers. Despite this, most of them have a strong preference to stay in the area where they are currently living. This may be because they are more likely to report trusting someone who lives close by/a neighbour than a complete stranger. Most of the respondents also reported that crime (burglaries, muggings, or thefts) and violence (between members of the same household, and between members of different households) are either not common, very rare, or never happens in their neighbourhood; and religious activities are regarded as either very important or important in their lives.

Increasing the average educational attainment, and the percentage of people who have a driver's license and are computer literate appears to be a vital policy tool, to increase human capital in South Africa. It is concerning that only 35.3% of the respondents reported that it is somewhat likely or very likely for someone who lives close by to return a wallet or purse containing R200 and only 18.3% of the respondents reported that it is somewhat likely or very likely for a complete stranger to return it. As mentioned previously (in Chapter 3) research indicates that in environments where individuals can trust others among whom they live or work, and can trust others in leadership positions, there is a higher level of happiness relative to areas where this trust level is low (Helliwell and Putman, 2004). Therefore, increasing the levels of trust among South African adults may also be an important policy tool to increase the level of happiness.

The next chapter aims to estimate an index for each of the capital elements, using PCA. These indices will then be used (in Chapter 6) as independent variables in an ordered probit regression model with happiness as the dependent variable, in order to determine the influence of the diverse capital elements on happiness in South Africa.

Chapter 5: Principal Component Analysis: methodology and results

Introduction

This chapter uses PCA to estimate an index for each of the capital elements. This analysis is done using Stata. This chapter begins with a description and justification of PCA, followed by the presentation and discussion of the KMO test and PCA results for each capital element.

5.1 Principal Component Analysis

PCA is a 'data reduction' technique that takes a large set of variables and looks at how the data can be reduced to a smaller number of inter-correlated factors or components of the original variables. PCA and Factor Analysis are similar techniques in many respects and are often used interchangeably by researchers because they tend to yield similar results (Pallant, 2016). The goals of PCA are: (a) to extract the most essential information from the data, (b) to condense the size of the dataset by keeping only the essential information, (c) to simplify the depiction of the dataset, and (d) to critically analyse the structure of the observations and the variables (Abdi and Williams, 2010). In order to attain these goals, PCA is used to compute new variables referred to as *principal components* which are linear combinations of the original variables. The first principal component has the largest possible variance, hence will explain the most amount of variation in the dataset (Abdi and Williams, 2010). As mentioned previously, this study makes use of PCA as a dimensionality reduction method to estimate an index for each of the capital elements. These indices are then used as independent variables in a regression model with happiness as the dependent variable.

As a data reduction technique, the PCA follows a few important steps. These are summarised in Table 5.1 below.

Table 5.1. Important Steps for PCA

Steps	Summary of the process
1	Check that the variables are suitable for Principal Component Analysis.
2	Select the criteria that will assist in the determination of component extraction.
3	Choose the rotation technique/s that will be used.
4	Label the components and interpret the rotated components results.
5	Estimate an index based on the first principal component that was acquired in the previous step.

Source: Own compilation adapted from Williams *et al*., 2010

Step 1 verifies that the variables are suitable for PCA. As mentioned previously, Field (2009) recommends that for factor analysis to be undertaken, a study should have at least 300 cases. The NIDS Wave 2 sample used for this study's purposes consists of 20,608 adults aged 18 and over with complete responses for the variables of interest; hence it is large enough to permit a Principal Component Analysis (Pallant, 2016). After identifying variables, on which data were collected in the second wave of NIDS related to financial capital, human capital, and social and spiritual capital, a KMO test has to be conducted to ensure that the variables are suitable for PCA. As a rule of thumb, a KMO test result greater than 0.5 indicates that the variables are suitable for PCA (Field, 2009). Furthermore, Kaiser (1974, p. 35) describes a KMO test result in the .80's as "meritorious" and below .50 as "unacceptable".

Step 2 assists the researcher in determining the number of components to retain in the PCA, following the Kaiser criterion and scree plot (Cattell,1966; Holland, 2008; Field, 2009; Ledesma *et al.,* 2015).

Kaiser's criterion suggests retaining all components with eigenvalues greater than one (Kaiser, 1960; Field, 2009). The eigenvalue associated with each component represents the total amount of variation explained by each component (Field, 2009).

The scree plot is a graph that shows the relationship between eigenvalues and the number of components (Brown, 2009a). The first point on the more-or-less straight (horizontal) line is considered the last component to be retained in the PCA (Cattell, 1966; Jolliffe, 2002). In other words, the point at which the resulting curve drastically changes indicates the maximum number of components to retain in the PCA (Ledesma

et al., 2015). Therefore, from the graph, only components with an eigenvalue greater than 1 are retained in the PCA (Field, 2009).

Step 3 selects the rotation technique that is used in the study. The two main types of rotation techniques are orthogonal and oblique (Abdi and Williams, 2010). Orthogonal rotation methods assume that the components in the analysis are uncorrelated whereas oblique rotation methods assume that the components in the analysis are correlated (Brown, 2009b). There is no clear consensus among scholars regarding which rotation method to employ in research. It can be argued that adopting an orthogonal rotation method (such as varimax) may be preferred over an oblique rotation method (such as promax) because it is much simpler to understand and interpret (Kim and Mueller, 1978; Brown, 2009b). This study employed the varimax rotation method developed by Kaiser (1958) to facilitate and strengthen the interpretation of the results. It is worth noting that varimax rotation is the most popular rotation method (Abdi and Williams, 2010). The varimax rotation results are presented in this chapter, but the promax rotation results can be found in Appendix C (see Tables C.2, C.3, C.5, C.6, C.8, and C.9).

Step 4 involves labelling the components and interpreting the rotated components (for instance, varimax or promax) results.

Step 5 estimates an index for the capital element based on the first principal component that was acquired in the previous step. The first principal component will be used because it has the largest possible variance; hence, it explains the most amount of variation in the dataset (Abdi and Williams, 2010). These indices will then be used in the next chapter (Chapter 6) as independent variables in a regression model, with happiness as the dependent variable.

5.2 Financial capital

As highlighted in the literature review (Chapter 3), numerous factors influence happiness and some have to do with material wellbeing. In this section, the proxies for financial capital are combined using PCA to estimate an index for financial capital. Accordingly, 29 variables for financial capital were examined, ranging from per capita household income (R'000) to unit trusts, stocks, and shares, as presented in the previous chapter (Table 4.2 and Table 4.9).

5.2.1 Kaiser-Meyer-Olkin Measure of Sampling Adequacy

After identifying 29 questions (variables) related to financial capital on which data were collected in the second wave of NIDS, a KMO test was conducted to ensure that the variables are suitable for PCA. As mentioned in Step 1 above, as a rule of thumb, a KMO test result greater than 0.5 indicates that the variables are suitable for PCA (Field, 2009).

The KMO test result for the 29 financial capital variables is presented in Table 5.2 below.

Table 5.2. KMO Test for the 29 financial capital variables

Variable	Definition	KMO
wealth	Household net worth per capita	0.8251
logpchhincome	Log household income per capita	0.7427
logpchhexp	Log household expenditure per capita	0.7496
ownradio	Ownership of at least one radio in good working order?	0.8219
ownhifi	Ownership of at least one Hi-Fi Stereo, CD player, MP3 player in good working order?	0.8736
ownsew	Ownership of at least one sewing/knitting machine in good working order?	0.8894
ownvehicle	Ownership of at least one motor vehicle (private) in running condition in good working order?	0.8958
owncomvehicle	Ownership of at least one bakkie or truck in running condition in good working order?	0.8533
ownmot	Ownership of at least one motorcycle/scooter in good working order?	0.7114
ownbic	Ownership of at least one bicycle in good working order?	0.7846
owncom	Ownership of at least one computer in good working order?	0.8757
owncam	Ownership of at least one camera in good working order?	0.8721
owncel	Ownership of at least one cell phone in good working order?	0.8992
ownbond	Respondent has a home loan/bond?	0.9081
ownloan	Respondent has a personal loan from a bank?	0.8453
ownmicroloan	Respondent has a personal loan from a microlender?	0.6860
ownmshloan	Respondent has a loan with a Mashonisa?	0.5580
ownstudloan	Respondent has a study loan with a bank?	0.8218
ownstuother	Respondent has a study loan with an institution other than a bank?	0.7242
owncarloan	Respondent has vehicle finance (car payment)?	0.8506
owncreditcard	Respondent has a credit card?	0.8798

Variable	Definition	KMO
ownstorecard	Respondent has a store card?	0.8297
ownhp	Respondent has a hire purchase agreement?	0.7162
ownfamilyloan	Respondent has a loan from a family member?	0.5407
ownfriendloan	Respondent has loans from friends?	0.5335
ownemploan	Respondent has loans from an employer?	0.7035
ownunptax	Respondent has unpaid tax including PAYE, property taxes and VAT if a personal debt?	0.7553
ownarrears	Respondent has arrears in service and other monthly bills?	0.7350
ownfinassets	Respondent has unit trusts, stocks and shares?	0.8950
Overall		**0.8277**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.2 above, the overall KMO for financial capital was found to be approximately 0.828 (greater than 0.5); therefore, the financial capital variables were suitable for PCA (Field, 2009). Furthermore, the KMO value indicates that the financial capital variables have approximately 82.8% of variance in common. It is worth noting that of all the financial capital variables, the ownbond (respondent has a home loan/bond?) variable has the highest KMO value (approximately 0.908).

5.2.2 PCA results

PCA is used to estimate an index for financial capital. The index will represent financial capital (one of the three key independent variables) in the regression model discussed in Chapter 6. Similarly, indices for human capital and social and spiritual capital are estimated in section 5.3 and 5.4 respectively.

Table 5.3 below shows that there are 29 components in the original variables set. The eigenvalues associated with each component, the difference in the eigenvalues of each additional component, the proportion of variation explained by each component, and the cumulative variation explained (accumulation of variation for each principal component) are presented in Table 5.3 below.

Table 5.3. PCA results for financial capital

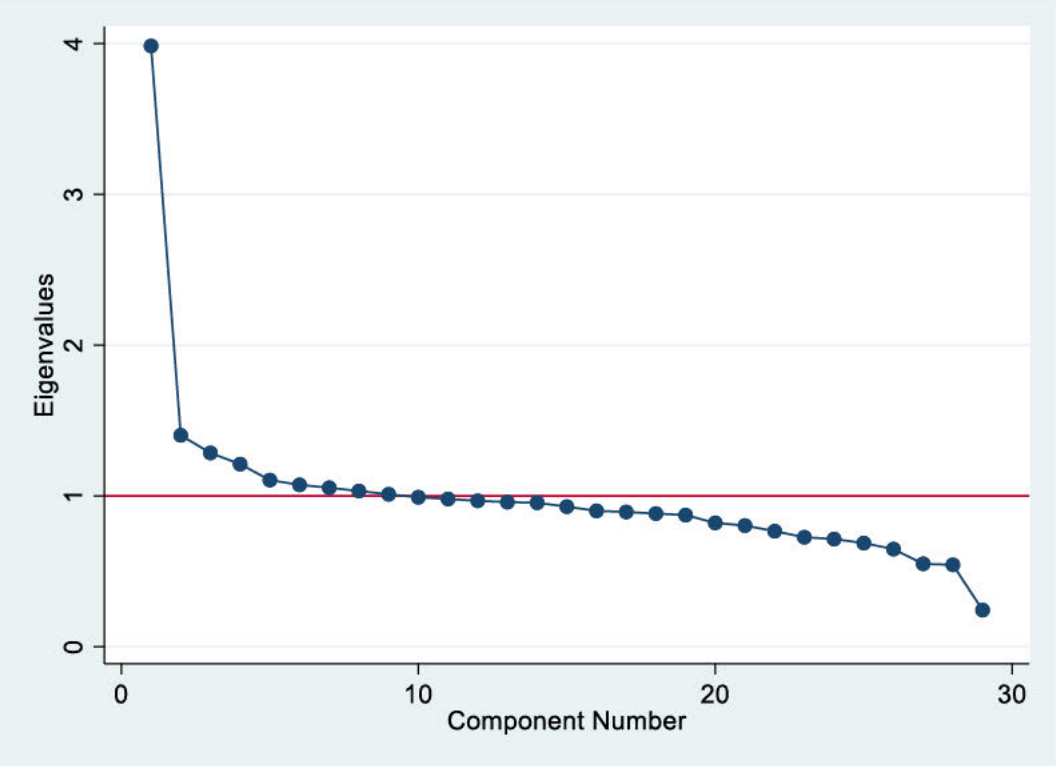
Component	Initial Eigenvalues			
	Total	Difference	% of variance	Cumulative %
1	3.98406	2.58194	0.1374	0.1374
2	1.40213	.116917	0.0483	0.1857
3	1.28521	.074007	0.0443	0.2300
4	1.2112	.105975	0.0418	0.2718
5	1.10523	.0315921	0.0381	0.3099
6	1.07364	.0191972	0.0370	0.3469
7	1.05444	.0217406	0.0364	0.3833
8	1.0327	.0216257	0.0356	0.4189
9	1.01107	.0194063	0.0349	0.4538
10	.991666	.0117021	0.0342	0.4880
11	.979964	.0117006	0.0338	0.5218
12	.968264	.00928814	0.0334	0.5552
13	.958976	.00380938	0.0331	0.5882
14	.955166	.0258437	0.0329	0.6212
15	.929323	.0281448	0.0320	0.6532
16	.901178	.00710499	0.0311	0.6843
17	.894073	.0108852	0.0308	0.7151
18	.883188	.00999755	0.0305	0.7456
19	.87319	.0515324	0.0301	0.7757
20	.821658	.0177113	0.0283	0.8040
21	.803946	.037298	0.0277	0.8317
22	.766648	.0402551	0.0264	0.8582
23	.726393	.0120063	0.0250	0.8832
24	.714387	.0266803	0.0246	0.9079
25	.687707	.0401005	0.0237	0.9316
26	.647606	.0973958	0.0223	0.9539
27	.550211	.00685836	0.0190	0.9729
28	.543352	.299928	0.0187	0.9916
29	.243424	.	0.0084	1.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As mentioned previously, the Kaiser criterion and scree plot were used to determine the number of components retained in the study. Table 5.3 identifies a set of 9 extracted components (in accordance with Kaiser's criterion) that explain approximately 45.38% of the total variation in the underlying latent variable "financial

capital". The rest of the components (10 to 29) were not considered in the analysis, because their eigenvalues are less than 1. In addition, the scree plot (Figure 5.1) below confirms the extraction of nine components with an eigenvalue greater than one. Therefore, we retained nine financial capital components in this study.

Figure 5.1. Scree plot for financial capital PCA



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Performing PCA with the nine extracted components

In this step, we performed PCA with the nine extracted components. Table 5.4 below shows the following: (1) Stata retained nine components in the program, (2) principal components (eigenvectors) estimated exactly nine components, (3) loadings on the nine principal components, (4) original variables such as wealth (W2 per capita household net worth in R1000's), logpchhincome (per capita household income (R'000) logged) and logpchhexp (per capita household expenditure (R'000) logged), and (5) percent of variation that is still unexplained. For example, the wealth (W2 per capita household net worth in R1000's) variable (with nine components) has 54.24% unexplained variation in the data; therefore, it explains 45.76% of the variation in the data. The logpchhincome (per capita household income (R'000) logged) variable (with

nine components) has 27.55% unexplained variation in the data; therefore, it explains 72.45% of the variation in the data. It is preferable that the variables have a (fairly) low unexplained variation.

Table 5.4. Eigenvectors showing the correlations between the 29 original variables and the 9 retained components

Variable	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	Component 8	Component 9	Unexplained
wealth	0.0675	-0.1463	0.0016	-0.1538	0.1463	0.1102	-0.1683	0.4921	0.2518	.5424
logpchhincome	0.3441	0.0003	0.1699	-0.2604	0.0600	-0.2215	-0.0764	0.2482	0.0841	.2755
logpchhexp	0.3557	-0.0155	0.1814	-0.2506	0.0765	-0.1952	-0.0773	0.2352	0.0746	.2609
ownradio	0.1841	-0.0188	0.4214	-0.0110	-0.1161	0.3299	0.0671	-0.1899	-0.0781	.4563
ownhifi	0.2493	0.0916	0.2941	-0.0004	-0.1011	0.2342	0.0498	-0.1387	-0.0786	.5305
ownsew	0.1218	-0.0454	0.1290	-0.1731	0.1306	0.2773	-0.0204	-0.2030	-0.1055	.7247
ownvehicle	0.3377	-0.0997	-0.1471	-0.0318	0.0897	0.0638	0.0240	-0.0533	-0.0952	.4767
owncomvehicle	0.1642	-0.1684	-0.0362	0.2731	-0.1697	0.2782	-0.0060	0.3071	0.1683	.5198
ownmot	0.0944	-0.2985	0.1360	0.4559	-0.2200	-0.2069	-0.0160	0.0944	0.1593	.4295
ownbic	0.0984	-0.2022	0.2122	0.3685	-0.1312	-0.2200	-0.0394	-0.1888	-0.0472	.5701
owncom	0.3046	-0.2145	-0.0665	0.0083	0.0593	-0.1241	-0.0085	-0.1772	-0.0488	.5047
owncam	0.2830	-0.1959	-0.1060	0.0331	0.0758	-0.0844	-0.0325	-0.2363	-0.0623	.5347
owncel	0.1863	0.1484	0.3422	-0.0999	-0.0890	0.0405	0.0470	0.0350	-0.0104	.6541
ownbond	0.2320	-0.0549	-0.2245	-0.0749	0.0848	-0.0097	0.1015	0.0282	-0.0292	.6892
ownloan	0.1589	0.3739	-0.1260	0.0785	-0.1564	0.0003	0.0926	-0.0089	0.1166	.6256
ownmicroloan	0.0357	0.1773	-0.0061	0.0557	0.1925	-0.2446	-0.3861	-0.1566	0.1653	.6317
ownmshloan	-0.0078	0.0498	0.1209	0.1612	0.2931	0.1435	0.3283	-0.1810	0.3824	.5336
ownstudloan	0.0556	0.1006	-0.0828	-0.0364	-0.1165	-0.0926	0.4195	0.1605	-0.2767	.6492
ownstuother	0.0414	0.0727	0.0099	-0.0164	-0.1536	-0.2818	0.4345	-0.0409	0.5252	.3942
owncarloan	0.2348	-0.0121	-0.3745	0.1091	-0.0014	0.1870	0.1383	0.0623	-0.0977	.5142
owncreditcard	0.2423	0.1573	-0.3318	0.0532	0.0205	-0.0378	0.0627	-0.1353	-0.0445	.5595

Variable	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	Component 8	Component 9	Unexplained
ownstorecard	0.2024	0.4491	-0.0795	0.0546	-0.0590	-0.0543	-0.0123	-0.0388	0.0472	.5312
ownhp	0.0623	0.3492	0.0806	0.1166	-0.1656	0.0200	-0.2060	0.0226	0.0654	.7084
ownfamilyloan	0.0134	0.0650	0.0848	0.2682	0.4911	-0.0516	0.1077	0.2423	-0.1626	.528
ownfriendloan	-0.0046	0.0863	0.1330	0.1965	0.5620	0.0869	0.1702	-0.0116	0.0707	.527
ownemploan	0.0365	0.1023	0.1069	0.3070	-0.0717	-0.0721	0.1223	0.3295	-0.4016	.549
ownunptax	0.0492	0.0421	-0.1633	0.1422	-0.0990	0.4861	-0.1615	0.1241	0.2629	.5513
ownarrears	0.0612	0.2945	0.0238	0.2642	0.0950	-0.0580	-0.3517	-0.0039	-0.0636	.6301
ownfinassets	0.1446	-0.2037	-0.1541	0.1292	0.0684	0.0040	-0.1875	-0.1469	0.0697	.7383

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table 5.4 shows that logpchhincome (per capita household income (R'000) logged) has a high loading on component 1 (loading $\approx$ 0.344) but does not have a high loading on components 2 to 9. Similarly, Table 5.4 shows that logpchhexp (per capita household expenditure (R'000) logged) has a high loading on component 1 (loading $\approx$ 0.356) but does not have a high loading on components 2 to 9.

Rotations

The component loadings in Table 5.4 above were rotated using the varimax rotation method. It is worth noting that PCA with varimax rotation and PCA with promax rotation produce similar results. The varimax rotation results are presented below, but the promax rotation results can be found in Appendix C (see Tables C.2 and C.3).

Varimax

PCA with varimax rotation was run on the 29 financial capital variables. The PCA with varimax rotation results are presented in Table 5.5 below.

Table 5.5 below only shows component loadings greater than +0.3 and less than -0.3, because they are generally accepted as making a significant contribution to the principal components (Katchova, 2013a). Therefore, component loadings less than 0.3 and greater than - 0.3 are not considered, as they influence the components less.

Table 5.5. Rotated Components (varimax) of financial capital variables

Rotated Components (varimax)									
	Components								
Financial capital variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
wealth		0.4339					0.3782		
logpchhincome		0.5746							
logpchhexp		0.5678							
ownradio			0.6094						
ownhifi			0.4868						
ownsew			0.3298						
ownvehicle	0.3820								
owncomvehicle							0.5328		
ownmot					0.6437				
ownbic					0.5366				
owncom	0.3543								
owncam	0.3788								
owncel			0.3414						
ownbond	0.3174								
ownloan				0.3614					
ownmicroloan				0.3574				-0.3628	
ownmshloan						0.4432			0.3940
ownstudloan								0.5105	
ownstuother									0.7498
owncarloan	0.4045								
owncreditcard	0.3922								
ownstorecard				0.4603					
ownhp				0.4236					
ownfamilyloan						0.5741			
ownfriendloan						0.6424			

Rotated Components (varimax)									
	Components								
Financial capital variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ownemploan								0.5583	
ownunptax							0.6003		
ownarrears				0.4611					
ownfinassets									
Variation Explained	**8.8**	**6.63**	**5.35**	**5.08**	**4.46**	**3.88**	**3.85**	**3.69**	**3.63**
Components Labels	Ownership of durable assets and access to long-term and short-term credit.	Financial flows	Home assets	Access to short-term credit	Simple mobility assets	Non-institutional loans	Wealth and business-related assets and liabilities	Institutional loans	Non-traditional loans

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.5 above, the first component explains 8.8% of the total variation in the data. It is most closely related to the following six variables: ownvehicle - ownership of at least one motor vehicle (private) in running condition in good working order? (loading ≈ 0.382), owncom - ownership of at least one computer in good working order? (loading ≈ 0.354), owncam - ownership of at least one camera in good working order? (loading ≈ 0.379), ownbond - respondent has a home loan/bond? (loading ≈ 0.317), owncarloan - respondent has vehicle finance (car payment)? (loading ≈ 0.405), and owncreditcard - respondent has a credit card? (loading = 0.3922). Therefore, this component is labelled as **ownership of durable assets and access to long-term and short-term credit**. This is an unexpected finding, because the descriptive statistics in Chapter 4 (Table 4.9) indicated that most of the respondents do not own a motor vehicle (private), computer, or a camera in good working order. Furthermore, most of the respondents do not have a home loan/bond, vehicle finance (car payment), or a credit card. It is worth noting that only 4,5% of the respondents have a home loan/bond. Therefore, all of the respondents have some income (for instance, some of them may be social grant recipients) and expenditure, however that is not an indicator that they have financial capital. This component can be seen as a proxy for financial stability because it is related to employment (specifically formal employment) and access to credit markets. In the South African context, individuals need to have stable employment in order to access long term credit/financing assets. One needs to have stable employment and/or put down a deposit (for instance, if one does not qualify for a 100% home loan or vehicle finance) in order to access a home loan/bond or vehicle finance (car payment).

The second component explains 6.63% of the total variation in the data. Therefore, two components jointly explain 15.43% (8.8% + 6.63%) of the total variation in the data. The second component is most closely related to the following three variables: wealth - W2 per capita household net worth in R1000's (loading ≈ 0.434), logpchhincome - per capita household income (R'000) logged (loading ≈ 0.575), and logpchhexp - per capita household expenditure (R'000) logged (loading ≈ 0.568). Therefore, this component is labelled as **financial flows**. This finding is contrary to our expectations. The flows of income and expenditure are the main drivers of wealth accumulation in South Africa. Therefore, it is expected that income, expenditure, and wealth (net worth) are strongly related to financial capital. However, in this study,

financial capital is strongly related to financial stability (i.e. the variables that component 1 is closely related to), not to financial flow. It is also surprising that the variables closely related to the second component are less volatile.

The third component explains 5.35% of the total variation in the data. Therefore, three components jointly explain 20.78% (15.43% + 5.35%) of the total variation in the data. The third component is most closely related to the following four variables: ownradio - ownership of at least one radio in good working order? (loading ≈ 0.609), ownhifi - ownership of at least one Hi-Fi Stereo, CD player, MP3 player in good working order? (loading ≈ 0.487), ownsew - ownership of at least one sewing/knitting machine in good working order? (loading ≈ 0.330), and owncel - ownership of at least one cell phone in good working order? (loading ≈ 0.341). Therefore, this component is labelled as **home assets**, most of which are semi-durable assets, which reflect a degree of wealth accumulation.

The fourth component explains 5.08% of the total variation in the data. Therefore, four components jointly explain 25.86% (20.78% + 5.08%) of the total variation in the data. The fourth component is most closely related to the following five variables: ownloan - respondent has a personal loan from a bank? (loading ≈ 0.361), ownmicroloan - respondent has a personal loan from a microlender? (loading ≈ 0.357), ownstorecard - respondent has a store card? (loading ≈ 0.460), ownhp - respondent has a hire purchase agreement? (loading ≈ 0.424) and ownarrears - respondent has arrears in service and other monthly bills? (loading ≈ 0.461). Therefore, this component is labelled as **access to short-term credit**.

The fifth component explains 4.46% of the total variation in the data. Therefore, five components jointly explain 30.32% (25.86% + 4.46%) of the total variation in the data. This component is most closely related to the following two variables: ownmot - ownership of at least one motorcycle/scooter in good working order? (loading ≈ 0.644), and ownbic - ownership of at least one bicycle in good working order? (loading ≈ 0.537). Therefore, this component is labelled as **simple mobility assets**.

The sixth component explains 3.88% of the total variation in the data. Therefore, six components jointly explain 34.21% (30.32% + 3.88%) of the total variation in the data. The sixth component is most closely related to the following three variables:

ownmshloan - respondent has a loan with a Mashonisa? (loading ≈ 0.443), ownfamilyloan - respondent has a loan from a family member? (loading ≈ 0.574), and ownfriendloan - respondent has loans from friends? (loading ≈ 0.642). Therefore, this component is labelled as **non-institutional loans**.

The seventh component explains 3.85% of the total variation in the data. Therefore, seven components jointly explain 38.06% (34.21% + 3.85%) of the total variation in the data. The seventh component is most closely related to the following three variables: wealth - W2 per capita household net worth in R1000's (loading ≈ 0.378), owncomvehicle - ownership of at least one bakkie or truck in running condition in good working order? (loading ≈ 0.533), and owunptax - respondent has unpaid tax including PAYE, property taxes and VAT if a personal debt? (loading ≈ 0.600). Therefore, this component is labelled as **wealth and business-related assets and liabilities**.

The eighth component explains 3.69% of the total variation in the data. Therefore, eight components jointly explain 41.75% (38.06% + 3.69%) of the total variation in the data. The eighth component is most closely related to the following three variables: ownmicroloan - respondent has a personal loan from a microlender? (loading ≈ -0.363), ownstudloan - respondent has a study loan with a bank? (loading ≈ 0.511), and ownemploan - respondent has loans from an employer? (loading ≈ 0.558). Therefore, this component is labelled as **institutional loans**.

The ninth component explains 3.63% of the total variation in the data. Therefore, nine components jointly explain 45.38% (41.75% + 3.63%) of the total variation in the data. The ninth component is most closely related to two variables: ownmshloan - respondent has a loan with a Mashonisa? (loading ≈ 0.394), and ownstuother - respondent has a study loan with an institution other than a bank? (loading ≈ 0.750). Therefore, this component is labelled as **non-traditional loans**.

As mentioned previously, PCA estimates an index for financial capital based on the first principal component, because it has the largest possible variance; hence, it explains the most amount of variation in the dataset (Abdi and Williams, 2010).

Table 5.6 below shows the scoring coefficients of the financial capital index.

Table 5.6. Index of financial capital

Variables	Components								
	1	2	3	4	5	6	7	8	9
wealth	0.0675	-0.1463	0.0016	-0.1538	0.1463	0.1102	-0.1683	0.4921	0.2518
logpchhincome	0.3441	0.0003	0.1699	-0.2604	0.0600	-0.2215	-0.0764	0.2482	0.0841
logpchhexp	0.3557	-0.0155	0.1814	-0.2506	0.0765	-0.1952	-0.0773	0.2352	0.0746
ownradio	0.1841	-0.0188	0.4214	-0.0110	-0.1161	0.3299	0.0671	-0.1899	-0.0781
ownhifi	0.2493	0.0916	0.2941	-0.0004	-0.1011	0.2342	0.0498	-0.1387	-0.0786
ownsew	0.1218	-0.0454	0.1290	-0.1731	0.1306	0.2773	-0.0204	-0.2030	-0.1055
ownvehicle	0.3377	-0.0997	-0.1471	-0.0318	0.0897	0.0638	0.0240	-0.0533	-0.0952
owncomvehicle	0.1642	-0.1684	-0.0362	0.2731	-0.1697	0.2782	-0.0060	0.3071	0.1683
ownmot	0.0944	-0.2985	0.1360	0.4559	-0.2200	-0.2069	-0.0160	0.0944	0.1593
ownbic	0.0984	-0.2022	0.2122	0.3685	-0.1312	-0.2200	-0.0394	-0.1888	-0.0472
owncom	0.3046	-0.2145	-0.0665	0.0083	0.0593	-0.1241	-0.0085	-0.1772	-0.0488
owncam	0.2830	-0.1959	-0.1060	0.0331	0.0758	-0.0844	-0.0325	-0.2363	-0.0623
owncel	0.1863	0.1484	0.3422	-0.0999	-0.0890	0.0405	0.0470	0.0350	-0.0104
ownbond	0.2320	-0.0549	-0.2245	-0.0749	0.0848	-0.0097	0.1015	0.0282	-0.0292
ownloan	0.1589	0.3739	-0.1260	0.0785	-0.1564	0.0003	0.0926	-0.0089	0.1166
ownmicroloan	0.0357	0.1773	-0.0061	0.0557	0.1925	-0.2446	-0.3861	-0.1566	0.1653
ownmshloan	-0.0078	0.0498	0.1209	0.1612	0.2931	0.1435	0.3283	-0.1810	0.3824
ownstudloan	0.0556	0.1006	-0.0828	-0.0364	-0.1165	-0.0926	0.4195	0.1605	-0.2767
ownstuother	0.0414	0.0727	0.0099	-0.0164	-0.1536	-0.2818	0.4345	-0.0409	0.5252
owncarloan	0.2348	-0.0121	-0.3745	0.1091	-0.0014	0.1870	0.1383	0.0623	-0.0977
owncreditcard	0.2423	0.1573	-0.3318	0.0532	0.0205	-0.0378	0.0627	-0.1353	-0.0445
ownstorecard	0.2024	0.4491	-0.0795	0.0546	-0.0590	-0.0543	-0.0123	-0.0388	0.0472
ownhp	0.0623	0.3492	0.0806	0.1166	-0.1656	0.0200	-0.2060	0.0226	0.0654
ownfamilyloan	0.0134	0.0650	0.0848	0.2682	0.4911	-0.0516	0.1077	0.2423	-0.1626
ownfriendloan	-0.0046	0.0863	0.1330	0.1965	0.5620	0.0869	0.1702	-0.0116	0.0707
ownemploan	0.0365	0.1023	0.1069	0.3070	-0.0717	-0.0721	0.1223	0.3295	-0.4016

Variables	Components								
	1	2	3	4	5	6	7	8	9
ownunptax	0.0492	0.0421	-0.1633	0.1422	-0.0990	0.4861	-0.1615	0.1241	0.2629
ownarrears	0.0612	0.2945	0.0238	0.2642	0.0950	-0.0580	-0.3517	-0.0039	-0.0636
ownfinassets	0.1446	-0.2037	-0.1541	0.1292	0.0684	0.0040	-0.1875	-0.1469	0.0697

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:

The index of financial capital is composed of component 1 and the other components are included in the table for completeness.

It should be noted that the values of the index vary and include some negative values, so it made sense to standardise them to a range between 0 and 1. This is just a rescaling procedure and does not change the underlying idea.

As shown in Table 5.6, logpchhincome (per capita household income (R'000) logged), logpchhexp (per capita household expenditure (R'000) logged), ownvehicle (ownership of at least one motor vehicle (private)?), and owncom (ownership of at least one computer?) have a high loading on component 1, ranging from 0.3441 to 0.3046.

Similarly, ownloan (respondent has a personal loan from a bank?), ownstorecard (respondent has a store card?), and ownhp (respondent has a hire purchase agreement?) have a high loading on component 2, ranging from 0.3739 to 0.3492.

Further, ownradio (ownership of atleast one radio?), owncel (ownership of at least one cell phone?), owncarloan (respondent has a vehicle finance (car payment)?), and owncreditcard (respondent has a credit card?) have a high loading on component 3, ranging from 0.4214 to -0.3318.

Regarding component 4, ownmot (ownership of at least one motorcycle/scooter?), ownbic (ownership of at least one bicycle?) and ownemploan (respondent has loans from an employer?) have high loadings, ranging from 0.4559 to 0.3070.

Component 5 is linked to ownfamilyloan (respondent has a loan from a family member?) and ownfriendloan (respondent has loans from friends?), which have loadings ranging from 0.4911 to 0.5620.

With respect to component 6, ownradio (ownership of atleast one radio?) and ownunptax (respondent has unpaid tax?) have high loadings, ranging from 0.3299 to 0.4861.

Regarding component 7, ownmicroloan (respondent has a personal loan from a microlender?), ownmshloan (respondent has a loan with a Mashonisa?), ownstudloan (respondent has a study loan with a bank?), ownstuother (respondent has a study loan with an institution other than a bank?), and ownarrears (respondent has arrears in service and other monthly bills?) have high loadings, ranging from -0.3861 to -0.3517.

Component 8 is linked to wealth (W2 per capita household net worth in R1000's), owncomvehicle (ownership of at least one bakkie or truck?), and ownemploan (respondent has loans from an employer?), which have high loadings ranging from 0.4921 to 0.3295.

Lastly, ownmshloan (respondent has a loan with a Mashonisa?), ownstuother (respondent has a study loan with an institution other than a bank?), and ownemploan (respondent has loans from an employer?) have a high loading on component 9, ranging from 0.3824 to -0.4016.

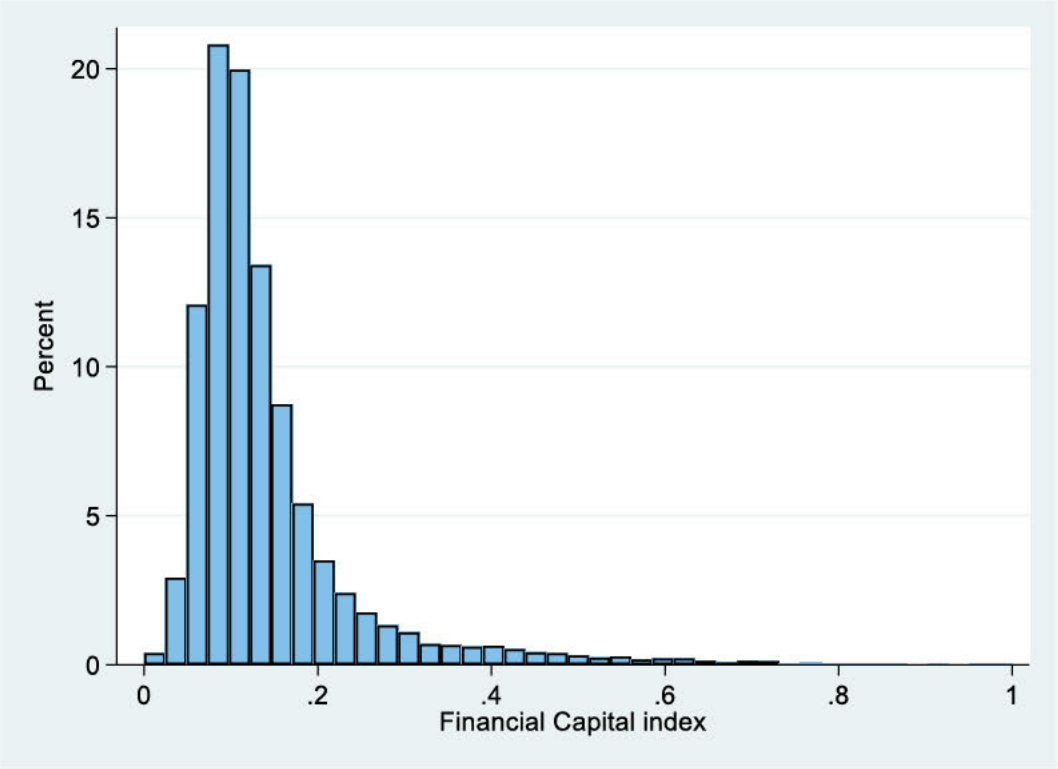
5.2.3 Assessing the distribution of the financial capital index

The most common methods used to assess whether the distribution of a variable is symmetrical or not include graphs such as a histogram and descriptive statistics such as skewness and kurtosis (Islam *et al.*, 2022).

The histogram (Figure 5.2) below visually shows the distribution of the financial capital variable. The distribution seems to be positively skewed (i.e., not symmetrical) and heavy-tailed. This means that most of the respondents have very little financial capital, while very few have a lot of financial capital. The respondents who have a lot of financial capital are the outliers in the dataset, hence the distribution seems to be positively skewed. This is in line with the descriptive statistics for the variables included in the financial capital category in Chapter 4 (Table 4.9) and the South African context due to the extreme concentration of wealth and wealth inequality in the country (Chatterjee *et al.,* 2020).

Chatterjee *et al.* (2020) conducted a study titled “Estimating the distribution of household wealth in South Africa” using household surveys, tax microdata, and macroeconomic balance sheet statistics. The results showed that wealth inequality has not been decreasing since apartheid (Chatterjee *et al.,* 2020). If anything, the authors found that wealth inequality has remained generally stable and has also slightly risen within the wealthiest groups (Chatterjee *et al.,* 2020).

Figure 5.2. Histogram showing the distribution of the financial capital index



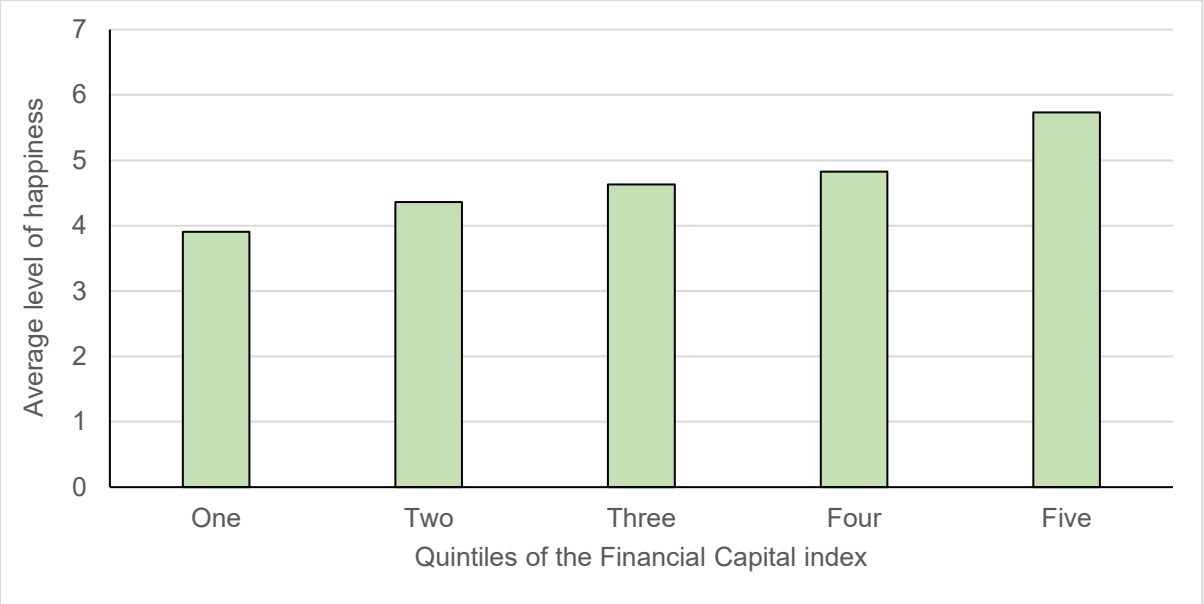
Source: Own calculations using NIDS data from 2010-2011, Wave 2

Skewness refers to the direction and degree of asymmetry (Hamilton, 2012). Skewness = 0 indicates a perfectly symmetrical distribution, skewness > 0 indicates a positive skew and heavier right tailed distribution, and skewness < 0 indicates a negative skew and heavier left tailed distribution (Hamilton, 2012). The data for the financial capital index has a skewness of approximately 2.918 (greater than 0). This indicates a positively skewed and heavier right tailed distribution. On the other hand, Kurtosis indicates whether the data is light-tailed or heavy-tailed in contrast to a normal distribution (Islam *et al.*, 2022). In general, data with high kurtosis have a heavy-tailed distribution, and data with low kurtosis have a light-tailed distribution (Islam *et al.*, 2022). A normal (symmetrical) distribution has a kurtosis of 3 (Hamilton, 2012; Islam *et al.*, 2022). The data for the financial capital index has a kurtosis of approximately 14.090 (greater than 3). This indicates that the financial capital index has positive kurtosis and a heavy-tailed distribution in contrast to a normal distribution. As expected, the standard deviation ($\sigma \approx 0.106$) is wide.

5.2.4 Average level of happiness for each quintile of the financial capital index

The relationship is made clearer when the average level of happiness is reviewed for each quintile of the financial capital index in Figure 5.3 below.

Figure 5.3. Bar Graph showing average level of happiness by quintiles of the financial capital index



Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Figure 5.3 above, the average level of happiness is low for respondents with lower levels of financial capital compared to respondents with higher levels of financial capital. Clearly, there is a positive relationship between the financial capital index and happiness: on average, those who report lower levels of happiness report lower levels of financial capital than those who report higher levels of happiness. However, this raises the question: how strong is the relationship between the financial capital index and happiness? A cross-tabulation of happiness categories and quintiles of the financial capital index is presented in Table 5.7 below in order to illustrate the degree of overlap.

Table 5.7. Cross-tabulation of happiness category and quintile of the financial capital index

	Happiness category										
Quintile of the financial capital index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
1	565	353	392	508	423	227	164	91	52	88	2,863
	19.73	12.33	13.69	17.74	14.77	7.93	5.73	3.18	1.82	3.07	100
	34.92	26.09	21.42	23.29	16.47	14.54	14.64	10.38	12.04	11.64	20.03
2	333	299	440	488	528	311	180	115	62	102	2,858
	11.65	10.46	15.4	17.07	18.47	10.88	6.30	4.02	2.17	3.57	100
	20.58	22.10	24.04	22.38	20.56	19.92	16.07	13.11	14.35	13.49	19.99
3	282	283	409	460	518	340	195	168	76	131	2,862
	9.85	9.89	14.29	16.07	18.10	11.88	6.81	5.87	2.66	4.58	100
	17.43	20.92	22.35	21.09	20.17	21.78	17.41	19.16	17.59	17.33	20.02
4	277	258	360	429	547	308	239	174	102	163	2,857
	9.70	9.03	12.60	15.02	19.15	10.78	8.37	6.09	3.57	5.71	100
	17.12	19.07	19.67	19.67	21.30	19.73	21.34	19.84	23.61	21.56	19.98
5	161	160	229	296	552	375	342	329	140	272	2,856
	5.64	5.60	8.02	10.36	19.33	13.13	11.97	11.52	4.90	9.52	100
	9.95	11.83	12.51	13.57	21.50	24.02	30.54	37.51	32.41	35.98	19.98
Total	1,618	1,353	1,830	2,181	2,568	1,561	1,120	877	432	756	14,296
	11.32	9.46	12.80	15.26	17.96	10.92	7.83	6.13	3.02	5.29	100
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Note:

It is important to note that the numbers in each cell present the frequency, row percentage, and column percentage respectively.

As shown in the cross-tabulation above, of all the respondents in the lowest quintile of the financial capital index (2,863), only 19.73% are in the lowest current satisfaction level of life category, and only 32.06% (19.73% + 12.33%) are in the lowest two current satisfaction level of life categories. In contrast, there are respondents who are reportedly unhappy with their lives even though they fall into the highest quintile of the financial capital index. 11.24% (5.64% + 5.60%) of the respondents in the 5^{th} quintile of the financial capital index and 18.73% (9.7% + 9.03%) of the respondents in the 4^{th} quintile of the financial capital index report current satisfaction level of life in the lowest 2 categories. It is interesting to note that while only 4.89% (3.07% + 1.82%) of the respondents in the lowest quintile of the financial capital index report current satisfaction levels of life in the 2 highest happiness categories, only 11.24% (5.64% + 5.60%) of the respondents in the highest quintile of the financial capital index report current satisfaction levels of life in the 2 lowest happiness categories.

The highest degree of overlap occurs at the intersection between the eighth column and the fifth set of rows. 37.51% of respondents in the eighth current satisfaction level of life category are in the fifth quintile of the financial capital index. Furthermore, this is the highest cell percentage compared to all cells in the eighth column, which indicates that there is a reasonable amount of agreement between the financial capital index and happiness at this point. However, this percentage is still low.

The correlation coefficient between the financial capital index and happiness is ≈ 0.250. Since the correlation coefficient is positive, one can conclude that increased financial capital is associated with increased happiness. Figure 5.3 above illustrates this positive relationship, where average happiness in the first quintile of the financial capital index is relatively low but rises gradually for each succeeding quintile of the financial capital index. However, despite a positive relationship between the financial capital index and happiness, the size of the correlation coefficient (≈ 0.250) is small. This suggests that the relationship between the financial capital index and happiness is relatively weak.

5.3 Human capital

In this section, the proxies for human capital are combined using PCA to estimate an index for human capital. Accordingly, 6 variables for human capital were examined, ranging from years of schooling completed (derived) to perceived health status, as presented in the previous chapter (Table 4.3 and Table 4.10).

5.3.1 Kaiser-Meyer-Olkin Measure of Sampling Adequacy

After identifying 6 questions (variables) related to human capital on which data were collected in the second wave of NIDS, a KMO test was conducted to ensure that the variables are suitable for PCA (Field, 2009).

The KMO test result for the 6 human capital variables is presented in Table 5.8 below.

Table 5.8. KMO Test for the 6 human capital variables

Variable	**Definition**	**KMO**
yrschool	Years of schooling completed – derived	0.9143
complit	Respondent is computer literate?	0.8300
driverslic	Respondent has a driver's license?	0.7805
readeng	Respondent's reading level in English	0.6471
writeeng	Respondent's writing level in English	0.6477
health	Perceived health status	0.9621
Overall		**0.7281**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.8 above, the overall KMO for human capital was found to be approximately 0.728 (greater than 0.5); therefore, the human capital variables were suitable for PCA (Field, 2009). Furthermore, the KMO value indicates that the human capital variables have approximately 72.8% of variance in common. It is worth noting that of all the human capital variables, the health (perceived health status) variable has the highest KMO value (approximately 0.962).

5.3.2 PCA results

PCA is used to estimate an index for human capital. The index will represent human capital (one of the three key independent variables) in the regression model discussed in Chapter 6. As mentioned previously, in a similar way, the social and spiritual capital index is estimated in section 5.4 below.

Table 5.9 below shows that there are 6 components in the original variables set. The eigenvalues associated with each component, the difference in the eigenvalues of each additional component, the proportion of variation explained by each component and the cumulative variation explained (accumulation of variation for each principal component) are presented in Table 5.9 below.

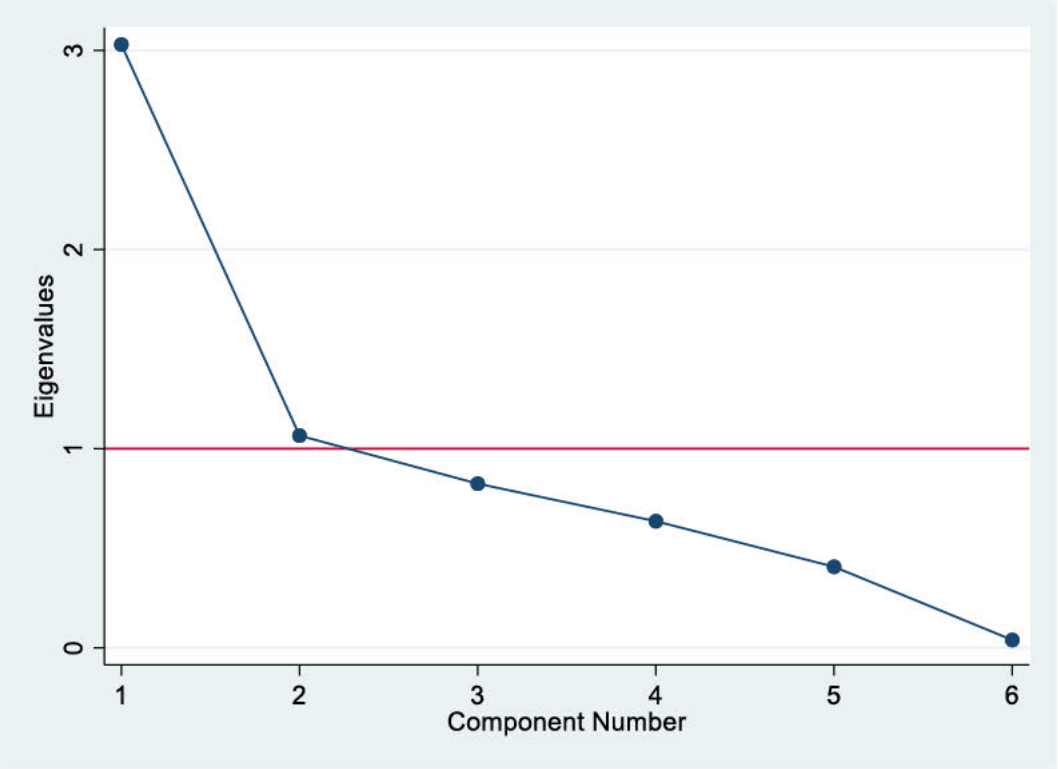
Table 5.9. PCA results for human capital

	Initial Eigenvalues			
Component	Total	Difference	% of Variance	Cumulative %
1	3.02886	1.96349	0.5048	0.5048
2	1.06537	.241214	0.1776	0.6824
3	.824161	.188622	0.1374	0.8197
4	.635539	.228722	0.1059	0.9257
5	.406816	.367569	0.0678	0.9935
6	.0392472	.	0.0065	1.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table 5.9 identifies a set of 2 extracted components (in accordance with Kaiser's criterion) that explain approximately 68.24% of the total variation in the underlying latent variable "human capital". The rest of the components (3 to 6) were not considered in the analysis, because their eigenvalues are less than 1. In addition, the scree plot (Figure 5.4) below confirms the extraction of two components with an eigenvalue greater than one. Therefore, we retained two human capital components in this study.

Figure 5.4. Scree plot for human capital PCA



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Performing PCA with the two extracted components

In this step, we performed PCA with the two extracted components. Table 5.10 below shows the following: (1) Stata retained two components in the program, (2) principal components (eigenvectors) estimated exactly two components, (3) loadings on the two principal components, (4) original variables such as yrschool (years of schooling completed - derived), complit (respondent is computer literate?) and driverslic (respondent has a driver's license?), and (5) percent of variation that is still unexplained. For example, the yrschool (years of schooling completed - derived) variable (with two components) has 32.26% unexplained variation in the data; therefore, it explains 67.74% of the variation in the data, and the complit (respondent is computer literate?) variable (with two components) has 42.79% unexplained variation in the data; therefore, it explains 57.21% of the variation in the data. As mentioned previously, it is preferable that the variables have a (fairly) low unexplained variation.

Table 5.10. Eigenvectors showing the correlations between the 6 original variables and the 2 retained components

Variable	Component 1	Component 2	Unexplained
yrschool	0.4724	0.0384	.3226
complit	0.3555	0.4214	.4279
driverslic	0.2249	0.7312	.2772
readeng	0.5196	-0.2183	.1316
writeeng	0.5205	-0.2165	.1295
health	0.2429	-0.4379	.617

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table 5.10 shows that yrschool (years of schooling completed - derived) has a high loading on component 1 (loading ≈ 0.472) but does not have a high loading on component 2 (loading ≈ 0.038). Similarly, Table 5.10 shows that driverslic (respondent has a driver's license?) has a high loading on component 2 (loading ≈ 0.731) but does not have a high loading on component 1 (loading ≈ 0.225).

Rotations

The component loadings in Table 5.10 above were rotated using the varimax rotation method. As mentioned previously, it is worth noting that PCA with varimax rotation and PCA with promax rotation produce similar results. The varimax rotation results are presented below, but the promax rotation results can be found in Appendix C (see Tables C.5 and C.6).

Varimax

PCA with varimax rotation was run on the 6 human capital variables. The PCA with varimax rotation results are presented in Table 5.11 below.

Table 5.11 below only shows component loadings greater than +0.3 and less than -0.3, because as mentioned previously they are generally accepted as making a significant contribution to the principal components (Katchova, 2013a). Therefore, component loadings less than 0.3 and greater than - 0.3 are not considered, as they influence the components less.

Table 5.11. Rotated Components (varimax) of human capital variables

Rotated Components (varimax)		
	Components	
Human capital variables	**1**	**2**
yrschool	0.4279	
complit		0.5203
driverslic		0.7634
readeng	0.5632	
writeeng	0.5635	
health	0.3826	-0.3230
Variation Explained	**46.35**	**21.89**
Components Labels	Education, proficiency in English, and health	Practical (essential) skills and health

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.11 above, the first component explains 46.35% of the total variation in the data. It is most closely related to the following four variables: yrschool - years of schooling completed – derived (loading ≈ 0.428), readeng - respondent's reading level in English (loading ≈ 0.563), writeeng - respondent's writing level in English (loading ≈ 0.564), and health - respondent's perceived health status (loading ≈ 0.383). Therefore, this component is labelled as **education, proficiency in English and health**. This is in line with the descriptive statistics in Chapter 4 (Table 4.10). The average South African individual completed slightly more than Grade 9 (Std 7/Form 2). More than half of the respondents reported that they can read very well in English, and more than half of the respondents reported that they can write very well in English. Most of the respondents described their health at present as either very good or excellent. This component is not closely related to an individual's ability to drive and computer literacy presumably, because most of the respondents reported that they are not computer literate and do not have a driver's license.

The second component explains 21.89% of the total variation in the data. Therefore, two components jointly explain 68.24% (46.35% + 21.89%) of the total variation in the data. The second component is most closely related to the following three variables:

complit - respondent is computer literate? (loading ≈ 0.520), driverslic - respondent has a driver's license? (loading ≈ 0.763), and health - respondent's perceived health status (loading ≈ -0.323). Therefore, this component is labelled as **practical (essential) skills and health**. It is interesting to note that the first component and second component are most closely related to health (overlap with the health variable). The coefficient of the health variable is positive in component 1 but negative in component 2. The negative coefficient could relate to disability and how an ability to drive and computer literacy can aid persons with disabilities to access employment.

As mentioned previously, PCA estimates an index for human capital based on the first principal component.

Table 5.12 below shows the scoring coefficients of the human capital index.

Table 5.12. Index of human capital

Variables	Components	
	1	2
yrschool	0.4724	0.0384
complit	0.3555	0.4214
driverslic	0.2249	0.7312
readeng	0.5196	-0.2183
writeeng	0.5205	-0.2165
health	0.2429	-0.4379

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:

The index of human capital is composed of component 1 and the second component is included in the table for completeness.

It should be noted that the values of the index vary and include some negative values, so it made sense to standardise them to a range between 0 and 1. This is just a rescaling procedure and does not change the underlying idea.

As shown in Table 5.12, yrschool (years of schooling completed – derived), complit (respondent is computer literate?), readeng (respondent's reading level in English) and writeeng (respondent's writing level in English) have a high loading on component 1, ranging from 0.4724 to 0.5205.

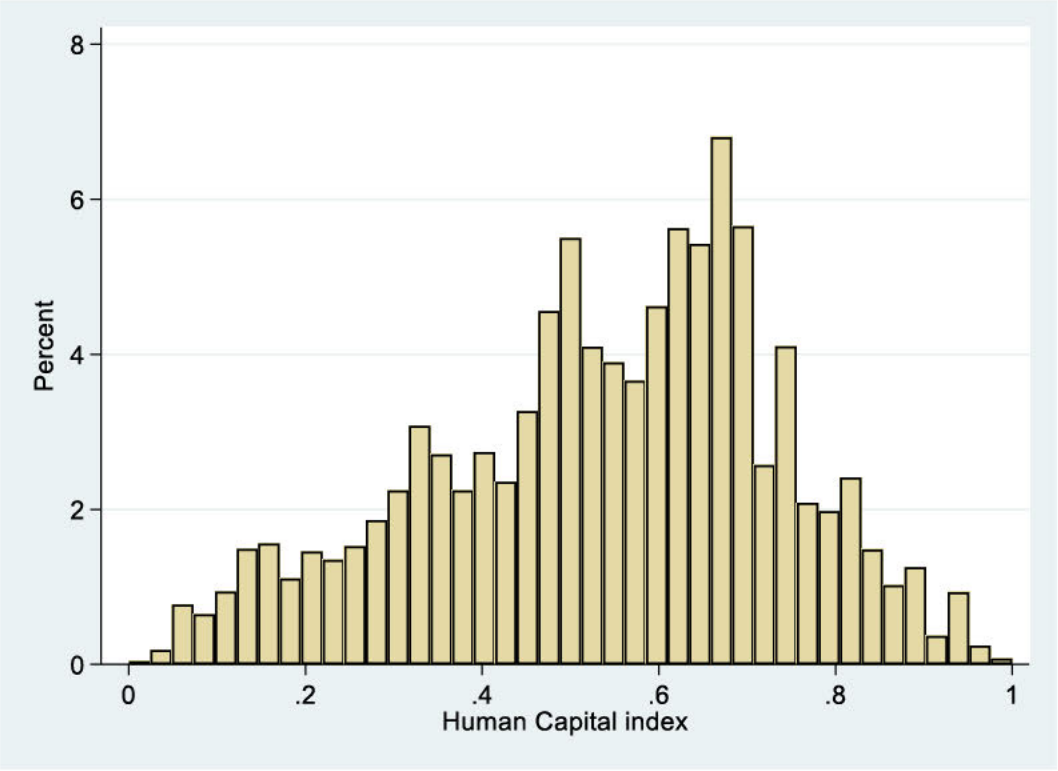
Similarly, complit (respondent is computer literate?), driverslic (respondent has a driver's license?) and health (perceived health status) have a high loading on component 2, ranging from 0.4214 to -0.4379.

5.3.3 Assessing the distribution of the human capital index

A histogram and descriptive statistics will be used to assess whether the distribution of this variable is symmetrical or not.

The histogram (Figure 5.5) below visually shows the distribution of the human capital variable. The distribution seems to be negatively skewed (i.e., not symmetrical) and light tailed. This means that most of the respondents have a lot of human capital, while very few have very little human capital. The respondents who have very little human capital are the outliers in the dataset, hence the distribution seems to be negatively skewed. This is in line with the descriptive statistics for the variables included in the human capital category in Chapter 4 (Table 4.10).

Figure 5.5. Histogram showing the distribution of the human capital index



Source: Own calculations using NIDS data from 2010-2011, Wave 2

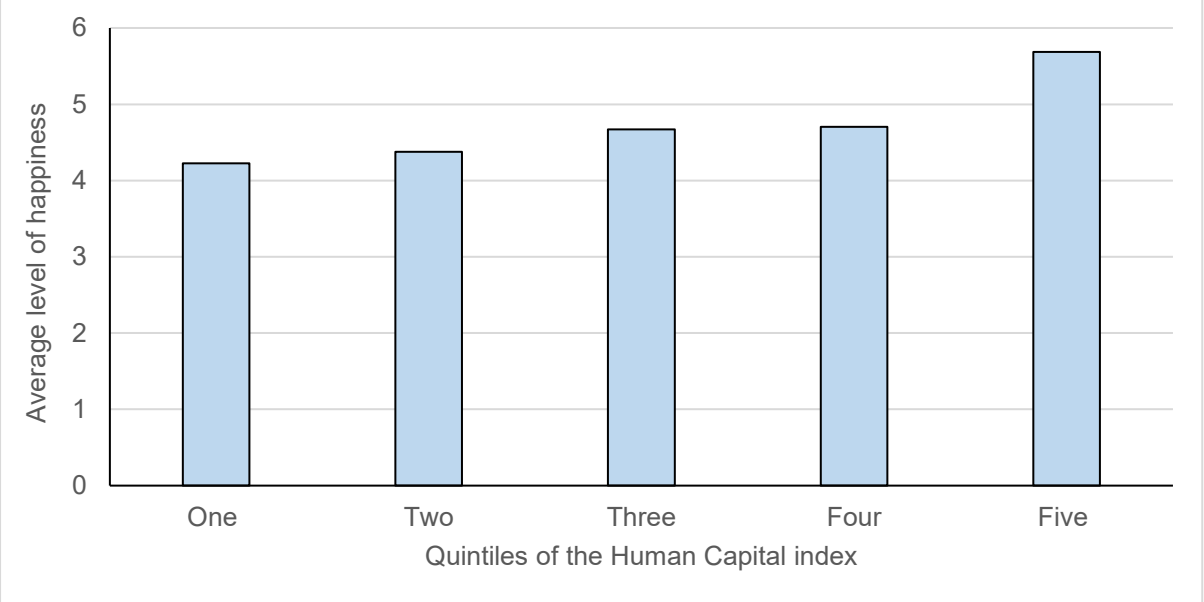
The data for the human capital index has a skewness of approximately -0.373 (less than 0). This indicates a negatively skewed and heavier left tailed distribution. On the other hand, the data for the human capital index has a kurtosis of approximately 2.577 (less than 3). This indicates that the human capital capital index has a positive kurtosis and light-tailed distribution in contrast to a normal distribution. As expected, the

standard deviation ($\sigma \approx 0.199$) is wide. It is worth noting that the human capital index has more variation than the financial capital index.

5.3.4 Average level of happiness for each quintile of the human capital index

The relationship is made clearer when the average level of happiness is reviewed for each quintile of the human capital index in Figure 5.6 below.

Figure 5.6. Bar Graph showing average level of happiness by quintiles of the human capital index



Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Figure 5.6 above, the average level of happiness is low for respondents with lower levels of human capital compared to respondents with higher levels of human capital. Clearly, there is a positive relationship between the human capital index and happiness: on average, those who report lower levels of happiness report lower levels of human capital than those who report higher levels of happiness. However, this raises the question: how strong is the relationship between the human capital index and happiness? A cross-tabulation of happiness categories and quintiles of the human capital index is presented in Table 5.13 below in order to illustrate the degree of overlap.

Table 5.13. Cross-tabulation of happiness category and quintile of the human capital index

	Happiness category										
Quintile of the human capital index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
1	373	334	461	527	473	271	151	115	70	103	2,878
	12.96	11.61	16.02	18.31	16.44	9.42	5.25	4.00	2.43	3.58	100
	24.00	24.85	25.05	23.94	18.30	17.37	13.39	13.34	15.73	12.65	20.08
2	385	299	385	473	505	290	211	137	70	99	2,854
	13.49	10.48	13.49	16.57	17.69	10.16	7.39	4.80	2.45	3.47	100
	24.77	22.25	20.92	21.49	19.54	18.59	18.71	15.89	15.73	12.16	19.91
3	319	269	362	481	535	304	214	141	77	175	2,877
	11.09	9.35	12.58	16.72	18.60	10.57	7.44	4.90	2.68	6.08	100
	20.53	20.01	19.67	21.85	20.70	19.49	18.97	16.36	17.30	21.50	20.07
4	315	293	372	423	544	323	211	150	88	181	2,900
	10.86	10.10	12.83	14.59	18.76	11.14	7.28	5.17	3.03	6.24	100
	20.27	21.80	20.22	19.22	21.05	20.71	18.71	17.40	19.78	22.24	20.23
5	162	149	260	297	527	372	341	319	140	256	2,823
	5.74	5.28	9.21	10.52	18.67	13.18	12.08	11.30	4.96	9.07	100
	10.42	11.09	14.13	13.49	20.39	23.85	30.23	37.01	31.46	31.45	19.70
Total	1,554	1,344	1,840	2,201	2,584	1,560	1,128	862	445	814	14,332
	10.84	9.38	12.84	15.36	18.03	10.88	7.87	6.01	3.10	5.68	100
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Note:

It is important to note that the numbers in each cell present the frequency, row percentage, and column percentage respectively.

As shown in the cross-tabulation above, of all the respondents in the lowest quintile of the human capital index (2,878), only 12.96% are in the lowest current satisfaction level of life category, and only 24.57% (12.96% + 11.61%) are in the lowest two current satisfaction level of life categories. In contrast, there are respondents who are reportedly unhappy with their lives even though they fall into the highest quintile of the human capital index. 11.02% (5.74% + 5.28%) of the respondents in the 5^{th} quintile of the human capital index and 20.96% (10.86% + 10.10%) of the respondents in the 4^{th} quintile of the human capital index report current satisfaction level of life in the lowest 2 categories. It is interesting to note that while only 6.01% (2.43% + 3.58%) of the respondents in the lowest quintile of the human capital index report current satisfaction levels of life in the 2 highest happiness categories, only 11.02% (5.74% + 5.28%) of the respondents in the highest quintile of the human capital index report current satisfaction levels of life in the 2 lowest happiness categories.

The highest degree of overlap occurs at the intersection between the eighth column and fifth set of rows. 37.01% of respondents in the eighth current satisfaction level of life category are in the fifth quintile of the human capital index. Furthermore, this is the highest cell percentage compared to all cells in the eighth column, which indicates that there is a reasonable amount of agreement between the human capital index and happiness at this point. However, this percentage is still low.

The correlation coefficient between the human capital index and happiness is ≈ 0.191. Since the correlation coefficient is positive, one can conclude that increased human capital is associated with increased happiness. Figure 5.6 above illustrates this positive relationship, where average happiness in the first quintile of the human capital index is relatively low but rises gradually for each succeeding quintile of the human capital index. However, despite a positive relationship between the human capital index and happiness, the size of the correlation coefficient (≈ 0.191) is small. This suggests that the relationship between the human capital index and happiness is relatively weak.

5.4 Social and Spiritual capital

In this section, the proxies for social and spiritual capital are combined using PCA to estimate an index for social and spiritual capital. Accordingly, 9 variables for social and spiritual capital were examined, ranging from preference to continue living in current area to importance of religious activities in life, as presented in the previous chapter (Table 4.4 and Table 4.11).

5.4.1 Kaiser-Meyer-Olkin Measure of Sampling Adequacy

After identifying 9 questions (variables) related to social and spiritual capital on which data were collected in the second wave of NIDS, a KMO test was conducted to ensure that the variables are suitable for PCA.

The KMO test result for the 9 social and spiritual capital variables is presented in Table 5.14 below.

Table 5.14. KMO Test for the 9 social and spiritual capital variables

Variable	**Definition**	**KMO**
maritalstatus	Marital status	0.5401
crime1	Frequency of burglaries, muggings or thefts in the neighbourhood	0.8132
crime2	Frequency of violence between members of the same household in the neighbourhood	0.6565
crime3	Frequency of violence between members of the different household in the neighbourhood	0.6782
trust1	Likelihood of neighbour returning wallet or purse containing R200	0.5087
trust2	Likelihood of complete stranger returning wallet or purse containing R200	0.5093
staypref	Preference to continue living in current area	0.6025
comgroupstot	Number of memberships in community groups	0.5911
arelnb	Importance of religious activities in life	0.5373
Overall		**0.6658**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.14 above, the overall KMO for social and spiritual capital was found to be approximately 0.666 (greater than 0.5); therefore, the social and spiritual capital variables were suitable for PCA (Field, 2009). Furthermore, the KMO value indicates that the social and spiritual capital variables have approximately 66.6% of variance in common. It is worth noting that of all the social and spiritual capital

variables, the crime1 (frequency of burglaries, muggings or thefts in the neighbourhood) variable has the highest KMO value (approximately 0.813).

5.4.2 PCA results

PCA is used to estimate an index for social and spiritual capital. The index will represent social and spiritual capital (one of the three key independent variables) in the regression model discussed in Chapter 6.

Table 5.15 below shows that there are 9 components in the original variables set. The eigenvalues associated with each component, the difference in the eigenvalues of each additional component, the proportion of variation explained by each component, and the cumulative variation explained (accumulation of variation for each principal component) are presented in Table 5.15 below.

Table 5.15. PCA results for social and spiritual capital

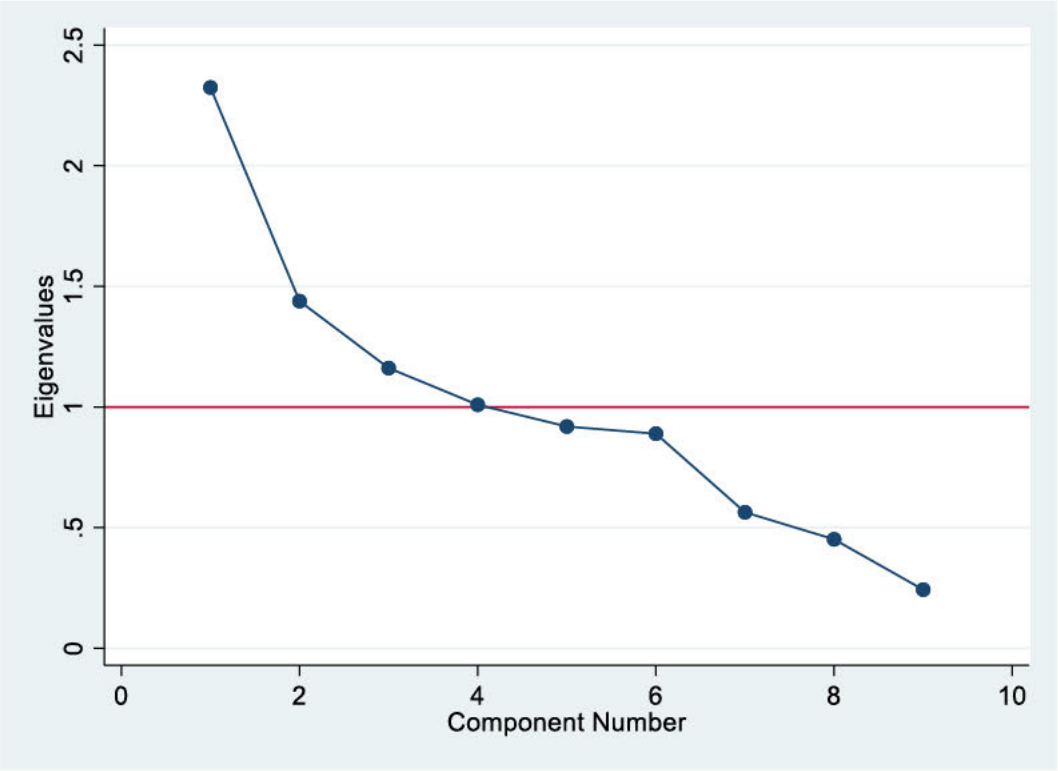
Component	Initial Eigenvalues			
	Total	Difference	% of variance	Cumulative %
1	2.32391	.885297	0.2582	0.2582
2	1.43861	.277263	0.1598	0.4181
3	1.16135	.152102	0.1290	0.5471
4	1.00924	.090225	0.1121	0.6592
5	.919019	.0296339	0.1021	0.7613
6	.889386	.325638	0.0988	0.8602
7	.563747	.112116	0.0626	0.9228
8	.451632	.208523	0.0502	0.9730
9	.243108	.	0.0270	1.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table 5.14 identifies a set of 4 extracted components (in accordance with Kaiser's criterion) that explain approximately 65.92% of the total variation in the underlying latent variable "social and spiritual capital". The rest of the components (5 to 9) were not considered in the analysis, because their eigenvalues are less than 1. In addition, the scree plot (Figure 5.7) below confirms the extraction of four components with an

eigenvalue greater than one. Therefore, we retained four social and spiritual capital components in this study.

Figure 5.7. Scree plot for social and spiritual capital PCA



Source: Own calculations using NIDS data from 2010-2011, Wave 2

Performing PCA with the four extracted components

In this step, we performed PCA with the four extracted components. Table 5.16 below shows the following: (1) Stata retained four components in the program, (2) principal components (eigenvectors) estimated exactly four components, (3) loadings on the four principal components, (4) original variables such as maritalstatus (marital status), crime1 (frequency of burglaries, muggings or thefts in the neighbourhood) and crime2 (frequency of violence between members of the same household in the neighbourhood), and (5) percent of variation that is still unexplained. For example, the maritalstatus (marital status) variable (with four components) has 51.73% unexplained variation in the data; therefore, it explains 48.57% of the variation in the data, and the crime1 (frequency of burglaries, muggings or thefts in the neighbourhood) variable (with four components) has 31.6% unexplained variation in the data; therefore, it

explains 68.4% of the variation in the data. As mentioned previously, it is preferable that the variables have a (fairly) low unexplained variation.

Table 5.16. Eigenvectors showing the correlations between the 9 original variables and the 4 retained components

Variable	Component 1	Component 2	Component 3	Component 4	Unexplained
maritalstatus	0.0252	0.0690	0.5913	0.2602	.5173
crime1	0.5396	-0.0599	-0.0410	0.0134	.316
crime2	0.5919	-0.0799	-0.0238	-0.0289	.1751
crime3	0.5790	-0.0976	-0.0226	-0.0327	.2055
trust1	0.0954	0.6819	-0.1340	0.0716	.2839
trust2	0.0827	0.6859	-0.1182	-0.0220	.2906
staypref	0.0722	0.1124	0.4573	0.5868	.3794
comgroupstot	0.0215	0.1629	0.3429	-0.6822	.3545
arelnb	-0.0308	-0.0330	-0.5376	0.3389	.5446

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table 5.16 shows that crime1 (frequency of burglaries, muggings or thefts in the neighbourhood) has a high loading on component 1 (loading ≈ 0.540) but does not have a high loading on components 2 to 4. Similarly, Table 5.16 shows that crime2 (frequency of violence between members of the same household in the neighbourhood) has a high loading on component 1 (loading ≈ 0.592) but does not have a high loading on components 2 to 4.

Rotations

The component loadings in Table 5.16 above were rotated using the varimax rotation method. As mentioned previously, it is worth noting that PCA with varimax rotation and PCA with promax rotation produce similar results. The varimax rotation results are presented below, but the promax rotation results can be found in Appendix C (see Tables C.8 and C.9).

Varimax

PCA with varimax rotation was run on the 9 social and spiritual capital variables. The PCA with varimax rotation results are presented in Table 5.17 below.

Table 5.17 below only shows component loadings greater than +0.3 and less than -0.3, because as mentioned previously they are generally accepted as making a significant contribution to the principal components (Katchova, 2013a). Therefore, component loadings less than 0.3 and greater than - 0.3 are not considered, as they influence the components less.

Table 5.17. Rotated Components (varimax) of social and spiritual capital variables

Rotated Components (varimax)				
Social and Spiritual capital variables	**Components**			
	1	**2**	**3**	**4**
maritalstatus			0.6265	
crime1	0.5435			
crime2	0.5983			
crime3	0.5880			
trust1		0.7037		
trust2		0.6989		
staypref			0.7370	
comgroupstot				0.7655
arelnb				-0.5961
Variation Explained	**25.58**	**16.00**	**12.37**	**11.97**
Components Labels	Crime and violence in the neighbourhood	Trusting neighbours and complete strangers	Marital status and preference to stay in current area (village or suburb)	Community group memberships and religion

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 5.17 above, the first component explains 25.58% of the total variation in the data. It is most closely related to the following three variables: crime1 - frequency of burglaries, muggings or thefts in the neighbourhood (loading ≈ 0.544), crime2 - frequency of violence between members of the same household in the neighbourhood (loading ≈ 0.598), and crime3 - frequency of violence between members of the different household in the neighbourhood (loading ≈ 0.588). Therefore, this component is labelled as **crime and violence in the neighbourhood**. This is in line with the descriptive statistics in Chapter 4 (Table 4.11). Most of the

respondents reported the following: (1) burglaries, muggings or thefts are either not common, very rare or never happens in their neighbourhood; (2) violence between members of the same household is either not common, very rare or never happens in their neighbourhood; and (3) violence between members of different households is either not common, very rare or never happens in their neighbourhood. As mentioned previously, this is a surprising finding due to the high crime rate in South Africa. Furthermore, some respondents may not have reported the true extent of crime and violence in their neighbourhoods. We also expected component 1 to be most closely related to the following variables: staypref (preference to continue living in current area) and arelnb (importance of religious activities in life) since most of the respondents have a strong preference to stay in the area that they are currently living in, and regard religious activities as either very important or important in their lives; however, these variables only show up in the third component and fourth component respectively.

The second component explains 16.00% of the total variation in the data. Therefore, two components jointly explain 41.58% (25.58% + 16.00%) of the total variation in the data. The second component is most closely related to the following two variables: trust1 - likelihood of neighbour returning wallet or purse containing R200 (loading ≈ 0.704), and trust2 - likelihood of complete stranger returning wallet or purse containing R200 (loading ≈ 0.699). Therefore, this component is labelled as **trusting neighbours and complete strangers**.

The third component explains 12.37% of the total variation in the data. Therefore, three components jointly explain 53.95% (41.58% + 12.37%) of the total variation in the data. The third component is most closely related to the following two variables: maritalstatus – marital status (loading = ≈ 0.627), and staypref - preference to continue living in current area (loading ≈ 0.737). Therefore, this component is labelled as **marital status and preference to stay in current area (village or suburb)**.

The fourth component explains 11.97% of the total variation in the data. Therefore, four components jointly explain 65.92% (53.95% + 11.97%) of the total variation in the data. The fourth component is most closely related to the following two variables: comgroupstot - number of memberships in community groups (loading ≈ 0.766), and arelnb - importance of religious activities in life (loading ≈ -0.596). Therefore, this

component is labelled as **community group memberships and religion**. This finding is contrary to our expectations. As mentioned above, we expected the first component to be closely related to the arelnb (importance of religious activities in life) variable, since most of the respondents regard religious activities as either very important or important in their lives. Additionally, as mentioned previously, freedom of religion is a fundamental constitutional right in South Africa. The negative coefficient of the importance of religious activities in life variable could relate to respondents who regard religious activities as unimportant or not important at all, and how memberships in community groups provides them with an opportunity to be socially connected (which will ultimately increase their level of happiness).

As mentioned previously, PCA estimates an index for social and spiritual capital based on the first principal component.

Table 5.18 below shows the scoring coefficients of the social and spiritual capital index.

Table 5.18. Index of social and spiritual capital

	Components			
Variable	**1**	**2**	**3**	**4**
maritalstatus	0.0252	0.0690	0.5913	0.2602
crime1	0.5396	-0.0599	-0.0410	0.0134
crime2	0.5919	-0.0799	-0.0238	-0.0289
crime3	0.5790	-0.0976	-0.0226	-0.0327
trust1	0.0954	0.6819	-0.1340	0.0716
trust2	0.0827	0.6859	-0.1182	-0.0220
staypref	0.0722	0.1124	0.4573	0.5868
comgroupstot	0.0215	0.1629	0.3429	-0.6822
arelnb	-0.0308	-0.0330	-0.5376	0.3389

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:

The index of social and spiritual capital is composed of component 1 and the other components are included in the table for completeness.

It should be noted that the values of the index vary and include some negative values, so it made sense to standardise them to a range between 0 and 1. This is just a rescaling procedure and does not change the underlying idea.

As shown in Table 5.18, crime1 (frequency of burglaries, muggings or thefts in the neighbourhood), crime2 (frequency of violence between members of the same household in the neighbourhood) and crime3 (frequency of violence between

members of the different household in the neighbourhood) have a high loading on component 1, ranging from 0.5396 to 0.5790.

Similarly, trust1 (likelihood of neighbour returning wallet or purse containing R200) and trust2 (likelihood of complete stranger returning wallet or purse containing R200) have a high loading on component 2, ranging from 0.6819 to 0.6859.

Further, maritalstatus (marital status), staypref (preference to continue living in current area), comgroupstot (number of memberships in community groups) and arelnb (importance of religious activities in life) have a high loading on component 3, ranging from 0.5913 to -0.5376.

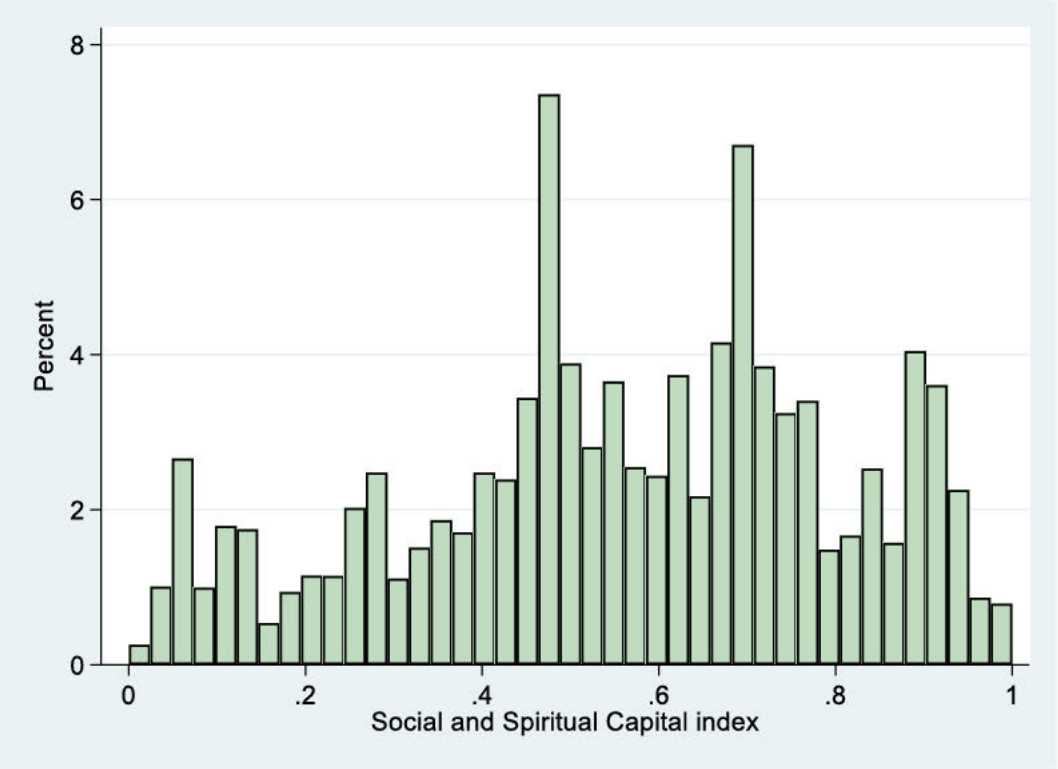
In addition, staypref (preference to continue living in current area), comgroupstot (number of memberships in community groups) and arelnb (importance of religious activities in life) have a high loading on component 4, ranging from 0.5868 to 0.3389.

5.4.3 Assessing the distribution of the social and spiritual capital index

As mentioned previously, a histogram and descriptive statistics will be used to assess whether the distribution of this variable is symmetrical or not.

The histogram (Figure 5.8) below visually shows the distribution of the social and spiritual capital variable. The distribution seems to be negatively skewed (i.e., not symmetrical) and light tailed. This means that most of the respondents have a lot of social and spiritual capital, while very few have very little social and spiritual capital. The respondents who have very little social and spiritual capital are the outliers in the dataset, hence the distribution seems to be negatively skewed. This is in line with the descriptive statistics for the variables included in the social and spiritual capital category in Chapter 4 (Table 4.11).

Figure 5.8. Histogram showing the distribution of the social and spiritual capital index



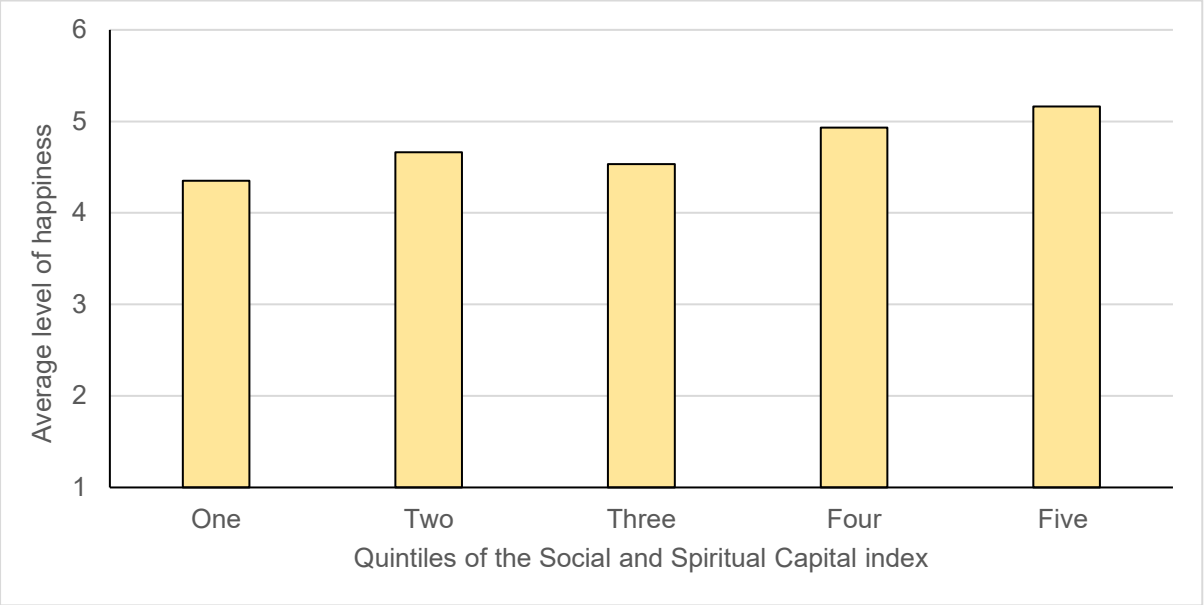
Source: Own calculations using NIDS data from 2010-2011, Wave 2

The data for the social and spiritual capital index has a skewness of approximately -0.341 (less than 0). This indicates a negatively skewed and heavier left tailed distribution. On the other hand, the data for the social and spiritual capital index has a kurtosis of approximately 2.35 (less than 3), therefore we can conclude that the social and spiritual capital index has positive kurtosis and a light-tailed distribution in contrast to a normal distribution. As expected, the standard deviation ($\sigma \approx 0.243$) is wide. It is worth noting that this index has the widest standard deviation (most amount of variation) compared to the financial capital, and human capital indices.

5.4.4 Average level of happiness for each quintile of the social and spiritual capital index

The relationship is made clearer when the average level of happiness is reviewed for each quintile of the social and spiritual capital index in Figure 5.9 below.

Figure 5.9. Bar Graph showing average level of happiness by quintiles of the social and spiritual capital index



Source: Own calculations using NIDS data from 2010-2011, Wave 2

An interesting observation in terms of the social and spiritual capital index and happiness is that the average level of happiness of the third quintile of the social and spiritual capital index is lower (4.53) than the average level of happiness of the second quintile of the social and spiritual capital index (4.66). This may be due to the complexity of the relationship between trust and happiness and the fact that the relationship may differ across different contexts. International studies such as Tokuda *et al.* (2010) and Kuroki (2011) found a positive relationship between social trust and happiness. Bălțătescu (2009) found that interpersonal trust is a stronger predictor of SWB than political trust in the Western and Southern European societies, whereas the opposite was found in the Eastern European countries. On the other hand, Zhang (2020) used data from 18 societies and found a positive longitudinal association between trust in community and life satisfaction, and reverse associations where life satisfaction was longitudinally associated with social trust (trust in close relations and community), suggesting a more complex relationship.

A cross-tabulation of happiness categories and quintiles of the social and spiritual capital index is presented in Table 5.19 below in order to illustrate the degree of overlap.

Table 5.19. Cross-tabulation of happiness category and quintile of the social and spiritual capital index

	Happiness category										
Quintile of the social and spiritual capital index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
1	525	313	370	401	475	274	200	133	60	191	2,942
	17.85	10.64	12.58	13.63	16.15	9.31	6.80	4.52	2.04	6.49	100
	33.35	22.62	18.91	17.93	18.19	17.04	17.47	15.36	14.02	21.78	20.03
2	297	247	411	481	577	347	223	131	46	175	2,935
	10.12	8.42	14.00	16.39	19.66	11.82	7.60	4.46	1.57	5.96	100
	18.87	17.85	21.00	21.50	22.10	21.58	19.48	15.13	10.75	19.95	19.98
3	266	266	458	505	587	366	211	119	52	111	2,941
	9.04	9.04	15.57	17.17	19.96	12.44	7.17	4.05	1.77	3.77	100
	16.90	19.22	23.40	22.57	22.48	22.76	18.43	13.74	12.15	12.66	20.02
4	230	286	415	438	479	336	257	203	102	195	2,941
	7.82	9.72	14.11	14.89	16.29	11.42	8.74	6.90	3.47	6.63	100
	14.61	20.66	21.21	19.58	18.35	20.90	22.45	23.44	23.83	22.23	20.02
5	256	272	303	412	493	285	254	280	168	205	2,928
	8.74	9.29	10.35	14.07	16.84	9.73	8.67	9.56	5.74	7.00	100
	16.26	19.65	15.48	18.42	18.88	17.72	22.18	32.33	39.25	23.38	19.94
Total	1,574	1,384	1,957	2,237	2,611	1,608	1,145	866	428	877	14,687
	10.72	9.42	13.32	15.23	17.78	10.95	7.80	5.90	2.91	5.97	100
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Note:

It is important to note that the numbers in each cell present the frequency, row percentage, and column percentage respectively.

As shown in the cross-tabulation above, of all the respondents in the lowest quintile of the social and spiritual capital index (2,942); only 17.85% are in the lowest current satisfaction level of life category, and only 28.49% (17.85% + 10.64%) are in the lowest two current satisfaction level of life categories. In contrast, there are respondents who are reportedly unhappy with their lives even though they fall into the highest quintile of the social and spiritual capital index. 18.03% (8.74% + 9.29%) of the respondents in the 5^{th} quintile of the social and spiritual capital index and 17.54% (7.82% + 9.72%) of the respondents in the 4^{th} quintile of the social and spiritual capital index report current satisfaction level of life in the lowest 2 categories. It is interesting to note that while only 8.53% (2.04% + 6.49%) of the respondents in the lowest quintile of the social and spiritual capital index report current satisfaction levels of life in the 2 highest happiness categories, only 18.03% (8.74% + 9.29%) of the respondents in the highest quintile of the social and spiritual capital index report current satisfaction levels of life in the 2 lowest happiness categories.

The highest degree of overlap occurs at the intersection between the ninth column and fifth set of rows. 39.25% of respondents in the ninth current satisfaction level of life category are in the fifth quintile of the social and spiritual capital index. Furthermore, this is the highest cell percentage compared to all cells in the ninth column, which indicates that there is a reasonable amount of agreement between the social and spiritual capital index and happiness at this point. However, this percentage still does not represent the majority of respondents.

The correlation coefficient between the social and spiritual capital index and happiness is ≈ 0.115. Since, the correlation coefficient is positive, one can conclude that increased social and spiritual capital is associated with increased happiness. However, despite a positive relationship between the social and spiritual capital index and happiness, the size of the correlation coefficient (≈ 0.115) is small. This suggests that the relationship between the social and spiritual capital index and happiness is positive, though not relatively strong.

It is worth noting that the correlation coefficient of this index is the smallest compared to the size of the correlation coefficients of the financial capital and human capital indices.

Concluding Remarks

Using PCA, this chapter estimated an index for each of the capital elements. Firstly, the results revealed that nine components jointly explain 45.38% of the total amount of variation relating to financial capital. The first component explained 8.8% of the total variation in the data and was labelled as ownership of durable assets and access to long-term and short-term credit. Secondly, the PCA results showed that two components jointly explain 68.24% of the total amount of variation relating to human capital. The first component explained 46.35% of the total variation in the data and was labelled as education, proficiency in English and health. Thirdly, the PCA results indicated that four components jointly explain 65.92% of the total amount of variation relating to social and spiritual capital. The first component explained 25.58% of the total variation in the data and was labelled as crime and violence (inside and outside the household) in the neighbourhood.

Lastly, the PCA results revealed that the financial capital index was closely related to household income per capita, household expenditure per capita, and the ownership of durable assets. The human capital index was strongly linked to literacy in English, educational attainment, and computer literacy, while the social and spiritual capital index was rooted in the relations inside and outside the household, reflected in experiences of violence and crime in the neighbourhood, as well as in trust. It is important to note that the financial capital index had the highest positive correlation with happiness ($r \approx 0.250$), followed by the human capital index ($r \approx 0.191$) and social and spiritual capital index ($r \approx 0.115$).

The next chapter aims to determine the influence of the diverse capital elements (using the indices estimated in this chapter) on happiness, using an ordered probit regression model. The regression results may aid in enriching policy discussions on how to increase the level of happiness in South Africa.

Chapter 6: Ordered probit regression: methodology and results

Introduction

The previous chapter used PCA to estimate an index for each of the capital elements. This chapter aims to investigate the relationship between happiness and the capital elements using the indices as independent variables in a regression model with happiness as the dependent variable. Therefore, to examine the underlying relationship between financial, human, and social and spiritual capital as latent explanatory variables in the model, and happiness as the dependent variable, regression analysis would be undertaken.

This chapter starts with a description and justification of the ordered probit regression model used in this dissertation. This is followed by the presentation and discussion of the ordered probit regression results, ordered probit model marginal effects results, ordered probit model predicted probabilities results, and the detection of multicollinearity results.

6.1 Regression Analysis

Regression Analysis is a statistical technique that is used to investigate the relationship between a dependent variable and one or more independent variables (Lavrakas, 2008; Uyanık and Güler, 2013). This method permits survey researchers to simultaneously look at the effect of several independent variables on a dependent variable and answer questions regarding the relationship between different variables of interest (Lavrakas, 2008). A multivariate regression shows the individual effect of a variable of interest on the dependent variable, holding the other variables constant (Gujarati and Porter, 2009).

The score for happiness and the measures for each type of capital that the PCA yielded are used in the regression analysis to examine the influence of each capital element on happiness. Therefore, in accordance with the literature and theoretical discussion above, the regression analysis in this study can be expressed as:

Happiness = F (financial capital, human capital, social and spiritual capital, demographic and socioeconomic control variables)

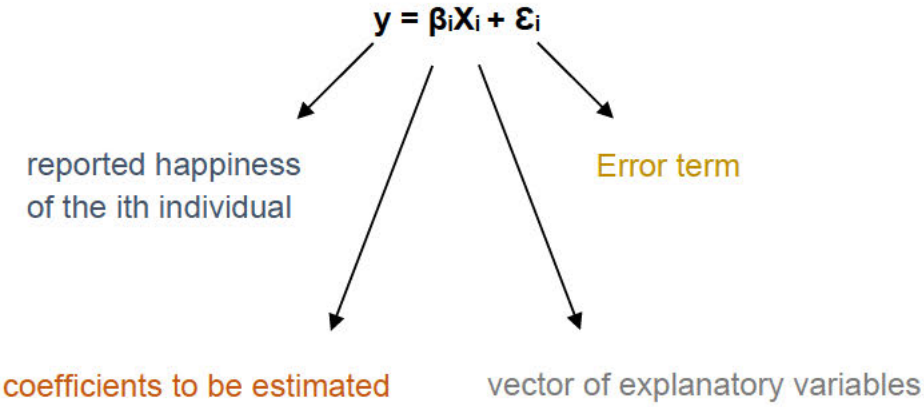
It is important to note that two-way causality with happiness is possible for all the elements of capital, but since the dataset for analysis is cross-sectional, establishing causality is beyond the scope of the study.

6.1.1 Ordered Probit Regression

An ordered probit model estimates relationships between an ordinal (ordered outcome) dependent variable and a set of independent variables, including the indices for the three types of capital and demographic and socioeconomic control variables (Stata, 2013; Katchova, 2013b). Given the ordinal nature of the happiness (SWB) measure available in NIDS (individuals are asked to assess their overall satisfaction with their lives on an ordinal scale of one (very dissatisfied) to ten (very satisfied)), and consistent with previous studies on happiness (Clark and Oswald, 1994; McBride, 2001; Powdthavee, 2003; Hinks and Gruen, 2007; Posel and Casale, 2011; Botha and Booysen, 2013; Ebrahim *et al.,* 2013; Botha, 2014), an ordered probit model will be adopted to determine the influence of different capital elements on happiness. The variables (three types of capital drawn from the PCA and extracted from the NIDS data) represent the independent variables (explanatory factors); age, age squared (divided by 100), race, gender, employment status, type of region where the individual resides, and the number of children under 7 years of age, who live in the individual's household represent the control variables; while the level of happiness, proxied by level of satisfaction, represents the dependent variable.

The following ordered probit model is estimated:

$$y = \beta_i X_i + \varepsilon_i$$



6.1.1.1 Hypothesis Testing

Based on the literature and the proposed model, and in light of the South African context, this study proposes the following hypotheses:

Table 6.1. List of Hypotheses

Hypotheses	Null and Alternative Hypothesis Statements
H_1	H_{10}: There is a relationship between financial capital and happiness. H_{1a}: There is no relationship between financial capital and happiness.
H_2	H_{20}: There is a relationship between human capital and happiness. H_{2a}: There is no relationship between human capital and happiness.
H_3	H_{30}: There is a relationship between social and spiritual capital and happiness. H_{3a}: There is no relationship between social and spiritual capital and happiness.

Source: Own compilation

6.2 Ordered probit regression results

As mentioned in Chapter 4, this study makes use of survey weights since the dataset is cross-sectional. The estimates are adjusted according to the survey design and provision is made for the standard errors and confidence intervals to take into account the NIDS stratification and clustering (Branson and Wittenberg, 2018). Table 6.2 below presents the weighted ordered probit regression results.

Table 6.2. Weighted ordered probit regression results for the influence of capital elements on happiness in South Africa

Dependent variable: 10-level happiness	
Variables	Coefficients and Standard Errors
Financial Capital index	0.604***
	(0.208)
Human Capital index	0.805***
	(0.131)
Social and Spiritual Capital index	0.515***
	(0.130)
Age	-0.011*
	(0.007)
Age squared divided by 100	0.018**
	(0.008)

Dependent variable: 10-level happiness	
Variables	Coefficients and Standard Errors
Race = 2, Coloured	0.662***
	(0.093)
Race = 3, Asian/Indian	1.026***
	(0.226)
Race = 4, White	0.672***
	(0.111)
Gender = 1, Male	-0.040
	(0.034)
Employment status = 1, Unemployed	-0.012
	(0.070)
Employment status = 2, Employed	0.132**
	(0.052)
GeoType2011 = 2, Traditional	-0.054
	(0.082)
GeoType2011 = 3, Farms	-0.065
	(0.101)
numchild	-0.046
	(0.034)
/cut1	-0.595***
	(0.184)
/cut2	-0.219
	(0.180)
/cut3	0.203
	(0.182)
/cut4	0.618***
	(0.180)
/cut5	1.141***
	(0.175)
/cut6	1.545***
	(0.177)
/cut7	1.961***
	(0.177)
/cut8	2.455***
	(0.188)
/cut9	2.675***
	(0.196)
Sample	9428
Population	18721268
pseudo R-squared[1]	0.0584
Wald Chi-squared[1]	477.92***
F(14, 550)[1]	35.04
Prob > F[1]	0.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Notes:

Standard errors in parentheses
Results are weighted using the cross-sectional survey weights.
*** p<0.01, ** p<0.05, * p<0.1

[1] With regard to the regression diagnostics, the following tests are used:

- The pseudo R-squared (pseudo R^2) test indicates the percentage of variation in happiness explained by the independent variables in the model (Ebrahim *et al.,* 2013; Botha and Booysen, 2013; Blaauw and Pretorius, 2013). The Pseudo R-squared of 0.0584 is similar to what has been reported in other cross-sectional happiness studies that employed an ordered probit model (Ebrahim *et al.,* 2013; Botha and Booysen, 2013; Blaauw and Pretorius, 2013).
- The Wald Chi-squared (Wald χ^2) test indicates that the explanatory variables are jointly significant in explaining the variation in happiness – the Wald χ^2 is significant at a 1% level.
- The F statistic is a test of significance for the entire regression. At $\alpha = 0.05$, this regression is statistically significant because the p-value < 0.05.

All of the tests above indicate that the regression has statistically significant explanatory power.

6.2.1 Discussion of results

The weighted ordered probit regression results for each variable (shown in Table 6.2 above) will be interpreted in the following subsections. The signs (positive or negative) and significance (p-value) of the explanatory and control variables coefficients will indicate whether the variable has a positive or negative influence on happiness in South Africa.

Capital elements

In Table 6.2, the weighted ordered probit regression results indicate that statistically significant (at all conventional significance levels) positive relationships exist between all capital elements (financial capital, human capital, and social and spiritual capital) and happiness. Human capital has the strongest relationship with happiness (0.805), followed by financial (0.604), and social and spiritual capital (0.515). Overall, the results support all the Null Hypothesis Statements (H_{10}, H_{20}, H_{30}) in Table 6.1 above, in that there is a relationship between all diverse capital elements (financial capital, human capital, and social and spiritual capital) and happiness. Furthermore, the results suggest that all diverse capital elements can make a difference in enhancing people's happiness.

Control variables

The control variables included in the weighted ordered probit regression have often been included in the previous literature when examining the influence of microeconomic factors on happiness (Walen and Lachman, 2000; Headey and Wooden, 2004; Hinks and Gruen, 2007; Mahadea and Rawat, 2008; Di Tella *et al.,*

2010; Botha 2014). As mentioned previously, the control variables are age, age squared (divided by 100), race, gender, employment status, type of region where the individual resides, and the number of children under 7 years of age, who live in the individual's household.

Age

The age variable is a continuous variable. The relationship between age and happiness is only significant at the 10% level. Therefore, there is a U-shaped relationship between age and happiness. This result is consistent with South African studies (Clark *et al.,* 1996; Gerdtham and Johannesson, 2001; Powdthavee, 2003; Powdthavee, 2005; Ebrahim *et al.,* 2013) and international studies (Blanchflower and Oswald, 2008; Caporale *et al.,* 2009) that found a U-shaped relationship between age and happiness. In contrast, Mahadea and Rawat (2008) found a positive relationship between age and happiness, and Hinks and Gruen (2007) found that age appears to have no effect on the likelihood of happiness.

Race

Coloured

The coefficient of Coloured people is statistically significant at all conventional levels. It implies that Coloured people are significantly happier than Africans, as the latter group is the base category.

Asian/Indian

The coefficient of Asian/Indian people is statistically significant at all conventional levels. Furthermore, since this is the largest coefficient out of those on the three race dummy variables, Asian/Indian people are happier than all the other population groups, on average. Ebrahim *et al. (*2013) used data from the NIDS conducted in 2008, and in contrast, found that Coloured people are happier than Indian people.

White

The coefficient of White people is statistically significant at all conventional levels. Furthermore, the coefficient for White people is similar in size to that for Coloured

people. This result is supported by Ebrahim *et al.* (2013) findings that Coloured people are not significantly happier than White people.

This study found that Asian/Indian people are the happiest with life followed by White people and Coloured people. In contrast, Powdthavee (2005) used cross-sectional data from the October Household Survey of 1997 (OHS97) and found that Coloured people reported the highest level of happiness in South Africa followed by Indian and White people. In contrast, Hinks and Gruen (2007) used data from three of the Durban (a city in the province of KwaZulu-Natal, South Africa) Quality of Life Studies, and found that White people, on average, are the happiest with life followed by Asian, Coloured and African people.

Gender

Male

There is an insignificant (p-value = 0.227) negative relationship between the male gender and happiness. This result is consistent with South African studies (Hinks and Gruen, 2007; Mahadea and Rawat, 2008) and international studies (Ravallion and Lokshin, 1999; Graham, 2008) that found no statistically significant differences in the level of happiness among males and females. Gerdtham and Johannesson (2001), in contrast, show that there is a significant negative relationship between male gender and happiness in Sweden.

Employment status

Unemployed

The coefficient of unemployed people is insignificant at all conventional levels. It implies that unemployed people are not happier than those who are Not Economically Active, as the latter group is the base category. This result is supported by previous South African studies (Hinks and Gruen, 2007; Kingdon and Knight, 2007; Møller, 2007; Møller and Radloff, 2010; Mahadea, 2013; Ebrahim *et al.,* 2013; Botha, 2014) and international studies (Clark and Oswald, 1994; Oswald, 1997; Frey and Stutzer, 2000; Gerdtham and Johannesson, 2001; Ravallion and Lokshin, 2001; Graham, 2008) that found a negative relationship between unemployment and happiness.

Employed

The coefficient of employed people is positive and statistically significant at the 5% level. It implies that employed people are happier than those who are Not Economically Active, as the latter group is the base category.

Furthermore, the results confirm that unemployed people have a lower level of happiness than employed people. This result is consistent with that of international studies such as Schoon *et al.* (2005) who found that people who are employed are happier than people who are unemployed.

Type of region where the individual resides

Traditional and Farms

The coefficients of people who live in a traditional area and on a commercial farm are not significant at all conventional levels. It implies that people who live in a traditional area and on a commercial farm are not happier than those living in urban areas, as the latter group is the base category.

Children

Number of children under 7 years of age

An insignificant (p-value = 0.167) negative relationship exists between the number of children under 7 years of age residing in the household and happiness.

The evidence regarding the influence of having children on happiness is mixed and differs across country and measure (Dolan *et al.,* 2008). A study by Clark and Oswald (1994), for example, used data from the British Household Panel Study and showed that individuals with children (especially one) are less happy. On the other hand, Haller and Hadler (2006) used 41 nations data from the World Values Survey (1995-1997) and confirmed that individuals with children are significantly happier than individuals who do not have children.

Upon closer examination, children seem to generally have a greater negative influence on the happiness of for instance, divorced mothers, single parents, and a poor family (Frey and Stutzer, 2000; Alesina *et al.,* 2004; Schoon *et al.,* 2005; Dolan *et al.,* 2008). Therefore, children seem to be an additional challenge to happiness if there are other relatively negative circumstances (Dolan *et al.,* 2008).

6.3 Ordered probit model marginal effects

The ordered probit model marginal effects indicate the change in the probability of any of the ten categories of happiness when there is a one-unit increase in the independent variable (Torres-Reyna, 2014). For continuous variables, the marginal effect shows the change in the probability of happiness when there is an instantaneous change in the variable, whereas, for binary variables, the marginal effect shows the change in the probability of happiness when there is a change from 0 to 1 in the variable (Torres-Reyna, 2014).

Table 6.3 below shows the 10 sets of marginal effects, one for each category of happiness (Satisfaction level 1, Satisfaction level 2, Satisfaction level 3, Satisfaction level 4, Satisfaction level 5, Satisfaction level 6, Satisfaction level 7, Satisfaction level 8, Satisfaction level 9, Satisfaction level 10).

Table 6.3. Marginal Effects for ordered probit regression

	Current satisfaction level of life									
	Satisfaction level 1	Satisfaction level 2	Satisfaction level 3	Satisfaction level 4	Satisfaction level 5	Satisfaction level 6	Satisfaction level 7	Satisfaction level 8	Satisfaction level 9	Satisfaction level 10
Financial capital	-.0776706	-.0497925	-.0602459	-.04318	-.0036596	.0376617	.0582889	.0656873	.0222332	.0506774
Human capital	-.1035156	-.066361	-.0802927	-.0575481	-.0048773	.0501937	.0776846	.0875449	.0296313	.0675403
Social and Spiritual capital	-.0662756	-.0424875	-.0514072	-.0368451	-.0031227	.0321364	.0497374	.0560504	.0189713	.0432425
Age	.0014446	.0009261	.0011205	.0008031	.0000681	-.0007005	-.0010841	-.0012217	-.0004135	-.0009425
Agesquared (divided by 100)	-.0022896	-.0014678	-.0017759	-.0012729	-.0001079	.0011102	.0017183	.0019363	.0006554	.0014939
Coloured	-.0851923	-.0546144	-.0660801	-.0473615	-.0040139	.0413089	.0639336	.0720485	.0243862	.055585
Asian/Indian	-.1319562	-.0845934	-.1023529	-.0733593	-.0062173	.0639842	.0990282	.1115975	.0377723	.0860968
White	-.0863742	-.0553721	-.0669969	-.0480186	-.0040696	.041882	.0648206	.0730481	.0247246	.0563562
Male	.0051818	.0033219	.0040193	.0028808	.0002441	-.0025126	-.0038888	-.0043824	-.0014833	-.003381

	Current satisfaction level of life									
	Satisfaction level 1	Satisfaction level 2	Satisfaction level 3	Satisfaction level 4	Satisfaction level 5	Satisfaction level 6	Satisfaction level 7	Satisfaction level 8	Satisfaction level 9	Satisfaction level 10
Unemployed	.0015175	.0009728	.0011771	.0008436	.0000715	-.0007358	-.0011388	-.0012834	-.0004344	-.0009901
Employed	-.0169365	-.0108575	-.0131369	-.0094156	-.000798	.0082123	.0127102	.0143234	.004848	.0110505
Traditional Area	.0069211	.004437	.0053684	.0038477	.0003261	-.003356	-.0051941	-.0058533	-.0019812	-.0045158
Farms	.0083573	.0053576	.0064824	.0046461	.0003938	-.0040524	-.0062719	-.0070679	-.0023923	-.0054529
Number of children under 7 years of age residing in the household	.0059492	.0038139	.0046146	.0033074	.0002803	-.0028847	-.0044647	-.0050314	-.001703	-.0038817

Source: Own calculations using NIDS data from 2010-2011, Wave 2

6.3.1 Discussion of results

Since interpreting 10 sets of marginal effects results will be very repetitive, we adopt the convention of interpreting the marginal effect results at the midpoint (Gujarati and Porter, 2009). Hence, we will interpret the marginal effect results at the current satisfaction level 5 of life category.

As seen in Table 6.3 above, if the financial capital index increases by 1 unit, one is approximately 0.366% less likely to be in the current satisfaction level 5 of life category. Further, if the human capital index increases by 1 unit, one is approximately 0.488% less likely to be in the current satisfaction level 5 of life category, and if the social and spiritual capital index increases by 1 unit, one is approximately 0.312% less likely to be in the current satisfaction level 5 of life category. In general, the marginal effects of the three capital elements are negative for the lower happiness levels (satisfaction level 1 to satisfaction level 5) and switch to positive for the higher levels. Hence, individuals with more capital (whether financial, human, or social and spiritual) are more likely to be satisfied with their lives than those with less capital. Human capital has the highest marginal impact.

It is worth noting that the positive coefficient and marginal effects of Asian/Indian people on happiness are larger in magnitude than the positive coefficient and marginal effects of White and Coloured people on happiness. The results for this variable are for the most part not in line with the literature. Møller (2007) used data from the 2002 General Household Survey and in contrast confirmed that the percentage of White people who reported that they were satisfied with their life in general was higher compared to the other race groups (Coloured, Indian/Asian, and Black/African). Ebrahim *et al*. (2013) used data from the NIDS 2008 survey of South Africa and in contrast, found that Coloured people are happier than Indian people. Botha (2014) also used data from the NIDS 2008 survey of South Africa and showed that Coloured people reported the highest level of happiness followed by White and Asian people.

As expected, the positive coefficient and marginal effects of employed people on happiness are larger in magnitude than the negative coefficient and marginal effects of unemployed people on happiness. The larger and positive effect of employment on happiness could arise because, as discussed in Chapter 1, the income earned enables

individuals to spend on goods and services, from which they gain utility and satisfaction. On the other hand, unemployment decreases income, does not alleviate poverty, adversely affects an individual's self-esteem, does not provide one with an opportunity to purchase more goods and services and does not contribute to individuals increasing their life satisfaction and living a happier life (van Hoorn, 2008; Layard, 2011). Research conducted in various developing and developed countries (such as Russia, South Africa, and Sweden) has found that unemployment negatively affects an individual's happiness (Hinks and Gruen, 2007). This finding contradicts the neo-classical assumption that ceteris paribus, work does not inherently affect an individual's happiness (Hinks and Gruen, 2007).

It is also worth noting that the negative coefficient and marginal effects of people that live in a traditional area on current satisfaction level 6 of life to current satisfaction level 10 of life are larger in magnitude than the negative coefficient and marginal effects of people that live on a farm on current satisfaction level 6 of life to current satisfaction level 10 of life. Furthermore, the marginal effects of people that live on a farm on current satisfaction level 1 of life to current satisfaction level 5 of life are larger in magnitude than the marginal effects of people that live in a traditional area on current satisfaction level 1 of life to current satisfaction level 5 of life.

Individuals living in both traditional and commercial farming areas report lower levels of happiness, on average than those in urban areas. The marginal effects further reveal that for both these areas, individuals tend to choose happiness levels in the middle of the scale, compared to those residing in urban locations.

6.4 Ordered probit model predicted probabilities and actual percentage distribution of happiness

Table 6.4 and Figure 6.1 below show a comparison between the average predicted probabilities and actual percentage distribution of happiness.

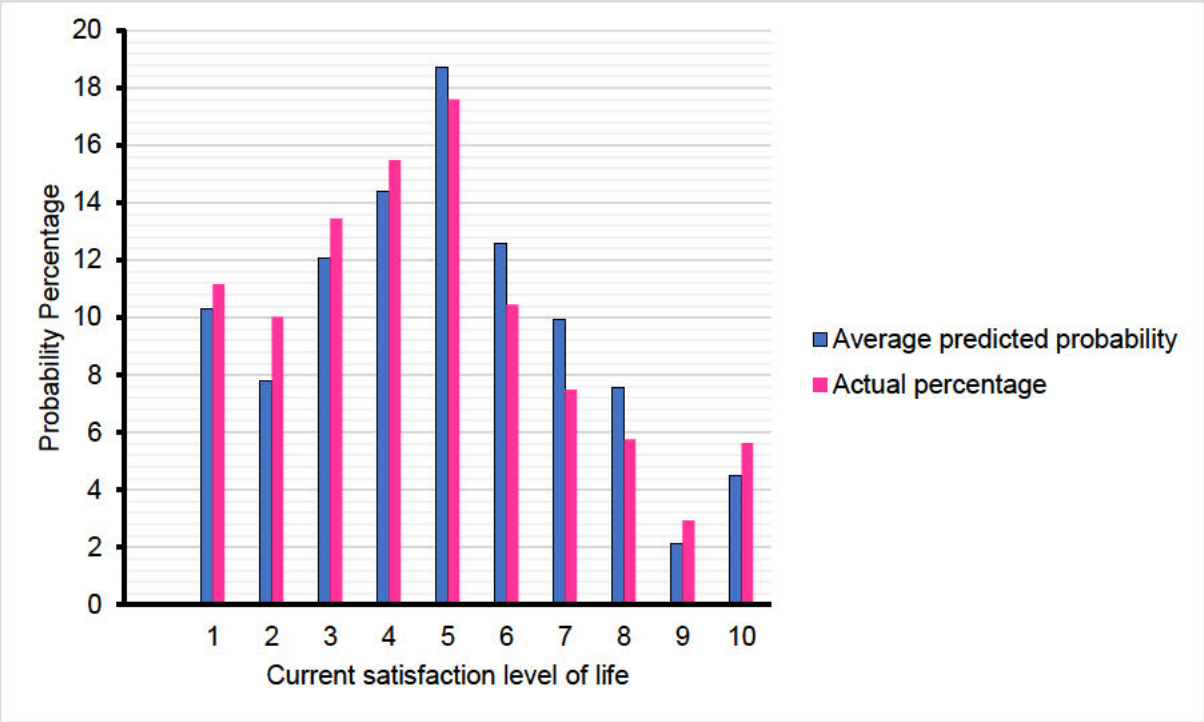
Table 6.4. Ordered probit model average predicted probabilities and observed proportions for each category of happiness

Current satisfaction level of life	Average predicted probability	Actual percentage
Satisfaction level 1	10.30403	11.17
Satisfaction level 2	7.78702	10.02

Current satisfaction level of life	Average predicted probability	Actual percentage
Satisfaction level 3	12.08006	13.45
Satisfaction level 4	14.37846	15.48
Satisfaction level 5	18.73003	17.60
Satisfaction level 6	12.5937	10.45
Satisfaction level 7	9.93053	7.49
Satisfaction level 8	7.57085	5.76
Satisfaction level 9	2.11772	2.94
Satisfaction level 10	4.5076	5.64

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Figure 6.1. Bar Graph showing ordered probit model average predicted probabilities and observed proportions for each category of happiness



Source: Own calculations using NIDS data from 2010-2011, Wave 2

As seen in Table 6.4 and Figure 6.1 above, the average predicted probability results are closer to the observed proportions in the middle of the distribution (at satisfaction level 5), and farther apart at satisfaction levels 2, 6, 7, and 8. For example, given the mean values of the independent variables, the average predicted probability value of reporting satisfaction level 5 is approximately 18.730%. Given the actual percentages, the actual percentage of reporting satisfaction level 5 is 17.60%. On average, the

predicted probabilities are similar to the observed proportions, therefore the ordered probit model seems to fit the data reasonably well (Salisu, 2016).

6.5 Detecting multicollinearity

One of the assumptions we make when using multiple regression is that there is no perfect multicollinearity (i.e., no exact linear relationship among explanatory variables (X's) exists).

Multicollinearity exists in a regression model when two or more independent variables are highly correlated (Gujarati, 2002). It leads to a lack of precision of point estimates (coefficients) in the model. The estimates may not be statistically significant. Ideally, when we want to run a regression analysis, we want to ensure that two or more independent variables are not highly correlated.

The following "rules of thumb" were used (after the ordered probit regression) to detect multicollinearity:

1. Significant R^2 (F-statistic) but few significant t-statistics.

We regressed happiness on financial capital index, human capital index, social and spiritual capital index, age, age squared (divided by 100), race, gender, employment status, type of region where the individual resides, and number of children under 7 years of age, who live in the individual's household. The results are shown in Table 6.5 below.

Table 6.5. Linear Regression results

Source	SS	df	MS	Number of obs	=	9,428
				F(14, 9413)	=	117.75
Model	8458.59983	14	604.185702	Prob > F	=	0.0000
Residual	48300.0649	9,413	5.13120842	R-squared	=	0.1490
				Adj R-squared	=	0.1478
Total	56758.6647	9,427	6.02086186	Root MSE	=	2.2652

happiness	Coefficient	Std. err.	t	|P>t|	[95% conf.	interval]
FC_index	2.16384	.2832924	7.64	0.000	1.608526	2.719154
HC_index	1.556007	.1483161	10.49	0.000	1.265276	1.846739
SoSpC_index	.875879	.0979495	8.94	0.000	.6838768	1.067881
age	-.0234486	.0090764	-2.58	0.010	-.0412403	-.0056569
agesquared	.0393125	.0104879	3.75	0.000	.0187539	.059871

happiness	Coefficient	Std. err.	t	|P>t|	[95% conf. interval]	
race						
Coloured	1.535148	.0724758	21.18	0.000	1.39308	1.677216
Asian/Indian	2.37771	.2047464	11.61	0.000	1.976363	2.779058
White	1.319088	.1463282	9.01	0.000	1.032253	1.605922
gender						
Male	-.0391881	.0484691	-0.81	0.419	-.134198	.0558218
emplostatus						
Unemployed	.1282308	.0674278	1.90	0.057	-.0039422	.2604039
Employed	.2033627	.0599114	3.39	0.001	.0859234	.320802
GeoType2011						
Traditional	.0872018	.054933	1.59	0.112	-.0204788	.1948824
Farms	-.1431421	.0971573	-1.47	0.141	-.3335914	.0473072
numchild	-.016605	.0202419	-0.82	0.412	-.0562834	.0230734
_cons	2.985347	.2076087	14.38	0.000	2.578389	3.392305

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 6.5 above, the following variables: financial capital index, human capital index, social and spiritual capital index, age, age squared (divided by 100), and categories: Coloured, Asian/Indian, White, and employed are statistically significant at the 5% level.

The overall model is significant at all conventional significance levels. The F-statistic is 117.75 with 14 and 9413 degrees of freedom, and the probability of getting a value this high is 0.0000 if the null hypothesis of no explanatory power were true. Hence, we can reject the null hypothesis at all conventional significance levels.

It can be concluded that there is a significant R^2 (F-statistic) but there are not a few significant t-statistics. Hence, this “rule of thumb” indicates that there is no substantial evidence for multicollinearity.

2. Examination of pair-wise correlations and partial correlations.

It should be noted that the categorical variables were separated into their respective binary dummies before estimating the pairwise correlations and partial correlations.

If the correlation coefficient between two regressors is high (for instance, greater than 0.8), then multicollinearity could be serious. This, however, is a sufficient but not a necessary condition for the existence of multicollinearity, because it can exist even if the pairwise correlations are relatively low.

As shown in Table 6.6 below, the correlation coefficient between age squared (divided by 100) and age is ≈ 0.981 (greater than 0.8). This is the highest pairwise correlation coefficient, and it arises because the one variable is derived from the other. All other pairwise correlations are lower than 0.8. It is important to note that age squared (divided by 100) and age are control variables, and the pair-wise correlation coefficients between the variables of interest are not high. The correlation coefficient between the human capital index and the financial capital index is positive (≈ 0.417), the correlation coefficient between the social and spiritual capital index and the financial capital index is positive (≈ 0.123), and the correlation coefficient between the social and spiritual capital index and the human capital index is positive (≈ 0.030).

2a) Check for high pairwise correlations among the regressors.

The Stata command for pairwise correlations is corr. The pairwise correlation results are shown in Table 6.6 below.

Table 6.6. Pairwise correlation results

	Financial capital index	Human capital index	Social and Spiritual capital index	Age	Age squared (divided by 100)	Male	Coloured	Asian/Indian	White	Unemployed	Employed	Traditional area	Farms	Number of children under 7 years of age residing in the household
Financial capital index	1.0000													
Human capital index	0.4166	1.0000												
Social and Spiritual capital index	0.1225	0.0296	1.0000											
Age	0.2328	-0.3464	0.0672	1.0000										
Age squared (divided by 100)	0.1975	-0.3475	0.0662	0.9813	1.0000									
Male	0.0876	0.0750	0.0178	-0.0659	-0.0588	1.0000								
Coloured	0.0812	-0.0590	0.1003	0.0827	0.0738	-0.0068	1.0000							
Asian/Indian	0.1277	0.0974	0.0541	0.0404	0.0376	0.0076	-0.0492	1.0000						
White	0.4337	0.2168	0.1069	0.1876	0.1968	0.0129	-0.0787	-0.0232	1.0000					
Unemployed	-0.1490	0.0187	-0.0556	-0.1570	-0.1584	-0.0102	-0.0064	-0.0082	-0.0643	1.0000				
Employed	0.3810	0.1875	0.0235	0.0801	0.0154	0.1284	0.0930	0.0172	0.0628	-0.3503	1.0000			

	Financial capital index	Human capital index	Social and Spiritual capital index	Age	Age squared (divided by 100)	Male	Coloured	Asian/Indian	White	Unemployed	Employed	Traditional area	Farms	Number of children under 7 years of age residing in the household
Traditional area	-0.2901	-0.1443	-0.0399	-0.0962	-0.0785	-0.0086	-0.3224	-0.0960	-0.1533	0.0755	-0.2099	1.0000		
Farms	-0.0035	-0.0663	0.1448	0.0038	-0.0040	0.0207	0.0623	0.1793	0.0361	-0.0501	0.0686	-0.2195	1.0000	
Number of children under 7 years of age residing in the household	-0.2249	-0.0631	-0.0053	-0.1569	-0.1557	-0.1243	-0.0775	-0.0521	-0.1105	0.0531	-0.1033	0.1463	0.0098	1.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

2b) Calculate the partial correlation coefficients between the explanatory variables.

As mentioned above, multicollinearity can exist even if the pairwise correlations are relatively low. For instance, it is generally unlikely that r13 will reflect the true degree of (linear) association between Y and X3 in the presence of X2 (Gujarati, 2002). Therefore, one requires a correlation coefficient that is independent of the influence (variability), if any, of X2 on X3 and Y (Gujarati, 2002). Such a correlation coefficient is known as the partial correlation coefficient (Gujarati, 2002).

The Stata command for partial correlations is pcorr. The partial correlation results are shown in Table 6.7 below.

Table 6.7. Partial correlation results

Variable	Partial corr.	Semipartial corr.	Partial corr.^2	Semipartial corr.^2	Significance value
Human capital index	0.4090	0.3172	0.1673	0.1006	0.0000
Social and Spiritual capital index	0.0726	0.0515	0.0053	0.0026	0.0000
Age	0.1823	0.1312	0.0332	0.0172	0.0000
Agesquared (divided by 100)	-0.1210	-0.0862	0.0146	0.0074	0.0000
Male	0.0539	0.0382	0.0029	0.0015	0.0000
Coloured	0.0609	0.0432	0.0037	0.0019	0.0000
Asian/Indian	0.1050	0.0747	0.0110	0.0056	0.0000
White	0.3314	0.2485	0.1098	0.0617	0.0000
Unemployed	-0.0210	-0.0149	0.0004	0.0002	0.0415
Employed	0.2276	0.1654	0.0518	0.0273	0.0000
Traditional area	-0.1135	-0.0809	0.0129	0.0065	0.0000
Farms	-0.0693	-0.0491	0.0048	0.0024	0.0000
Number of children under 7 years of age residing in the household	-0.1107	-0.0788	0.0123	0.0062	0.0000

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 6.7 above, the partial correlation coefficient between the financial capital index and the human capital index (while holding the other explanatory variables constant) appears to be weak (≈ 0.409), but it is statistically significant. The partial correlation coefficient between the financial capital index and the social and spiritual capital index (while holding the other explanatory variables constant) is weak (≈ 0.073), but it is statistically significant. The other partial correlations are also low. This indicates that high levels of collinearity is not present, and hence multicollinearity does not seem to be a problem in this study.

It is worth noting that the other partial correlations are positive, weak, and statistically significant besides the partial correlation between the financial capital index and age squared (divided by 100) which is negative, weak (≈ -0.121), and statistically significant; and the partial correlation between the financial capital index and unemployed which is negative, weak (≈ -0.021), and statistically significant.

3) Calculate the Variance inflation factor (VIF)

As mentioned above, multicollinearity exists in a regression model when two or more independent variables are highly correlated. The VIF command in Stata was used (after the ordered probit regression) to check for multicollinearity (Torres-Reyna, 2007). As a rule of thumb, a variable is considered as highly collinear when the VIF value associated with the variable is greater than 10 (Gujarati, 2002; Field, 2009). It is important to note that a VIF value greater than 10 is not a problem provided that the variables with VIF values greater than 10 are control variables and not variables of interest (Allison, 2012). Table 6.8 below shows the VIF for each variable.

Table 6.8. Variance inflation factor (VIF) for each variable

Variable	VIF
Financial capital index	2.00
Human capital index	1.70
Social and Spiritual capital index	1.06
Age	32.90
Age squared (divided by 100)	32.06
Coloured	1.18
Asian/Indian	1.09
White	1.36
Male	1.05
Unemployed	1.20
Employed	1.53
Traditional area	1.32
Farms	1.14
Number of children under 7 years of age residing in the household	1.10
Mean VIF	5.76

Source: Own calculations using NIDS data from 2010-2011, Wave 2

As shown in Table 6.8 above, all the variables except age and age squared (divided by 100) have a VIF value that is less than 10. The high VIF value associated with age (32.90) and age squared divided by 100 (32.06) can be safely ignored because they

are control variables and not collinear with the variables of interest (Allison, 2012). Therefore, it can again be concluded that multicollinearity is not a problem in this study.

Concluding Remarks

Using ordered probit regression analysis, this chapter investigated the influence of financial capital, human capital, and social and spiritual capital on happiness in South Africa. The ordered probit regression results indicate that statistically significant positive relationships exist between all capital elements and happiness. Human capital has the strongest relationship with happiness, followed by financial, and social and spiritual capital. Overall, the results suggest that all diverse capital elements can make a difference in enhancing South African's happiness.

The results confirm some of the findings from previous South African and international studies. Asian/Indian people are the happiest with life followed by White people and Coloured people. There is an insignificant negative relationship between the male gender and happiness. Unemployed people are not happier than those who are Not Economically Active and employed. In contrast, employed people are happier than those who are Not Economically Active. People who live in a traditional area and on a commercial farm are not happier than those living in urban areas, and an insignificant negative relationship exists between number of children under 7 years of age residing in the household and happiness.

It is interesting to note that the positive coefficient and marginal effects of Asian/Indian people on happiness are larger in magnitude than the positive coefficient and marginal effects of White and Coloured people on happiness. As expected, the positive coefficient and marginal effects of employed people on happiness are larger in magnitude than the negative coefficient and marginal effects of unemployed people on happiness.

In terms of the differences between the ordered probit model predicted probabilities and observed proportions, the predicted probability results are closer to the observed proportions in the middle of the distribution (at satisfaction level 5) and farther apart at satisfaction levels 2,6,7 and 8.

Finally, after examining the F-statistics, t-statistics, pair-wise correlations, and partial correlations, and calculating the VIF, it can be concluded that multicollinearity is not a problem in this study.

Chapter 7: Conclusion

This study was primarily driven by the necessity to broaden the scope of South African literature on happiness. The aim was to move beyond the traditional focus on material aspects of well-being and delve into the economic context within a broader capital set. Hence, this study investigated the influence of financial, human, and social and spiritual capital on happiness in the context of South Africa as a post-apartheid developing economy.

A review of previous economic theories and literature has shown that individuals who have wealth, high income, education and skills, extensive work experience, trust others among whom they live or work and in leadership positions, are involved in community associations, have intimate social relationships, are married and are strongly religious are happier (Smith *et al.,* 1997; Frey and Stutzer, 2000; Diener and Biswas-Diener, 2002; Helliwell and Putman, 2004; Heady *et al.*, 2005; Castriota, 2006; Rule, 2007; Stark and Maier, 2008; Sen, 2010; Christoph, 2010; Layard, 2011; Saphire-Bernstein and Taylor, 2013; Blaauw and Pretorius, 2013; Mahadea and Ramroop, 2015; Pilling, 2019).

This dissertation used Wave 2 of NIDS to investigate the influence of capital elements on happiness in South Africa. The descriptive statistics for the happiness variable, demographic and socioeconomic control variables, variables for the financial capital index, variables for the human capital index, and variables for the social and spiritual capital index were first presented in order to show how happiness is correlated with each capital element and control variable. PCA was then used to estimate an index for each of the three capital elements. Finally, the indices were used as independent variables in an ordered probit regression model with happiness as the dependent variable in order to examine the underlying relationship between the capital elements and happiness in South Africa.

The descriptive statistics for the variables included in the financial capital category indicate that besides owning at least one cell phone in good working order, most of the respondents do not own at least one durable asset. Furthermore, most of the respondents do not have personal debt. The descriptive statistics for the variables included in the human capital category indicate that the average South African individual possesses little more than Grade 9 (Std 7/Form 2). Furthermore, most of the

respondents are not computer literate and do not have a driver's license, more than half of the respondents have very good literacy in English, and most of the respondents described their health at present as either very good or excellent. Lastly, the descriptive statistics for the variables included in the social and spiritual capital category indicate that more than half of the respondents were never married. Furthermore, most of the respondents reported that they have a strong preference to stay in the area that they are currently living in; have low levels of trust towards both neighbours and strangers; burglaries, muggings or thefts are either not common, very rare or never happens in their neighbourhood; violence between members of the same household is either not common, very rare or never happens in their neighbourhood; violence between members of different households is either not common, very rare or never happens in their neighbourhood; and religious activities are regarded as either very important or important in their lives.

Turning to PCA, firstly, the results revealed that nine components jointly explain 45.38% of the total amount of variation relating to financial capital. The first component explained 8.8% of the total variation in the data and was most closely related to variables representing ownership of durable assets (motor vehicle, computer, and camera), and access to long-term and short-term credit (home loan/bond, vehicle finance and credit card). Secondly, the PCA results revealed that two components jointly explain 68.24% of the total amount of variation relating to human capital. The first component explained 46.35% of the total variation in the data and was most closely related to variables representing education (years of schooling completed), proficiency in English (reading level in English and writing level in English) and health (health status). Thirdly, the PCA results revealed that four components jointly explain 65.92% of the total amount of variation relating to social and spiritual capital. The first component explained 25.58% of the total variation in the data and was most closely related to variables representing crime (burglaries, muggings, or thefts) and violence (between members of the same household, and between members of different households) in the neighbourhood. Lastly, the PCA results showed that the financial capital index was closely related to household income per capita, household expenditure per capita and the ownership of durable assets. The human capital index was strongly linked to literacy in English, educational attainment, and computer literacy, while the social and spiritual capital index was rooted in the relations inside

and outside the household, reflected in experiences of violence and crime in the neighbourhood, as well as trust. It is worth noting that the financial capital index had the highest positive correlation with happiness, followed by the human capital index and social and spiritual capital index.

The ordered probit regression results indicate that statistically significant positive relationships exist between all capital elements and happiness. Human capital has the strongest relationship with happiness, followed by financial, and social and spiritual capital. Overall, the results suggest that all diverse capital elements can make a difference in enhancing people's happiness.

The findings from this study are consistent with the findings of previous international studies in terms of the fact that social capital is found to have a positive influence on individual happiness (Putnam, 2000; Leung *et al.,* 2013; Rodríguez-Pose and von Berlepsch, 2014; Rukumnuaykit and Pholphirul, 2016).

Significance of this study and policy directions

As mentioned in Chapter 1, in 2015, South Africa and 192 other countries adopted the 2030 Agenda for Sustainable Development to ensure that everyone enjoys peace and prosperity within the next ten years (Statistics South Africa, 2019; United Nations, 2022; United Nations Development Programme, 2024). If South Africa wants to achieve the 2030 Agenda, then as Sarracino (2013) posits, public policy should focus on both traditional (for instance, economic growth and income) and non-traditional (for instance, human capital and social and spiritual capital) measures as proxies of happiness. Policies aimed at one element of capital (for instance social and spiritual capital) should not be implemented at the expense of another capital element (for instance financial capital or human capital).

Furthermore, non-traditional indicators related to happiness and lifestyle (so human and social and spiritual capital) are important reflections of welfare and development. They provide a better understanding of the factors that determine an individual's quality of life, reaching beyond one's material conditions and income (Stiglitz *et al.,* 2009). It is important to note that these indicators do not replace conventional economic indicators (such as GDP and income) but instead can be used to enrich policy discussions (Stiglitz *et al.,* 2009). The results from this study, for instance, can

be used to understand the progress of the South African society and to improve policymaking with regard to the enhancement of individuals' happiness.

Enhancing each type of capital will significantly augment citizens' happiness in South Africa. Financial capital, in particular, has the highest positive correlation with happiness. Steps towards greater financial inclusion, such as improving access to employment, loans, and credit facilities, can increase individuals' financial capital over time, positively impacting their happiness. Ensuring a continuous flow of capital is also crucial, as without regular earnings and spending, people are more likely to experience unhappiness and social problems, like crime and drug abuse.

Improvements in social and spiritual capital also increase happiness. National authorities should, therefore, focus on addressing issues such as crime, violence, and lack of trust within society. Promoting a community spirit of responsible citizenship, grounded in high moral values and altruism, is essential.

Human capital, which this study found to have the strongest link with happiness, however, tends to deteriorate when educated and skilled individuals are unemployed due to a lack of inclusive economic growth and job opportunities. Economic policies should, therefore, aim to enhance all aspects of human capital development, including providing education, training, and experience that align with labour market demands in a rapidly evolving economy.

Limitations and Suggestions for Future Research

Surveys such as NIDS have the following disadvantages: (1) households selected to participate in the survey can decline participation altogether or refuse to answer some of the questions (voluntary participation), (2) survey results will be biased if the willingness to participate differs between richer and poorer individuals, and (3) surveys rely on attitudinal data (what individuals say that they would do, requiring them to be honest) in contrast to an experimental research design which relies on observations (how individuals behave) (Posel and Hinks, 2013; Orthofer, 2016). Some of the shortcomings of cross-sectional surveys can be corrected using survey weights (such as the ones employed in this study's analysis), but these do not compensate perfectly for missing or skewed data.

Self-report bias may be present because the data used in this study (from NIDS Wave 2) is self-reported (Adjaye-Gbewonyo *et al.,* 2018).

It should be noted that it is particularly challenging to measure wealth in household interview surveys due to its social sensitivity and the challenges encountered in obtaining accurate estimates of the market value of financial or physical assets (Brown *et al.,* 2012). However, the NIDS Wave 2 survey made a good attempt to measure individual and household net worth.

Asset indices are not a good measure of wealth, as they often rank individuals with rural assets (specifically, livestock) below individuals with no assets at all (Wittenberg and Leibbrandt, 2017).

The NIDS Wave 2 team found that the distribution of total debt is extremely skewed (National Income Dynamics Study, 2012). Some respondents may not have reported their true level of debt; hence, the individual and household debt values may be underestimated. Furthermore, it is likely that some respondents did not qualify for a loan from a bank or any formal financial institution. Therefore, they may have resorted to borrowing money from family and/or friends. This is not reflected in the NIDS Wave 2 survey.

The questions on trust (“Imagine you lost a wallet or purse that contained R200 and it was found by someone who lives close by. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?”, and “Imagine you lost a wallet or purse that contained R200 and it was found by a complete stranger. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?”) firstly do not include information regarding how the wallet may be returned to its owner since it does not specify whether the wallet includes the owner's contact details or not (Posel and Hinks, 2013). Therefore, expectations about the likelihood of the wallet being returned as well as trust may be reflected in the responses (Posel and Hinks, 2013). Secondly, given that 79,2% of the South African population in 2011 was Black African, respondents may have visualized a “complete stranger” as a Black African person (Ngyende, 2012; Posel and Hinks, 2013). Lastly, everyone values money differently depending on their financial well-being and life circumstances (Diener and Biswas-Diener, 2002). Therefore, the value of R200 in the wallet or purse and the associated risk will vary considerably among the NIDS Wave 2 respondents (Posel and Hinks, 2013).

This study's methodology assumes that the direction of causality runs from the capital elements to happiness. However, two-way causality with happiness is possible for all the elements of capital. Whilst establishing the direction of causality between happiness and the capital elements is beyond the scope of this study (since the dataset for analysis is cross-sectional), there is a need for future research on the influence of capital elements on happiness in South Africa that does so. For example, to establish whether happier individuals are more likely to succeed in accumulating particular types of capital or whether certain capital elements are more likely to lead to happiness.

As the NIDS dataset does not contain many questions related to human capital and social and spiritual capital, there is a need for future studies on the influence of capital elements on happiness in South Africa that include more variables related to human capital and social and spiritual capital. For example, the questions related to certain aspects of these capital elements (such as computer literacy, driver's license, years of schooling completed, English proficiency, health, crime, marital status, memberships in community groups, neighbourhood environment, trust, and religion), while other aspects were neglected (such as skills, training, work experience, confidence, communication skills, personal freedom, personal values, relationships with family and friends, use of leisure time, working environment, trust in the police, participation in acts of worship, and influence of religion on assisting the disadvantaged, forgiving others, and being patient towards others) in estimating the human capital and social and spiritual capital indices used in this study.

Future research could focus on gender differences to understand the distinct nature of the relationships between the capital elements and happiness for men and women and racial differences to understand the influence of capital elements on happiness among race groups in South Africa. Another potential area for future research would be to investigate the influence of capital elements on happiness in the nine provinces of South Africa separately (or spatial differences in general). It would be interesting to investigate how the influence of capital elements on happiness differs, if at all, between the nine provinces, and which elements of capital have a greater influence in generating individual happiness in each of South Africa's nine provinces.

Conclusion

The goal of development should be to maximise individuals' life satisfaction, with measures that promote overall happiness, not just the happiness of a particular individual, group, or region. South Africa has a high rate of unemployment, over 32% in the first quarter of 2024 (Q1 2024), and many individuals do not earn a comfortable income other than state grants, yet they believe that the state would make them happy (Government of South Africa, 2024a; Government of South Africa, 2024b; Statistics South Africa, 2024). Individuals' happiness cannot come exclusively from the government measures. South Africa has registered, on average, a growth of just over 1% in the past 15 years of democracy. South Africans can be happier if the economy produces more GDP growth, without corruption, resulting in more income, employment, and redistribution. Lots of efforts have to come from individuals and society in a spirit of cooperation and ubuntu (having humanity towards others). Hence, as the results indicate, one should not be obsessed with accumulation of financial capital only, but also seek a satisfying life of endeavour by enhancing one's human capital and social relationship with others in a trusting and caring manner.

References

Abdi, H. and Williams, L.J., 2010. Principal Component Analysis. *Wiley Interdisciplinary Reviews: Computational Statistics*, *2*(4), pp.433-459.

Abidi, S.A. and Majeed, M.T., 2019. Happiness and Spirituality: An Empirical Analysis using Divine Perspectives in Pakistan. *Empirical Economic Review*, *2*(1), pp.117-151.

Abounoori, E. and Asgarizadeh, D., 2013. Macroeconomic Factors Affecting Happiness. *International Journal of Business and Development Studies*, 5(1), pp.5-22.

Adedeji, A., Olonisakin, T.T., Buchcik, J. and Idemudia, E.S., 2023. Socioeconomic status and social capital as predictors of happiness: evidence and gender differences. *Humanities and Social Sciences Communications*, 10(1), pp.1-8.

Adjaye-Gbewonyo, K., Kawachi, I., Subramanian, S.V. and Avendano, M., 2018. High social trust associated with increased depressive symptoms in a longitudinal South African sample. *Social Science & Medicine*, 197, pp.127-135.

Adjibolosoo, S., 2013. *Spiritual capital: Its meaning and essence*. Bloomington, IN: WestBow Press.

Ahuvia, A.C. and Friedman, D.C., 1998. Income, consumption, and subjective well-being: Toward a composite macromarketing model. *Journal of Macromarketing*, 18(2), pp.153-168.

Ahuvia, A.C., 2008. Wealth, consumption and happiness. *The Cambridge Handbook of Psychology and Economic Behaviour*, Cambridge University Press, New York, pp.199-226.

Alesina, A., Di Tella, R. and MacCulloch, R., 2004. Inequality and happiness: Are Europeans and Americans different? *Journal of Public Economics*, 88(9-10), pp.2009–2042.

Allison, P. 2012. *When Can You Safely Ignore Multicollinearity?* [online]. Available at https://statisticalhorizons.com/multicollinearity/ [Accessed 10 October 2023].

Amadeo, K. 2021. *What is Financial Capital?* [online]. Available at https://www.thebalance.com/what-is-financial-capital-3305825 [Accessed 20 February 2022].

Angrist, J.D. and Krueger, A.B., 1991. Does compulsory school attendance affect schooling and earnings? *The Quarterly Journal of Economics*, 106(4), pp.979-1014.

Annas, J., 2011. *Intelligent virtue*. Oxford: Oxford University Press.

Awaludin, A., 2017. Martin Seligman and Avicenna on happiness. *Journal Pemikiran Islam*, 1(1), pp.1-30.

Bălțățescu, S., 2009. Differential effects of interpersonal and political trust on happiness and life satisfaction. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.1952595

Becker, G.S., 1975. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, Second Edition, New York: Columbia University Press.

Beebe, J.R., 2003. *Socrates on Prozac and Happiness.* [online]. Available at http://www.acsu.buffalo.edu/~jbeebe2/Happiness.htm [Accessed 02 September 2022].

Beja, E.L., 2018. The U-shaped relationship between happiness and age: Evidence using World Values Survey Data. *Quality & Quantity*, 52(4), pp.1817-1829.

Bernanke, BS., 2012. *Economic Measurement.* [online]. Available at https://www.federalreserve.gov/newsevents/speech/bernanke20120806a.htm [Accessed 05 January 2023].

Bhandari, H. and Yasunobu, K., 2009. What is social capital? A comprehensive review of the concept. *Asian Journal of Social Science*, 37(3), pp.480-510.

Biyase, M. and Zwane, T., 2015. Does education pay in South Africa? Estimating returns to education using two stage least squares approach. *International Business & Economics Research Journal*, 14(6), pp.807-814.

Blaauw, D. and Pretorius, A., 2013. The determinants of subjective well-being in South Africa-an exploratory enquiry. *Journal of Economic and Financial Sciences*, 6(1), pp.179-194.

Blanchflower, D.G. and Oswald, A.J., 2000. *Rising well-being of the young*. In Blanchflower, D.G. & Freeman, R.B. (Eds), Youth Employment and Joblessness in Advanced Countries. University of Chicago Press, Chicago, pp.289–312.

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

Blanchflower, D.G. and Oswald, A.J., 2008. Is well-being U-shaped over the life cycle? *Social Science & Medicine*, 66(8), pp.1733-1749.

Blanchflower, D.G. and Oswald, A.J., 2017. Do Humans Suffer a Psychological Low in Midlife? Two Approaches (With and Without Controls) in Seven Data Sets. National Bureau of Economic Research Working Paper No. 23724.

Botha, F. and Booysen, F., 2013. The gold of one's ring is not far more precious than the gold of one's heart: Reported life satisfaction among married and cohabitating South African adults. *Journal of Happiness Studies*, 14(2), pp.433–456.

Botha, F., 2014. Life satisfaction and education in South Africa: Investigating the role of attainment and the likelihood of education as a positional good. *Social Indicators Research*, 118(2), pp.555-578.

Bourdieu, P., 1986. *The Forms of Capital*. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education*, New York: Greenwood Press, pp.241–258.

Branson, N. and Wittenberg, M., 2018. Longitudinal and cross sectional weights in the NIDS data 1-5. Cape Town: Southern Africa Labour and Development Research Unit, National Income Dynamics Study Technical Paper 8.

Brekke, T., 2016. *Faithonomics: Religion and the free market*. Oxford University Press.

Brophy, T., Branson, N., Daniels, R.C., Leibbrandt, M., Mlatsheni, C. and Woolard, I., 2018. National income dynamics study panel user manual. Technical Note Release, Version 1, pp.1-83.

Brown, J., 2009a. Choosing the right number of components or factors in PCA and EFA. *The Japan Association for Language Teaching Testing & Evaluation SIG Newsletter*, 13(2), pp. 19-23.

Brown, J.D., 2009b. Choosing the right type of rotation in PCA and EFA. *Shiken: The Japan Association for Language Teaching Testing & Evaluation SIG Newsletter*, 13(3), pp.20–25.

Brown, M., Daniels, R.C., De Villiers, L., Leibbrandt, M. and Woolard, I., eds. 2012, National Income Dynamics Study Wave 2 User Manual, Cape Town: Southern Africa Labour and Development Research Unit.

Bruni, L. and Porta, P.L., 2007. *Handbook on the Economics of Happiness*, Edward Elgar, Cheltenham.

Caporale, G.M., Georgellis, Y., Tsitsianis, N. and Yin, Y.P., 2009. Income and happiness across Europe: Do reference values matter? *Journal of Economic Psychology*, 30(1), pp.42-51.

Carabelli, A., 2019. Keynes's Aristotelian Eudaimonic Conception of Happiness and the Requirement of Material and Institutional Preconditions: The Scope for Economics and Economic Policy. *Annals of the Fondazione Luigi Einaudi: An Interdisciplinary Journal of Economics, History and Political Science*, 53(2), pp.213-226.

Casale, D. and Posel, D., 2011. English language proficiency and earnings in a developing country: The case of South Africa. *The Journal of Socio-Economics*, 40(4), pp.385-393.

Castriota, S., 2006. Education and happiness: A further explanation to the Easterlin Paradox. Working Paper No. 246, Centre for Economic and International Studies, Tor Vergata University of Rome.

Cattell, R.B., 1966. The scree test for the number of factors. *Multivariate Behavioral Research*, 1(2), pp.245-276.

Chakraborty, T. and Bakshi, S.K., 2016. English language premium: Evidence from a policy experiment in India. *Economics of Education Review*, 50(1), pp.1-16.

Chatterjee, A., Czajka, L. and Gethin, A., 2020. Estimating the distribution of household wealth in South Africa. World Institute for Development Economics Research Working Paper No. 45.

Chinhema, M., Brophy, T., Brown, M., Leibbrandt, M., Mlatsheni, C. and Woolard, I., 2016. *National Income Dynamics Study panel user manual*. *Cape Town: Southern Africa Labour and Development Research Unit,* University of Cape Town.

Chiswick, B.R. and Miller, P.W., 2003. The complementarity of language and other human capital: Immigrant earnings in Canada. *Economics of Education Review*, 22(5), pp.469-480.

Christoph, B., 2010. The Relationship between Life Satisfaction and the Material Situation: A re-evaluation using Alternative Measures. *Social Indicators Research,* 98 (3), pp.475-499.

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

Clark, A., Oswald, A. and Warr, P., 1996. Is job satisfaction U-shaped in age? *Journal of Occupational and Organizational Psychology*, 69(1), pp.57-81.

Clark, A.E., 1997. Job satisfaction and gender: why are women so happy at work? *Labour Economics*, 4(4), pp.341-372.

Coady, D. and Dizioli, A., 2017. Income Inequality and Education Revisited; Persistence, Endogeneity, and Heterogeneity, International Monetary Fund Working Paper No. 2017/126.

Coleman, J.S., 1990. *Foundations of social theory*. Cambridge: Belknap Press of Harvard University Press.

Coyle, D., 2012. *The Economics of Enough: How to Run the Economy as If the Future Matters*, Economics Books, Princeton University Press, Princeton, edition 1, number 9402.

Craig, H., 2019. *The Philosophy of Happiness in Life (+ Aristotle's view).* [online]. Available at https://positivepsychology.com/philosophy-of-happiness/ [Accessed 02 September 2022].

Crespo, R.F. and Mesurado, B., 2015. Happiness economics, eudaimonia and positive psychology: From happiness economics to flourishing economics. *Journal of Happiness Studies*, 16(4), pp.931-946.

Crocker, R.K., 2002, *Learning Outcomes: A Critical Review of the State of the Field in Canada*, Canadian Education Statistics Council, Ottawa.

Csikszentmilalyi, M., 1997. *Flow: The Psychology of Optimal Experience*, Basic Books, New York.

Daniels, R.C., Finn, A. and Musundwa, S., 2012. Wealth in the National Income Dynamics Study Wave 2, Southern Africa Labour and Development Research Unit Working Paper Series No. 83, National Income Dynamics Study Discussion Paper 2012/6, University of Cape Town, Cape Town.

DataFirst. 2018. *South Africa – National Income Dynamics Study 2010-2011, Wave 2 Secure Data*. [online]. Available at https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/705/study-description [Accessed 18 August 2023].

Dávila, A. and Mora, M.T., 2000. English skills, earnings, and the occupational sorting of Mexican Americans along the US-Mexico border. *International Migration Review*, 34(1), pp.133-157.

Deaton, A. and Stone, A.A., 2013. Two happiness puzzles. *American Economic Review*, 103(3), pp.591-597.

Department for International Development. 2008. *Growth: building jobs and prosperity in developing countries*. London, Great Britain.

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

Diener, E. and Biswas-Diener, R., 2002. Will money increase subjective well-being? *Social Indicators Research*, 57(2), pp.119-169.

Diener, E. and Biswas-Diener, R., 2008. Happiness: *Unlocking the Mysteries of Psychological Wealth*. Malden, MA: Blackwell Publishing.

Diener, E., Diener, M. and Diener, C., 2009. Factors Predicting the Subjective Well-Being of Nations. In E. Diener (Ed.), Social Indicators Research Series 38, pp.43-70. Dordrecht, The Netherlands: Springer.

Diener, E. and Chan, M.Y., 2011. Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being*, 3(1), pp.1-43.

Di Tella, R., MacCulloch, R.J. and Oswald, A.J., 2003. The Macroeconomics of Happiness. *The Review of Economics and Statistics*, 85(4), 809–827.

Di Tella, R., Haisken-De New, J. and MacCulloch, R., 2010. Happiness adaptation to income and to status in an individual panel. *Journal of Economic Behavior & Organization*, 76(3), pp.834-852.

Dobreva, R. and Posel, D., 2023. “Your Health at Present”: Are Patterns of Reporting Heterogeneity in Self-rated Health Gendered? *Applied Research in Quality of Life*, 18(5), pp.2197-2226.

Dolan, P., Peasgood, T. and 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), pp.94-122.

Dolan, P., 2015. *Happiness by Design: Change what you do, not how you think*. Penguin Books, London.

Duflo, E., 2001. Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment. *American Economic Review*, 91(4), pp.795-813.

Dutt, A.K. and Radcliff, B., 2009. *Happiness, Economics and Politics*, Cheltenham, U.K: Edward Elgar Publishing.

Easterlin, R.A., 1974. Does economic growth improve the human lot? Some empirical evidence. In P. A. David, and M.W. Reder (Eds), *Nations and Households in Economic*

Growth: Essays in Honour of Moses Abramowitz. Academic Press, New York and London, pp. 89-125.

Easterlin, R.A., 1995. Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization*, 27(1), pp.35-47.

Easterlin, R.A., 2001. Income and happiness: Towards a unified theory. *The Economic Journal*, 111(473), pp.465-484.

Easterlin, R.A., 2003. Explaining happiness. *Proceedings of the National Academy of Sciences*, 100(19), pp.11176-11183.

Easterlin, R.A., 2004. The economics of happiness, *Daedalus,* 133(2), pp.26-33.

Easterlin, R.A., 2005a. Diminishing marginal utility of income? Caveat emptor. *Social Indicators Research*, 70(3), pp.243-255.

Easterlin, R.A., 2005b. Feeding the illusion of growth and happiness: A reply to Hagerty and Veenhoven. *Social Indicators Research*, 74(3), pp.429-443.

Easterlin, R.A., 2013. Happiness, Growth and Public Policy, *Economic Inquiry*, 51(1), pp.1-15.

Ebrahim, A., Botha, F. and Snowball, J., 2013. The Determinants of Happiness Among Race Groups in South Africa, *Development Southern Africa*, 30(2), pp.168-185.

Economic and Social Research Council. 2022. *The Easterlin Paradox.* [online]. Available at https://webarchive.nationalarchives.gov.uk/ukgwa/20220208115325/https://esrc.ukri.org/about-us/50-years-of-esrc/50-achievements/the-easterlin-paradox/ [Accessed 20 June 2022].

Egan, R., MacLeod, R., Jaye, C., McGee, R., Baxter, J. and Herbison, P., 2011. What is spirituality? Evidence from a New Zealand hospice study. *Mortality*, 16(4), 307-324.

Ellison, C.G., Gay, D.A. and Glass, T.A., 1989. Does religious commitment contribute to individual life satisfaction? *Social Forces*, 68(1), pp.100-123.

Ellison, C.G., 1991. Religious Involvement and Subjective Well-being. *Journal of Health and Social Behavior,* 32(1), pp.80-99.

Emmons, R.A., 1999. Religion in the psychology of personality. *Journal of Personality*, 67(6), pp.873–888.

Etang, A., 2010. Analysing the Radius of Trust in Rural Cameroon, *Journal of African Economies*, 19(5), pp.691–717.

Fang, H., Eggleston, K.N., Rizzo, J.A., Rozelle, S. and Zeckhauser, R.J., 2012. The returns to education in China: Evidence from the 1986 compulsory Education Law. National Bureau of Economic Research Working Paper No. 18189, National Bureau of Economic Research, Cambridge, MA.

Ferrante, F., 2009. Education, aspirations and life satisfaction. *Kyklos*, 62(4), pp.542-562.

Ferrer-i-Carbonell, A. and Frijters, P., 2004. How important is methodology for the estimates of the determinants of happiness? *The Economic Journal*, 114(497), pp.641-659.

Ferrer-i-Carbonell, A., and Gowdy, J.M., 2007. Environmental degradation and happiness. *Ecological Economics*, 60(3), pp.509–516.

Fidrmuc, J. and Tunali, C.B., 2015. Happiness and Religion. Center for Economic Studies and Ifo Institute Working Paper No. 5437, Category 13: Behavioural Economics.

Field, A., 2009. *Discovering Statistics using SPSS*, third edition, SAGE Publications Ltd, London.

Frank, R.H., 1997. The Frame of Reference as a Public Good. *Economic Journal*, 107(445), pp.1832-1847.

Frey, B.S. and Stutzer, A., 2000. Happiness, Economy and Institutions. The *Economic Journal*, 110(466), pp.918-938.

Frey, B.S. and Stutzer, A., 2002. What can economists learn from happiness research? *Journal of Economic Literature*, 40(2), pp.402-435.

Galay, K., 2007. Patterns of Time Use and Happiness in Bhutan: Is there a relationship between the two? *Institute of Developing Economies Journal*, Visiting Research Fellow Monograph Series No. 432, pp.1-67.

Gerdtham, U.G. and Johannesson, M., 2001. The relationship between happiness, health, and socio-economic factors: results based on Swedish microdata. *The Journal of Socio-Economics*, 30(6), pp.553-557.

Goldin, C.D., 2016. *Human capital*. In: Diebolt. C, Haupert. M (eds) Handbook of cliometrics. Springer Verlag, Heidelberg, pp.55-86.

Government of South Africa. 2024a. *SoNA-in-Numbers – 2024* [online]. Available at https://www.gov.za/news/sona-numbers-2024 [Accessed 29 March 2024].

Government of South Africa. 2024b. *StatsSA publishes General Household Survey* [online]. Available at https://www.gov.za/news/media-statements/statssa-publishes-general-household-survey-23-may-2024 [Accessed 29 May 2024].

Graham, C., 2005. The Economics of Happiness. *World Economics*, 6(3), pp.41-55.

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 No. 649, Washington, DC.

Gujarati, D.N., 2002. *Basic Econometrics* (4th ed.). McGraw-Hill, New York.

Gujarati, D.N. and Porter, D.C., 2009. *Basic econometrics* (5th ed.). McGraw-Hill, New York.

Guo, T. and Hu, L., 2011. Economic determinants of happiness: evidence from the US General Social Survey. Cornell University, New York, pp.1-25.

Haller, M. and Hadler, M., 2006. How social relations and structures can produce happiness and unhappiness: An international comparative analysis. *Social Indicators Research*, 75(2), pp.169-216.

Hamilton, L.C., 2012. *Statistics with Stata: version 12*. Cengage Learning.

Hatch, M.D., 2018. *Economic studies of motherhood and childcare in South Africa* (Doctoral dissertation, University of the Witwatersrand, Faculty of Commerce, Law and Management, School of Economic and Business Sciences).

Headey, B. and Wearing, A.J., 1992. *Understanding happiness: A theory of subjective well-being*. Longman Cheshire.

Headey, B. and Wooden, M., 2004. The effects of wealth and income on subjective well-being and ill-being. *Economic Record*, 80(1), pp.S24-S33.

Heady, B., Muffels, R. and Wooden, M., 2005. Money and Happiness: The combined effects of wealth, income and consumption. *Journal of Contextual Economics-Schmollers Jahrbuch,* 125(3), pp.131-144.

Helliwell, J.F., 2003. How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling*, 20(2), pp.331-360.

Helliwell, J.F. and Putnam, R.D., 2004. The social context of well–being. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 359(1449), pp.1435-1446.

Helliwell, J.F. and Wang, S., 2010. Trust and Well-Being. National Bureau of Economic Research Working Paper Series No. 15911.

Helliwell, J.F., Layard, R. and Sachs, J.D. (Eds.)., 2013. *World Happiness Report 2013*. New York: UN Sustainable Development Solutions Network.

Helliwell, J.F., Layard, R. and Sachs, J.D., 2018. *World Happiness Report 2018*, New York: Sustainable Development Solutions Network.

Helliwell, J.F., Layard, R. and Sachs, J.D. (Eds.)., 2019. *World Happiness Report 2019*. New York: Sustainable Development Solutions Network.

Helliwell, J.F., Layard, R., Sachs, J.D and De Neve, J-E., 2020. *World Happiness Report 2020*. New York: Sustainable Development Solutions Network.

Helliwell, J.F., Layard, R., Sachs, J.D., De Neve, J-E., Aknin, L.B., and Wang, S. (Eds.)., 2022. *World Happiness Report 2022*. New York: Sustainable Development Solutions Network.

Helliwell, J.F., Layard, R., Sachs, J.D., De Neve, J-E., Aknin, L.B. and Wang, S. (Eds.)., 2024. *World Happiness Report 2024*. University of Oxford: Wellbeing Research Centre.

Hinks, T. and Gruen, C., 2007. What is the structure of South African happiness equations? Evidence from quality of life surveys. *Social Indicators Research*, 82(2), pp.311-336.

Holland, S.M., 2008. Principal components analysis (PCA). University of Georgia, Athens, pp.1-11.

Howell, R.T., Kurai, M. and Tam, L., 2013. Money buys financial security and psychological need satisfaction: Testing need theory in affluence. *Social Indicators Research*, 110(1), pp.17-29.

Ingram, P., 2013. *Does Inequality Make You Happier?* [online]. Available at https://business.columbia.edu/cgi-economics-policy/chazen-global-insights/does-inequality-make-you-happier [Accessed 06 April 2022].

Irwin, W., 2014. *How to Be Happy with Adam Smith.* [online]. Available at https://www.psychologytoday.com/za/blog/plato-pop/201411/how-be-happy-adam-smith [Accessed 02 September 2022].

Islam, M.K., Merlo, J., Kawachi, I., Lindström, M. and Gerdtham, U.G., 2006. Social capital and health: Does egalitarianism matter? A literature review. *International Journal for Equity in Health*, 5(1), pp.1-28.

Islam, M.T., Kabir, R. and Nisha, M., 2022. Data analysis with STATA: A comprehensive guide for data analysis and interpretation of outputs (1st ed.). ASA Publications, Dhaka.

Jackson, T., 2010. *Prosperity without growth: Economics for a finite planet*. Earthscan Publishers, London.

Jolliffe, I.T., 2002. *Principal component analysis (2nd edition)*. New York: Springer.

Kahneman, D., 2000. Experienced utility and objective happiness: A moment-based approach. In D. Kahneman & A. Tversky (Eds), Choices, Values, and Frames. Cambridge University Press, New York, pp. 673–692.

Kaiser, H.F., 1958. The varimax criterion for analytic rotation in factor analysis. *Psychometrika*, 23(3), pp.187-200.

Kaiser, H.F., 1960. The application of electronic computers to factor analysis. *Educational and Psychological Measurement,* 20(1), pp.141–151.

Kaiser, H.F., 1974. An index of factorial simplicity. *Psychometrika*, 39(1), pp.31-36.

Kannermeyer, C., 2016. Subjective Well-Being: Adult South Africans' Life Satisfaction (2008-2014). Southern Africa Labour and Development Research Unit Working Paper No. 177, National Income Dynamics Study Discussion Paper 2016/4, University of Cape Town, Cape Town.

Kashani, M.M.F., 2012. *Spiritual Mysteries and Ethical Secrets*. London, United Kingdom: Islamic College for Advanced Studies Publications.

Katchova, A., 2013a. *Principal Component Analysis and Factor Analysis Example* [online]. Available at https://drive.google.com/file/d/0BwogTI8d6EEiLVhSMXZYM2pFbDQ/edit?resourcekey=0-Ovvp7ocW74JqHe3yApKFag [Accessed 10 October 2023].

Katchova, A., 2013b. Ordered probit and logit models. *Econometrics Academy*.

Kawachi, I., Kennedy, B.P., Lochner, K. and Prothrow-Stith, D., 1997. Social capital, income inequality, and mortality. *American Journal of Public Health*, 87(9), pp.1491-1498.

Kawachi, I., Kennedy, B.P. and Glass, R., 1999. Social capital and self-rated health: a contextual analysis. *American Journal of Public Health*, 89(8), pp.1187-1193.

Kenny, C., 2005. Does Development Make You Happy? Subjective Wellbeing And Economic Growth in Developing Countries. *Social Indicators Research*, 73(2), pp.199-219.

Khan, H.T. and Raeside, R., 2014. Between Country Variations in Self-Rated-Health and Associations with the Quality of Life of Older People: Evidence from the Global Ageing Survey. *Applied Research in Quality of Life,* 9(4), pp. 923–949.

Kim, J.O. and Mueller, C.W., 1978. *Introduction to Factor Analysis: What it is and How To Do It.* Beverly Hills, CA: Sage.

Kingdon, G.G. and Knight, J., 2007. Community, Comparisons and Subjective Well-Being in a Divided Society. *Journal of Economic Behaviour and Organization,* 64(1), pp. 69-90.

Kirkpatrick, L.A., Shillito, D.J. and Kellas, S.L., 1999. Loneliness, social support, and perceived relationships with God. *Journal of Social and Personal Relationships*, 16(4), pp.513-522.

Kollamparambil, U., 2020. Happiness, Happiness Inequality and Income Dynamics in South Africa. *Journal of Happiness Studies*, 21(1), pp.201-222.

Krause, N. and Wulff, K.M., 2005. "Church-Based Social Ties, A Sense of Belonging in a Congregation, and Physical Health Status". *The International Journal for the Psychology of Religion*, 15(1), pp.73-93.

Krishnakumar, S. and Neck, C.P., 2002. The “what”, “why” and “how” of spirituality in the workplace. *Journal of Managerial Psychology*, 17(3), pp.153-164.

Kuroki, M., 2011. Does social trust increase individual happiness in Japan? *The Japanese Economic Review*, 62(4), pp.444-459.

Lane, E., 2000. The loss of happiness in market democracies. New Haven: Yale University Press.

Lau, Y.K. and Ataguba, J.E., 2015. Investigating the relationship between self-rated health and social capital in South Africa: a multilevel panel data analysis. *BioMed Central Public Health*, 15(1), pp.1-10.

Lavrakas, P.J., 2008. *Encyclopedia of Survey Research Methods*. Sage publications.

Layard, R., 2006. Happiness and Public Policy: A Challenge to the Profession. *The Economic Journal,* 116(510), pp.C24-C33.

Layard, R., 2011. *Happiness: Lessons from a New Science*, 2nd edition. London: Penguin.

Layard, R. and Ward, G., 2020. *Can We Be Happier? Evidence and Ethics*. London, UK: Penguin Random House.

Ledesma, R.D., Valero-Mora, P. and Macbeth, G., 2015. The Scree Test and the Number of Factors: a Dynamic Graphics Approach. *The Spanish Journal of Psychology*, 18, E11, pp.1-10.

Lee, D.R., 2006. Who says money cannot buy happiness? *The Independent Review*, 10(3), pp.385-400.

Leonard, A., 2019. *The Goal of Happiness: A Summary of Nicomachean Ethics.* [online]. Available at https://classicalwisdom.com/philosophy/aristotle/the-goal-of-happiness-a-summary-of-nicomachean-ethics/ [Accessed 02 September 2022].

Leung, A., Kier, C., Fung, T., Fung, L. and Sproule, R., 2013. Searching for happiness: The Importance of Social Capital. In: Della Fave, A. (Eds.), *The Exploration of Happiness: Present and Future Perspectives, Happiness Studies Book Series,* pp.247-267. Dordrecht, Springer.

Levinsohn, J., 2007. Globalization and the Returns to Speaking English in South Africa. In A. Harrison (Ed.), *Globalization and poverty* (pp. 629–646). University of Chicago Press.

Lim, C. and Putnam, R.D., 2010. Religion, Social Networks, and Life Satisfaction. *American Sociological Review*, 75(6), pp.914-933.

Lim, C., 2016. Religion, Time Use, and Affective Well-Being. *Sociological Science*, 3, pp.685-709.

Mahadea, D. and Rawat, T., 2008. Economic growth, income and happiness: An exploratory study. *South African Journal of Economics*, 76(2), pp.276-290.

Mahadea, D., 2013. On the Economics of Happiness: The Influence of Income and Non-Income Factors. *South African Journal of Economics and Management Sciences*, 16(1), pp. 39-51.

Mahadea, D., 2014. Happinomics among Factors of Production Using a Principal Component Analysis Approach: A case study of Labour and Entrepreneurs' Subjective

Happiness in KwaZulu-Natal, South Africa. *Mediterranean Journal of Social Sciences*, 5(4), pp.99-110.

Mahadea, D. and Ramroop, S., 2015. Influences on happiness and subjective well-being of entrepreneurs and labour: KwaZulu-Natal case study. *South African Journal of Economic and Management Sciences*, 18(2), pp.245-259.

Mahadea, D., 2017. *Economics: An Introduction 2/E.* 2nd edn. Pearson South Africa.

Mahadea, D. and Kaseeram, I., 2018. Impact of unemployment and income on entrepreneurship in post-apartheid South Africa: 1994–2015. *The Southern African Journal of Entrepreneurship and Small Business Management*, 10(1), pp.1-9.

Mahadea, D. and Kaseeram, I., 2020. Economic and philosophical pathways to subjective well-being and a flourishing good life: an exploratory perspective. *African Journal of Development Studies*, 10(1), p.67-92.

Mahadea, D. and Kabange, M., 2022. Examining the relationship between economic freedom, income and entrepreneurship in South Africa: a VECM approach. *Journal of Developmental Entrepreneurship*, 27(01), 2250004.

Malloch, T.R., 2010. Spiritual capital and practical wisdom. *Journal of Management Development*, 29(7/8), pp.755-759.

Malloch, T.R., 2017. *Practical Wisdom in Management: Business Across Spiritual Traditions*. Routledge.

Mankiw, N.G., 2015. *Macroeconomics*, 9th edition. New York: Worth Publishers.

Matson, E.W., 2021. A dialectical reading of Adam Smith on wealth and happiness. *Journal of Economic Behavior & Organization*, 184, pp.826-836.

Mayer, S.E., 1997a, *What Money Can't Buy: Family Income and Children's Life Chances.* Harvard University Press, Cambridge, MA.

Mayer, S.E., 1997b, 'Indicators of children's economic well-being and parental employment', in R.M. Hauser, B.V. Brown and W.R. Prosser (eds.), Indicators of Children's Well-being. Russell Sage Foundation, New York.

McBride, M., 2001. Relative-income effects on subjective well-being in the cross-section. *Journal of Economic Behavior & Organization*, 45(3), pp.251-278.

Mdingi, K. and Ho, S.Y., 2023. Income inequality and economic growth: An empirical investigation in South Africa. *Cogent Economics & Finance,* 11(2), pp.1-21.

Merkofer, P. and Murphy, A., 2009. The e-skills landscape in South Africa: The issues of demand and supply and the use of international benchmarks to inform the South African e-skills development context. *Zeitschrift für Politikberatung*, 2(4), pp.685-695.

Michalos, A.C., 2017. Education, Happiness and Wellbeing. In: Connecting the Quality of Life Theory to Health, Well-being and Education. Springer International Publishing, pp.277-300.

Møller, V., 2001. Monitoring quality of life in cities: The Durban case. *Development Southern Africa,* 18(2), pp.217-238.

Møller, V., 2007. Satisfied and dissatisfied South Africans: Results from the General Household Survey in international comparison. *Social Indicators Research*, 81, pp.389-415.

Møller, V and Radloff, S., 2010. Monitoring perceptions of social progress and pride of place in a South African community. *Applied Research in Quality Life,* 5(1), pp.49-71.

Mousa, A.E., 2020. The Impact of Workplace Spirituality on Employee Performance: Evidence from Abu Dhabi University. *International Business Research*, 13(5), pp.1-79.

Mueller, P., 2015. *Adam Smith's Ethics: Happiness.* [online]. Available at https://www.libertarianism.org/columns/adam-smiths-ethics-happiness [Accessed 02 September 2022].

Mueller, P.D., 2017. Adam Smith's views on consumption and happiness. *The Adam Smith Review*, 8, pp. 293-308. Routledge.

National Income Dynamics Study. 2012. *NIDS Wave 2: Overview 2012*. [online]. Available at

http://www.nids.uct.ac.za/documents/wave-2-documents-and-questionnaires/123-nids-wave-2-overview-document/file [Accessed 18 December 2023].

National Income Dynamics Study. 2014. *Inclusion of Census 2011 Geographic Variables in NIDS (household level).* [online]. Available at http://www.nids.uct.ac.za/documents/docs-and-files/211-inclusion-of-census-2011-geographic-variables-in-nids/file [Accessed 02 February 2023].

National Income Dynamics Study. 2016. *Adult (15+) Questionnaire Wave 2: 2011* [online]. Available at http://www.nids.uct.ac.za/images/documents/wave2/W2_Adult_Questionnaire_12May2016.pdf [Accessed 8 November 2023].

National Income Dynamics Study. 2020a. *What is NIDS?* [online]. Available at http://www.nids.uct.ac.za/about/what-is-nids [Accessed 8 November 2023].

National Income Dynamics Study. 2020b. *General FAQs.* [online]. Available at http://www.nids.uct.ac.za/nids-data/documentation/faqs/general [Accessed 02 November 2023].

Ng, Y-K. 1997. A case for happiness, cardinalism, and interpersonal comparability. *Economic Journal,* 107(445), pp.1848-58.

Ng, Y-K. 2006. Public policy implications of behavioural economics and happiness studies, in Ng, Y-K & HO, L.S (eds.) *Happiness and public policy.* New York: Palgrave Macmillan.

Ng, Y-K., 2022. *Happiness—Concept, measurement and promotion*. Springer Nature, pp.1-183.

Ngyende, A., 2012. *Census 2011* [online]. Available at https://www.statssa.gov.za/publications/P03014/P030142011.pdf [Accessed 25 February 2024].

Orthofer, A., 2016. Wealth inequality in South Africa: Evidence from survey and tax data. Research Project on Employment, Income Distribution & Inclusive Growth Working Paper No. 15, University of Cape Town, Cape Town.

Oswald, A., 1997. Happiness and economic performance. *Economic Journal*, 107(445), pp.1815-1831.

O'Toole, J., 2005. *Creating the Good Life*, Rodale, London.

Pallant, J., 2016. SPSS Survival Manual, McGraw-Hill, London.

Peiró, A., 2006. Happiness, satisfaction and socio-economic conditions: Some international evidence. *The Journal of Socio-Economics*, 35(2), pp.348-365.

Pettinger, T., 2019. *Human Capital definition and importance.* [online]. Available at https://www.economicshelp.org/blog/26076/economics/human-capital-definition-and-importance/ [Accessed 20 February 2022].

Pilling, D., 2019. The Growth Delusion, Bloomsbury, London.

Plato. 1999. *The Symposium.* Walter Hamilton (ed). London: Penguin Classics.

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

Posel, D. and Hinks, T., 2013. Trusting neighbours or strangers in a racially divided society: Insights from survey data in South Africa. *Journal of African Economies*, 22(1), pp.136-162.

Powdthavee, N., 2003. Is the structure of happiness equations the same in poor and rich countries? The case of South Africa. The University of Warwick: Department of Economics Research Papers No. 675. UK: Coventry.

Powdthavee, N., 2005. Unhappiness and crime: evidence from South Africa. *Economica*, 72(287), pp.531-547.

Pressman, S.D. and Cohen, S., 2005. Does positive affect influence health? *Psychological Bulletin*, 131(6), pp.925–971.

Pursuit of Happiness. 2024a. *Socrates.* [online]. Available at https://www.pursuit-of-happiness.org/history-of-happiness/socrates/ [Accessed 02 January 2024].

Pursuit of Happiness. 2024b. *Martin Seligman.* [online]. Available at https://www.pursuit-of-happiness.org/history-of-happiness/martin-seligman-psychology/ [Accessed 02 January 2024].

Putman, R.D., 2001. Social capital: measurement and consequences. *Canadian Journal of Policy Research,* 2(1), pp.41-51.

Putnam, R.D., 2000. *Bowling alone : the collapse and revival of American community*. New York: Simon & Schuster.

Rasmussen, D.C., 2006. Does “bettering our condition” really make us better off? Adam Smith on progress and happiness. *American Political Science Review*, 100(3), pp.309-318.

Ravallion, M. and Lokshin, M., 1999. *Subjective Economic Welfare*. Policy Research Working Paper No. 2106. The World Bank. Washington, D.C.

Ravallion, M. and Lokshin, M., 2001. Identifying welfare effects from subjective questions. *Economica*, 68(271), pp.335-357.

Realo, A. and Dobewall, H., 2011. Does life satisfaction change with age? A comparison of Estonia, Finland, Latvia, and Sweden. *Journal of Research in Personality*, 45(3), pp.297-308.

Reave, L., 2005. Spiritual values and practices related to leadership effectiveness. *The Leadership Quarterly*, 16(5), pp.655-687.

Rego, A. and Cunha, M.P., 2008. Workplace spirituality and organizational commitment: an empirical study. *Journal of Organizational Change Management*, 21(1), pp.53-75.

Rizvi, M.A.K. and Hossain, M.Z., 2017. Relationship between religious belief and happiness: A systematic literature review. *Journal of Religion and Health*, 56(5), pp.1561-1582.

Rodríguez-Pose, A. and von Berlepsch, V., 2014. Social capital and individual happiness in Europe. *Journal of Happiness Studies*, 15(2), pp.357-386.

Rosmarin, D.H. and Koenig, H.G. eds., 1998. *Handbook of religion and mental health*. Elsevier Science, USA.

Rukumnuaykit, P. and Pholphirul, P., 2016. Happiness from social capital: An investigation from micro data in rural Thailand. *Community Development*, 47(4), pp.562-573.

Rule, S., 2007. Religiosity and Quality of Life in South Africa. *Social Indicators Research,* 81(2), pp.417–434.

Salinas-Jiménez, M., Artés, J. and Salinas-Jiménez, J., 2011. Education as a positional good: A life satisfaction approach. *Social Indicators Research*, 103(3), pp.409-426.

Salisu, A., 2016. *Analyses of ordered logit and probit models.* [Presentation]. University of Ibadan, 9th July.

Saphire-Bernstein, S. and Taylor, S.E., 2013. Close relationships and happiness. In S.A. David, I. Boniwell, & A.C. Ayers (Eds.), *The Oxford Handbook of Happiness* (pp. 821-833). Oxford, UK: Oxford University Press.

Sarracino, F., 2013. Determinants of subjective well-being in high and low income countries: Do happiness equations differ across countries? *The Journal of Socio-Economics*, 42, pp.51-66.

Schoon, I., Hansson, L. and Salmela-Aro, K., 2005. Combining work and family life: Life satisfaction among married and divorced men and women in Estonia, Finland and the UK. *European Psychologist*, 10(4), pp.309–319.

Schultz, B., 2017. *The happiness philosophers: The lives and works of the great utilitarians*. Princeton University Press.

Schwartz, B., 2016. *The Paradox of Choice*, New York, Harper Collins.

Sen, A., 1993. Capability and well-being. In Nussbaum, N. and Sen, A. (Eds), *The Quality of Life*. Clarendon Press, Oxford, pp. 30–53.

Sen, A., 2010. *The Idea of Justice.* London: Penguin.

Smith, A. (1759). The Theory of Moral Sentiments. D.D. Raphael and A.L. Macfie (Eds.), Indianapolis: Liberty Fund.

Smith, J.R., Brooks-Gunn, J. and Jackson, A.P., 1997. Parental Employment and Children, in R.M. Hauser, B.V. Brown and W.R. Prosser (eds.), Indicators of Children's Well-being. Russell Sage Foundation, New York.

Solan, M., 2021. Health and happiness go hand in hand. [online]. Available at https://www.health.harvard.edu/mind-and-mood/health-and-happiness-go-hand-in-hand [Accessed 25 June 2022].

Southern Africa Labour and Development Research Unit. 2024. *About.* [online]. Available at https://www.saldru.uct.ac.za/about/ [Accessed 10 September 2024].

Spilerman, S., 2000. Wealth and stratification process. *Annual Review of Sociology*, 26(1), pp.497–524.

Stark, R. and Maier, J., 2008. Faith and happiness. *Review of Religious Research*, 50(1), pp.120-125.

Stata. 2013. *oprobit – Ordered probit regression*. [online]. Available at https://www.stata.com/manuals13/roprobit.pdf [Accessed 14 September 2023].

Statistics South Africa. 2019. *Tracking South Africa's Sustainable Development Goals.* [online]. Available at http://www.statssa.gov.za/?p=12813 [Accessed 13 March 2022].

Statistics South Africa. 2024. *Quarterly Labour Force Survey Quarter 1: 2024.* [online]. Available at https://www.statssa.gov.za/publications/P0211/P02111stQuarter2024.pdf [Accessed 27 May 2024].

Stavrova, O., Fetchenhauer, D. and Schlösser, T., 2013. Why are religious people happy? The effect of the social norm of religiosity across countries. *Social Science Research*, 42(1), pp.90-105.

Steptoe, A., 2019. Happiness and health. *Annual Review of Public Health*, 40(1), pp.339-359.

Stevenson, B. and Wolfers, J., 2008. *Economic growth and subjective well-being: Reassessing the Easterlin paradox*. National Bureau of Economic Research Working Paper No. 14282.

Stevenson, B. and Wolfers, J., 2009. The paradox of declining female happiness. *American Economic Journal: Economic Policy*, 1(2), pp.190–225.

Stiglitz, J.E., Sen, A. and Fitoussi, J.P., 2009. Report by the commission on the measurement of economic performance and social progress.

Stutzer, A. and Frey, B.S., 2006. Does marriage make people happy, or do happy people get married? *The Journal of Socio-Economics*, 35(2), pp.326-347.

Tay, L., Li, M., Myers, D. and Diener, E., 2014. Religiosity and subjective well-being: An international perspective. In C. Kim-Prieto (Ed.), *Religion and Spirituality Across Cultures*, pp.163-175. Springer Science & Business Media.

Thiran, R., 2017. *What Adam Smith Teaches Us About Becoming Happier.* [online]. Available at https://www.leaderonomics.com/articles/leadership/adam-smith-happiness [Accessed 20 February 2022].

Tiliouine, H., 2009. Health and subjective wellbeing in Algeria: A developing country in transition. *Applied Research in Quality of Life*, 4(2), pp.223-238.

Todaro and Smith. 2020. *Economic Development*, 13th Edition, Pearson.

Tokuda, Y., Fujii, S. and Inoguchi, T., 2010. Individual and country-level effects of social trust on happiness: The Asia barometer survey. *Journal of Applied Social Psychology*, 40(10), pp.2574-2593.

Torres-Reyna, O., 2007. Linear regression using Stata. New Jersey: Princeton University.

Torres-Reyna, O., 2014. Predicted probabilities and marginal effects after (ordered) logit/probit using margins in Stata. New Jersey: Princeton University.

United Nations. 2015. *'Pursuit of happiness is fundamental human goal,' Minister of Bhutan tells UN Assembly.* [online]. Available at https://news.un.org/en/story/2015/10/511502-pursuit-happiness-fundamental-human-goal-minister-bhutan-tells-un-assembly [Accessed 05 April 2022].

United Nations. 2022. *SDG Moment 2022* [online]. Available at https://www.un.org/sustainabledevelopment/sdg-moment/ [Accessed 02 October 2022].

United Nations Development Programme. 2024. *What are the Sustainable Development Goals?* [online]. Available at https://www.undp.org/content/undp/en/home/sustainable-development-goals.html [Accessed 05 January 2024].

Uyanık, G.K. and Güler, N., 2013. A study on multiple linear regression analysis. *Procedia - Social and Behavioral Sciences*, 106, pp.234-240.

van Hoorn, A., 2008. A Short Introduction to Subjective Well-being: Its Measurement, Correlates and Policy Uses. In *Statistics, Knowledge and Policy 2007*, pp.215-230.

Veenhoven, R., 1988. The utility of happiness. *Social Indicators Research*, 20(4), pp.333-354.

Veenhoven, R., 1991. Is happiness relative? *Social Indicators Research,* 24(1), pp.1-34.

Veenhoven, R., 1999. *World Database of Happiness.* [online]. Available at https://worlddatabaseofhappiness.eur.nl/ [Accessed 02 September 2022].

Veenhoven, R., 2002. Why social policy needs subjective indicators. *Social Indicators Research,* 58(1-3), pp.33-46.

Veenhoven, R., 2008. Healthy happiness: Effects of happiness on physical health and the consequences for preventive health care. *Journal of Happiness Studies*, 9(3), pp.449-469.

Veenhoven, R., 2010. Greater happiness for a greater number. *Journal of Happiness Studies*, 11(5), pp.605-629.

Veenhoven, R., 2013. *Conditions of happiness*. Springer Science & Business Media.

Villani, D., Sorgente, A., Iannello, P. and Antonietti, A., 2019. The Role of Spirituality and Religiosity in Subjective Well-Being of Individuals With Different Religious Status. *Frontiers in Psychology*, 10, pp.1-11.

Walen, H.R. and Lachman, M.E., 2000. Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships*, 17(1), pp.5-30.

Weil, A., 2011. *Spontaneous Happiness: A New Path to Emotional Well-Being.* New York, NY: Little, Brown and Company.

Welch, M.R., Sikkink, D. and Loveland, M.T., 2007. The Radius of Trust: Religion, Social Embeddedness and Trust in Strangers. *Social Forces*, 86(1), pp.23-46.

Williams, B., Onsman, A. and Brown, T., 2010. Exploratory Factor Analysis: A Five-Step Guide for Novices. *Australasian Journal of Paramedicine*, 8(3), pp.1–13.

Wilson, J.B., Ellwood, D.T. and Brooks-Gunn, J., 1995. 'Welfare-to-work through the eyes of children', in P.L. Chase-Lansdale and J. Brooks-Gunn (eds.), *Escape from Poverty.* Cambridge University Press, New York.

Wittenberg, M. and Leibbrandt, M., 2017. Measuring inequality by asset indices: A general approach with application to South Africa. *Review of Income and Wealth*, 63(4), pp.706-730.

Witter, R.A., Stock, W.A., Okun, M.A. and Haring, M.J., 1985. Religion and subjective well-being in adulthood: A quantitative synthesis. *Review of Religious Research*, 26(4), pp.332-342.

Woolcock, M., 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27(2), pp.151-208.

World Bank. 1985. World Development Report. Washington, DC: The World Bank.

World Bank. 2022a. *New World Bank Report Assesses Sources of Inequality in Five Countries in Southern Africa.* [online]. Available at https://www.worldbank.org/en/news/press-release/2022/03/09/new-world-bank-report-assesses-sources-of-inequality-in-five-countries-in-southern-africa [Accessed 29 March 2023].

World Bank. 2022b. *In Southern Africa, Leveling the Playing Field at Birth Critical to Reducing Inequality, Intergenerational Poverty.* [online]. Available at https://www.worldbank.org/en/region/afr/publication/in-southern-africa-leveling-the-

playing-field-at-birth-critical-to-reducing-inequality-intergenerational-poverty [Accessed 15 June 2022].

World Bank. 2022c. *Inequality in Southern Africa: An Assessment of the Southern African Customs Union* [online]. Available at https://documents1.worldbank.org/curated/en/099125303072236903/pdf/P1649270c02a1f06b0a3ae02e57eadd7a82.pdf [Accessed 06 April 2023].

World Bank. 2024a. *The World Bank in South Africa.* [online]. Available at https://www.worldbank.org/en/country/southafrica/overview [Accessed 20 April 2024].

World Bank. 2024b. *GDP growth (annual %) – South Africa.* [online]. Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=ZA&view=chart [Accessed 15 May 2024].

World Bank. 2024c. *GDP per capita (current US$) – South Africa.* [online]. Available at https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZA&view=chart [Accessed 15 May 2024].

World Bank. 2024d. *Access to electricity (% of population) – South Africa.* [online]. Available at https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ZA [Accessed 15 May 2024].

World Economic Forum. 2011. *The Global Information Technology Report 2010-2011.* [online]. Available at https://www3.weforum.org/docs/WEF_GITR_Report_2011.pdf [Accessed 09 February 2023].

World Economic Forum. 2017. *The four levels of computer skills, and the surprising number of adults who fail.* [online]. Available at https://www.weforum.org/agenda/2017/02/a-quarter-of-adults-can-t-use-a-computer/ [Accessed 9 February 2023].

World Health Organization. 2024. *Constitution.* [online]. Available at https://www.who.int/about/governance/constitution [Accessed 2 January 2024].

Worldometer. 2024*. How many countries are there in the world?* [online]. Available at https://www.worldometers.info/geography/how-many-countries-are-there-in-the-world/ [Accessed 10 June 2024].

World Values Survey. 2020. *WVS Wave 6 (2010-2014).* [online]. Available at https://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp [Accessed 13 March 2024].

Zhang, R.J., 2020. Social trust and satisfaction with life: A cross-lagged panel analysis based on representative samples from 18 societies. *Social Science & Medicine*, 251, 112901, pp.1-7.

Appendix

Appendix A: Ranking of Happiness according to the World Happiness Report

Table A.1. Ranking of Happiness according to the World Happiness Report 2013

Ranking	Country
1	Denmark
2	Norway
3	Switzerland
4	Netherlands
5	Sweden
6	Canada
7	Finland
8	Austria
9	Iceland
10	Australia
11	Israel
12	Costa Rica
13	New Zealand
14	United Arab Emirates
15	Panama
16	Mexico
17	United States
18	Ireland
19	Luxembourg
20	Venezuela
21	Belgium
22	United Kingdom
23	Oman
24	Brazil
25	France
26	Germany
27	Qatar
28	Chile

Ranking	Country
29	Argentina
30	Singapore
31	Trinidad and Tobago
32	Kuwait
33	Saudi Arabia
34	Cyprus
35	Colombia
36	Thailand
37	Uruguay
38	Spain
39	Czech Republic
40	Suriname
41	South Korea
42	Taiwan
43	Japan
44	Slovenia
45	Italy
46	Slovakia
47	Guatemala
48	Malta
49	Ecuador
50	Bolivia
51	Poland
52	El Salvador
53	Moldova
54	Paraguay
55	Peru
56	Malaysia
57	Kazakhstan
58	Croatia
59	Turkmenistan
60	Uzbekistan
61	Angola
62	Albania
63	Vietnam
64	Hong Kong

Ranking	Country
65	Nicaragua
66	Belarus
67	Mauritius
68	Russia
69	North Cyprus
70	Greece
71	Lithuania
72	Estonia
73	Algeria
74	Jordan
75	Jamaica
76	Indonesia
77	Turkey
78	Libya
79	Bahrain
80	Montenegro
81	Pakistan
82	Nigeria
83	Kosovo
84	Honduras
85	Portugal
86	Ghana
87	Ukraine
88	Latvia
89	Kyrgyzstan
90	Romania
91	Zambia
92	Philippines
93	China
94	Mozambique
95	Dominican Republic
96	South Africa
97	Lebanon
98	Lesotho
99	Morocco
100	Swaziland

Ranking	Country
101	Somaliland region
102	Mongolia
103	Zimbabwe
104	Tunisia
105	Iraq
106	Serbia
107	Bosnia and Herzegovina
108	Bangladesh
109	Laos
110	Hungary
111	India
112	Mauritania
113	Palestinian Territories
114	Djibouti
115	Iran
116	Azerbaijan
117	Congo (Kinshasa)
118	Macedonia
119	Ethiopia
120	Uganda
121	Myanmar
122	Cameroon
123	Kenya
124	Sudan
125	Tajikistan
126	Haiti
127	Sierra Leone
128	Armenia
129	Congo (Brazzaville)
130	Egypt
131	Burkina Faso
132	Mali
133	Liberia
134	Georgia
135	Nepal
136	Niger

Ranking	Country
137	Sri Lanka
138	Gabon
139	Malawi
140	Cambodia
141	Chad
142	Yemen
143	Afghanistan
144	Bulgaria
145	Botswana
146	Madagascar
147	Senegal
148	Syria
149	Comoros
150	Guinea
151	Tanzania
152	Rwanda
153	Burundi
154	Central African Republic
155	Benin
156	Togo

Source: Own compilation from Helliwell *et al.,* 2013

Table A.2. Ranking of Happiness according to the World Happiness Report 2024

Ranking	Country
1	Finland
2	Denmark
3	Iceland
4	Sweden
5	Israel
6	Netherlands
7	Norway
8	Luxembourg
9	Switzerland
10	Australia
11	New Zealand
12	Costa Rica
13	Kuwait
14	Austria
15	Canada
16	Belgium
17	Ireland
18	Czechia
19	Lithuania
20	United Kingdom
21	Slovenia
22	United Arab Emirates
23	United States
24	Germany
25	Mexico
26	Uruguay
27	France
28	Saudi Arabia
29	Kosovo
30	Singapore
31	Taiwan Province of China
32	Romania
33	El Salvador
34	Estonia

Ranking	Country
35	Poland
36	Spain
37	Serbia
38	Chile
39	Panama
40	Malta
41	Italy
42	Guatemala
43	Nicaragua
44	Brazil
45	Slovakia
46	Latvia
47	Uzbekistan
48	Argentina
49	Kazakhstan
50	Cyprus
51	Japan
52	South Korea
53	Philippines
54	Vietnam
55	Portugal
56	Hungary
57	Paraguay
58	Thailand
59	Malaysia
60	China
61	Honduras
62	Bahrain
63	Croatia
64	Greece
65	Bosnia and Herzegovina
66	Libya
67	Jamaica
68	Peru
69	Dominican Republic
70	Mauritius

Ranking	Country
71	Moldova
72	Russia
73	Bolivia
74	Ecuador
75	Kyrgyzstan
76	Montenegro
77	Mongolia
78	Colombia
79	Venezuela
80	Indonesia
81	Bulgaria
82	Armenia
83	South Africa
84	North Macedonia
85	Algeria
86	Hong Kong S.A.R. of China
87	Albania
88	Tajikistan
89	Congo (Brazzaville)
90	Mozambique
91	Georgia
92	Iraq
93	Nepal
94	Laos
95	Gabon
96	Ivory Coast
97	Guinea
98	Türkiye
99	Senegal
100	Iran
101	Azerbaijan
102	Nigeria
103	State of Palestine
104	Cameroon
105	Ukraine
106	Namibia

Ranking	Country
107	Morocco
108	Pakistan
109	Niger
110	Burkina Faso
111	Mauritania
112	Gambia
113	Chad
114	Kenya
115	Tunisia
116	Benin
117	Uganda
118	Myanmar
119	Cambodia
120	Ghana
121	Liberia
122	Mali
123	Madagascar
124	Togo
125	Jordan
126	India
127	Egypt
128	Sri Lanka
129	Bangladesh
130	Ethiopia
131	Tanzania
132	Comoros
133	Yemen
134	Zambia
135	Eswatini
136	Malawi
137	Botswana
138	Zimbabwe
139	Congo (Kinshasa)
140	Sierra Leone
141	Lesotho
142	Lebanon

Ranking	Country
143	Afghanistan

Source: Own compilation from Helliwell *et al.,* 2024

Appendix B: Questions chosen for this study from NIDS Wave 2

Table B.1. Dependant variable

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
1	happiness	M5	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?	Satisfaction level (1-10)	
				Refused	-8
				Don’t know	-9

Source: Own compilation from NIDS Wave 2 Questionnaire

Table B.2. Variables that influence happiness, grouped into the financial capital category

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
1	logpchhincome	Imputed values of household income			
2	logpchhexp	Imputed values of household expenditure			
3	wealth	Imputed values of household net worth			
4	ownradio	G1	Do you personally own at least one radio in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
5	ownhifi	G2	Do you personally own at least one Hi-Fi Stereo, CD player, MP3 player in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
6	ownsew	G3	Do you personally own at least one sewing/knitting machine in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
7	ownvehicle	G4	Do you personally own at least one motor vehicle (private) in running condition in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
8	owncomvehicle	G5	Do you personally own at least one bakkie or truck in running condition in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
9	ownmot	G6	Do you personally own at least one motorcycle/scooter in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
10	ownbic	G7	Do you personally own at least one bicycle in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
11	owncom	G8	Do you personally own at least one computer in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
12	owncam	G9	Do you personally own at least one camera in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
13	owncel	G10	Do you personally own at least one cell phone in good working order?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
14	ownbond	G11	Do you personally have a Home loan/bond?	Yes	1
				No	2
				Refused	-8
				Don't know	-9

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
15	ownloan	G12	Do you personally have a personal loan from a bank?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
16	ownmicroloan	G13	Do you personally have a personal loan from a micro-lender?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
17	ownmshloan	G14	Do you personally have a loan with a Mashonisa?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
18	ownstudloan	G15	Do you personally have a study loan with a bank?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
19	ownstuother	G16	Do you personally have a study loan with an institution other than a bank?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
20	owncarloan	G17	Do you personally have a vehicle finance (car payment)?	Yes	1
				No	2
				Refused	-8
				Don't know	-9

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
21	owncreditcard	G18	Do you personally have a credit card?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
22	ownstorecard	G19	Do you personally have a store card (for example, Edgars, Foschini or Woolworths store card)?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
23	ownhp	G20	Do you personally have a hire purchase agreement?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
24	ownfamilyloan	G21	Do you personally have a loan from a family member?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
25	ownfriendloan	G22	Do you personally have loans from friends?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
26	ownemploan	G23	Do you personally have loans from an employer?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
27	ownunptax	G24	Do you personally have unpaid tax including PAYE, property taxes and VAT if a personal debt?	Yes	1
				No	2
				Refused	-8
				Don't know	-9

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
28	ownarrears	G25	Do you personally have arrears in service and other monthly bills?	Yes	1
				No	2
				Refused	-8
				Don't know	-9
29	ownfinassets	G30	Do you personally have unit trusts, stocks and shares?	Yes	1
				No	2
				Refused	-8
				Don't know	-9

Source: Own compilation from NIDS Wave 2 Questionnaires

Table B.3. Variables that influence happiness grouped into the human capital category

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
1	yrschool	best_edu	Best education	Grade 1 (previously Sub A/Class 1)	1
				Grade 2 (previously Sub B/Class 2)	2
				Grade 3 (Std 1)	3
				Grade 4 (Std 2)	4
				Grade 5 (Std 3)	5
				Grade 6 (Std 4)	6
				Grade 7 (Std 5)	7
				Grade 8 (Std 6/Form 1)	8
				Grade 9 (Std 7/Form 2)	9
				Grade 10 (Std 8/Form 3)	10
				Grade 11 (Std 9/Form 4)	11
				Grade 12 (Std 10/Matric/Senior Certificate)	12
				NTC 1	13
				NTC 2	14
				NTC 3	15
				Certificate with less than Grade 12/Std 10	16
				Diploma with less than a Grade 12/Std 10	17
				Certificate with Grade 12/Std 10	18
				Diploma with Grade 12/Std 10	19
				Bachelor’s Degree	20
				Bachelor’s Degree and diploma	21
				Honours Degree	22
				Higher Degree (Masters, Doctorate)	23
				Other (specify)	24
				No schooling	25
				Grade R/0	-8

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
				Don’t know	-9
2	complit	H32	Are you computer literate?	Yes highly literate	1
				Yes basic use	2
				No	3
				Refused	-8
				Don’t know	-9
3	driverslic	H33	Do you have a driver's license?	Yes	1
				No	2
				Refused	-8
				Don’t know	-9
4	readeng	H37	How well can you read in English?	Very well	1
				Fair	2
				Not well	3
				Not at all	4
				Refused	-8
				Don’t know	-9
5	writeeng	H38	How well can you write in English?	Very well	1
				Fair	2
				Not well	3
				Not at all	4
				Refused	-8
				Don’t know	-9
6	health	J1	How would you describe your health at present? Would you say it is excellent, very good, good, fair, or poor?	Excellent	1
				Very good	2
				Good	3
				Fair	4
				Poor	5
				Refused	-8
				Don’t know	-9

Source: Own compilation from NIDS Wave 2 Questionnaires

Table B.4. Variables that influence happiness grouped into the social and spiritual capital category

		Original NIDS variable				
	Name	Section and question number or derived variable	Question	Categories		
1	staypref	M1	Think about the area (village or suburb) in which you live. How strong is your preference to continue living in this area?	Strong preference to stay		1
				Moderate preference to stay		2
				Unsure (no strong preference to stay or leave)		3
				Moderate preference to leave		4
				Strong preference to leave		5
				Refused		-8
				Don't know		-9
2	comgroupstot	M9	Please indicate if you belong to any of the following groups?		Yes	No
				1. Stokvel	1	2
				2. Burial Society	1	2
				3. Community Garden group	1	2
				4. Farmer's Association	1	2
				5. Sewing group	1	2
				6. Sports group	1	2
				7. Study group	1	2
				8. Singing or music group	1	2
				9. Youth Group	1	2
				10. Informal trader's group	1	2
				11. Men's association	1	2
				12. Women's association	1	2
				13. School Committee	1	2
				14. Water Committee	1	2
				15. Development Committee	1	2
				16. Tribal Authority	1	2
				17. Other (specify)	1	2

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
3	trust1	M10	Imagine you lost a wallet or purse that contained R200 and it was found by someone who lives close by. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?	Very likely	1
				Somewhat likely	2
				Not likely at all	3
				Don't know	-9
				Refused	-8
4	trust2	M11	Imagine you lost a wallet or purse that contained R200 and it was found by a complete stranger. Is it very likely, somewhat likely or not likely at all to be returned with the money in it?"	Very likely	1
				Somewhat likely	2
				Not likely at all	3
				Don't know	-9
				Refused	-8
5	crime1	D41.1	How common are burglaries, muggings or thefts in your neighbourhood?	Never happens	1
				Very Rare	2
				Not common	3
				Fairly common	4
				Very common	5
				Refused	-8
				Don't know	-9
6	crime2	D41.2	How common is there violence between members of the same household in your neighbourhood?	Never happens	1
				Very Rare	2
				Not common	3
				Fairly common	4
				Very common	5
				Refused	-8
				Don't know	-9

		Original NIDS variable			
	Name	Section and question number or derived variable	Question	Categories	
7	crime3	D41.3	How common is there violence between members of different households in your neighbourhood?	Never happens	1
				Very Rare	2
				Not common	3
				Fairly common	4
				Very common	5
				Refused	-8
				Don't know	-9
8	maritalstatus	B10	What is […]'s current marital status?	Married	1
				Living with partner	2
				Widow/Widower	3
				Divorced or separated	4
				Never married	5
				Don't know	-9
				Refused	-8
9	arelnb	M7	How important are religious activities in your life?	Not important at all	1
				Unimportant	2
				Important	3
				Very important	4
				Don't know	-9
				Refused	-8

Source: Own compilation from NIDS Wave 2 Questionnaires

Table B.5. Demographic and socioeconomic control variables

		Original NIDS variable				
	Name	Section or derived variable	Question	Definition	Categories	
1	age	best_age_yrs	Best age in years	Adults aged 18 and over		
2	agesquared			Age squared divided by 100		
3	race	best_race	Best race	Population group	African	1
					Coloured	2
					Asian/Indian	3
					White	4
					Don't know	-9
4	gender	best_gen	Best gender	Gender	Male	1
					Female	2
					Don't know	-9
5	emplostatus	empl_stat	Employment status – Adult only	Employment status	Not Economically Active	0
					Unemployed_Discouraged	1
					Unemployed_Strict	2
					Employed	3
					Refused	-8
6	GeoType2011	geo2011	Sampled GeoType (2011 Census)	Type of region where the individual resides	Traditional	1
					Urban	2
					Farms	3

		Original NIDS variable				
	Name	Section or derived variable	Question	Definition	Categories	
7	numchild	Household roster		Number of children under 7 years of age residing in the household		

Source: Own compilation from NIDS Wave 2 Questionnaire

Appendix C: Additional Principal Component Analysis Results

Table C.1. Component rotation matrix (varimax) of financial capital

	Comp1	**Comp2**	**Comp3**	**Comp4**	**Comp5**	**Comp6**	**Comp7**	**Comp8**	**Comp9**
Comp1	0.6948	0.5304	0.3656	0.2423	0.1527	-0.0044	0.1177	0.0611	0.0505
Comp2	-0.1771	-0.0780	0.0679	0.8176	-0.4585	0.0921	-0.0710	0.2071	0.1513
Comp3	-0.5686	0.2825	0.6551	-0.0350	0.2766	0.1980	-0.2252	-0.0054	-0.0053
Comp4	0.0503	-0.4232	-0.0746	0.3055	0.6916	0.3739	0.2522	0.1883	-0.0476
Comp5	0.1267	0.1575	-0.1785	-0.0895	-0.2417	0.8574	-0.1603	-0.2533	-0.1894
Comp6	0.0142	-0.2960	0.4838	-0.1574	-0.3570	0.0907	0.6733	-0.0555	-0.2474
Comp7	0.1564	-0.1973	0.1564	-0.3671	-0.1417	0.2422	-0.1195	0.5322	0.6333
Comp8	-0.3053	0.5302	-0.3524	-0.0767	-0.0160	0.0793	0.4626	0.5155	-0.0967
Comp9	-0.1614	0.1454	-0.1115	0.0698	0.0736	0.0649	0.3993	-0.5492	0.6817

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.2. Rotated components (promax) of financial capital variables

Rotated Components (promax)									
	Component								
Financial capital variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
wealth		0.4403				0.3843			
logpchhincome		0.5817							
logpchhexp		0.5744							
ownradio			0.6203						
ownhifi			0.4935						
ownsew			0.3351						
ownvehicle	0.3886								
owncomvehicle						0.5533			
ownmot					0.6862				
ownbic					0.5478				
owncom	0.3513								
owncam	0.3753								
owncel			0.3445						
ownbond	0.3219								
ownloan				0.3566					
ownmicroloan				0.3762					-0.3644
ownmshloan							0.4587	0.4208	
ownstudloan									0.5134
ownstuother								0.7938	
owncarloan	0.4208								
owncreditcard	0.3951								
ownstorecard				0.4593					
ownhp				0.4237					
ownfamilyloan							0.5817		
ownfriendloan							0.6505		

Rotated Components (promax)									
	Component								
Financial capital variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ownemploan									0.6036
ownunptax						0.6159			
ownarrears				0.4719					
ownfinassets									
Variation Explained	**9.17**	**6.95**	**5.49**	**5.23**	**4.86**	**4.20**	**3.99**	**3.98**	**3.91**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.3. Component rotation matrix (promax) of financial capital

	Comp1	**Comp2**	**Comp3**	**Comp4**	**Comp5**	**Comp6**	**Comp7**	**Comp8**	**Comp9**
Comp1	0.7150	0.5538	0.3710	0.2639	0.1728	0.1763	0.0025	0.0535	0.0591
Comp2	-0.1755	-0.0553	0.0477	0.8073	-0.4531	-0.1017	0.1263	0.1032	0.1460
Comp3	-0.5873	0.2737	0.6741	-0.0498	0.2679	-0.1984	0.1971	0.0249	0.0432
Comp4	0.0842	-0.4387	-0.0520	0.3028	0.7304	0.2792	0.3735	-0.0043	0.2528
Comp5	0.1349	0.1466	-0.1735	-0.0526	-0.3182	-0.1715	0.8518	-0.1562	-0.1922
Comp6	0.0254	-0.2793	0.5175	-0.1336	-0.3489	0.6793	0.0813	-0.3289	-0.0769
Comp7	0.1148	-0.1721	0.1149	-0.4046	-0.0457	-0.1817	0.2972	0.6230	0.5300
Comp8	-0.2477	0.5246	-0.3088	-0.0749	0.0024	0.4406	0.0874	-0.0902	0.4981
Comp9	-0.1705	0.1950	-0.1416	0.0970	0.1388	0.4115	0.0661	0.7475	-0.6375

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.4. Component rotation matrix (varimax) of human capital

	Comp1	**Comp2**
Comp1	0.9347	0.3553
Comp2	-0.3553	0.9347

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.5. Rotated components (promax) of human capital variables

Rotated Components (promax)		
	Component	
Human capital variables	**1**	**2**
yrschool	0.4236	
complit		0.5181
driverslic		0.7644
readeng	0.5639	
writeeng	0.5641	
health	0.3898	-0.3283
Variation Explained	**45.92**	**21.63**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.6. Component rotation matrix (promax) of human capital

	Comp1	**Comp2**
Comp1	0.9273	0.3431
Comp2	-0.3759	0.9399

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.7. Component rotation matrix (varimax) of social and spiritual capital

	Comp1	**Comp2**	**Comp3**	**Comp4**
Comp1	0.9886	0.1261	0.0766	0.0314
Comp2	-0.1385	0.9697	0.1261	0.1567
Comp3	-0.0524	-0.2051	0.7664	0.6064
Comp4	-0.0288	0.0404	0.6251	-0.7789

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.8. Rotated components (promax) of social and spiritual capital variables

Rotated Components (promax)				
	Component			
Social and Spiritual capital variables	**1**	**2**	**3**	**4**
maritalstatus			0.6204	
crime1	0.5434			
crime2	0.5984			
crime3	0.5881			
trust1		0.7045		
trust2		0.7006		
staypref			0.7473	
comgroupstot				0.7753
arelnb				-0.5878
Variation Explained	**25.59**	**16.08**	**12.41**	**12.02**

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Table C.9. Component rotation matrix (promax) of social and spiritual capital

	Comp1	**Comp2**	**Comp3**	**Comp4**
Comp1	0.9886	0.1272	0.0785	0.0341
Comp2	-0.1391	0.9761	0.1374	0.1705
Comp3	-0.0486	-0.1806	0.7385	0.5721
Comp4	-0.0319	0.0363	0.6621	-0.8072

Source: Own calculations using NIDS data from 2010-2011, Wave 2

Appendix D: Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

20 June 2022

Miss Fathima Danka (216003570)
School Of Acc Economics&Fin
Pietermaritzburg

Dear Miss Fathima Danka,

Original application number: 00017571
Project title: Influence of capital elements on happiness

Exemption from Ethics Review

In response to your application received on 13 June 2022 , your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted]

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

17 April 2023

Miss Fathima Danka (216003570)
School Of Acc Economics&Fin
Westville

Dear Miss Fathima Danka,

Protocol reference number: HSSREC/004579/2019

Project title: Influence of capital elements on happiness.

Amended title: Influence of capital elements on happiness in South Africa.

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 14 April 2023 has now been approved as follows:

- Change in thesis /project title _____

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

Best wishes for the successful completion of your research protocol.

Yours faithfully

[redacted] 17 April 2023

Prof Josue Mbonigaba
ACADEMIC LEADER RESEARCH
SCHOOL OF ACCOUNTING, ECONOMICS AND FINANCE

Cc: Prof Darma Mahadea
Dr Ralitza Dobreva

Humanities & Social Sciences Research Ethics Committee
Dr Rosemary Sibanda (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za