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An Investigation Into the Relative Importance of Civil Institutions on Subjective Well-Being

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AN INVESTIGATION INTO THE RELATIVE IMPORTANCE OF CIVIL

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By

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Abstract Title

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  Poverty is not a material problem; in fact, it is a much greater problem, the problem of social, natural, and economic disconnect from the institutions of stability, wealth, justice, and well-being. When considering human flourishing, we must look beyond the material at "lives that are not necessarily morally good, but good for us" (Tiberius, 2006, p. 493). In the vein of Sen's Capabilities Theory, this paper uses subjective well-being as a comprehensive measure of an individual's life and circumstances examines how civil institutions impact an individual's non-monetary welfare function. This paper conducts a series of regression models in an attempt to explore and identify the relative impact of the determinants of subjective well-being in the context of individual experience and historical dependency. Analyzing a panel survey in South Africa, this paper compares a fixed effects and autoregressive model to the baseline ordinary least squares (OLS) model in order to determine how civil institutions and path dependency play a role in determining subjective well-being. I find that the autoregressive model does not substantially improve parameter estimates, most likely due to the short structure of the panel. The autoregressive model does confirm the impact of religious involvement and family units, both positively significant in all models. The strength of religious importance directly correlates to increased life satisfaction, and individuals in family units (married or cohabitating) show increased levels of life satisfaction, although the anticipated effect of formal marriage does not show in the data. This analysis lays a foundation for understanding opportunities for governmental intervention with the purpose of maximizing subjective well-being.

Welfare economist Amartya Sen, opening his collection of speeches "Development as Freedom", recalls an ancient Indian proverb in which a couple discusses the effect of working harder and gaining more income. They discuss how many hours they should work, if they should change jobs, when they will retire, when they will finally have "enough" wealth. The couple comes to the conclusion that all the material wealth in the world will not bring immortality; the discussion ends with the wife wondering, "What should I do with that by which I do not become immortal?"

In this one question, Sen and the proverb lay out the fundamental human problem of limited resources and unlimited desires. It also probes further into that problem, asking whether, fundamentally, if resources were unlimited, could human desires ever be fulfilled? When economists consider the problem of poverty, more and more that consideration extends to dimensions beyond that of income and material wealth. Poverty is not a material problem; in fact, it is a much greater problem, the problem of social, natural, and economic disconnect from the civil and social institutions of stability, wealth, justice, and well-being.

Economic research is making strides towards incorporating this understanding of the non-material elements of poverty and human flourishing. Richard Easterlin, perhaps the paramount economist working to understanding happiness and human welfare, finds (2003) that individuals "allocate a disproportionate amount of time to the pursuit of pecuniary objectives," a fact which greatly distorts the importance of material wealth and understates the crucial socioeconomic, contextual factors in determining well-being (Easterlin 2003). As far back as 1973, Bernard van Praag posited evidence for an individual welfare function, necessitating a paradigm of welfare research accounting for

human experience beyond just income. While van Praag's initial welfare function is tied to income, it establishes a precedent of contextual factors, including interpersonal comparison, past standing, and future aspirations to derive an individual welfare function. DiTella and MacCulloch (2006) survey the increased integration of happiness data into modern economic analysis and demonstrate how concern for holistic human well-being shapes understanding of economic phenomena in the modern age.

As a result of this increased integration of subjective well-being, a diverse theoretical platform has arisen. Specifically, in the modeling of subjective well-being, competing theories arise in the determination of path-dependent happiness based on longitudinal data. Headey (2005) refines a theory of set point, dynamic equilibrium for happiness, suggesting that similar to human capital theory (Becker 1975) in that an individual has an innate and circumstantial predisposition to a certain level of happiness, a set point. External shocks to that individual's environment alter welfare, only to return to about the prior level, in a sort of affective habituation of well-being (Heady 2005). The affective habituation understanding presents a paradigm through which one can view every life circumstance as an exogenous impact on this innate predisposition to satisfaction levels. This adaptive recovery of well-being is supported empirically in dynamic models (Wunder 2012, Bottan and Truglia 2011). In this arena, research investigates stabilizers and destabilizers of well-being in the lives of individuals.

The alternative to the set point model is an autoregressive examination of the composition of present well-being. As opposed to above, dynamic regressions of subjective well-being address the issue of mutual endogeneity between well-being, disposition, and environment. Here, research aims to trace the influence of the past on

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today's welfare, focusing more on the construction and drivers of well-being, as opposed to relative effects based on an individual's predisposition. Studies capture the personal disposition element in domain satisfaction (von Praag 2004) and examine the "complex coevolution of various life domains" with vector autoregression (Binder and Ward 2013). This paper suggests a foundation for unification in the modeling of subjective well-being by identifying the key stabilizers and drivers of a predisposed set point, and using the path-dependency framework to examine how the historical presence of those institutions of stability cultivate increased life satisfaction. Incorporating panel and autoregressive specifications in a model of subjective well-being, this study establishes an understanding of of the lasting effects of external and internal civil institutions in determining life satisfaction. This paper attempts to control for issues of mutual endogeneity in life circumstances and satisfaction by capitalizing on panel data structure and an historical term, accounting for the intertemporal interplay of subjective welfare, and finds that religious involvement and membership in a family unit significantly contribute to subjective well-being.

1. LITERATURE BACKGROUND

1.1 Subjective Well-Being

Considering poverty as an issue of human flourishing, then we must turn our attention to the composition of subjective well-being. SWB is an individual's rating, at a given time, of the entirety of their life circumstances, both personal and contextual. Economic research at the turn of the century has established that economic welfare clearly extends well beyond material standing. Sen's (1999) capabilities theory emphasizes that opportunity and agency are predominant determinants of economic well-being,

highlighting the importance of institutional factors which influence well-being. Easterlin's paradox, a foundational piece of the welfare puzzle, establishes two facts of material wealth and subjective welfare: First, richer people report higher satisfaction than those poorer, but second, rising levels of life satisfaction do not always accompany rising levels of income (Easterlin, 2010). Modern efforts (Sachs et al. 2010) refine the paradox, emphasizing the importance of examining the institutional and interpersonal aspects of material wealth. This paradox conveys the confounding nature of focusing on objective material wealth when discussing subjective well-being. In fact, much research confirms that income and wealth relative to one's peers – gender, race, and neighborhood - is a more accurate and complete point of reference for the effects wealth have on well-being (Bookwalter and Dalenberg 2010, Casale and Posel 2011, Luttmer 2005). These three foundational findings – that of the importance of economic mobility, the existence of a satiation to income, and the importance of perceived material standing – in the determination of subjective well-being represent the directional alignment towards a comprehensive and contextual understanding of subjective well-being in modern economic research.

Having established that individual welfare extends beyond mere objective material status into the circumstances of life situation, the anatomy of this well-being must be considered. To date, this lacks a simple answer, although economics has made great strides in considering "what we have when our lives are going well for us, when we are living lives that are not necessarily morally good, but good for us" (Tiberius, 2006, p. 493). Economic welfare has evolved to account for the understanding of the layered complexity of subjective-well being. Angner (2010) concludes, "well-being is a matter of

desired mental states." Subjective well-being is a "complex coevolution of various life domains" (Binder and Ward 2013) and "should be seen as a statistical 'aggregator' that turns a distribution into a single number that provides an overall judgment on a person's circumstances" (Deaton 1997, p. 135). The modern movement into understanding subjective well-being as an indicator of economic welfare portends that happiness is not defined simply or directly, but instead, is a function of complex interactions between various domains of objective and subjective characteristics of an individual's life (von Praag et al., 2003). SWB is a complex, dynamic measure of an individual's life at a point in time. Von Praag notes, "Individual Satisfaction depends not only on the individual's objective situation but also on his or her personality."

FIG (1): VAN PRAAG'S DOMAINS OF SWB

Figure 1 displays how individual personality interacts with the different domains of satisfaction in Von Praag's model. Many of the factors influencing subjective well-being are in fact in return influenced by SWB; that is to say, domains, disposition, and subjective well-being are all mutually endogenous. This simultaneous coevolution of subjective well-being is the funnel through which all ideas of the effects of life domains on well-being must flow.

For the sake of clarity, Kanneman and Deaton (2010) discuss the distinction between two aspects of subjective well-being. They define emotional well-being as "the emotional quality of an individual's everyday experience," a more experiential assessment of their

lives. On the other hand, "life evaluation" is analogous to subjective well-being as used in this study, "the thoughts that people have about their life when they think about it." This study concerns that latter definition, the self-reflective assessment, and although at times happiness, subjective well-being, and subjective welfare are used interchangeably, the terms in this paper all refer to that "life evaluation."

Prior to considering these issues of mutual endogeneity, a definition of subjective well-being requires an examination into the domains of life satisfaction. Well-being is a result of a person's innate characteristics molded and shaped by external factors and internal disposition which converge at a point in time as a self-reported happiness rating (Layard et al. 2012). Additionally, the path-dependency of well-being has been noted (Binder and Ward 2013, Bottan and Truglia 2011). The World Happiness Report of 2012 explains, "A person's happiness at a point in time is determined by her whole life course." Taking into account that path-dependency means that at any given point in time, an individual's response to the well-being question is mitigated by their choices (Headey et al. 2010), and circumstances. Circumstances include, but are not limited to, internal and external factors playing out upon a person. We can derive a function for individual well-being, accommodating for a person's state, economically, psychologically, and contextually: factors include income and employment status, social integration, personal values, and more.

The domains which contribute to an individual's well-being lie in two general arenas. The first arena is that of the internal life, that of the interactions, beliefs, and values closest to an individual's home. Panel and cross-sectional studies confirm the positive association between marriage and life satisfaction, and the existence of spill-over effects

of life satisfaction between married couples (Powdhatvee 2009, Posel and Casale 2011).

Marriage provides a foundational support system, an effective insulation against external

shocks, emotional and otherwise, and is therefore a key element in the determination of

subjective well-being. Cross-sectional analysis of family type has touted the significant

relationship between family structure and well-being (Cracolici et al. 2014). A

noteworthy contributor to the internal life that also plays a role in family cohesion is

religious involvement, and the value structures that accompany it. Whereas prior studies

find religion to be a community activity (Binder and Ward 2013) or an external factor

(Layard et al. 2012), this paper argues that religion plays a formative role in the lives of

adherents, and as religion is such a substantial force in creation of worldview and a lens

through which to filter lived experience, it is considered a crucial element of the internal

domain. Mochon and Ariely (2011) find positive relationships between religious

involvement and subjective well-being. Their research parses out the interaction between

the effective devoutness of one's belief and the level of SWB, explaining that emotional

welfare can be compromised by ambiguous belief, which offers a possible explanation

for the increasing abandonment of religious activity in developed nations (Ruiter and De

Graaf 2006). Despite declining rates of religious participation in developed nations,

religion plays a significant and perhaps − when contrasted to developed nations - even

elevated role in the daily lives and worldviews of individuals, and its influence as a

unique institution cannot be neglected. Finally, an individual's perception of their own

health correlates with subjective well-being and therefore must be included in the

composition of welfare (Graham 2011, Dolon 2011). Marriage, family structure, health,

and religious involvement lay the foundation for the interior domains of human

flourishing.

Those domains of the interior life, forming the aforementioned "filter" of lived

experience, compound with external, contextual domains to determine an individual's

welfare. An individual's daily external interaction consists of community integration and

employment. Social support structures contribute to well-being (Lucas and Clark 2006,

Siedlecki et al. 2013, Kingdon and Knight 2007) as do measures of community trust and

integration (Powdthavee 2008). Additionally, unemployment and underemployment take

a toll on individual welfare. Economic research notes the negative emotional impact of

unemployment (Clark and Georgellis 2010, Layard et al. 2012, Lucas 2004), while the

detriment of extended unemployment is long-documented in more popular literature.

Wendell Berry, for instance, posits (1977), "If we do not live where we work and when

we work we are wasting our lives and our work too," explaining at once not only the

necessity of human work, but the fundamental health and wholeness that comes from

challenging and meaningful employment of the mind and body. Structural VAR analysis

also support the positive effects on life satisfaction that come from meaningful and

challenging work (Coad and Binder 2013). Lastly, analysis of generosity in social

employment insurance "suggest that investments in active labor market measures will

yield relatively greater gains in subjective well-being among the unemployed,"

empirically affirming the relationship between employment and subjective welfare

(Jakubow 2016). Thus community integration and meaningful employment play

prominent roles in the external domain of life satisfaction.

Much of economic welfare research thus far has evolved out of cross sectional data and into panel data analysis. However, the limitation of the panel data is still the issue of path dependency, and so much of subjective well-being research neglects the mutual endogenity of the welfare equation. Panel data does not capture the interaction of historical circumstances with current events, despite its ability to control for some dispositional and time-invariant characteristics. Current research efforts into subjective well-being have turned the corner into analysis of institutional constitutions of certain living situations – that is, looking at both national and personal context in the determination of subjective well-being (Helliwell 2002; Spruk and Keseljevic, 2016). Where these papers take a macroeconomic approach to make cross-country comparisons of systematic influences of subjective well-being, this paper applies a microeconomic lens – a bottom-up approach - to the institutions of community and stability in examining subjective well-being.

Recent efforts include further examination of the mechanics of change in subjective well-being. Set Point Theory, a long investigated theory from the field of psychology about the nature of life circumstances and personal disposition, argues that a set level of subjective welfare can be derived from an individual's circumstances, and their adaptation to exogenous shocks consist of a set of positive and negative deviations and returns to that previously-established level (Headey 1980). The controversy of the set level invites criticism and further scrutiny (Easterlin 2003), and much research has documented the inconsistent adaptation of subjective well-being (Wonder 2012, Bottan and Truglia 2011, DiTella et al. 2010). Binder and Ward (2013) incorporate the historical influence of prior domains through a vector autoregression, continuing the

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conversation on this dimension of self-dependent welfare. While VAR research into SWB confirms an intertemporal structure for subjective well-being (Bottan and Truglia 2011), the analysis is wanting in two arenas. First, their admittedly crude approximation of social integration is marriage. This implicitly classifies marriage as an exclusively external, social institution. As the literature supports and as noted above, the value of marriage in a person's subjective well-being involves the formative disposition that marriage cultivates. Secondly, Binder and Ward lump religion in with other community activities. This paper theorizes that religious belief is a unique determinant of SWB, in that it represents a vector of worldview assumptions and personal values. Additionally, as estimates place worldwide religious affiliation at anywhere between 68-80%, the individual impact of religious institutions (social, personal, and communal) ought not to be ignored.

This paper aims to test the hypothesis that religious involvement and marriage play unique roles in determining an individual's life satisfaction. In an attempt to reconcile the path-dependent nature of subjective well-being with the nascent (4 waves) dataset, drawing from the panel vector autoregression methodology as laid out by Binder and Ward (2013), this paper incorporates an auto-regressive term to explore the dynamic relationship between institutional stability and subjective welfare over time and expands our understanding of the composition of subjective well-being through the emphasis of internal and external domains.

1.2 Cultural and Social Trends in a Post-Apartheid South Africa

South Africa is currently undergoing a period of rapid development - GDP rose 400% from 2000 to 2010, and currently sits at about $6000 US per capita, nearly three times that of the year 2000 (Odimegwu et al. 2016). Aside from an expected decline during the global recession of the mid-2000's, the South African economy is establishing itself steadily in the period since apartheid, a reflection of the modernization of the nation. Apartheid, a codified system of segregation by race, systematically denied millions access to institutional opportunities for personal advancement. The development of South Africa has been a legal and institutional challenge, as the nation works to resolve years of exclusion and marginalization of Black Africans, mostly through a series of legislative efforts and nationwide initiatives.

FIGURE (2): PIPED WATER ACCESS BY SATISFACTION LEVEL
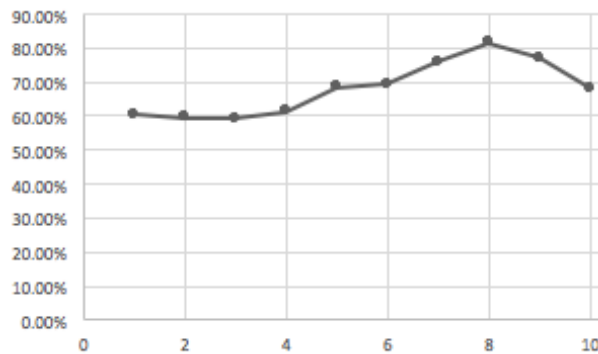
This process is still evident in the demography of South Africa, a nation which boasts modern cities, yet still has a large swaths of the population (54.98 million people) rural and impoverished – 16 million (29%) do not have access to piped water or sanitation (35.7% in the sample for this paper). Figure 2 displays access to piped water by

satisfaction level, suggesting that more individuals higher on the satisfaction scale have piped water. This disparity between developed and developing makes South Africa an interesting subject for studying subjective well-being; by examining well-being and controlling for income and expenditure, this project can look for average effects of drivers of subjective well-being, but also isolate the effects of poverty and relative wealth. In many domains of everyday life, government policy has aimed to maximize development both economically and culturally through increased literacy, accommodating family dynamics, and integrated labor force participation.

1.2.1 Trends in Education

As part of the wave of social reform in the mid-nineties, the South African government enacted a series of educational polices aimed to reorganize the educational climate of systemized inequality, including early childhood and adult education, infrastructure increases, and compulsory school attendance. This strategic development of educational quality and access in South Africa continues even into more recent days; students are required to attend from ages 7 to 15, or through the 9th grade, and state grants cover the tuition fees for students who cannot afford them. Education as an outcome variable provides a unique perspective on quality of life; those with better objective circumstances are more likely to have better education, and those who have better education are more likely to have more opportunities to increase their objective standing. Gilimani et al (2016), examining the annual census, find that the percentage of adults (15 to 34 year olds) with no schooling in South Africa has fallen from almost 12% to now under 3%. For Black African adults, that result is an even grander decrease - in 1996, 15% of Black African adults reported no schooling, whereas in 2007, that had

fallen to 3.3%. Additionally, Gilman et al (2016) find that women are more likely in 2007 to gain an advanced degree than they were in 1996, and than men. In the sample for this study, slightly more than 60% of adults have completed schooling past the required 9th grade (62.41%). Because this study considers only adults (age of at least 18), we would expect younger students, specifically those in school in the wake of these educational reforms, to show an increased attendance in those higher grades, which happens to be the case – 73.62% of the sample under age 30 have attended beyond the national requirement. Although the nation has seen improvement in educational attainment, there are still areas for growth: whites are still more likely to receive higher education than non-whites, although that number is dropping in recent years, and students without parents are far behind those with, even though educational outcomes have improved for all groups in the last fifteen years. Overall, educational attainment in South Africa is shifting somewhat from a closed door system, reserved for the rich and powerful, to a slightly more equitable system of opportunity.

1.2.2   Labor Force Demographics

As South Africa transitions out of the closed economy into a freer market, changes in the labor force should reflect the expanded opportunity across demographics in the marketplace. Odimegwu et al (2016) conduct a demographic survey of labor force trends in South Africa. They find that increased education among Black Africans and some correlate to higher rates of labor force participation, and while the proportion of men to women in the labor force has stayed relatively constant, slight changes in those rates reflect the adjustment of a burgeoning economy. Additionally, Odimegwu et al. find that whereas married men out-participate their unmarried counterparts, the group that has

shown the most significant increase in labor force participation is the unmarried females, who now outpace married females, and continue to grow. In the sample for this study, women make up the slight majority of the workforce, as 53.93% of those economically active over the course of four waves are women. Additionally, more than a third of the workforce are married or living with a partner, and the trend of female workforce outperformance holds steady in those unmarried – again, 55% of the unmarried economically active individuals in this survey are female.

Additionally, skilled jobs have increased over 100% since the end of apartheid, as now almost four million individuals in South Africa hold skilled jobs. Semi-skilled jobs offered employment to more than three million new workers in the last ten years, another indicator of the increase of opportunity in the employment sector in South Africa (Statistics South Africa 2015). There are some caveats to that growth – adjusted unemployment rates have remained constant since the end of apartheid, although the labor force has opened substantially towards women and minorities. Overall, there remains much opportunity for growth in employment opportunities for South Africans, but as GDP has improved, so have employment outcomes for some of the most marginalized groups in the nation.

1.2.3   Household and Family Dynamics

The household and family composition of South Africans is an important understanding for the context of the developing nation. Jhamba and Mmatli (2016) survey trends in modern South Africa pertaining to family structure and composition. Households in South Africa are predominantly headed by males, as is true in the sample of this study. The average household in South Africa in 2007 was 3.82 people, with an

average of 1.44 children. In our sample, household size averages 5.3. Households in this sample average 2.13 children, again consistent with the 2007 averages and accommodating population growth. In 2007, nearly 85% of households reported a couple (married or unmarried) living together, indicating that the majority of couples constitute households and families. Additionally, Jhamba and Mmatli (2016) find that the overwhelming majority (more than 70%) of children live with their parents, an indicator of stability and family continuity in this developing nation. Ultimately, the family ties in South Africa are an important consideration when evaluating daily life and satisfaction of individuals.

1.2.4   The Primacy of SWB as a Poverty Measurement in South Africa

Simelane and Masiteng (2016) justify analytical focus on multi-dimensional measures of poverty based on the unique socioeconomic policy approach of post-apartheid South Africa, the fallibility of absolute poverty measures in developing countries, and the precedent set by literature in developing countries of using such a measure. A subjective measure of well-being is desirable for the same reasons. Given the aforementioned government efforts to alter cultural dynamics, a subjective measure of well-being provides an opportunity to examine the effects of those efforts on the individual. As established above, poverty goes beyond the material and extends to a comprehensive individual condition, both internal and contextual. Subjective well-being provides a consistent manner in which to evaluate the overall quality of an individual's life, accounting for the subjective perception of standing, and capturing implicitly the objective characteristics of an individual's daily existence.

1.2.5 South Africa and the NIDS

Post apartheid South Africa is a country and an economy with many economic opportunites. Despite battling issues of government corruption, political backlash, and cultural integration, the nation has made marked strides towards progress. Literacy rates across the nation have increased, with especially robust growth among women and minorities. Employment opportunities have opened up for women and minorities, as education has increased, although overall employment has somewhat stagnated, focused mostly on realignment as opposed to singular growth. Additionally, culturally, approximately 85% of South Africans identify as religious (Jhamba and Mmatli 2016), and 85% of couples with children live together, emphasizing the importance of the household and family unit. This paper incorporates the cultural context of economic growth in an integrating society concerned with family and community to derive a subjective welfare function for the South African populace specifically, though a function flexible enough to adapt to the dynamic situations of other developing nations.

In the middle of the 20th century, South Africa codified a system of power imbalance and racial exclusion that lasted through the early 1990s. The government militarized and dealt harshly with protesters and revolutionaries, which in turn only exacerbated the public sentiment. In the mid 1980s, riding a wave of increasingly organized violence and protest, anti-apartheid leaders took to political and legal action. Drastic measures were taken by the government to suppress anti-apartheid uprisings, with states of emergency declared across many black villages. The heightened tensions of emergency rule and the efforts for legal reform lead to marginal improvements in government opportunity throughout the 1980s, with the liberation movement culminating

in South Africa's first legal, democratic election in 1994 (Republic of South Africa, 2015). Despite that formal government reform and moderate economic growth, government corruption has persisted, and public sentiment towards development efforts still bristles. The struggle for South Africa is a dual problem – that of fostering policy to increase growth and opportunity while continually reforming to prevent repeating the struggles of the mid-20th century.

2. EMPIRICAL ANALYSIS

2.1 Subjective Measures of Well-Being

A reliable estimation of subjective well-being requires a panel data structure to account for two key issues with self-reported measures. Statistical analyses of the determinants of self-reported well-being focus on the discrete observed perceptive measures, but the true value of these discussions lie in the ramifications of those analyses on the continuous unobserved realities underneath the discrete measures. Research in fields both economic and otherwise emphasize the sensitivity of these subjective measures to life events, (Heady 1993, Wonder 2012), but the degree of sensitivity is still unknown. For instance, considering changes in the discrete ratings, multiple individuals could report comparable discrete changes with vastly incomparable continuous changes. Consider a change in subjective well-being (on a scale from 1 to 10, 10 being the best well-off) reports for two individuals from six to seven. For the first individual, that change of one level could represent an increase in continuous, unobserved happiness from 5.8 to 6.8, while the second individual could be reporting a change from 6.3 to 6.6. Obviously, these two changes could substantially different in magnitude, and the Likert-style scale's insensitivity to the subtlety of change results in a persistent categorical error

in the reporting of subjective well-being. The bounded nature of such a scale often induces clustering of responses, especially at the top, which tends to overstate the diminishing marginal utility of increased consumption – or in the case of this study, increased involvement in civil and community activities - for individuals at the top of the highest levels of subjective well-being. A fixed effects panel approach is intrinsic to an appropriate accounting for these bounded data and individual systemic variation.

The pragmatic preference for panel regressions over ordinary least squares is founded on two assumptions of the nature of subjective well-being: unique consistency and dynamic adaptation. Measures of SWB are consistent in that individuals over time report their own welfare through the lens of their personal disposition and unique perceptions for all time periods, but OLS results assume the interpersonal comparability of subjective measures among individuals at different points in time. DiTella and MacCulloch (2006) affirm that combining individual happiness scores into groups forms a useful basis for drawing comparative conclusions about welfare. Panel regression controls for the individual idiosyncrasies and disposition of the respondent (which do not change over time), thus further affirming the assumption of comparative validity. Next, panel regression allows for examination of the "dynamic process by which individual perceptions of well-being change in response to changing circumstances" (Pudney 2008). As emphasized above, meaningful analysis on the dynamics of subjective well-being all but require an historical and path-oriented dataset. Panel regression methods accomplish this in allowing for the dynamic feedback of historical states into present measures.

2.2 Empirical Strategy

The modeling of subjective well-being is a complex and dynamic endeavor. A basic multivariate least squares regression will provide biased parameter estimates for a few key reasons. First, in a cross-section, the issue of self-selection cannot be ignored, especially in variables that match personality types – marriage and religious involvement, for example. In addition to the selection bias necessarily introduced through the cleaning of the data set, a cross-section is particularly troublesome for the variables of marriage and religion. The argument can be made that the effects of marriage and religion on subjective well-being will be overstated in a cross-section, as individuals who are preternaturally disposed to higher levels of satisfaction and perhaps more likely to be married (perhaps to someone also disproportionately disposed towards innate happiness) or be healthily involved in a religious community, which in turn increases their overall happiness. Additionally, the converse may be true: less happy individuals may seek out less happy individuals, may avoid marriage, or may withdraw from religious activities. The theory of this paper suggests that withdrawal from these civil institutions would decrease happiness, but that will not be made clear by ordinary least squares regressions biased with selection.

Secondly, deeply intertwined with the issues of selection is that of the idiosyncratic error. Given that subjective well-being is such a deeply personal - and often fickle - arena, any attempt at a suitable model must account for individual personalities and dispositions. A fixed effects model, at the suggestion of variable linkage in theoretical and empirical evidence, takes into account time-independent, individual-specific characteristics. For each person, over time, consistent with set point theory (Headey et al. 2005), the level of satisfaction will occupy a different baseline, and

necessarily interact differently even with similar circumstances. Thus, a fixed effects

specification is adopted. The fixed effect model, by essentially taking first differences of

the variables, divides each explanatory variable into a time-invariant, individual-specific

component and a time-variant component and then factors out that individual effect. The

benefit in this approach is to clarify misleading estimates by controlling for disposition,

provided that disposition remains constant over time. While a random effects model

might provide more desirable estimates, the correlation between the error term and the

individual life circumstances used to model subjective well-being cannot be overlooked.

Understanding that subjective well-being dynamically evolves over time, then

simple multivariate regression fails to account for the subtle interaction and

dependencies. Utilizing the domain framework (Layard et al. 2012; van Praag 2003)

previously established above incorporates the coevolution of life satisfaction with life

circumstances. In an attempt to extend the fixed effects model into an understanding of

the intertemporal realities of a dynamic life satisfaction, I employ an autoregressive

model to demonstrate the path dependency of life satisfaction. While that path

dependency is assumed throughout the model, it is empirically accounted for in the

autoregressive model. The hallmark benefit of the autoregressive model is the

incorporation of historical changes and the examination of how those changes feed into

current life satisfaction.

2.3 Regression Methods

This paper estimates a series of regression models in an attempt to explore and

identify the relative impact of the determinants of subjective well-being in the context of

individual experience and historical dependency. First, pooled linear regressions provide

initial comparisons for findings, and fixed effects regressions account for the panel structure of the data, testing whether errors are idiosyncratic or random. Lastly, an autoregressive term is added to the panel regressions, in both random and fixed effects, to further refine the precision of the estimates.

Pooled ordinary least squares regressions serve as a baseline for the effects of institutions on current happiness, grouped by wave. The model is a straightforward linear regression:

$$W_{it} = \alpha + \beta X_{it} + \gamma Y_{it} + \rho Z_{it} + \epsilon_{it}$$

with α a constant level of satisfaction, X the external factors of subjective well-being, Y_t the internal factors, Z the standard vector of controls, and ϵ_t the error term. These estimates will be necessarily biased upwards, as the errors will be correlated with the circumstantial determinants of subjective well-being – those individuals with higher satisfaction ratings will be more likely in situations conducive to increased life satisfaction. The most notable explanation for that bias is the time invariant characteristics of each individual that are intertwined with welfare. Treating the observations as a cross-section will give an initial understanding, but is too blunt a tool to derive precise estimates of causal influence under the assumptions of this study.

Panel regression improves on the estimates of the pooled OLS by accounting for the structure of the data; linking observations across waves accommodates the variety of individual surveyed, and especially captures the cultural and social differences, as well as the implicit changes in national attitude, policy, and economic environments. As mentioned before, the panel structure implicitly allows for the dynamic adaptation necessary to successfully model subjective well-being. Employing a fixed effect

specification assumes that individual, time invariant characteristics substantially impact subjective welfare. Starting with two period fixed effects model, the method subtracts the regressions for the two periods. The model for the individual becomes:

$$W_{it} = \alpha_i + W_{i,t-1} + \beta(X_{it} - X_{i,t-1}) + \gamma(Y_{it} - Y_{i,t-1}) + (\epsilon_{it} - \epsilon_{i,t-1})$$

where W_t is current life satisfaction in period t, α is the level of happiness determined by an individual's innate disposition and unique life experiences (which subtracted out, is zero in this model), X_t is the exterior domain of well-being, and Y_t is the vector of internal factors influencing subjective welfare. domains of well-being as discussed above, and ϵ_t is the error term.

TABLE 1: CHANGES IN RELIGIOUS IMPORTANCE RATING

	Wave to Wave		
	1 to 2	2 to 3	3 to 4
Less Religious	12.28%	16.39%	10.65%
No Change	71.91%	68.82%	71.86%
More Religious	15.81%	14.79%	12.49%

A fixed effect specification allows for an examination into the specific impact of a change in marital status, religious involvement, employment, and community factors over time apart from the dispositional lens through which individuals filter their circumstance (Layard et al. 2012). In this study, for example, religious difference does not vary for much of the sample (see Table 1). Initially of some concern, this apparent lack of variance is manageable in light of the fact that the regression yields significant estimates

for the religion variable. Note that the standard vector of controls is not included in the

fixed effect model, being subtracted out on the assumption of time invariance.

The random effects specification, on the other hand, assumes that the individual

errors do in fact have an influence in determining subjective well-being, and it does not

subtract out wholly the time invariant characteristics (demographics, living conditions,

etc.). The random effect of the model is absorbed into the error term, and thereby gives

parameters useful for an understanding the role of time invariant characteristics in the

determination of welfare. Additionally, the random effects regression allows for variation

in disposition, which is wrapped up in the constant term. The random effects model:

$$W_{it} = \alpha + \beta(X_{it}) + \gamma(Y_{it}) + (\epsilon_{it} + \mu_i)$$

where all variables are as specified above, but now the error term is broken up into

the between-observation error ϵ_t and the within-observation error μ. A Hausman test

confirms that the random effects model is insufficient in this case, and the theory

supports this confirmation – this model assumes that the errors are wholly uncorrelated

with the explanatory variables, and so the random effects results are not included.

Lastly, a panel auto-regression includes a lagged, auto-regressive term of life

satisfaction to examine the extent to which a person's history and experience form

current life satisfaction. The autoregressive model is similar to the random effects model,

but now instead of the divided error term, it includes that lagged term.

$$\omega_{it} = \alpha_i + \mu\omega_{i,t-1} + \beta(X_{it}) + \gamma(\varphi_{it}) + \epsilon_{it}$$

This estimation is used to explore the impact of path dependency, with the hopes of a

more precise estimation of subjective well-being. By incorporating a weighted historical

term, $\mu\omega_{t-1}$, this model factors in the partial correlation between lagged and present variables.

2.4 Data Set, Observation Requirements, and Variable Selection

This paper conducts analysis using a comprehensive panel data set from South Africa. As a result of the 1994 Statistics Act, the South African government conducts a series of national surveys and censuses. Since that act, the government has enacted three censuses, and a number of annual surveys on civil registration, labor force, and general household characteristics. In conjunction with that effort, a number of research and academic institutions conducted variations of those surveys.

The National Income Dynamics Survey (NIDS) is a continuing national panel survey developed and conducted by the Southern Africa Labour and Development Research Unit based in the University of South Africa, collected through a field and telephone survey every two years. This includes questionnaires conducted on the phone of the Continuing Survey Members (CSMs) and the Temporary Survey Members (TSM), the latter of which are included in waves in which they reside in the same household as a CSM. The NIDS contains a comprehensive Well-Being Module, and its fourth wave was just released in 2016. The 2008 study began with a nationally representative sample of over 28,000 individuals in over 7000 households across South Africa, and new waves are collected every two years. The appeal of the NIDS in studying subjective well-being is the comprehensive measures of subjective welfare, and the fact that it is the first such a study in South Africa and thus provides valuable opportunities to insight into the development process on a microeconomic level.

The dependent variable in this study is a subjective well-being rating, on a scale of 1-10, the levels of which are valid for intrapersonal and interpersonal comparison consistent with those, for example, of a Likert Scale. This variable is measured in two questions, attempting to capture past and present effects. The survey includes a question about current overall life satisfaction, "How do you feel about your life as a whole right now?" with responses ranging from 1, "very dissatisfied," to 10, "very satisfied."

FIGURE 3 - FREQUENCY DISTRIBUTION OF LIFE SATISFACTION
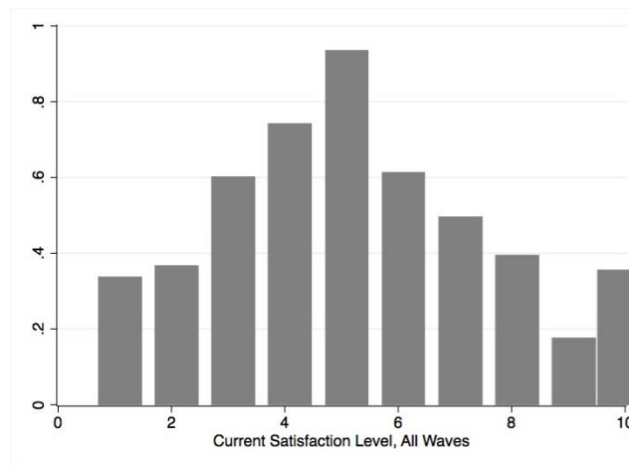
Additionally, the survey contains a self-reflective question, asking individuals to identify a broad level of happiness in comparison to 10 years ago. (In determining a final model, the similar variables about income step, past, present, and future are included as well.) These variables create a foundation for level comparison of subjective well-being, an aggregate measure of the holistic satisfaction with an individual's life, circumstances, and surroundings.

The determinants of subjective welfare studied in this paper are predominantly institutions of social stability – family, employment, community, and religion, with an

emphasis on family and religion as a driver of subjective well-being. The NIDS panel

contain the Well-Being Module, an eleven-question section of the survey, which asks a

host of questions attempting to capture subjective qualities of each individual's life. This

module contains the independent variables of interest for this study. The module also

includes measures of community strength, like preference to continue living in the same

place and trust of neighbors and strangers in community. The stranger trust question asks,

in the instance of losing a wallet or purse containing a large sum of money, "is it very

likely, somewhat likely, or not likely at all to be returned with the money in it?"

Figure 2: Significant Difference in Life Satisfaction

Waves	Difference in Mean	t Score
1 and 2	0.7091	17.0234
1 and 3	.04331	11.5520
1 and 4	-0.0508	-4.1895
2 and 3	-0.2837	-6.3684
2 and 4	-0.7596	-23.9961
3 and 4	-0.4758	-17.8813

The Well-Being Module also asks two questions about relative standing. First, it asks

individuals to classify the household in which they live, in terms of income, compared to

other households in the neighborhood. Next, it asks a series of questions involving a

hypothetical six step ladder ranking of people in South Africa, one being the poorest, and

six being the richest. The survey asks which step an individual considers their household

to be on at age 15 and today, and also about expected level two and five years from now.

Including measures of absolute and relative material standing allow for comparison and interaction between subjects and their environments. The expenditure variable used as a measure of absolute standing and as a basis for the relative standing variable eliminates several substantial outliers in the income responses and improves consistency of reporting. Outside of the Well-Being Module, other key measures of relative standing include a generated variable: distance in expenditure between household and average for their survey cluster. For each individual, the average consumption of their cluster is subtracted from their individual expenditure, revealing the relative wealth or poverty inside of clusters for each individual.

Crucial to the question of stability in civil institutions is marital status and children in the home; NIDS asks whether partners are living together or formally married, and asks the number of biological children living in the household. Placing a high value on the role of the nuclear family in an individual's life satisfaction, this study investigates marriage and children as unique drivers of subjective well-being, noting the benefits the institution of marriage and family provide in terms of social insulation and individual protection from exogenous shocks (Powdhatvee 2009), while allowing for the acknowledged benefits of less traditional family structures. Employment and hours worked are key components of subjective well-being, as they can measure an individual's level of engagement at work, and how that factors into satisfaction. It is the case that in this sample, though, the response rates for employment hours vary among waves in a way substantial enough to limit meaningful comparison.

The final independent variable of interest is that of religious importance. In contrast to prior studies which focus on religious involvement as a measure of community

participation, this study emphasizes the conveyance of values and worldview that self-reported religious involvement carries – beyond just a measure of how often an individual leaves the house, religious devotion entails a spiritual, personal, and introspective dimension which may factor in substantially to the disposition of an individual. Recent estimates of South African religious affiliation find that 80% of the population are Christian, while another four percent practice other religions, including Hinduism (1.2 percent), Islam (1.5 percent), Judaism (0.2 percent), and traditional African beliefs (0.3 percent). That leaves 15% of the population with no religious affiliation. The survey question used in the study asks, "How important is religion in your life?" It is scaled in this study, with zero being "Unimportant" and 3 being "Very Important."

TABLE 2 - RELIGIOUS IMPORTANCE BY LIFE SATISFACTION

Life Satisfaction	Not at all	Unimportant	Important	Very Important
1	5.12 %	8.17%	46.57%	40.14%
2	4.38%	7.43%	46.67%	41.53%
3	4.29%	5.98%	48.43%	41.31%
4	3.09%	6.15%	49.13%	41.62%
5	2.64%	5.08%	45.83%	46.45%
6	2.30%	5.20%	45.36%	47.14%
7	2.23%	4.10%	39.29%	54.39%
8	2.35%	3.66%	33.26%	60.73%
9	2.56%	2.92%	31.73%	62.79%
10	2.29%	3.40%	30.12%	64.18%

This study assumes that religion provides the discussed internal and social benefits regardless of affiliation, and therefore uses the self-reported measure of importance rather than any demographic religious information to derive subjective well-being. Table 2 shows life satisfaction scores for the sample, broken up by religious significance. Note that the overwhelming majority of individuals who reported the highest levels of life satisfaction (8,9,10) also reported that religion was "Very Important" in their lives.

A key idea tested by this model is the uniqueness of religion as a determinant of well-being. Much of the literature (Mochan and Ariely 2011, Binder and Ward 2013, Binder and Coad 2012) treats religion as one of many community activities, and although it does culturally represent a significant measure of community integration, it may carry much more weight in determining subjective well-being. I theorize that the personal vector of belief, disposition, self-confidence, and worldview that religious involvement conveys necessitates an accounting for in this model. Therefore, I include religion not as a measure of community participation, but utilize the NIDS's self-reported religious importance variable to attempt to capture that vector of worldview and disposition and personal values.

Two key restrictions on dependent variables arise due to the construction of the survey and response rates. In this study, the work variable is an economic activity report. Initially, the model was developed with the idea that work hours per week and work hours per week squared would model the importance of gainful employment on well-being and at the same time capture the diminishing returns to happiness of work; that is, those who work extremely few hours or extremely many hours would see some diminishment in their SWB. In the case of this study, though, unclear reporting and

nonresponse dictated that the employment hours variable be dropped. Attempts were

made to include other qualitative measures of employment status; for instance, the

occupational codes and self-employment measures were incorporated, but the

nonresponse was so great that not enough variation exists to meaningfully influence the

regression. For that reason, this model uses economic activity, divided into four

categories - economically inactive, unemployed and discouraged, unemployed and

looked, and employed. This allows for varying levels in stages of employment and is

	Wave 1	Wave 2	Wave 3	Wave 4	All Waves
TABLE 3- SUMMARY STATISTICS OF KEY VARIABLES					
Current Satisfaction	5.43	4.73	5.01	5.48	5.18
	(2.42)	(2.47)	(2.41)	(2.31)	(2.41)
Married	0.32	0.27	0.27	0.26	0.28
	(0.46)	(0.44)	(0.45)	(0.44)	(0.45)
Cohabitating	0.10	0.08	0.08	0.08	0.09
	(0.30)	(0.27)	(0.27)	(0.28)	(0.28)
Widowed	0.09	0.09	0.09	0.10	0.09
	(0.29)	(0.28)	(0.28)	(0.30)	(0.29)
Divorced	0.03	0.02	0.02	0.02	0.03
	(0.18)	(0.15)	(0.15)	(0.15)	(0.16)
Economically Inactive	0.35	0.51	0.44	0.42	0.43
	(0.48)	(0.50)	(0.50)	(0.49)	(0.50)
Importance of religious activities	2.30	2.36	2.36	2.40	2.36
	(0.77)	(0.76)	(0.73)	(0.69)	(0.73)
Likeliness of stranger returning wallet	2.84	2.69	2.71	2.78	2.75
	(0.47)	(0.64)	(0.60)	(0.53)	(0.57)
Age (years)	40.11	39.29	39.62	39.08	39.46
	(16.77)	(16.97)	(16.98)	(16.78)	(16.88)
Highest school grade completed	7.87	7.97	8.27	9.16	8.40
	(4.12)	(4.13)	(3.97)	(3.20)	(3.85)
Obs.	11183	13289	15437	19262	59171

more sensitive to variation in the disposition and reaction of individuals to employment status.

Lastly, controls commonly used in the literature are necessary to test the composition of subjective well-being. This includes measures of objective housing quality, absolute expenditure, access to piped water and indoor toilets, and demographics like age, race, language spoken at home, and gender. Note that age is squared, as is standard in the literature, while the rest of these controls are binary variables. Variables for household size and number of children are calculated by the household groups in the survey. Additionally, the responses for those children are removed, as this survey concerns all adults 18 and older.

An indicator variable for owning a bank account is applied to capture a measure of integration with modernity and trust in institutions. Especially for individuals in poverty, the luxury of a bank account can be hard to come by, but in a nation with developing institutions plagued by corruption in government, the faith in a bank to keep wealth represents a greater faith in the social contract, and so that banking variable can serve as a control for modernity and for faith in institutions. These population controls are included in the pooled OLS baseline regressions, but most are subtracted out in the fixed effects regressions, as explained in further detail below.

2.5 Results and Discussion

OLS provides a baseline for comparison of parameters, listed in Table 3 below. In all four waves, marriage has a positive significant impact on well-being, relative to not being married, although cohabitating is insignificant. Consistent with theory, this suggests that

individuals who are generally more satisfied with life are perhaps more likely to get

married, offering a potential explanation for the difference in bias between the married

and cohabitating indicators.

TABLE 3 - OLS BY WAVE

	(1) Wave 1	(2) Wave 2	(3) Wave 3	(4) Wave 4
Married	0.054 (0.066)	0.073 (0.075)	0.160** (0.062)	0.163*** (0.053)
Cohabitating	0.018 (0.083)	-0.162* (0.097)	0.005 (0.083)	-0.114 (0.075)
Unemployed Discouraged	-0.242** (0.105)	0.010 (0.157)	-0.186 (0.138)	0.659*** (0.152)
Unemployed Looking	-0.195** (0.088)	-0.101 (0.087)	-0.124* (0.069)	-0.071 (0.067)
Employed	0.021 (0.069)	0.113 (0.069)	0.082 (0.056)	0.147*** (0.048)
Religion Unimportant	-0.035 (0.156)	0.403** (0.162)	-0.171 (0.147)	0.079 (0.144)
Religion Somewhat Important	0.063 (0.129)	0.565*** (0.137)	0.157 (0.128)	0.111 (0.140)
Religion Very Important	0.270** (0.135)	0.948*** (0.138)	0.640*** (0.123)	0.288** (0.139)
Likeliness of stranger returning wallet containing R250	-0.080 (0.080)	0.450*** (0.081)	0.117* (0.069)	0.372*** (0.060)
Preference to continue living in current area	-0.071*** (0.025)	0.020 (0.031)	-0.126*** (0.023)	-0.134*** (0.022)
Relative Expenditure	-0.0108 (0.256)	-0.0127 (0.127)	-0.0245 (0.189)	-0.00404 (0.045)
Absolute Expenditure	0.0226*** (0.375)	0.0189** (0.248)	0.0497*** (0.365)	0.0234** (0.0216)
Level of happiness in comparison to 10 years ago	-1.064*** (0.041)	-0.691*** (0.059)	-0.736*** (0.041)	-0.776*** (0.034)
Age	-0.021*** (0.008)	-0.002 (0.007)	-0.023*** (0.007)	-0.052*** (0.007)
Perceived health status	0.036 (0.023)	0.230*** (0.034)	0.087*** (0.027)	-0.019 (0.027)
Regular Exercise	0.146** (0.058)	0.178** (0.073)	0.430*** (0.059)	0.280*** (0.052)
Household Size	0.017 (0.011)	-0.012 (0.010)	0.023** (0.010)	0.004 (0.010)
Highest school grade completed	0.035*** (0.008)	0.020** (0.009)	0.003 (0.008)	0.017** (0.008)
Constant	6.922*** (0.419)	2.365*** (0.428)	4.639*** (0.403)	5.458*** (0.329)
Number obs.	10703	12663	15270	17983
R^2	0.29	0.24	0.22	0.16

Standard errors in parentheses
The dependent variable is life satisfaction. Observations are broken up by wave.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In the OLS regressions, a self-assessment that religion is "very important" is

significantly positive on well-being, while the varying degrees of importance are mostly

insignificant, compared to the baseline religion being unimportant. Again, these are

consistent with theory, but necessarily biased upward in a cross-section, as discussed

above. Economic inactivity insignificant across all waves, further indicating the

insufficiency of this model to accommodate theory. The community variables are inconclusive, as high levels of trust in a stranger are only significant in Waves 2 and 4. Preference to remain living in current neighborhood is expectedly negative and significant in three waves. The key demographic indicators of regular exercise, expenditure, access to piped water, owning a bank account, and subjective health rating are all expectedly signed and significant. These estimates may be biased, though, due to the fact that the independent variables are correlated to the idiosyncratic error term – that is, individuals who exercise more, for instance, are generally happier in the first place than those who do not exercise regularly, confounding the effect of the actual independent variable with the effect of a person's innate disposition.

Two attempts are made to address that correlation of the error terms. First, I run a fixed effects panel regression. In the fixed effects model (Table 4), marriage is positive, yet insignificant, while living with a partner is positive and significant, relative to never having married. Considering the consistency across models with which I find this result, perhaps an assumption about the importance of formal marriage in the culture of South Africa is flawed. It appears to be the case that long-term couples living together in whatever capacity appear to be happier than their non-married/cohabitating counterparts, indicating that the positive effect on well-being of a family unit exists, yet does not exactly take the anticipated form. Religious importance is significant; higher levels of importance are associated with increases in life satisfaction. Economic inactivity, as expected, is negative and significant, confirming that employment and even the hope for employment are positively associated with higher subjective well-being. Community variables in the fixed effects are both significant and signed consistent with expectations:

higher levels of trust in the community are associated with increases in subjective well-being, and stronger desires to leave the neighborhood are associated with decreases in subjective well-being. Comparisons to ten years ago also were significant in determining subjective well-being; considering oneself less happy today than ten years ago is associated with a significant decrease to current well-being. As in the OLS models, the demographic indicators of regular exercise, expenditure, access to piped water, owning a bank account, and subjective health rating are all expectedly signed and significant.

The fixed effects model, while a marked improvement over the OLS estimates, still has some unique flaws. First, the model only captures the fixed effects included in the model. Two specifications are evaluated, one with just individual fixed effects, and another with a year fixed effect. Including the year fixed effect just provides another avenue through which the model can account for unobserved changes – it is likely the case that the circumstances, laws, global economy, and national attitudes in South Africa were different in all four waves, and the year effect captures some of that in our estimates. In short, it is difficult to capture disposition wholly, and that disposition may even change over time itself. So, while attempts are made to account for individual and cultural effects, there are still some uncaptured effects. Secondly, an inherent limitation is that this is not an experiment; despite attempts to include all possible significant influences, this fixed effects regression does not represent a complete set of controls. Due to the non-experimental nature of the analysis, it is possible that there are lurking time variant unobservable influences unaccounted for in the model. Further research can seek to capture these unobservable and continue to refine these estimates towards a more precise model of subjective well-being.

TABLE 4 - FIXED EFFECTS AND AUTOREGRESSIVE MODELS

	(1) Individual Fixed Effects	(2) Wave Fixed Effects	(3) AR Individual	(4) AR Wave
Married	0.104 (0.074)	0.039 (0.074)	-0.000 (0.113)	-0.011 (0.113)
Cohabitating	0.183** (0.079)	0.147* (0.078)	0.231** (0.110)	0.227** (0.110)
Unemployed Discouraged	0.074 (0.097)	0.005 (0.094)	0.088 (0.121)	0.091 (0.121)
Unemployed Looking	0.132** (0.058)	0.054 (0.056)	0.038 (0.067)	0.042 (0.068)
Employed	0.272*** (0.051)	0.177*** (0.050)	0.199*** (0.059)	0.194*** (0.059)
Religion Unimportant	0.175 (0.114)	0.140 (0.109)	0.221 (0.147)	0.229 (0.147)
Religion Somewhat Important	0.197** (0.099)	0.181* (0.095)	0.269** (0.123)	0.282** (0.123)
Religion Very Important	0.545*** (0.100)	0.549*** (0.095)	0.702*** (0.124)	0.714*** (0.124)
Likeliness of stranger returning wallet containing R250	0.322*** (0.044)	0.274*** (0.043)	0.260*** (0.032)	0.261*** (0.032)
Preference to continue living in current area	-0.068*** (0.017)	-0.068*** (0.017)	-0.106*** (0.018)	-0.104*** (0.018)
Relative Expenditure	-0.0143 (0.149)	-0.0106 (0.109)	--0.0137 (0.187)	-0.0119 (0.158)
Absolute Expenditure	0.0215* (0.217)	0.0174* (0.178)	0.0186** (0.261)	0.0164* (0.227)
Level of happiness in comparison to 10 years ago	-0.781*** (0.029)	-0.772*** (0.029)	-0.697*** (0.027)	-0.692*** (0.027)
Age	-0.027 (0.019)	0.030 (0.046)	0.117*** (0.027)	0.104*** (0.028)
Perceived health status	0.054*** (0.019)	0.080*** (0.019)	0.089*** (0.019)	0.091*** (0.019)
Regular Exercise	0.265*** (0.044)	0.234*** (0.044)	0.225*** (0.054)	0.223*** (0.054)
Household Size	0.007 (0.009)	0.016* (0.009)	0.027** (0.011)	0.028** (0.011)
Highest school grade completed	0.016 (0.016)	-0.002 (0.015)	-0.051** (0.024)	-0.046* (0.024)
Wave Fixed Effects	Yes	Yes	Yes	Yes
Constant	5.295*** (0.665)	2.998 (1.844)	-0.423 (0.458)	-0.028 (0.539)
Number obs.	56619	56619	29029	29029
R^2	0.09	0.11	0.0546	0.0868

Standard errors in parentheses
The dependent variable is life satisfaction.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The second attempt to account of correlation of error terms also addresses the mutual endogeniety in the composition of subjective well-being by incorporating an autoregressive term into the model. A Wooldridge test for autocorrelation in the life satisfaction data indicates that we cannot reject the null hypothesis of no first order autocorrelation (F=2.338, p = .1263), but theory of path dependency in subjective well-being and the shortness of this panel suggest that the AR model is an appropriate inclusion in this study. This autoregressive term comes at a cost – it brings down the average number of observations per group to 1.8 from the 2.1 in the fixed effects model.

Notable in the autoregressive model is the consistency among the married and cohabitating parameters – as above, marriage is insignificant, whereas cohabitating is positive and significant. In this specification, employment status is stricter; the discouraged and unemployed conditions are insignificant, while employment positively affects subjective well-being. Religious importance retains the structure of stronger, positive effects on well-being as importance levels increase. Community variables are similar to the fixed effect models, with higher levels of trust in the community and preference to live in the same neighborhood associated with an increase in subjective well-being. The demographics indicators retain their significance in this model. The similarities between the fixed effects panel and the autoregressive model are due to the short panel; autoregressive estimates may improve as the panel continues and more observations are gathered.

2.5.1 Robustness

Regressions are tested for robustness in two specifications beyond the incorporation of a wave variable. First, an autoregression is run separated for male and female, and then second, for those individuals with incomes higher than their cluster and those with incomes lower than their cluster. In the gender specification, married or cohabitating females are not significantly happier than their unmarried counterparts. Religious importance retains its structure of increasing impact on increasing levels, affirming the theory that religious involvement plays a prominent personal role in determining subjective well-being. The coefficient and significance on employment is higher than the both-gender regression, indicating that the marginal benefits of employment to females is larger than to males. Additionally, unemployment but

searching for a job is slightly significant and positive, suggesting that mere participation in the labor force yields dividends for the well-being of females in a developing economy. The demographic controls maintain their significance, although education is insignificant in this specification for females, perhaps due to the disparity between men and women in educational attainment of South Africa resulting in less variation in this specification. On the whole, though, the structure of this regression remains fairly similar to the original specification, suggesting the appropriateness of all past models, including the AR model in deriving a subjective welfare function for individuals of both genders.

In the second specification, those individuals whose relative expenditure is negative (henceforth referred to as "relatively poor" for brevity and clarity), neither marriage nor cohabitation are significant in the determination of subjective well-being. Additionally, religious importance loses some of its weight for the relatively poor – still associated with an increase in well-being, but not to the extent of earlier specifications. In general, the community variables retain their significance, but the demographic controls lose significance. From this regression, it appears that for the very worst off, materially, in this survey, comparison is much more important in determining satisfaction, consistent with the literature. A relatively poor individual's preference to remain living in the neighborhood and trust in strangers in the neighborhood reflect strongly on their well-being; for those relatively poor, the barometer of their immediate peers and surroundings drive welfare. Additionally, the intrapersonal comparison to the past plays an immense psychological role in current satisfaction – individuals who indicate they are less happy compared to the past show consistent decreases in current satisfaction, demonstrating a

TABLE 5 - ROBUSTNESS CHECKS FOR GENDER AND WEALTH

	(1) Female	(2) Male	(3) Relatively Rich	(4) Relatively Poor
Married	-0.069 (0.198)	0.017 (0.139)	-0.461 (0.370)	0.097 (0.167)
Cohabitating	0.065 (0.174)	0.345** (0.144)	0.115 (0.399)	0.379** (0.154)
Unemployed Discouraged	0.141 (0.229)	0.078 (0.143)	-0.080 (0.401)	0.117 (0.167)
Unemployed Looking	0.272** (0.117)	-0.070 (0.084)	-0.337 (0.226)	-0.031 (0.100)
Employed	0.364*** (0.101)	0.111 (0.073)	-0.031 (0.179)	0.056 (0.088)
Religion Unimportant	0.258 (0.185)	0.198 (0.246)	0.205 (0.526)	0.176 (0.203)
Religion Somewhat Important	0.259* (0.155)	0.320 (0.207)	0.326 (0.459)	0.289* (0.169)
Religion Very Important	0.673*** (0.158)	0.766*** (0.207)	0.898* (0.460)	0.687*** (0.169)
Likeliness of stranger returning wallet containing R250	0.227*** (0.055)	0.276*** (0.040)	0.232** (0.090)	0.247*** (0.049)
Preference to continue living in current area	-0.119*** (0.028)	-0.099*** (0.023)	-0.138*** (0.049)	-0.075*** (0.026)
Relative Expenditure	-0.0103 (0.087)	-0.129 (0.137)	-0.0291* (0.097)	-0.0117** (0.010)
Absolute Expenditure	0.0162** (0.141)	0.0175* (0.178)	0.0253** (0.095)	0.133** (0.011)
Level of happiness in comparison to 10 years ago	-0.668*** (0.045)	-0.707*** (0.034)	-0.614*** (0.083)	-0.714*** (0.040)
Age	0.108** (0.045)	0.110*** (0.036)	0.139 (0.115)	0.124*** (0.041)
Perceived health status	0.098*** (0.031)	0.087*** (0.024)	0.086 (0.053)	0.086*** (0.029)
Regular Exercise	0.238*** (0.076)	0.203*** (0.077)	0.130 (0.133)	0.186** (0.084)
Household Size	0.013 (0.019)	0.038*** (0.014)	-0.028 (0.036)	0.027 (0.020)
Highest school grade completed	-0.053 (0.040)	-0.041 (0.030)	0.067 (0.086)	-0.093*** (0.034)
Wave Fixed Effects	Yes	Yes	Yes	Yes
Constant	0.182 (0.789)	-0.468 (0.729)	0.593 (0.789)	-0.841 (0.531)
Number obs.	11189	17840	5947	15926
R^2	0.0426	0.0819	0.0948	0.0590

Standard errors in parentheses
The dependent variable is life satisfaction. The groups are separated by gender and relative standing to test the robustness of the autoregressive model.
$^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

feedback loop consistent with the hedonic treadmill theory in the literature (Bottan and Truglia 2011). This finding, in line with the literature, refines the theory of this paper in suggesting that the foundations of well-being are laid in contextual perception of one's life circumstances. Hearkening back to Layard et al. (2012), it would appear that in the absence of material satiation, the "filter" for life experiences becomes more competitive and outward. Perhaps it is the case that for the individuals in this sample, community plays a larger role implicitly in determining subjective well-being, as respondents look to friends and neighbors to affirm their present life stations.

These robustness checks have important ramifications for policy and government in South Africa. The diverse landscape of the South African populace demands a governmental approach that focuses on individual well-being and access to opportunity. The sensitivities to rich and poor, especially, in this model suggest that community-level improvements in infrastructure would yield large returns to individual well-being, especially in the most economically devastated communities. Additionally, seeing how important employment is for women, policies that facilitate training and hiring of women into the workforce could yield large gains in the well-being of the nation.

3 Conclusion

Economic research is working towards an understanding of the non-material elements of poverty and development. Drawing on existing theory about set points of happiness and hedonic feedback, this paper examines specific drivers and the path dependency of life satisfaction in South Africa, and finds that religious involvement and membership in a family unit are important drivers of subjective well-being. Additionally, robustness checks find that women in this sample are more sensitive to gains in subjective welfare from employment, and low income individuals are more inclined to use interpersonal comparison when evaluating their life states.

This paper attempts to control for issues of mutual endogeneity in life circumstances and satisfaction by capitalizing on panel data structure of the National Income Dynamic Study and an historical term, accounting for the intertemporal interplay of subjective welfare, estimating the contribution of religious involvement and marriage to subjective well-being. Having established that individual welfare extends into the circumstances of life situation, the anatomy of this well-being – this current rating of life circumstances

and subjection perceptions - must be considered. Subjective well-being is comprised of various domain satisfactions; these domains of the interior life, a kind of "filter" of lived experience, compound with external, contextual domains to determine an individual's welfare. Much of economic welfare research thus far has evolved out of cross sectional data and into panel data analysis, an admirable and necessary shift for the field. This paper aims to unify themes in the expansive literature on subjective well-being to embellish an economic understanding of the lasting effects external and internal social domains have in determining an individual's life satisfaction. Understanding that subjective well-being dynamically evolves over time, then simple multivariate regression fails to account for the subtle interaction and dependencies.

This paper conducts a series of regression models in an attempt to explore and identify the relative impact of the determinants of subjective well-being in the context of individual experience and historical dependency. Panel regression improve on the estimates of the OLS by accounting for the structure of the data; linking observations across waves accommodates the variety of individual surveyed, and especially captures the cultural and social differences, as well as the implicit changes in national attitude, policy, and economic environments. I find that the autoregressive model does not substantially improve parameter estimates, most likely due to the short structure of the panel. The autoregressive model does confirm the impact of religious involvement and family units, both positively significant in all models. The strength of religious importance directly correlates to increased life satisfaction, and individuals in family units (married or cohabitating) show increased levels of satisfaction, although the anticipated effect of formal marriage does not show in the data.

The ramifications from this finding are key understandings for government agencies concerned with maximizing development in the context of human flourishing. The policy aim of "maximizing human flourishing" is an especially important one in a situation such as South Africa. Currently, the government does not have a cohesive policy focus. While women and people of color are presented with more opportunities in the wake of apartheid, those opportunities are still limited. Both quality of life and economic development are hampered by the concentration of wealth and power into a small group of elites in South Africa. Continuing to focus on individual opportunity and expanded access to opportunity must be a primary concern of South African government looking to serve their citizens and improve economic development.

First, limitations of this study need to be addressed to contextualize these findings. The paramount limitation of this study is of course the issue of selection bias inevitably accompanying such rigid restriction of the data. The sample for this population includes only those respondents to all four waves of the NIDS. The non-randomness of this sample must be acknowledged. Given this study's central focus of social institutions and stability in determining subjective welfare, there certainly is some underlying bias that clouds the mechanisms at work in path-dependent subjective welfare as examined in this paper. While that bias is notable and worthy of acknowledgement, for the present, the results of the paper report still provide foundational insights about the procedural and theoretical considerations of modeling subjective well-being in panel data sets.

In terms of maximizing human flourishing, South Africa is in a unique position to continue to refine foundational institutions that will directly benefit both the subjective and objective welfare of its citizens. Recent literature suggests that small policy changes

in specific arenas can create ripples of increased happiness across a nation (Layard et al. 2012, Helliwell 2004). From the analysis above, I find four areas for policy focus in South Africa: employment, community, religion, and family. To encourage higher levels of subjective well-being outside of monetary increases, governments could address some specific policies. First, continuing to expand opportunity for work force participation. Additionally, the government would do well to institute an Earned Income Tax Credit, where low income workers are relieved of tax burdens for earning a salary; the regressions above confirm that meaningful employment is crucial to subjective welfare. Additionally, attempts to increase community satisfaction may yield results through infrastructure improvements, like community piped water, street and neighborhood repair, and reexamined zoning laws. Religious involvement, the most personal of all aspects analyzed in this study, is the most tenuous arena for government to target. This looks most like solidifying freedom of practice laws and allowing religious institutions tax exemption to unburden their existence and serve their adherents best. Finally, given the revelations about family structure from this analysis, expanding tax deductions for households consisting of couples living together, whether formally married or not. Slight nudges in policy in these four arenas could yield substantial returns to national well-being.

This results of this paper confirm that for individuals in South Africa, religious involvement and membership in a family unit are important drivers of subjective well-being. Further research into subjective well-being would benefit from an inclusion of these findings to better develop an individual non-monetary welfare function. Opportunities for extensions in the study of subjective welfare in South Africa include

more refined autoregressive estimates as more waves come out, and continued

examinations of the discrepancies between male and female curves as the society

continues to modernize. South Africa is a nation with a lot of economic opportunity, and

concerted government efforts to ensure human flourishing through access to opportunity

are key in the health of the nation.

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