SECURITY VERSUS INCOME IN THE BATTLE FOR QUALITY OF LIFE

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Masters of Arts
in Security Studies

By

David Bredhoff, B.S.

Washington, DC
November 19, 2010
Copyright 2010 by David Bredhoff
All Rights Reserved
SECURITY VERSUS INCOME IN THE BATTLE FOR QUALITY OF LIFE

David Bredhoff, B.S.

Thesis Advisor: Tammy Schultz, Ph.D.

ABSTRACT

Security Studies, at its core, analyzes how humans behave to preserve and improve their quality of lives. This paper thus examines quality of life as the dependent variable of analysis and exams the relationship of the two most commonly ascribed variables that effect it; security and economic growth. This analysis takes these leading variables side-by-side over the course of 30 years through the vector of 60 populations as of 1980 to determine which variable has a stronger relationship to influencing quality of life. This paper hypothesizes that both security and economic growth will have statistically significant relationships with quality of life and that security will have a stronger strength of relationship. However, the results show that while both are statistically significant, economic growth, in fact more strongly relates to quality of life.
Contents

Narrative ........................................................................................................................................ 1

  Policy Implications .................................................................................................................. 2
  Literature Review .................................................................................................................... 3
  Definitions, Data and Methodology ......................................................................................... 12
  Findings and Analysis .............................................................................................................. 22
  Bibliography .............................................................................................................................. 27
Narrative

This analysis aims right to study what impacts the end-goal of human motivation; quality of life. It does so with a focus on the quality of life outcomes for undeveloped states that have need for improvement. It defines quality of life simply with life expectancy in order to increase the amount of observations due to poor data availability of multiple indicators and life expectancies’ high correlative relationship with other health indicators.

In order to improve quality of life, strategists frequently debate whether economic development or human security plays a greater role in improving environments that lack both. Theoretically, on the micro-level, security and economic development are dependent on each other. In order for development to occur, an actor must believe that she will be able to secure the benefits of her work; otherwise the incentive to conduct business vanishes. On the other hand, without a base of economic development, an actor to purchase basic resources such as food, clothing, shelter and health services, individuals are more likely to resort to violence and theft.¹

Conventional wisdom dictates that security must first be established before economic and quality of life improvements may occur. Secretary of State Hillary

Clinton poignantly describes this viewpoint regarding the United States Afghanistan strategy:

But it is a kind of a chicken-and-an-egg issue. We want to focus on development, particularly agriculture, rule of law, good governance, economic development, women’s employment, those kinds of issues. But in order to operate in many of the places in Afghanistan, you have to have a level of security.  

In addition to testing the veracity of the conventional wisdom asserting that security is a necessary prerequisite for economic and civil development, this research examines the question of whether a critical level of security must exist, after which economic development may commence. It also examines the dynamics of how positive or negative swings in human security and economic development affect each other as well as quality of life.

Policy Implications

Quality of life has direct implications to U.S. strategic objectives. Although quality of life of the world’s weakest populations is infrequently discussed directly as primary component of the U.S. strategic objectives, it has many implications on U.S. military outcomes. In order to acquire battlefield dominance, particularly with regard to counterinsurgency strategy, the U.S. must understand what it takes to improve the quality of life of the population. Accordingly, the center of

gravity of counterinsurgency campaign rests within the allegiance of the
population being fought over. Convincing the population in question that it will
have a higher quality of life if it sides with the counterinsurgent over provides the
simplest way to defeat the insurgent.³

Improving quality of life also impacts the efficacy of post-conflict stability
and reconstruction operations. In order to sustain order and rule of law, a
government needs a base of healthy and educated citizens to create viable
security forces and government administrators.⁴ Further, in addition to improving
quality of governance, a more educated and healthier population can also offer
greater support in the global fight against terrorism, providing a national security
dividend to the U.S.⁵

**Literature Review**

The most comprehensive literature regarding explanations and
interpretations of low quality of life is *Voices of the Poor*, a series of three books
commissioned by the World Bank that analyze interviews with over 60,000
impoverished people from 50 different countries. The reports attempted to
address the concept of quality of life by gathering impoverished perceptions of
good and bad lives, day-to-day priorities, assessments of interactions at public
forums such as the markets and civil institutions, how they coped with declines

---

in well-being, and how those coping strategies affected their lives.⁶ This methodology of interviewing people for their perceptions on quality of life is important because it shows how the concept of quality of life is relative to specific environmental conditions and cultural characteristics that people live within. Recognizing the complexity inherent in the variable quality of life, this does not attempt to capture a comprehensive mapping of quality of life due to the concept’s potential to have variance across groups with similar life outcomes, but different perceptions.

The consultations involved both poor urban settlements and rural villages and were primarily conducted by local experts rather than foreign social scientists to promote free expression of ideas and full comprehension of cultural implications.⁷ The study found that the poor primarily felt left out of the assistance process by their local governments, which corrupted well-intended but wasteful development programs.⁸ Additionally, the poor voiced discontent that they were ostracized from mainstream society and left out of delivery of public goods, even if civil laws mandated their inclusion. This led to relative notion of quality of life based on the existence of extreme poverty in the presence of a ruling class that had disproportionate power. Therefore, this analysis will

---

⁷ “Voices of the Poor: Reports.”
measure the percentage of people living in extreme poverty as another indicator of quality of life.

The study also concluded that poor qualities of life involved lacking food and assets and the powerlessness of dependency on others. As a result, infrastructure and public utilities emerged from the analysis as a critical medium that can improve the quality of life for across social strata in a given population:

Roads and transportation both increase physical and social connectedness and increase prices obtained for crops and products. Roads even to the next village are seen as expanding people’s options and access to services. Access to clean drinking water and water for irrigation frequently emerges as a distinguishing characteristic between the poor and the rich.9

Previous research has examined the linkages between both economic and security measures as they relate to quality of life. From its interviews, *Voices of the Poor* came to a summary assessment that security as the main obstacle to moving out of poverty and improving quality of quality of life.10

In addition to improving perception of quality of life, security plays a paramount role in stabilizing war-stricken areas and setting the building blocks for political and economic development as dividends of peace. In *Keeping the Peace*, Byman argues that establishing control of a population by eliminating violence carries paramount importance in post-conflict environments.11

---

9 Deepa et al. “Voices.”
As a modern example of emphasizing violence reduction as a pre-requisite to other areas of societal development, the Australian-led International Force for East Timor (INTERFET) implemented a Counterwar Strategy in East Timor. Australian forces prioritized mastering the conflict environment and intensively engaged locals to control violence rather than achieving policy ends through creating violence. These control tactics have since served as a model for counterwar strategy that used counterinsurgency tactics to immediately suppress disorder and violence on route to establishing and maintaining peace.

In *Winning the Peace*, Robert Orr assesses that security encompasses the provision of collective and individual security and is the precondition for achieving successful outcomes in the other pillars. Accordingly, once control has been established, responsive governmental institutions can grow, which Byman argues provide the best long-term strategy guy to future conflict. Power-sharing offers incentives for both emerging groups and established elites to preserve and work within institutions. Causal linkages have been established between strong institutions and conflict prevention, even in ethnically divided societies that are prone to conflict.

---

15 Byman, “Keeping the Peace,” p. 216.
16 Byman, “Keeping the Peace,” p. 216.
Classical research by Abraham Maslow underpins the argument that security is paramount to quality of life from a psychological perspective. According to Maslow’s Hierarchy of Needs, humans must first meet their basic needs prior to moving on to higher forms of social needs associated with development.\(^\text{18}\)

Maslow’s Hierarchy of Needs\(^\text{19}\)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physiological – Survival, breathing, thirst, hunger, sex</td>
</tr>
<tr>
<td>2</td>
<td>Security – Physical safety, freedom from attack</td>
</tr>
<tr>
<td>3</td>
<td>Social – Sharing love, affection, feeling belonging</td>
</tr>
<tr>
<td>4</td>
<td>Esteem – Achievement, reputation</td>
</tr>
<tr>
<td>5</td>
<td>Self-Actualization – Reaching full potential through marrying professional</td>
</tr>
<tr>
<td></td>
<td>pursuits with personal joys.</td>
</tr>
</tbody>
</table>

Maslow’s research has important implications for the process in which the pursuit of quality of life may occur based on his hierarchical conclusions. Accordingly, if humans have not met basic physiological needs, they will live lives solely based on securing basic resources to carry out necessary physical needs. If people do not feel safe in their environment, they will devote their efforts to securing themselves rather than taking measures that most efficiently maximize


\(^{19}\) Maslow. “Theory of Motivation.” Author’s note: the chart referenced is a summary paraphrasing of Maslow’s original work.
their economic gain. Thus, according to Maslow, only after safety needs have been sufficiently met, will humans be able to pursue economic gains.

Despite the prevalence of influential literature concluding that security is paramount in creating quality of life, equally compelling arguments can be made that economic development plays a more important role. Renowned economist Amartya Sen directly equates quality of life to societal economic growth.\textsuperscript{20} Sen operates on the definition of quality of life as the sum of capabilities available to individuals. According to Sen, increasing income, by definition, increases the capabilities of individuals. Increasing capabilities of individuals across a society derivatively increases the quality of life of a society.

Sen additionally adds the nuanced perspective that quality of life is greatly influenced by distribution of economic growth across a population.\textsuperscript{21} Due to decreasing marginal returns to increases in individual income, if all of the economic growth were concentrated in the hands of one individual, economic growth would not efficiently increase the quality of life of a society. This theoretical deduction coincides with the direct accounts from \textit{Voices of the Poor} that extreme poverty in the face of wealth is particularly disturbing to the quality of life.

\textsuperscript{21} Development Vol. 1, No. 1, 2000.
\textsuperscript{ibid.}
For example, if instead of distributing income gains solely into the coffer of one wealthy individual, economic growth was distributed between several households in need of education and health care, indicators of quality of life would increase at far greater rates. Thus, the impact of economic development on a state’s quality of life may increase or decrease based on how personal income is distributed across the state’s population.

In addition to variations in income distribution affecting the ability of economic growth to lead to quality of life growth, other variables have also shown to affect economic growth as it relates to quality of life. Subhir and Ravallion demonstrate that the effectiveness government administration of resources significantly impacts the ability of societal income gains to translate into quality of life gains.\textsuperscript{22} Von Braun demonstrates that gender differences in decision makers of resource allocation as accounting for greater utilization of economic gains for quality of life.\textsuperscript{23} Accordingly, in Gambian households, when women controlled resource allocation, household calorie consumption increased.\textsuperscript{24} Therefore, research has shown that multiple variables fluctuate the capability of economic growth to cause growth in quality of life.

Although economic growth has some theoretical drawbacks for consistently precipitating gains in quality of life, a growing range of scholars have

\textsuperscript{24}Ibid.
recently endorsed the theory that poor economic performance leads to a higher risk of internal conflict, thereby preventing the chance for security gains to increase quality of life.\textsuperscript{25} As the graph below demonstrates, as state income increases, the likelihood of entering civil war declines precipitously before reaching a plateau at approximately $2,000 per capita.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{risk_of_civil_war_and_gdp_per_capita_1960-1999.png}
\caption{Risk of Civil War and GDP per Capita, 1960-1999}
\end{figure}

Not only does economic performance bearing its influence on human security in quantitative analysis, but it also invokes broader theoretical tenants of security studies. The decisive role of national income on internal conflict fits within the classical realist theory known as the Dynamic Differential Theory (DDT), established by Dale Copeland. DDT explains that powers are most likely

\begin{flushright}
Source: Brookings Institution\textsuperscript{26}
\end{flushright}

\begin{flushright}
Not only does economic performance bearing its influence on human security in quantitative analysis, but it also invokes broader theoretical tenants of security studies. The decisive role of national income on internal conflict fits within the classical realist theory known as the Dynamic Differential Theory (DDT), established by Dale Copeland. DDT explains that powers are most likely
\end{flushright}

\begin{flushright}
\end{flushright}
to enter conflict while their position of dominance as measured by military and economic strength experiences decline and is exposed to threats by other actors.\textsuperscript{27} As a matter of self-preservation, the dominant powers turn to the offensive to preempt a greater risk of losing their dominance. Copeland outlined this theory with reference to causes of major international conflict, explaining Germany’s offensive actions once undergoing a period of decline prior to World War I and World War II; however, if one considers it in terms of internal conflict, DDT also applies. If a state undergoes a rapid economic decrease in income, its revenue stream to support internal police and defense and other methods of suppression of insurgencies also diminishes. In order to avoid further vulnerability, the state would have very high incentives to wage attack against threatening insurgents while it still has a high likelihood of victory. Further, when states have extremely low incomes, even small decreases in national revenue from an international perspective, equate to large percentages of total national revenue loss and the resulting power-base for the ruling party.

The Government of Sudan’s (GoS) actions in Darfur exemplify this theory. Between 1999 and 2002 Sudan’s economic growth slowed to less than one percent.\textsuperscript{28} In addition, with the southern portion of the country demanding access to oil revenues in order to end the civil war, the GoS’s national power underwent great economic stress. As a result, the government incited rebels in

Darfur and unleashed an offensive Mujahideen force that wreaked havoc killing hundreds of thousands and forcing millions to flee their homes.29

In addition to impacting likelihood of conflict, low GDP/Capita has also been highly correlated with poor educational attendance and performance as demonstrated by Collier, Howeffer and Soderbom.30 This is an important finding because access to education is a critical component in measurements of quality of life.

Despite income-based explanations showing high correlations for the onset of war and poor educational outcomes, any quantitative researcher must not forget that correlation falls far short of causation. Several intervening variables could cause correlations to appear in statistical models that create misperceptions when taken at face value. Therefore, multivariate analysis is needed to shed more light on exactly how the security and economic growth relate between themselves and resulting quality of life.

**Definitions, Data and Methodology**

Despite all of the literature based on analysis of interviews, case studies and logical deductions from basic economic data, a rigorous data analysis has not been done that specifically tests quality of life against security measures and

---


economic performance measures. Thus, this research fills this void with the most comprehensive, albeit limited, information available. Even though data is limited, which qualifies this paper’s analytic conclusions; the methodology set forth provides a foundation for future research and a motivation for future data capture from hazardous environments to develop useful research in the future.

*Voices of the Poor* highlighted key factors that constitute a poor quality of life, however it did not conduct a quantitative analysis comparing the stated perceptions to empirical observations of measurable quality of life outcomes. This research recognizes that perfect data does not exist to reference the viewpoints culled from the interviews with the poor, however sufficient data does exist to warrant a quantitative analysis across national-level indicators for income, security and quality of life.

To measure quality of life, this research analyzes four independent variables. The first, most prevalently available variable is life expectancy at birth. The second variable is the Physical Quality of life Index (PQLI). The PQLI incorporates was specifically designed to serve as an international benchmark for quality of life that separates the relationship of national income and quality of life.  

---

Calculation of the PQLI:

- Literacy Rate = proportion of literate population divided by illiterate.
- Indexed Infant Mortality Rate = (166 – Infant Mortality Rate) x .625.
- Indexed Life Expectancy = Life Expectancy * 2.7

\[
\text{PQLI} = \frac{(\text{Literacy Rate} + \text{INDEXED Infant Mortality} + \text{INDEXED Life Expectancy})}{3}
\]

Source: Morris\(^{32}\)

This research takes a multivariate approach to measuring quality of life.

Further, considering the large impact that infrastructure development has on overall quality of life as detailed in *Voices of the Poor*, this research will incorporate measures of access to roads as published in the World Bank’s Development Indicators Databank.

Acknowledging the limitations defining security universally, this paper will constrict its analysis to the fundamental notion of right to life. In researching security variables, this evaluated the possibility of creating a composite security index of violence and safety that would include rates of homicide, thefts and assaults as captured from the United Nations Surveys of Crime Trends and

\(^{32}\) Morris. “Measuring Condition”
Operations of Criminal Justice Systems. However, due to problematic aspects of much missing data from assault and theft reports, an indexed score would not provide enough data points to run a meaningful regression. Additionally since assaults and thefts are heavily correlated with homicides, grouping them together offers little in terms of statistical value for the analysis. Also, this research evaluated including battle-related deaths into homicides, however the nature of battle-related deaths are different to those of homicides. Battle-related deaths largely occur between combatants that willingly engage one another, whereas homicides by definition, demonstrate the killing of a civilian that had no did not intent to engage in battle. Since battle-related deaths would not accurately reflect the threat that non-combatant civilians face, it will not be included in the analysis. Therefore, this analysis constricts its measure of security to violence related deaths as measured by average homicides per one hundred thousand people.

One concern in researching the quality of life dependent variable as measured by life expectancy and using homicide rates as the independent variable for security would inextricably link the two variables and display an internal covariance. Accordingly, if one assumes murder rates increase, life expectancy necessarily decreases due to the premature death. However, murder is only one form of many causes of premature death, considering the prevalence

---

of health pandemics such as HIV in certain regions of the world and susceptibility to famine. Additionally, a murder’s impact on the measure of longevity naturally fluctuates depending the age of the victim. Therefore, two countries with identical murder rates could have great variance in life expectancy depending on the age at which the murders occur.

Despite being such a fundamental principle in economics, some disagreement exists as to what exactly defines economic growth. Some regard it as an increase in the ability to increase goods and services.\textsuperscript{34} In February 2010, Germany’s Prime Minister Angela Merkel called for the term economic growth to include the notion of lasting prosperity, to provide insight as to whether the growth will be sustained.\textsuperscript{35} Much research has linked Foreign Direct Investment (FDI) to economic growth, however growth linkages vary across sectors, which muddles the usefulness of the instrument as strong a measure of growth.\textsuperscript{36} Recognizing that the term carries some variability and imperfection, this research measures economic growth based on Gross Domestic Product at Purchasing Power Parity (GDP-PPP) at current international dollars, the most widely accepted definition for economic growth.\textsuperscript{37}

As shown in the literature review, citizen perception of relative poverty significantly impacts the psychological well being of the population. Also, the Von Braun and others’ research illuminate the distribution of income as having a significant impact on the efficacy of economic growth. To account for this fluctuation in impact of economic growth, this research tabulates the proportions of the population earning less than $1.25 PPP per day, which the World Bank defines as living in extreme poverty and uses to measure the poverty gap.\(^\text{38}\) This research will measure the poverty gap as another independent variable for quality of life. Presumably as national GDP/Capita grows, the poverty gap should decrease, however if domestic growth occurs unevenly with those already with high incomes getting richer, the poor will be left behind, therefore.

Importantly this analysis has selected the countries based on earliest year data are available, thus eliminating the cherry-picking problem commonly found when a methodology is based on the end-state and seeks to prove causation or correlation already known phenomenon. By selecting the population based on the 1980 data, this analysis is able to conduct a more true statistical comparison, because from an unbiased initial starting point, the population member rates could either go up or down.

This research selected subject countries based on life expectancy, which is the most prevalent quality of life indicator. Countries which had life expectancies as greater than 70 were excluded from the analysis. Additionally, countries that

did not have multiple observations before the year 2000 were also excluded due to a lack in duration of time for the dependent variables to impact the quality of life measures. As a result of these selection criteria, this research selects the following 60 countries:

<table>
<thead>
<tr>
<th>Argentina</th>
<th>India</th>
<th>Malaysia</th>
<th>Sudan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>Indonesia</td>
<td>Maldives</td>
<td>Suriname</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Jamaica</td>
<td>Mauritius</td>
<td>Swaziland</td>
</tr>
<tr>
<td>Botswana</td>
<td>Jordan</td>
<td>Moldova</td>
<td>Syrian Arab Republic</td>
</tr>
<tr>
<td>Chile</td>
<td>Kazakhstan</td>
<td>Myanmar</td>
<td>Tanzania</td>
</tr>
<tr>
<td>China</td>
<td>Korea, Rep.</td>
<td>Nepal</td>
<td>Thailand</td>
</tr>
<tr>
<td>Colombia</td>
<td>Kuwait</td>
<td>Peru</td>
<td>Tonga</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>Kyrgyz Republic</td>
<td>Philippines</td>
<td>Trinidad and Tobago</td>
</tr>
<tr>
<td>Ecuador</td>
<td>Latvia</td>
<td>Qatar</td>
<td>Turkey</td>
</tr>
<tr>
<td>EGYPT</td>
<td>Lebanon</td>
<td>Romania</td>
<td>Uganda</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Lesotho</td>
<td>Russia</td>
<td>Ukraine</td>
</tr>
<tr>
<td>Fiji</td>
<td>Liberia</td>
<td>Rwanda</td>
<td>Uruguay</td>
</tr>
<tr>
<td>Ghana</td>
<td>Libya</td>
<td>Seychelles</td>
<td>Vanuatu</td>
</tr>
<tr>
<td>Gibraltar</td>
<td>Madagascar</td>
<td>South Africa</td>
<td>Venezuela, RB</td>
</tr>
<tr>
<td>Honduras</td>
<td>Malawi</td>
<td>Sri Lanka</td>
<td>Zimbabwe</td>
</tr>
</tbody>
</table>

This research faces some problematic data. Due to citizen fear of new government institutions, or the remnants of institutions that have gone through war, citizens may not report thefts or murders for fear of government blackmail, or simply as a result of the inefficacy of the government body. Additionally black market economic activity may diminish economic indicators because citizens either do not trust the economic freedom of their country’s formal economy or seek to subvert taxes under lax enforcement. Most importantly, in areas that have the greatest room for growth in quality of life, data simply does not exist on homicide rates from governmental agencies, which restricts the conclusions from
this research to only countries that have developed enough governance to report crimes. Importantly, this limitation restricts the ability of the this research and its methodology to accurately assess the variable relationships in many parts of the world that it primarily seeks to understand what impacts quality of life to the greatest degree.

**Hypothesis**

Based on existing literature’s extensive correlations between economic performance and likelihood of conflict, this research hypothesizes that economic growth will carry a statistically significant positive relationship to increases in quality of life. This research also hypothesizes that improvements in security measures will also significantly cause to improvements in quality of life. The critical hypothesis, which addresses the title of this research, is that measurements of security will have a greater strength of relationship on quality of life for countries with the lowest initial qualities of life. The literature review provides overwhelming evidence from both quantified perceptions and analytic assessments that security and population control must occur before societal capacity to create economic goods and more efficiently use resources can take place.

However, considering the data limitations of the subject countries under analysis as only those that have the capacity to report each variable, this research concludes that those countries have already established the requisite
baselines of security for the populaces to focus more on economic growth than
security. Therefore, considering the data constraints, this research hypothesizes
that income will demonstrate a stronger relationship to quality of life from the
data regression results. Economic growth will impact quality of life because in
the cases under analysis, a base of security has already been established
because the countries have the ability to assess and report their crime rates.
Therefore, the citizens have likely moved from their first order needs as Maslow
discussed and begun placing their efforts towards their second order needs, such
as economic development, presumably will have a stronger effect on increasing
quality of life measures because economic growth can occur at a higher rate
than security improvement.

The null hypothesis of this analysis holds that no causal relationship exists
between either security or economic growth and quality of life.

**Methodological Design**

This research statistically evaluates both security and economic growth
independently as potential catalysts for improvements in quality of life. It will
utilize multivariate linear regressions test the hypotheses of causal linkages
between physical security and quality of life as well as economic development
and quality of life. The primary independent variables include security,
measured by the homicide rate and economic development, measured by
GDP(PPP)/per capita, while the United Nations’ Quality of life Index (PQLI) serves as the dependent variable.

Multivariable linear regressions calculate relationships over time \( (t) \) measuring the causal relationships of cumulative changes physical security \( (X_{tPS}) \) and economic development \( (X_{t,GDP}) \) to cumulative changes in quality of life \( (Y_{QoL}) \). Thus the following regression equation holds:

\[
Y_{tQoL} = \beta X_{GDP} - \beta X_{tPS} + e
\]

In this equation, \( Y \) represents the dependent variable, quality of life, and \( X \) represents the independent variable homicide rate and \( Z \) represents the other independent variable, GDP/Capita. \( \alpha \) signifies the level of quality of life when violent crime are measured at 0 and \( \beta \) represents the slope of the relationship between the independent and dependent variables. Accordingly, the negative sign indicates the inverse relationship that as homicide rates decline quality of life increases.

This research operates with the established social science rule that statistically significant relationship exists between the regress and, and the regressor if the regressor achieves a p-value of .05 or less from the regression. This research will analyze the Adjusted R-squared percentage, which explains the percentage of variation in the dependent variable that the model of analysis explains. Lastly, this analysis evaluates the measure strength of relationship of each variable in the regression influencing the dependent variable by the t-score.
Findings and Analysis

Four multivariate regressions were conducted to measure the effects of the independent variables on each measure of quality of life. The following results were obtained from Regression One, a multivariate regression described in the methodological design with life expectancy listed as lifeexpectancyatbirth, homicide rate listed as var 5 and GDP/Capita listed as gdppercapita.

```
.regress lifeexpectancyatbirth var5 gdppercapita

Source | SS df MS
-------|--------|-----|-----|
Model  | 9774.72148  2 4887.36074
Residual | 23189.3438  481 48.2106939
Total  | 32964.0653  483 68.2485823

Number of obs = 484
F( 2, 481) = 101.38
Prob > F = 0.0000
R-squared = 0.2965
Adj R-squared = 0.2936
Root MSE = 6.9434

 lifeexpect-h | Coef. Std. Err. t P>|t| [95% Conf. Interval]
-------------|--------|-----|-----|----------------------|
 var5       | -0.0381608 .0070005 -5.45 0.000 -.0519162 -.0244054
 gdppercapita | .0008077 .0000637 12.68 0.000 .0006825 .0009329
 _cons      | 61.88837 .4409609 140.35 0.000 61.02192 62.75482
```

The regression output proves the hypothesis of the research correct. Accordingly, both the measures of security and income have statistically significant relationships with the dependent variable, quality of life, as measured by the P score, which has p-value of 0.000, clearly underneath the threshold of .05. The telling indicator from the analysis is the t-score which shows a positive measure of GDP/Capita at 12.68, greater than the absolute value of the strength of the relationship of the security variable, which is -5.45. The negative sign of the t-score of the homicide rate demonstrates the inverse relationship of increasing deaths/capita to decreasing qualities of life. Meanwhile the positive
sign of the income variable denotes the expected relationship that as income increases, so does quality of life. Interestingly, the Adjusted R-squared measurement demonstrates that over 29 percent of the variance of quality of life is determined by either income or security.

Regression Two of quality of life regresses the independent variables against roads per square mile in a given country, listed in the regression below as roads. The independent variables retain their nomenclature from the preceding regression.

```
. regress roads gdppercapita vars
```

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>24584.2283</td>
<td>2</td>
<td>12292.1142</td>
<td>F(2, 172) = 15.58</td>
</tr>
<tr>
<td>Residual</td>
<td>135691.146</td>
<td>172</td>
<td>788.902013</td>
<td>Prob &gt; F = 0.0000</td>
</tr>
<tr>
<td>Total</td>
<td>160275.375</td>
<td>174</td>
<td>921.122843</td>
<td>Adj R-squared = 0.1435</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Root MSE = 28.087</td>
</tr>
</tbody>
</table>

|         | Coef.   | Std. Err. | t | P>|t| | [95% Conf. Interval] |
|---------|---------|-----------|---|-----|---------------------|
| roads   | .00075999 | .0004204 | 1.81 | 0.072 | -.00007 to .0015897 |
| gdppercapita | -.6857997 | .130821 | -5.24 | 0.000 | -.944021 to -.4275783 |
| vars    | 60.57211 | 3.530681 | 17.16 | 0.000 | 53.60307 to 67.54115 |
| _cons   |         |           |     |       |                     |

This regression demonstrates the importance of security on quality of governance and ability to deliver public goods. Accordingly, security has both a statistically significant causal relationship with roads, while economic development approaches significance, but does not reach the threshold. Additionally, the t-score of security is almost three times greater than that of income, demonstrating much greater strength of relationship. In this case the Adjusted R-squared rests at a high level of over fourteen percent, demonstrating
that these variables have a significant bearing on the level of infrastructure development, but less than they have on life expectancy.

Regression Three measures poverty gap against each independent variable. The poverty gap is listed as povertygapat125adayppp.

```
regress povertygapat125adayppp gdppercapita var5
```

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F(2, 72)</th>
<th>Prob &gt; F</th>
<th>R-squared</th>
<th>Adj R-squared</th>
<th>Root MSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>2889.26989</td>
<td>2</td>
<td>1444.63494</td>
<td>16.96</td>
<td>0.0000</td>
<td>0.3203</td>
<td>0.3014</td>
<td>9.2284</td>
</tr>
<tr>
<td>Residual</td>
<td>6131.71192</td>
<td>72</td>
<td>85.1626655</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9020.9818</td>
<td>74</td>
<td>121.905159</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| povertygap-p | Coef.  | Std. Err. | t   | P>|t|  | [95% Conf. Interval] |
|--------------|--------|-----------|-----|-----|---------------------|
| gdppercapita | -0.001255 | 0.0003071 | -4.09 | 0.000 | -0.0018672 to -0.0006428 |
| var5         | 0.0840899 | 0.0226063 | 3.72 | 0.000 | 0.0390251 to 0.1291547 |
| _cons        | 11.47943  | 1.950637  | 5.88 | 0.000 | 7.59091 to 15.36796   |

Regression Three shows statistically significant relationships on between both independent variables and the quality of life indicator. As expected, as GDP increases, the negative sign of the t-score shows that the poverty gap decreases. However, considering the definitional relationship between increasing income and reducing poverty, increasing homicides has nearly the exact same impact in the opposite direction by increasing the poverty gap. This provides profound implications for policy makers that maintaining low levels of crime is nearly just as important as increasing state income.

Regression Four measures the composite quality of life index, PQLI, against the independent variables.
Regression Four shows no statistically significant relationship. A statistically significant relationship may have occurred between these variables during the time period under study, however the lack of data availability for all three components of PQLI limits the number of observations to only forty four. Therefore, due to the lack of data to compute PQLI, the null hypotheses cannot be rejected that either security or income significantly impacts quality of life. This finding indicates that enhanced data capture of literacy and infant mortality rates would be useful to further research to gain enough data necessary to regress independent variables against a composite quality of life.

**Conclusion**

The purpose of this paper was to determine the relationship between income and security and quality of life. This paper examined literature that detailed theoretical and empirical observations that concluded that levels of security have paramount influence on quality of life in least developed states. This paper also reviewed literature that demonstrated the importance of income to quality of life.
as a determinant of security levels. This research hypothesized that due to the limited availability of data that levels of security would not have as strong of a relationship to quality of life as levels of economic development. It found conflicting results that largely proved the hypothesis largely correct. While measuring life expectancy, the most prevalently available observation of quality of life, it found income to have a stronger relationship. It also found income to have a stronger relationship in impacting the poverty gap; however security surprisingly had a significant relationship that was nearly as strong as income despite income’s definitional link to poverty. This research also found security to have a greater impact on road development than income, indicating that violence has a greater impact on government effectiveness than income.

Important lessons for policy result from the data analysis. Policy makers should note that income and security each impact quality of life to a significant degree and therefore deserve significant attention. Also, by gaining the capacity to reduce levels of crime, countries gain the ability to deliver public goods that greatly affect the quality of life of their citizens such as road development. Foreign powers should take note of this while conducting stability operations to emphasize security first, in order to build national infrastructure. This research recommends that investments be made to continue capture of each independent variable and each sub-component, especially in least developed nations to increase the applicability and value provided by the methodological design herein created.
Bibliography


