The Well-Being of Oregonians: Measuring Social Well-Being through Oregon's

Benchmarks

by

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Table of Contents

Introduction and Statement of Problem

Researchers have long sought to understand the relationship between economic growth and social development. The notion that economic growth increases social well-being was first written about by Rostow in 1960. This idea quickly became prominent and well accepted- the foundation of development policy. However, in the past twenty years many have pushed back against the assumption that "a rising tide raises all ships," i.e. that social well-being automatically increases with economic growth. The resulting debate has been especially pertinent in Oregon where the strategic vision and policy planning call for increases in both economic and social well-being. Early versions of Oregon's state-wide strategic plan, "Oregon Shines," assumed that as the economy thrived so too would social development. However, a 1999 research study by Fore and Kissler found that in spite of advances in Oregon's economic well-being, social well-being had stagnated. This paper further explores the relationship between Oregon's social and economic well-being.

Literature Review

<u>Potential Causal Relationships</u>

The prevailing belief in development literature for several decades was that social well-being is causally related to economic success. This theoretical relationship is based on the Rostovian model published in 1960 and is still the foundation of development policy. However, Mazudar (2000) clearly articulated reasons why the temporal order and the causal mechanisms between social development and economic growth are not necessarily clear.

In contemporary international economic development literature there are five competing modes of thought attempting to explain the temporal order and relationship between social development and economic growth:

1) Economic growth causes social development

2) Social development causes economic growth

3) Economic growth and social development are independent of one another

4) Social development and economic growth are inter-dependent

5) Economic growth and social development are linearly related to a point, after which they diverge, i.e. they grow together until a critical point, at which point economic growth continues to increase and social development decreases.

The first theory is based on what has become known as the Rostovian model and asserts that economic growth precedes the ability to pass through the various stages of development to a "fully modernized society" (Rostow, 1960). The basic assumption in this theory is that wealth and resources "trickle down" thereby increasing social well-being as a whole. For example, as prosperity increases so too will spending on social services such as police and education, and as spending in these areas increase, so will social well-being. This theory further purports that economic growth decreases poverty and increases access to health care. Until the early 1970's, this view remained largely unchallenged at which time Mcnamara (1971) and other critics began to question measurements of economic and social development, and challenge conventional wisdom surrounding the relationship between economic growth and social development.

In the late 1970s, researchers began to explore the inverse of the Rostovian model- that economic growth was a result of social development. This second theory was expressed by

Streeten (1977, 1981) who noted that extra income is often not spent on social welfare. Streeten suggests a "trickle-up" effect stating "improved education and health can make a major contribution to increased productivity" (1981). Hicks (1979, 1980) went even further arguing that "the development of [a] critical minimum level of basic human capital may be an important prerequisite for accelerating the growth of (economic) output" (1979). Hicks' research indicates that improved social services do not substantially decrease GNP growth rates but rather, increases in basic social needs, like infrastructure and health care, are associated with increased future economic growth. According to this second theory, investments in social services (public health initiatives, policing, education, etc.) are necessary for economic growth. Social investment improves social well-being by increasing education levels, decreasing crime, decreasing teen pregnancies, and decreasing child abuse, all of which in turn increase economic well-being because citizens are more healthy and productive.

Around the time Streeten and others began exploring the idea that social development causes economic development, Zuvekas (1979) developed a third theory, that economic growth and social development are unrelated. He argued that economic growth can occur absent increased social welfare if there is an uneven distribution of wealth causing only elite classes or corporations to benefit. According to this logic, increased economic growth would have virtually no effect on social variables traditionally related to social well-being, such as poverty or health insurance coverage, because money never reaches the bottom tiers of society.

Additionally, because of the way societies change over time, their conceptualization and measurement of well-being change. These changes may further diminish the relationship between economic growth and social well-being. It is easy understand and argue for the idea that economic growth decreases hunger, but it is more difficult to conceptualize the idea that

economic growth increases the level of integration individuals feel in their community. While community integration might be a satisfactory measure of well-being in more developed countries, less developed ones are likely concerned with more basic measures of well-being like hunger rates. Thus, as societies change their ideas and measurements of social well-being, the relationship between those adjusted perceptions and economic growth becomes more and more attenuated. Both Grants' (1973) international analysis and the Fore/Kissler study in Oregon (1999) lend empirical evidence to support this idea that economic growth and social well-being are unrelated.

However, other researchers have promulgated yet a fourth theory, that economic growth and social well-being are highly inter-dependent. Srinivasan (1977) believes that economic and social policies are interrelated. He posits that overemphasizing social needs would, in the short run, hinder economic growth which would in turn damage the government's capacity to increase human well-being (because of lack of funding). According to this model, economic growth causes investment in health, education, and policing thereby decreasing crime, preventable illness, and death, and increasing education. This would result in a more productive, healthy, and educated populace which would increase economic growth. However, this model assumes economic growth will "trickle down," i.e. that benefits from economic growth will be felt by all segments of the citizenry.

The fifth and final theory regarding the relationship between economic growth and social development is that the variables are related in an inverted "U" shape. During the late 1980s, Max-Neef headed a study by the Development Alternatives Centre in Chile looking at 19 economically diverse countries and the "elements and conditions [within those countries] that inhibited peoples' possibilities of adequately satisfying their desired personal well-being and

collective welfare" (Max-Neef, 1991). The study found that many people in wealthy countries expressed a growing feeling that "they were part of an overall deteriorating system that affected them both at the personal and collective levels." Using this information researchers developed a "Threshold Hypothesis" proposing that: "for every society there seems to be a period in which economic growth (as conventionally measured) brings about an improvement in the quality of life, but only up to a point--the threshold point--beyond which, if there is more economic growth, quality of life may begin to deteriorate."

Shortly after this article was published, the Index of Sustainable Economic Welfare (ISEW) for the United States was developed and published (Daly and Cobb, 1990). While this and the Max-Neef study used completely different methodologies, they came to similar conclusions—that quality of life and economic growth are correlated up to a point, after which traditional measures of economic growth continue to increase but measures of welfare decrease. The index created by ISEW combined social factors, income inequalities, and environmental deterioration. The research discovered that in the United States the index ran parallel to GNP until the early 1970s after which GNP continued to increase but the index declined.

In the early 1990's indices similar to the one created by ISEW were created for the United Kingdom, Germany, the Netherlands, Denmark, and Austria. Each index was slightly different in its construction because of data availability. However, all revealed somewhat similar results. Per capita GNP and social welfare rose together up to a point, after which GNP continued to grow and welfare declined. Although the threshold point and the severity of the decline varied across each country, every threshold point was somewhere between the early 1970's and early 1980's. While this research is important, ISEW's focus is not solely on social welfare. The index also includes measures of environmental degradation and defensive public

expenditures, both of which are beyond the scope of this paper. While welfare economics is

intrinsically linked to social welfare the two fields have different foci and methodologies, yet

there is still weight behind the argument that economic growth and social development are

related only to a point. Beyond that point investments in social welfare programs decrease and

the benefits of social development are enjoyed only by a select group of individuals or

corporations.   Each of these theoretical approaches tries to explain the relationship between

economic and social well-being. The following sections apply the logic of these approaches to

the realities in Oregon.

<u>Economic Development and Social Well-Being in Oregon</u>

In Oregon, it is important to understand the relationship between economic growth, as

defined by the adjusted gross state product (GSP), and social development. The existence of a

statistically significant causal link between the two will give policy makers valuable information

for state policy priorities. For example, if there is a negative correlation between economic

growth and feeling of community, then policymakers may consider policies to increase social

capital as economic capita increases. In Oregon, there are several key factors that may affect

whether there appears to be a relationship between economic development and social well-being.

These factors are (A) The way in which economic development is measured, (B) Economic

dispersion, (C) Investment levels in social well-being programs, and (D) Social Capital.

A. The way in which economic development is measured

Increases in GSP may be an artifact of the way in which GSP is measured rather than a

result of "real" economic growth. As a result of the way GSP is measured, similar activities may

or may not be included in the GSP depending on whether they are "home based." For example,

if a child is cared for at home no economic transfer is made and the labor involved in caring for

the child is not included in the GSP. However, if the same child is cared for in a day care facility an economic transfer is made and the work involved in caring for the child is included in the GSP. The same holds true for the labor involved in cooking meals at home versus the labor involved in cooking meals at a restaurant. Over time, as more families are single parent or dual-income with more women participating in the labor force, many activities that were traditionally done at home have been outsourced to local service providers. This has caused an increase in GSP even though the amount of work done is relatively similar. In addition, outsourcing labor from the home may actually decrease social well-being even though it increases GSP. Women working outside the home may decrease social capital by decreasing a woman's time to volunteer, to be involved in her community, and to be involved in her children's lives. Furthermore, GSP measures cigarette, alcohol, and pornography sales as positive economic growth even though the negative externalities associated with these activities may yield decreases in social well-being. It is thus important to consider whether all increases in GSP are good.

Critics of using GSP as a measure of economic development suggest making fundamental changes to the system of measuring economic progress in order to gain a better understanding of what is truly happening in the economic arena. Critics such as Talbert, Cobb, and Slattery (2006) who created the genuine progress indicator, suggest quantifying negative externalities associated with growth and decreasing the reported GSP accordingly. These critics suggest increasing the GSP for non-economic positive goods. More specifically, some of the factors suggested for use in adjusting GSP are:

a. The household and volunteer economies—a great deal of important work that directly impacts social and economic well-being occurs in individual households, community

groups, and non-profits. Only if these activities can be tied to some economic exchange are they reported in the GSP. The creators of the Genuine Progress Indicator believe social welfare should not account for the same or substantially similar work inconsistently. Household, community, and volunteer work should be included in the GSP at the same rate at which an individual would be hired to perform the tasks in an ordinary workplace.

b. Crime—the GSP counts money spent deterring crime and repairing the damages of crime as economic growth. Talbert, Cobb, and Slattery suggest that the cost of crime should be taken out of GSP so that the effects of crime are not included as economic growth.

c. Degradation of habitat—pollution can take a major toll on health and overall well-being. Therefore, Talbert, Cobb and Slattery suggest that damages to human health, agriculture, buildings, and recreational areas be subtracted from the GSP.

In addition to these factors, some, advocate taking more extreme measures to adjust for "real" economic growth by adjusting for loss of leisure time. In sum, GSP is not a perfect measure of economic growth, and because of how GSP is measured, some reported growth in recent years may not be "real" economic development.

B. Economic dispersion

If the logic behind "trickle down" economics holds true, there should be decreases in poverty when the economy grows and increases in poverty when the economy declines. However, in Oregon there is evidence that wealth remains in the upper echelons of society and societal gains from increased GSP are disproportionate across certain segments of the population. In 2006, the top 5 percent of Oregonians had an income 10.1 times greater than that of the bottom 20 percent of Oregonians, whereas in Wyoming the ratio was only 8 (Sahadi,

2006). In addition, measures of total wealth tend to show even greater class inequality than measures of income. At this level of economic inequality in Oregon, general economic growth will benefit the rich the most. The claim that economic growth does not seem to equally benefit all Oregonians is further validated by data collected by the Oregon Benchmarks which finds that per capita income is only weakly correlated with poverty rates (correlation coefficient of -.267) (see correlation matrix Appendix 1). If growth in the economy in general trickles down to all segments of the population, we would expect to see higher decreases in poverty rates as per capita income increases.

C. Investment levels in social well-being programs

Investment, efficacy, and efficiency of social well-being programs may have a large impact on the level of social well-being in a state or society. Even if, in a particular society, there is large disparity in incomes, the government or private entities may invest in social well-being to counter-act the effects of unequal income distribution. For example, even if an individual lives below the poverty line, if they have free access to education, food , and health insurance they are more likely not to turn to crime. However, Oregon seems to have fairly low levels of investment in social well-being programs. In 2005-2006, Oregon spent only $9,460 per pupil in education expenditures, whereas the United States average for per pupil education expenditures are $9,963 (Mitani 2009). While the evaluation of the effectiveness of program spending is beyond the scope of this paper, it seems that Oregon has a relatively low level of investment in human services programs which may increase social well-being.

D. Social capital

While social capital has many definitions and contexts, for the purpose of this paper social capital will be defined as a social good which "typically consists in ties, norms, and trust

transferable from one social setting to another" (Putnam, 1995 p. 38). In other words, social

capital is social support or "feature[s] of social organization, such as networks, norm, and trust

that facilitates coordination and cooperation for mutual benefit" (Putnam, 1995, p. 35-36).

Social capital is thought to increase economic well-being because people in

> "higher-trust societies spend less to protect themselves from being exploited in economic
>
> transactions. Written contracts are less likely to be needed, and they do not have to specify
>
> every possible contingency. Litigation may be less frequent. Individuals in high-trust
>
> societies are also likely to divert fewer resources to protecting themselves—through tax
>
> payments, bribes, or private security services and equipment—from unlawful (criminal)
>
> violations of their property rights. Low trust can also discourage innovation. If
>
> entrepreneurs must devote more time to monitoring possible malfeasance by partners,
>
> employees, and suppliers, they have less time to devote to innovation in new products or
>
> processes (Knack and Keefer, 1997)."

Additionally, in most cases social capital is thought to increase social well-being. If

community members are engaged in one another's lives, they are more likely to help monitor and

guide each other's children which in turn leads to decreased crime rates. However, social capital

also has a negative aspect. The mafia has strong social capital in that members are

interconnected and transactions are based on trust. However, the mafia uses this trust and

interconnectivity to perform illegal activity. Thus, in order to increase social well-being, social

capital must be put to good uses. In Oregon, social capital may be used to increase economic

productivity and increase social well-being. Social capital is often measured by volunteerism

rates and feeling of community. Oregon ranks 16th in volunteerism rate out of the 50 states and

Washington DC (Volunteering In America, 2009). Also over 50 percent of Oregonians say they

feel like they are part of their community (Oregon benchmarks, 2006). These factors indicate

that Oregon has a fairly high level of social capital which may increase social well-being.

<u>Methods of Measuring Social Well-Being</u>

In addition to providing an overview of the literature regarding the relationship between

economic and social inequality, this paper explores how agencies and researchers define and

measure well-being. It provides a critique of the most common method used to measure well-

being: the index. This study uses two different indices and several different methodologies in

order to compare and contrast the different approaches to measuring social well-being.   The

paper continues by examining the usefulness, validity, reliability, and limitations of indices, and

by seeking to explain some of the problems relevant to data collection and interpretation of

social welfare issues. It also provides a critique of the different approaches used to construct and

analyze indices.

Social well-being is a vague, intuitive, and usually ill-defined concept; however, it is one

that is gaining attention because of policy makers', researchers', and the average citizens'

awareness that society is not what it used to be. With this knowledge and attention, researchers

have developed many different ways to quantify and measure the intangible concept of social

well-being. Some researchers are focusing on "subjective well-being" or happiness. Others try

to make scales to compare and contrast different countries or states such as the Human

Development Index or the Fordham Foundation Well-being Index. Others still focus on certain

aspects of social well-being such as the freedom house rating, the democracy index, and the Gini

coefficient (used to measure inequality). One of the main difficulties of this type of research is

conceptualizing and operationalizing what it means to be a socially developed society. In this

paper, rather than focusing on aggregated measures of subjective happiness which seem more a

product of individual rather than collective (or public) policy choices, this research uses concrete macro-level indicators of social health thereby allowing a focus on societal trends rather than on patterns or rates between various groups. Long-term macro-level indicators are used so as to address the quality of life issues of a broad cross-section of Oregonians.

Policy makers and regular citizens are often faced with an enormous number of statistics and indicators providing vast quantities of information which many people do not know how to interpret or compare. Some indicators are important, while others are trivial, but without context, it can be difficult to discern the difference. As Edna St. Vincent Millay put it in her collected sonnets:

> Upon this gifted age, in its dark hour
>
> Rains from the sky a meteoric shower
>
> Of facts . . . they lie unquestioned, uncombined.
>
> Wisdom enough to leach us of our ill
>
> Is daily spun; but there exists no loom
>
> To weave it into fabric.

It is important to question, combine, and bind together these indicators so as to "weave a fabric" of wisdom. Social well-being data is often, as Millay suggests, unquestioned and uncombined. By combining data into an index researchers attempt to weave together different indicators so as to get an overview of social health generally. A social well-being index promises to create a more comprehensive picture of social health combining issues such as income, housing, safety, and education. Indices of this type offer several advantages: their results are usually easy to interpret and easy to compare over time or across countries or states;

they provide a type of general barometer to understand trends; they also create a measure of social well-being that can be easily compared to measures of economic or environmental well-being like the GSP.

However, indices also have limitations. First, like the GSP, an index of social well-being only provides an overview of social conditions and is not as helpful when looking at specific policy issues. Second, an index may mask fluctuations and variations in individual indicators. Therefore it is important to carefully select indicators to be combined into an index.

Methodology:

<u>Content Construction</u>

This paper follows up on the Fore/ Kissler report published by the Oregon Progress Board in 1999. In the Fore/ Kissler article, six factors (Unemployment rate, Average earnings, Poverty rate, Juvenile arrest rate, Teen pregnancy rate, and Overall crime rate) are used to construct a Well-Being of Oregon Index. Fore and Kissler propose that GSP causes well-being; however, in the analysis they do not find a statistically significant relationship between GSP and well-being. Their finding is potentially misleading because half of the indicators they use in the index seem to be social indicators (Juvenile arrest rate, Teen pregnancy rate, and Overall crime rate) and the other half of the indicators are economic in nature (Unemployment rate, Average earnings, Poverty rate). Thus, in the analysis relating social well-being to GSP, the economic indicators would theoretically have a stronger correlation to GSP, thus the index social well being is in part really a measure of the economic well-being- the independent variable. This is likely to skew the results of the correlation analysis in unpredictable ways that could attenuate a real correlation (Fore 1999). However since this paper is a follow-up study to the Fore and Kissler report, it will examine the usefulness of their methodology and use the same content

construction of their index (use the same variables). The criteria Fore and Kissler used for choosing the indicators included in their index relied on the Oregon Progress Board social and economic benchmarks and the logic laid out in the state strategic plan (Fore and Kissler, 1999). I will also use the same array of variables (except substituting per capita income for average wage as the Progress Board no longer reports average wage data) used in the Fore and Kissler paper in this analysis and call it the Fore/Kissler Index.

In order to provide comparison to the Fore Kissler Index and incorporate other variables, I also create another index (the Myers Index) to assess social well-being. This index is based on the Fore Kissler index and the theoretical and methodological developments observed in the academic literature over the past ten years (Mazudar ,2000, Opdyche and Mirringoff, 2008;Talbert, Slattery & Cobb 2006). In particular, the Institute for Innovation in Social Policy (IISP) created a cross sectional index of the social health of different states that serves as a helpful model for measuring well-being. The Well-Being Index that they created for each state is composed of 16 different social indicators representing cradle-to-grave service (Infant Mortality to Elderly Suicide rates). One of the positive features of this index is that it contains only indicators of social well-being, without the economic indicators that likely skewed the results of the Fore/ Kissler paper (Opdycke and Miringoff, 2008). However, this index only uses annual cross sectional state level data and does not use longitudinal data for each state. The criteria that they use to create their index focuses on sixteen social indicators that illustrate social well-being in an age spectrum from childhood to old age so as to provide an overview of social well-being "at various critical junctures in the life span." (Opdycke and Miringoff, 7). Since the IISP index looks at state data, covers a large age span, relies on socially grounded rather than economic or environmental data and is still fairly narrow in the number of indicators used, the

criteria for selecting indicators for the Myers Index was based loosely based on the indicators from the IISP index. The Myers Index was also based on the Oregon Progress Board's conception of social well-being. However, the Progress Board now looks at 61 different indicators when considering the ideal social environment. As the number of indicators considered in determining the ideal social environment has expanded, it has become more difficult to combine all these indicators into one index. Also, since generally the greater the number of variables there are in an index the more likely the index is to obscure relationships between variables, I limited the number of different indicators.

While every indicator cannot be included in the index, it is important to take into account the indicators that the Progress Board considers necessary for the ideal social environment as this is how state planning committees have conceptualized social wellbeing. Thus, in order to create the Myers Index, the indicators collected by the Progress Board were compared with the indicators used by the IISP. All the indicators used in the IISP Index that were collected by the Oregon Progress Board for at least the past ten years were included in the Myers Index.   I chose to include socially grounded economic variables such as unemployment, per capita income, and poverty because equivalent variables were included in the IISP index and in the original Fore/Kissler study. However, subsequent analysis beyond this paper would do well to experiment with indices completely stripped of any economic indicators.

Additionally, even though the indicator "Feeling of Community" was not included in the IISP Index, it was included in the Myers index because it was collected by the Oregon Progress Board and because it can be used to measure social capital. I chose to include a measurement of social capital because of the theoretical importance and growing attention to the role that social capital plays in social well-being. It is important to note that several other indicators could not

be included in the index because their importance has just been realized in the last few years, thus data for them has only been collected for a few years. For example, volunteering rates only became available starting in 2002.

While, looking at different indices of social health, it is important to understand that the content construction of all social well-being indices are subjective. Different researchers use different content constructions because of their personal beliefs and interpretations about what social well-being means and how it should be measured. As discussed earlier, concepts of social well-being have changed dramatically over time and so have the indicators we use to measure social health. While some of these content constructions may have a better theoretical foundation for the circumstances of a particular society than others, the validity of any particular index is open to discussion. Because health insurance coverage, infant mortality, feeling of community, and child abuse rates were not included in the earlier Fore Kissler index, I decided that they were appropriate new additions to an index that would better capture residents' experiences in the state. The indicators which were included in each index are presented and defined below:

Fore/Kissler Index	Myers Index	Variable Definition
Unemployment rate	Unemployment rate	Oregon unemployment rate: a. annual rate.
Per Capita Income	Per Capita Income	Oregon per capita personal income as a percent of US per capita personal income (US=100%).
Poverty rate	Poverty rate	Percent of Oregonians with household incomes below 100% of the federal poverty level, all ages.
Juvenile arrest	Juvenile arrest	Juvenile arrests per 1,000 juvenile Oregonians per year.
Teen pregnancy rate	Teen pregnancy rate	Pregnancies per 1,000 females ages 15-17.
Overall crime rate	Overall crime rate	Overall reported crimes per 1,000 Oregonians.
	Infant Mortality	Infant mortalities per 1,000 live births.
	Substantiated rate of child abuse or neglect	Substantiated number of child abuse victims per 1,000 Oregonians, ages 0-17: a. substantiated neglected/abused (excluding threat of harm category).
	Health insurance	Percent of Oregonians without health insurance.
	Feeling of Community	Percent of Oregonians who feel strongly or somewhat strongly that they are a part of their community.

As mentioned earlier, the variable used to measure economic well-being is per capita real gross state product (GSP). GSP is the economic value of all goods and services produced in Oregon in a given year, adjusted for inflation and that year's population, expressed in 2000 prices. It is equal to compensation of employees plus taxes on production and imports minus subsidies plus gross operating surplus (US Department of Commerce).

<u>Mathematical Construction</u>

Indices are vary widely not only in their content construction (the indicators used), but also in their mathematical construction. Part of the contribution of this paper is to compare and contrast the usefulness of several different approaches for constructing an index. I evaluate the advantages and disadvantages of using a simple average, an average of the percent change from year to year, and the average of the percent change from a base year to construct the indices. Sometimes indices use weights for different components of an index; however, I have not included weights because of a lack of theoretical rationale or program criteria for granting more weight to one component than another. Similarly, some analysts use standardized measures of index components, relying on standard deviations as units of measures. However, that is not possible with annual data of state-level indicators over a brief span of time, the very nature of the data available for Oregon. Finally, factor analysis of various indicators relevant to an index of well-being initially would promise insights into unexpected clustering of variables, but my supplementary analysis of the data using factor analysis did not yield any results that would inform how to change the creation of the index. As a result, I gave each component equal weight and used simple percentage measures when creating the index.

For each of these methods I reversed the polarity (assigning a negative value) to negative social well-being variables such as infant mortality, child abuse, juvenile arrests, high school drop outs, teen pregnancy, poverty rate, crime rate, and unemployment rate. Thus, for example, an increase in crime is logically included as a decrease in well-being. This way, the variables used to explain negative social phenomena could be added to variables used to explain positive social phenomena with consistent results. Also, the 'feeling of community' and 'health insurance coverage' variables were only reported every two years. Thus, for missing data points, the rates for the previous and following year were averaged- providing a mid-point.

Simple average:

First, any indicator that was reported in a different format was changed into a per capita form. For example, the crime rate is usually reported as crimes per 1000 Oregonians. So, if the crime rate was 6 crimes per 1000 Oregonians, it will now be reported in its per capita form of .006. This is done so that all indicators are standardized. Then, all per capita indicators are added and divided by the number of indicators in the index. Therefore the equation to determine the indices for each year is given by $\sum (x_i)/n.$, where x's are the observations and n is the number of indicators in the index.

Average of the percent change from year to year:

In this approach, the current year value is subtracted from the previous year value and then that total is divided by the previous year value to ensure that all numbers are reported in the same format. Next, all percent changes for a particular year are summed. For example, since the values for teen pregnancy rates in 1997 and 1998 are 44.2 and 42.1 respectively, 42.1 is subtracted from 44.2 to get 2, two is then divided by 44.2 to get 5 percent. This process is then

done for every indicator in a particular year. All of those figures are then summed together and to get a yearly figure. The equation for every year in this methodology is given by $(\sum (x_i - x_{i-1})/x_{i-1})$. The advantage of this method is that all indicators are now scaled to a percent change format that is more comparable between indicators.

Averaged percent change from the first year (base year):

In this construction, the current year is reported as a percent change from the base year—1997. In this way, the data is standardized and therefore easy to compare. Next, all percent changes for a particular year are summed and then divided by the number of indicators in the index. So for example, the teen pregnancy rate in 1997 (the base year) is 44.2, so for year 2003 the teen pregnancy rate is 26.4. So 26.4 is subtracted from 44.2 and then divided by 44.2 to get 40.27. This process is then done for every indicator in year 1997, and summed to get a yearly figure. The equation for this mathematical construction is $(\sum (x_i - x_1)/x_1)$.

<center>Limitations</center>

Developing an index of social health is complex and presents researchers with many challenges and limitations. There are several key issues with the construction of an index that demonstrate their limitations including (A) Data availability, (B) Differing Scales of Measurement, (C) Different Conceptualizations of Well- being, (D) Differing methodologies used in the construction on indices, and (E) Interactions and Inter-Correlations between variables used an index.

(A) Data availability:

As a society, our thinking and definitions about social well-being have changed substantially over time. Since our current conceptualization of social well-being is fairly new, data we might want may not have been collected for very long. This makes longitudinal or time series analysis difficult. However, certain researchers have circumvented this issue by doing national or state-wide comparisons rather than performing longitudinal studies of the same state or country.

(B) Differing Scales of Measurement:

Economic data such as GSP has the advantage of always being on the same scale—money. Monetary values can also easily be adjusted for income and inflation. Social well-being indicators do not have this advantage. Conceptually it is difficult to put feeling of community into the same scale as juvenile delinquency. While we attempt to standardize the scale by using different methodologies and approaches, standardization is still conceptually difficult when looking at indicators that are difficult to compare such as feeling of community and crimes per 1000 Oregonians.

(C) Different conceptualizations of well-being:

As a country becomes industrialized and moves toward post industrialization, so do the issues surrounding that country. For example, in the developing world access to clean drinking water may be a valuable indicator of social well-being, but in the developed world this information may be irrelevant and education levels may give us a better understanding of social well-being. As a result, our ways of measuring and thinking about social well-being have changed over time.   In Oregon, as the state strategic vision has changed, so have the indicators

that we use to measure social well-being. For example, rates of volunteerism have only been measure since 2002.

Conceptualization of social well-being also changes from region to region. For example, in some regions seniors' ability to live independently may be a good measure of social well-being, but in other regions it is not culturally desirable for seniors to live independently. Indicators in an index are subjective in that they reflect the social and cultural values of those that construct the index. For example, Oregon places an emphasis on independent living that does not exist in other states (benchmarks 59-61).

(D) Different methodologies used in the construction of indices:

This paper uses several different methods to construct an index in order to compare their various pros and cons. Conceptually a crime rate of .05 (50 crimes per 1000 people) has a more negative economic and social effect than the positive impact of having 50 out of 1000 people say that they feel like they are part of their community. Additionally conceptually and from longitudinal data, we know that some indicators are more stable over time than others. Infant mortality rates have not changed substantially in the past 20 years, so a .5 percent change from a base year might indicate a substantial improvement when the values range from 5.4 to 5.9. Whereas with indicators such as feeling of community where there is greater fluctuation in the data (values ranging from 36 percent to 51 percent), a .5 percent change from the base year might not indicate substantial improvement. For whatever reason, certain indicators may be more volatile than others.

 (E) Interaction and inter-correlation between indicators used in the index

In each of the methodologies established above, there is no way to account for interaction effects and inter-correlation between the indicators. Inter-correlation between the indicators in an index may artificially inflate or deflate the relationship between the index and other variables. For example if teen pregnancy rates are highly negatively correlated with infant mortality rates, then decreases in teen pregnancy may increase infant mortality rates, and the two variables would cancel each other out in an index.

Results:

The purpose of this section is to see if the data for Oregon shows that there is a correlation between social well-being and GSP. In order to do this, I first took the correlation coefficients of all the indicators and the indices to GSP (Figure 1). The correlation coefficients are listed below:

Correlation to GSP	Simple average construction	Percent change year to year construction	Percent change from base year construction
Overall Crime	-.88	.44	.90
Juvenile arrests	-.83	-.37	.77
Per capita Income	.95	.00	.93
Unemployment	-.10	.27	.22
Poverty rate	.16	-.22	-.14
Teen Pregnancy	-.85	-.62	.79
Feeling of Community	.76	.18	.74
Health Insurance	.86	-.31	.83
Child Abuse	.08	-.66	-.38
Infant Mortality	-.18	.01	.02
Fore/Kissler Index	.34	.24	-.93
Myers Index	.67	.54	.33

Figure 1

One of the key findings of this project is that the Fore/Kissler simple average index has a fairly weak positive relationship with GSP, while the Myers simple average index (which adds infant mortality, feeling of community, child abuse rate, and health insurance coverage rate) was more highly correlated with GSP.   Adding the four indicators to the Myers index almost doubled the correlation.

However, in order to truly understand the relationship between GSP and the indices, it is important to understand the relationship between each of the indicators in the simple average

indices and GSP. Table 1 illustrates that certain indicators are highly correlated with economic growth while others are less correlated. Some of these results are surprising. For example, unemployment rate and poverty rate are not as highly correlated with GSP as crime rates, per capita income, and teen pregnancy. This is most likely an indication of economic disparity in Oregon. Even though GSP may be increasing, this has little impact on unemployment and poverty rates in Oregon-- most likely meaning that the benefits of GSP growth are not "trickling down" to decrease poverty or unemployment rates.

However, Oregon crime rates, per capita income, teen pregnancy rates, and health insurance rates are all fairly highly correlated with per capita GSP. Theoretically as GSP increases, this will lead to greater economic prosperity, which will in turn lead to decreased crime and increases in per capita income. Also, it seems logical that health insurance rates will increase as GSP increases. However, there is no clear theoretical reason for teen pregnancy rates to decrease as GSP increases. One other significant result is that per-capita income is very highly correlated with GSP. While this high level of correlation might indicate imperfect multi-collinearity, I chose to keep per-capita income in the indices because of the precedence in other measures of social health to have a measurement of income and because of the theoretical importance. Theoretically income levels give us an understanding of the purchasing power of Oregonians.

These correlation coefficients give important insight for state policy makers into the "unintended" consequences of their policy decisions. For example, a policy used to promote GSP growth will do little to decrease poverty rates or unemployment rates. However, a policy used to promote GSP growth will most likely also decrease crime rates and increase per capita income. In addition, it is important to note that these correlation coefficients do not determine

temporal order between the variables. It is possible that decreases in crime do more to bolster GSP growth than GSP growth does to decrease crime rates. There is need for greater research in this area and for more researchers to test the direction of the causality between variables whose relational direction has been taken for granted.

While the correlation coefficients between GSP and the indices given important insight into their relationships, I also graphed the data to better understand the relationship between GSP and well-being. When using a simple average mathematical construction of the Fore/ Kissler and Myers indices and GSP, the graphs show well-being to be slightly increasing and relatively related to per capita GSP for both indices [Figures 2 and 3].. From 1997 to 2006, the per capita real GSP increased from $28,922 to $37, 712. The well-being indices fluctuate between 9.3 % and 9.9 % in the Fore/Kissler Index [Figure 2] and 7.2 % and 8.6 % in the 2009 Index [Figure 3].
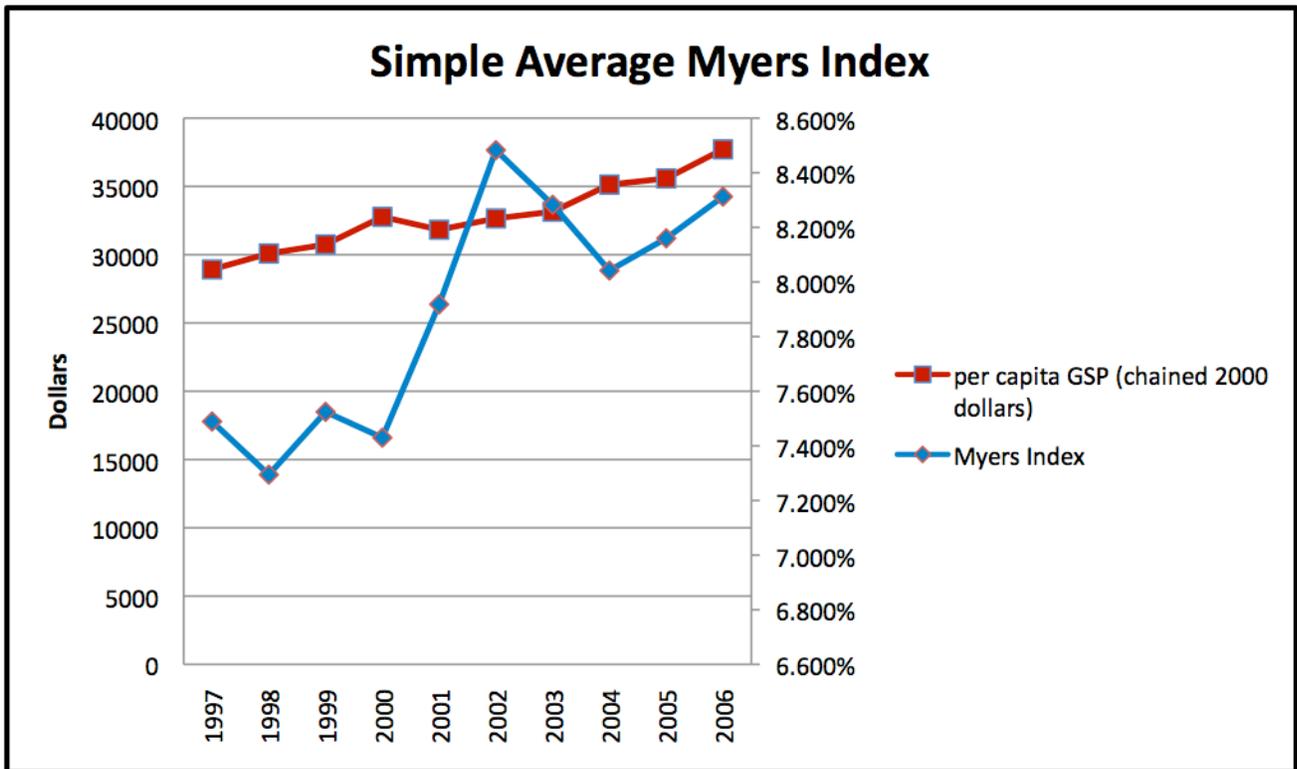

Figure 2

Simple Average Myers Index
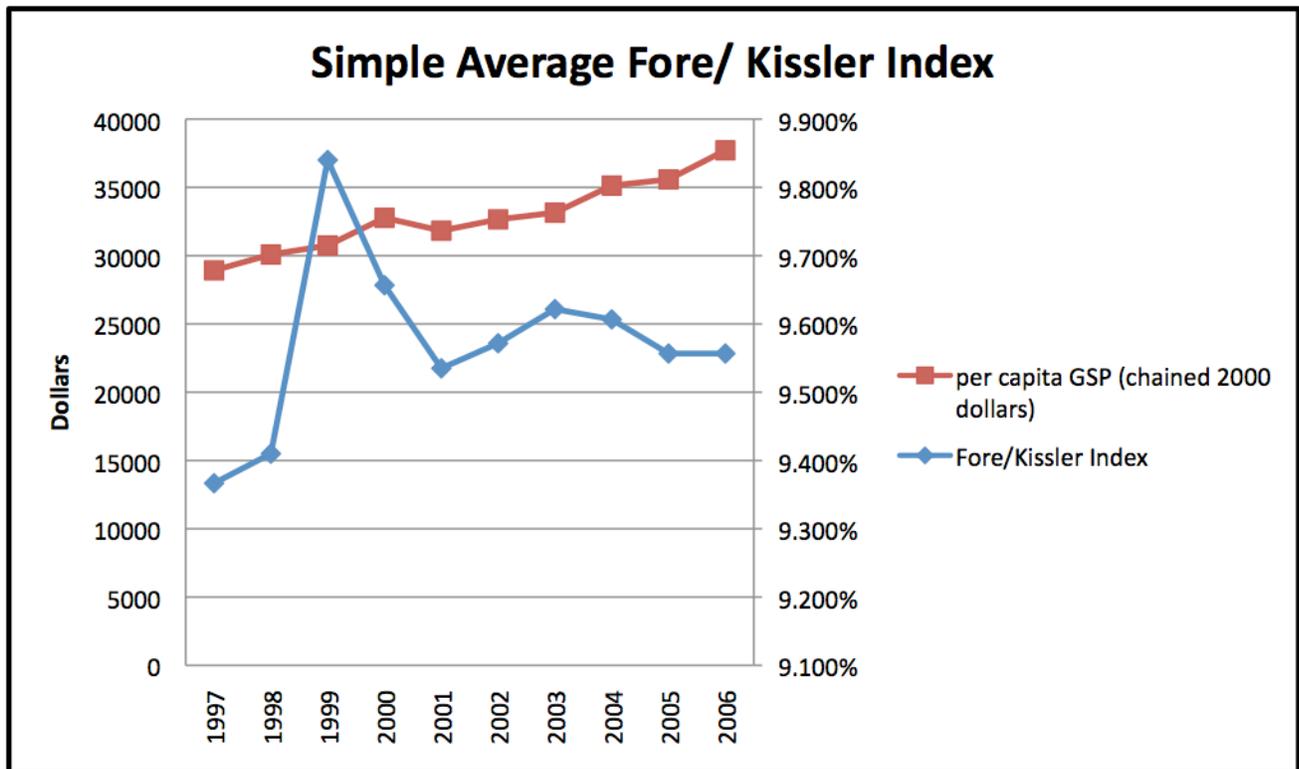
Figure 3

    While these results are encouraging about the state of Oregon's social well-being the simple average mathematical construction has some important limitations. In this approach, all values for all indicators are put into per capita terms and then these values are averaged for each year. Indicators are not scaled to a common denominator so, as can be seen in the graphs below small changes in one indicator such as per capita income may have a greater overall effect on the index than a large change in another indicator such as teen pregnancy rate. Essentially this weighs per capita income more heavily than the other indicators because of its relative scale. Additionally, conceptually a crime rate of .05 (50 crimes per 1000 people) may have a more negative economic and social effect than the positive impact of having a high per capita income. These limitations mean that perhaps there is a better approach to understanding and measuring social well-being.
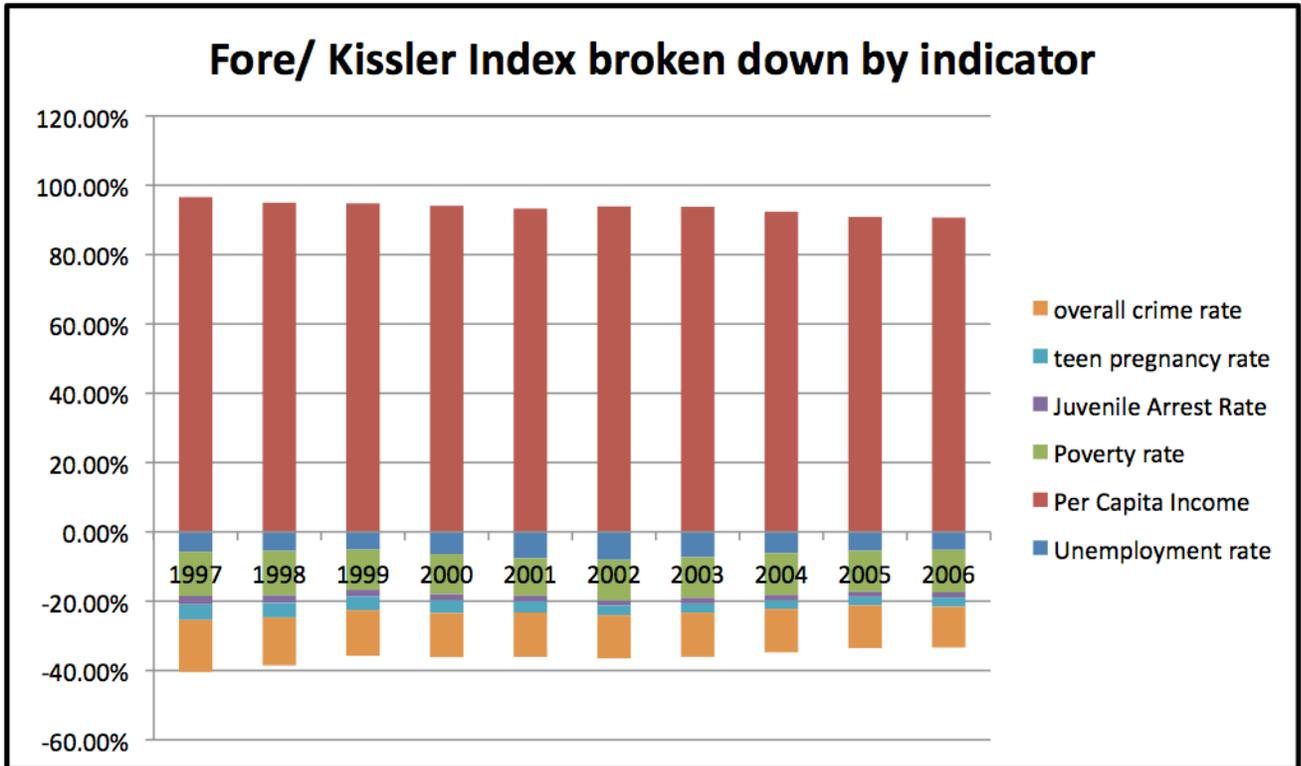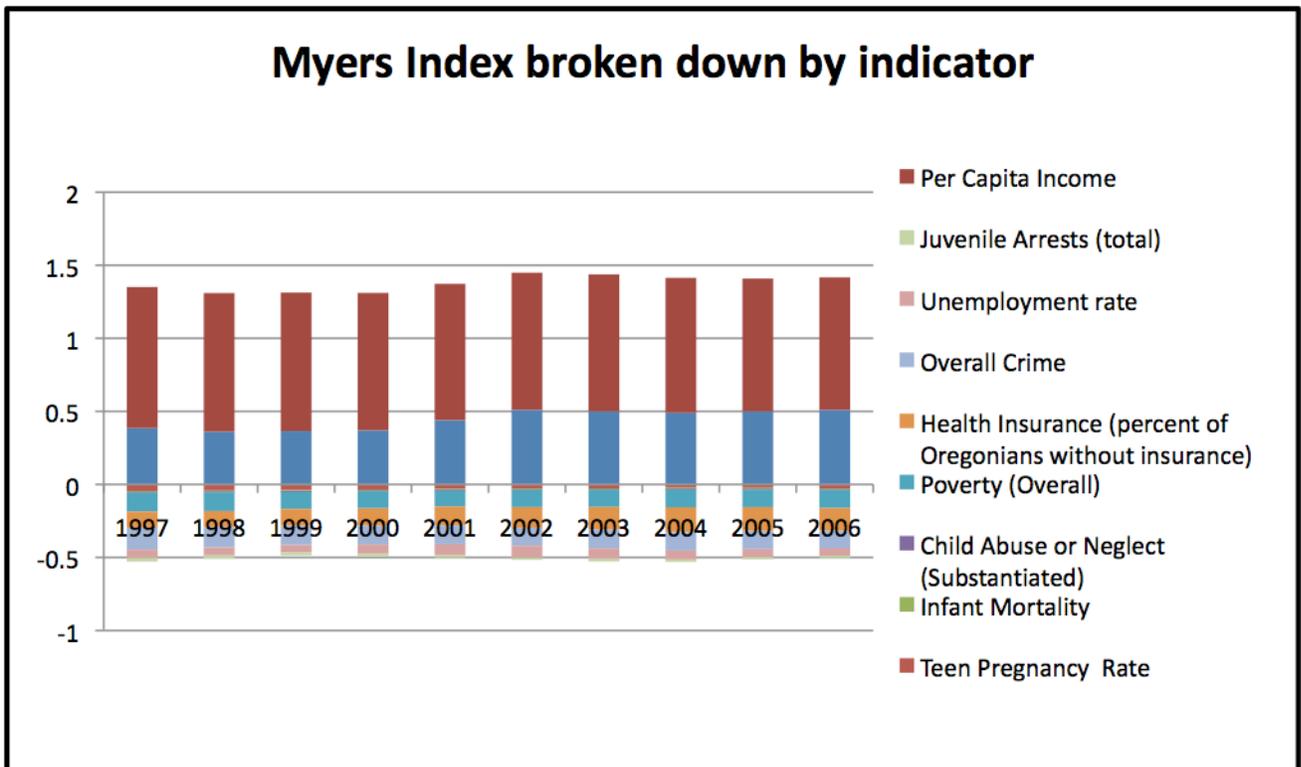
Figure 4

Figure 5

The percent change from year to year mathematical construction yielded results with the greatest fluctuations. This approach gives a general impression of rapid increase and decline (an inverted U) in the Fore/Kissler index, but a generally upwards highly volatile trend using the Myers index (Figures 6 and 7). The general upward trend for this construction of the Myers Index is consistent with the positive coefficient for the correlation (r = .54) between the Myers Index (year to year) and GSP (Table 1). The correlation coefficient for this construction of the Fore/Kissler index and GPS was weaker (r = .24), consistent with the volatile pattern in Figure 5. It appears that adding infant mortality, health insurance coverage, child abuse, and feeling of community in the Myers index increased the volatility (feeling of community is a highly volatile indicator) but showed greater well-being than the Fore/Kissler index.

While this method is useful in seeking to understand change or the sensitivity of an index, using percent changes from the previous year may artificially inflate the influence of small numbers over the influence of large numbers. For example, if the crime rate changed from 10 percent to 11 percent, this is a 10 percent change. However if per capita income changes from 90 to 91 percent, this only reads as a 1.11 percent change even though both of the indictors experienced a 1 percent increase in their respective scales. Since each of the indicators scales have different ranges this makes this methodology problematic. This is demonstrated by variations in both of the indices. The Myers index uses all of the same indicators as the Fore/Kissler index, but adds four more variables that have small scales. The Fore/ Kissler index ranges from -3.5 percent to 1 percent, but because of the addition of four small scale variables in the 2009 index the variables range from -30 percent to 15 percent. These limitations are so severe that this methodology seems to not be very useful, and perhaps even misleading in truly understanding the relationship of economic growth and social well-being.
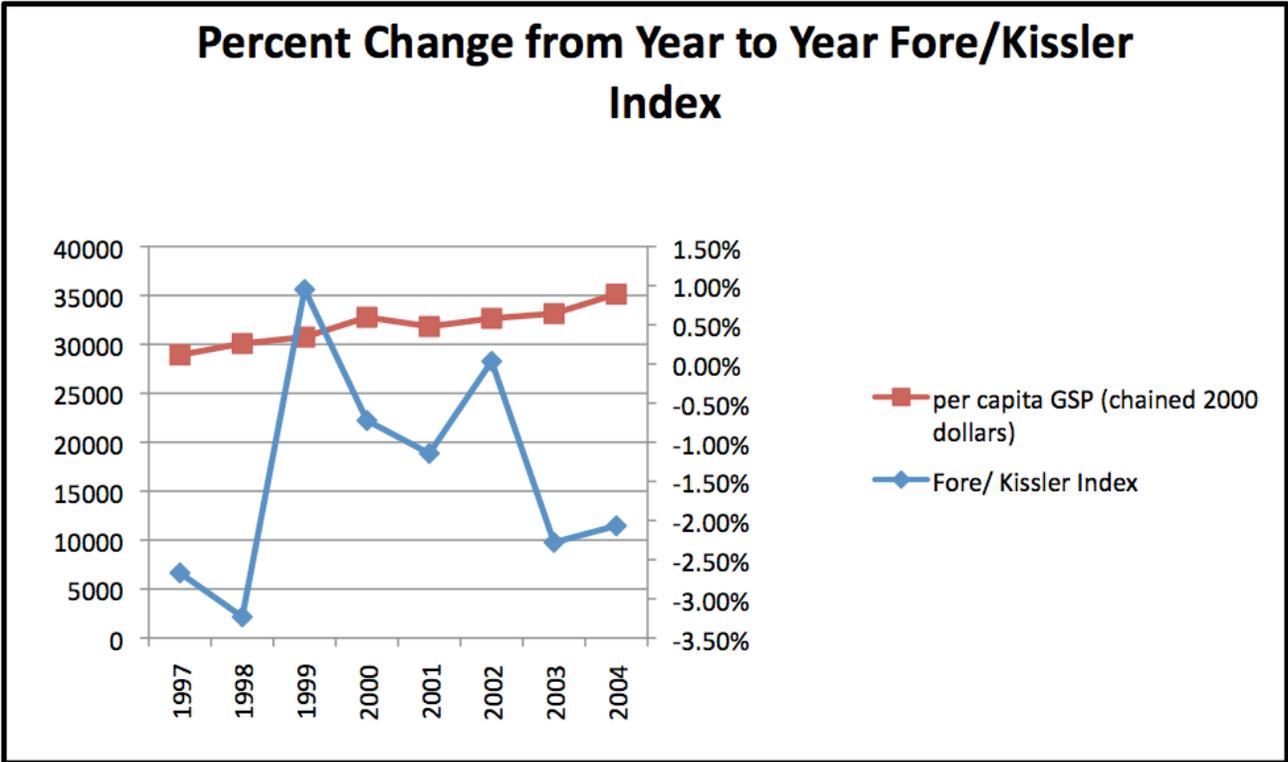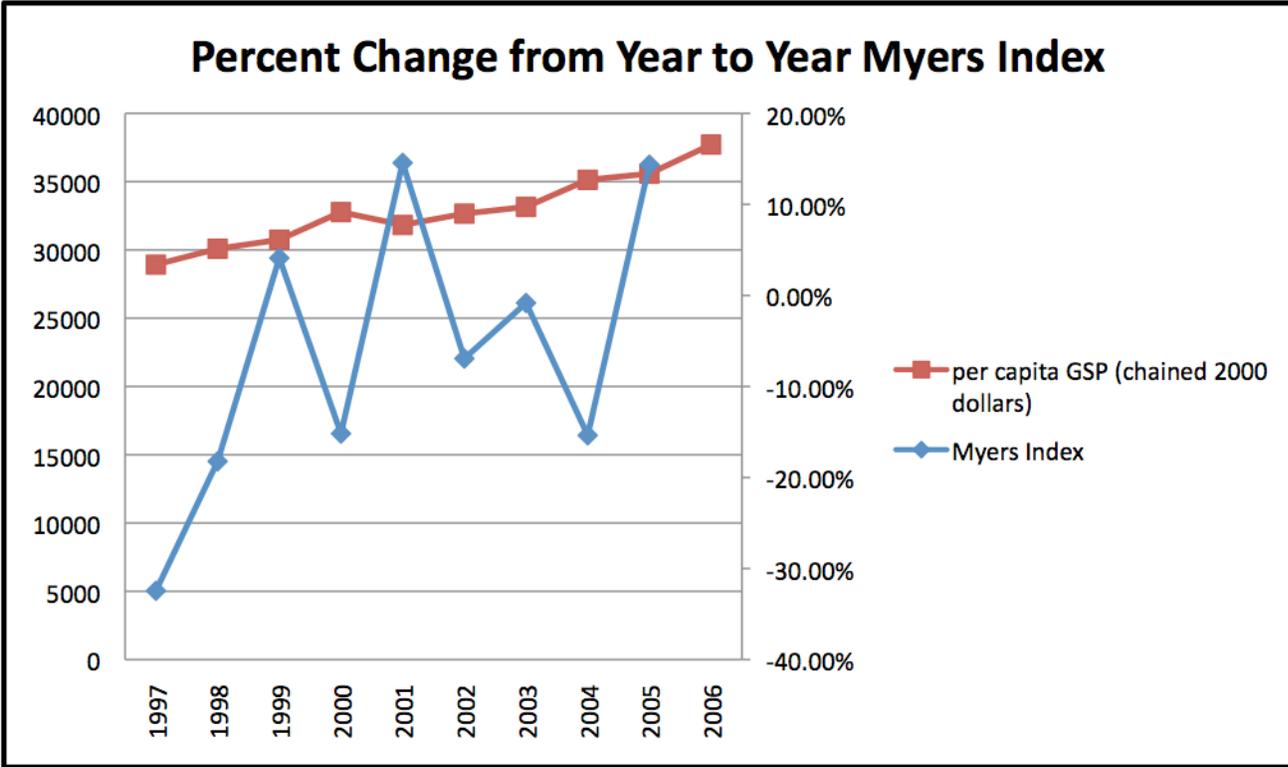
Figure 6

Figure 7

The final construction is the one used by the Fore/ Kissler in their 1999 paper and is perhaps the most widely used method for constructing an index. This approach uses a percent change from the base year. However, the results from these indices are discouraging. Using this approach the Fore/ Kissler paper found that as GSP increased, social well-being remained relatively flat and they predicted this trend to continue. However, instead of remaining relatively flat the index decreased quite substantially, ranging from -20 % to approximately -115% (Figure 8). This pattern is consistent with the strong negative correlation shown in Table 1 (r = -.93). The Myers index had slightly more encouraging results but still showed a fairly large decrease in social well-being (Figure 9). While the line appears to slightly decline, the volatile nature of it yields a weak correlations coefficient (r = .33) (Table 1).

These declining slopes seem very curious as Fore and Kissler predicted that social well-being would remain relatively flat. This unexpected finding may be the result of an unusually high new base year (1997) accentuating the apparent decline. Such a possibility illustrates the unstable nature of these estimates using a base year. Another limitation of this method is that it treats percent changes in each indicator as equal. Therefore, a 1 percent change in per capita income is equally as important as a 1 percent change in teen pregnancy. However, certain indicators are more stable than others. Infant mortality rates have changed very little since 2006 whereas feeling of community has seen large fluctuations.
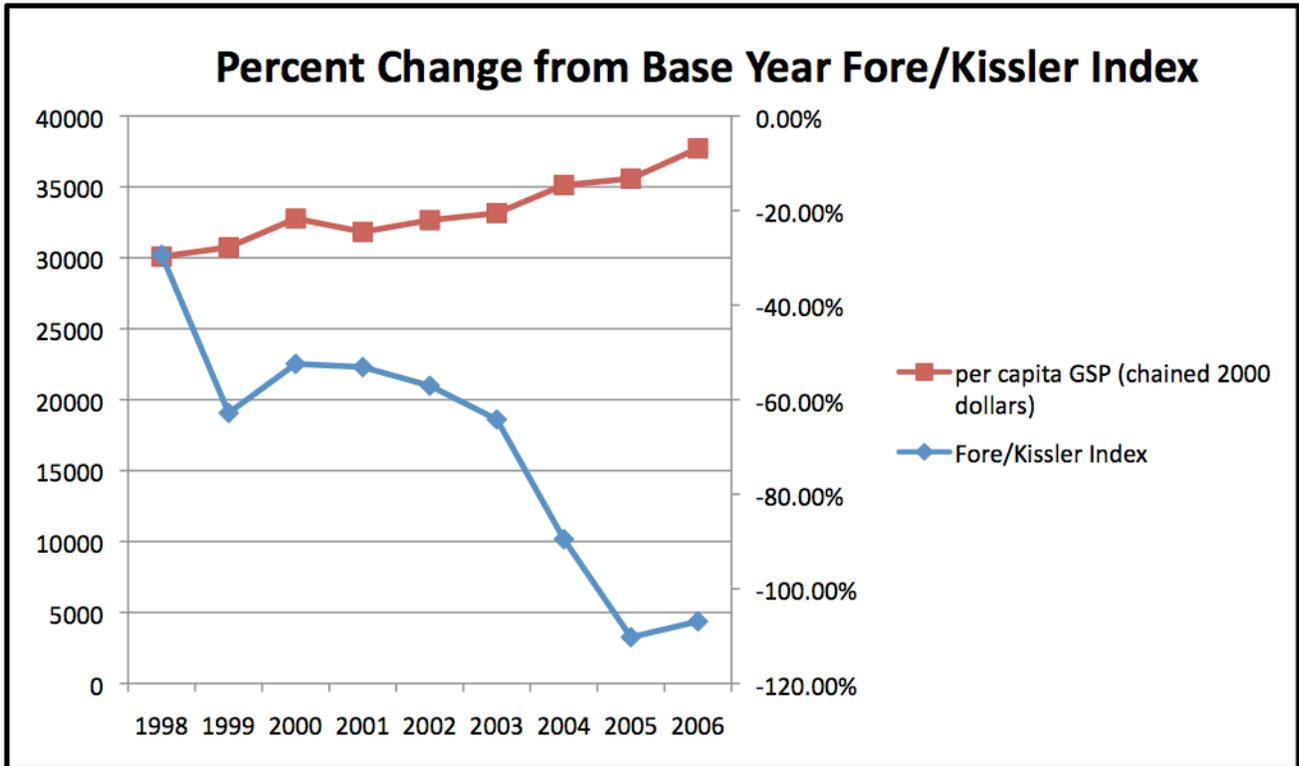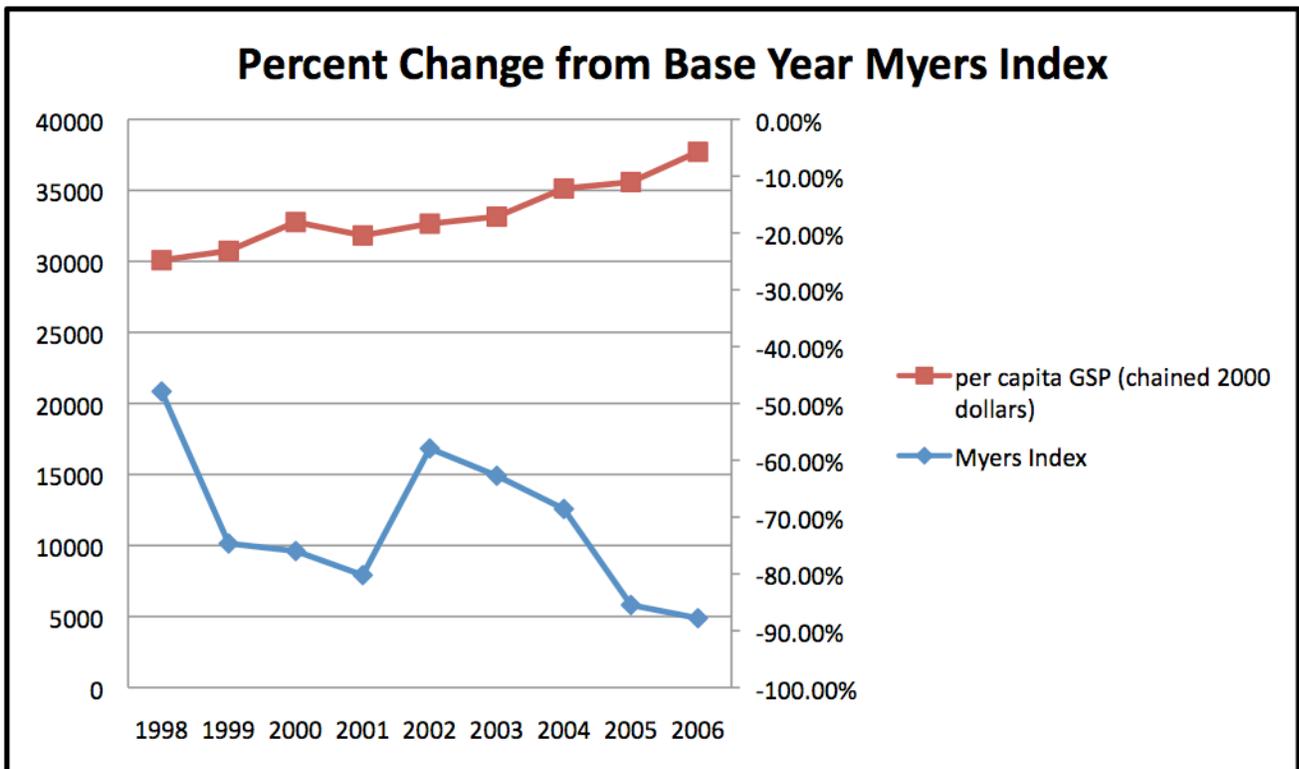
Figure 8

Figure 9

In each of the different methodologies the two different indices seemed to follow the same general trends, but to have variations from year to year and between the indices. This indicates that the indicators added in the Myers index (feeling of community, health insurance rate, infant mortality, child abuse rate) are conceptually similar to the indicators in the Fore/ Kissler index (overall crime, poverty rate, unemployment rate, per capita income, juvenile arrest rate, teen pregnancy rate). However, we know from the correlation coefficients that the Myers index is more highly correlated with GSP than the Fore/ Kissler paper. In the simple average construction, the Fore/Kissler index appears to show well-being as better off than in the Myers index, but this appears to be attributable to the high scale of feeling of community which may skew results. In essence, neither of the indices appears to be a "better" measurement of social well-being. Rather, both are valid and usage comes down to personal and organizational preferences and conceptualization.

The results from each of the methods of construction indicate that an index of social well-being, monitored over time, behaves in unpredictable ways that is powerfully influenced both by the mathematical and content construction of the index. As demonstrated in this paper, trying to measure social well-being in one index is difficult, especially because indicators are often moving in opposite directions and there is likely interaction between the indicators.   While indices may still be an important means to understanding well-being, creating an index of overall social well-being poses significant conceptual difficulties.   Perhaps more targeted indices (ie. indices of infant, juvenile, and senior health) would help us better understand the true state of social well-being. In these more targeted approaches one could narrow the content construction so that there would be less interference and interaction between indicators.   These results would be able to yield a clearer picture of certain populations' well-being. Or perhaps rather, than

using indices, it is better to try and measure the relationship between economic growth and one or two of the indicators that conceptualize social well-being.

Conclusion:

In studying the social well-being of Oregonians, an index is not the best way to measure social health because it obscures the true variations and connection between GSP and well-being. After using two content constructions and three mathematical constructions of social well-being, the results are inconclusive. Perhaps when assessing the social well-being of Oregonians, it is better to look at a variety of key indicators (like the Oregon Progress Board currently does) or to create targeted indices that assess more narrow populations. While these results may be more difficult to evaluate because there would be a greater volume of them, they are more specific in their relationship to policy options. This is important because policy makers want targeted information about specific populations rather than general information (i.e. teen pregnancy rates instead of social well-being rates in general) (Misaras, 2007). The Myers Index, which added several socially grounded variables, was actually more closely correlated with GSP than the Fore/Kissler study. This seems to be because of the high correlation between health insurance coverage and feeling of community and GSP.

While this study measures correlation between variables, it is important to note that it does not indicate causality between those variables. In order to determine causality, more research is needed to establish the temporal order of social and economic well-being, and to make sure the relationship is not spurious. If I were to replicate this study, I would drop per capita income as a variable from the index because of the multi-collinearity between the variable and GSP. If per capita income were dropped from the index, it is quite possible that there would be a much weaker correlation between GSP and social well-being.

While this project had many limitations and ultimately was inconclusive regarding the relationship between economic growth and social well-being in Oregon, it did uncover several important points. First, this paper shed light on some of the strengths and weaknesses of constructing an index. Second, this project determined that an index is not a useful tool for a concept that is as complex, fluctuating, and difficult to measure as social well-being. Third, this project delved into the concept of social well-being and pointed out much of the historical and prevailing thought on how to conceptualize and measure social well-being. Fourth, this paper provided important understanding into the connection between economic growth and the indicators used to measure social well-being. Fifth, this research has important implications for policy makers. As far as the methodology of indices, it is vital for policymakers to understand the subjective nature of indices' content construction and how this may impact the results. Additionally, it is important to understand the strengths and limitations of the different mathematical constructions of indices. It is imperative for policymakers to understand how interconnected social and economic variables truly are. This research gives insight into the potential consequences certain policies may or may not produce. For example, even when GSP increases it has very little impact on the poverty rate. This means economic growth alone cannot produce the ideal social environment. Policy makers must appreciate the importance of social well-being indicators and their helpfulness in understanding, describing, and improving our communities.