**Brief Primer on GDP**

GDP is an economic indicator used to measure the total value of goods and services produced in an economy. Of the United States’ GDP, the US Bureau of Economic Analysis states that “The growth rate of GDP is the most popular indicator of the nation's overall economic health.”(1) According to the St. Louis branch of the Federal Reserve Bank of the United States, which maintains a database called “FRED”, real US GDP is the 3rd most accessed data series provided by FRED, as of February 2020. (2)

In addition to being widely used as a metric by those performing economic analyses, many politicians target GDP, either implicitly or explicitly. For example, President Donald Trump states GDP targets following major legislation (3), and publicly boasts about GDP growth in the United States (4).

GDP is also often used as a metric to judge decisions of national or international importance. For example, polling on Brexit often focused on the impact of Brexit on the United Kingdom’s GDP (5), with numerous analyses and models being used to attempt to predict the impact of Brexit on GDP. Another example of the prominence of GDP in political decision making is Candidate Bernie Sanders’ “Medicare for All” plan, which has been repeatedly modeled by many organizations, with some finding massive contraction in GDP as a result, and others expansion, based on initial assumptions.

**Opposition to GDP**

Criticisms of GDP date almost to the very invention of GDP, with an extraordinarily influential paper, *Measure of Economic Welfare*, published by the National Bureau of Economic Research as far back as 1972. (7) Indeed, 2 of the 3 questions they raise: “(a) How good are measures of output currently used for evaluating the growth of economic welfare?” and “(b) Does the growth process inevitably waste our natural resources?” remain the core of many modern criticisms of GDP. For example, Nobel Laureate economist Paul Krugman states that “the link between overall growth and individual incomes seems to have been broken” (8). In essence, he (and other prominent economists such as Thomas Pikkety and Emmanuel Saez) argue that an increase in GDP does not automatically signal an increase in real standard of living for an average worker.

Still others, such as supporters of a “Green New Deal,” another policy proposal by Candidate Sanders, that GDP does not consider the cost of natural resource extraction, pollution, or habitat loss, and therefore is not truly representative of the overall gain of economic activity.

All these critics’ arguments can be boiled down thusly: insofar as governments of the world target GDP growth as their primary economic goal, they may be failing to actually increase the economic wellbeing of their peoples.

**Alternatives to GDP**

In the 50-year history of GDP criticism, dozens of alternative figures have been proposed. Among the most well-known are the Index of Social Health (9), the Genuine Progress Indicator, (10) and the United Nations Human Development Index (11). Common among these many alternatives is that they are a composite index made up of many individual indicators.

Such alternatives to GDP are becoming increasingly popular, particularly among progressive governments and politicians. The longest-running alternative used by an actual government is in the Kingdom of Bhutan, which has been targeting Gross National Happiness, a composite index of nine domains and many more individual indicator.

**Criticisms of Alternatives to GDP**

The primary purpose of this paper is to provide a criticism to such alternatives to GDP, and it is not an argument in favor of GDP targeting. Rather, it is an argument against targeting any particular composite indicator put forth by one or more groups.   
The major flaw in alternatives to GDP is that all of them are divergent in at least some ways. For example, the Index of Social Health includes highway deaths due to alcohol, but the UN HDI does not. Why is this decision made? At best, it reflects the different values of the people defining the indices – and in so doing, shows that that which one person values, another may not, thus making any of these a poor choice for a national government to impose upon it’s people. At worst, of course, these decisions may be a deliberate way to change the outcome of the indicator in relative ranking between countries and over time to justify one set of policies over another.

**Research of GDP Alternatives**

My research into alternatives to GDP is in two parts: first, I showed that a malicious designer could choose an arbitrary set of indicators to include in an index to show any result they wanted. To do this, I designed 3 algorithms, each of which was designed to indicate one country as the highest scoring, based on an OECD dataset. My first such algorithm is “USMAX”, which included Household Adjusted Disposable Income, Personal Earnings, Educational Attainment, and Self-Adjusted Health. Indeed, out of the tested countries, the US had the highest score on this index. I then repeated this process for Norway and for Japan, each time maximizing the score of the chosen country.

The key element here is that an ex-post story justifying any particular indicator is easy to create. I can say that USMAX includes economic wellbeing (personal and household income), human capital (educational attainment), and an important health metric. I can write the same stories for NorwayMAX or JapanMAX. A reasonable ex-post story, therefore, does not prove the legitimacy or value of a composite wellbeing indicator.

Understanding this is important, because it proves the need for skepticism in drawing any conclusions or policy directives from wellbeing indicators. However, intentional manipulation is not the only flaw of wellbeing indicators.

The second portion of my research involves a survey conducted at the Foothill College library. In this survey, I asked 5 students to choose 4 indicators from a list I presented to create one index. I then calculated which of the 5 nations I had chosen to study would be the highest rated on each student’s index. In doing so, I will discover whether even well-meaning individuals who do not intent to manipulate policy have similar values for wellbeing indicators.

Major flaws in my methodology include an extremely low sample size, a small palate of options both for different indicators and the weighting (I weighted all indicators chosen equally), the fact that the indicators were presented to each student in the same order, and the extremely unrepresentative sample size.

**Data**

Spreadsheet of data collected from interviewed students is attached.

**Data Analysis**

See attached .py file, containing code used to calculate values. Requires the OECD data referenced earlier in this paper. To rerun the code, change the file path to the location of your copy of the OECD data on line 4.

**Raw Data**

{'NZ': -0.3459892316693086, 'Japan': 1.7620168440042363, 'USA': 2.4489960587647177, 'Iceland': 2.6610309367765668, 'Norway': 3.6252180703663073}

{'Japan': -3.2778606438609814, 'USA': 1.7197679027304806, 'Norway': 4.361109040760992, 'NZ': 4.427582825962322, 'Iceland': 4.826903988084718}

{'Japan': -2.5211780481505377, 'NZ': 2.998192327617897, 'Norway': 3.3047495816451136, 'USA': 3.8921895929721426, 'Iceland': 4.734140135699496}

{'Japan': 0.5531584834958738, 'USA': 1.3629497569258677, 'NZ': 2.0087478404222505, 'Norway': 3.0036265526323804, 'Iceland': 3.981302630268362}

{'Japan': -3.848096435777483, 'NZ': 1.870282923503461, 'Iceland': 2.4679280610878753, 'USA': 3.207069959434226, 'Norway': 5.1350793355513105}

**Analysis of the Raw Data**

The ranking of countries based on these 5 samples is neither random, nor consistent. No GDP alternative defined by a student response has the same output; however, many consistencies are present. For example, in every student’s GDP alternative, Iceland ranks higher than Japan. I lack the statistical knowledge to determine how different from random this spread is.

Note from November 2023: This project was the first time I tried to do any kind of data analysis project, during my first ever programming course and shortly after my first statistics course. My code and excel would look quite different today, and I’d likely have tried to impute missing data. With more knowledge of statistics today, I would try to use spearman’s K or another similar method of comparing rankings to determine if the difference between different students’ proposals was truly random.

**Works Cited**

1. <https://www.bea.gov/data/gdp/gross-domestic-product>
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4. <https://twitter.com/realDonaldTrump/status/1039162221492928513>
5. <https://www.ipsos.com/ipsos-mori/en-uk/economists-views-brexit>
6. <https://www.nber.org/chapters/c7620.pdf>
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