

# Measuring Economic Well-being

## Gross Domestic Product (GDP)

- The value of all final goods & services produced within an economy over a time period.
  - "value" = market prices of goods & services.
  - "Final goods and services": goods intended for final sale. Example:
  - To calculate GDP, we use the "expenditure approach".
    - This adds up the total spent on all final goods.
- Intermediate good  
↓  
final good  
car engine → car  
nail → house
- $GDP = C + I + G + (X - M)$ , GDP shown as "Y"
- Consumption (C): spending on goods and services by households.
  - Investment (I): spending by firms on capital goods.
  - Government Spending (G): Spending by governments on goods & services.
  - Net exports ( $X - M$ ): Spending by foreigners on exports minus spending on imports.

## GDP Growth Rate

$$\begin{aligned} \cdot GDP_x &= \$10 \text{ m in 2020} \\ \cdot GDP_y &= \$12 \text{ m in 2021} \end{aligned} \quad \left. \begin{array}{l} \frac{12m - 10m}{12m} \cdot 100\% = 20\% \\ \text{approx} \end{array} \right. \quad \begin{array}{l} \text{100\% change} \end{array}$$

## Textbook 13.1 #1-3, pg 212

- $1,614,165 + 424,259 + 417,805 + (664,437 - 654,843)$   
= \$2,485,823, 100 millions
- consumer: 65%, investment: 17%, Govt: 17%, net export: 0.4% } need more demand
- Imports can get double counted as consumer expenditure.

Name Robin AryaDate/Period May 13**Student Activity****Part Two: The Components of GDP**

Directions: Use the information in the following situations to identify the components of gross domestic product. Place the dollar values in the correct row in the tables provided. Then calculate the total GDP.

$$\text{GDP Formula: } Y = C + I + G + (X - M)$$

- 1) Sterling is a small but highly industrialized nation. Last year, consumers spent \$12.5 million on goods and services. The government rebuilt the entire highway system and repaired all of the bridges in the nation. This project cost \$22 million dollars. Sterling exports leather goods and silver. The total exports were valued at \$6 million dollars. Sterling imports food products and electronic equipment. Due to an increased demand, Sterling imported \$10 million of these goods. Investment was the highest in the past 10 years, with \$40 million invested by businesses last year.

C	=	12.5
I	=	40
G	=	22
X	=	6
M	=	10
Y	=	70.5

- 2) Cosico is a nation that suffered a severe drought last year. Because most citizens are farmers, they endured financial losses. Consumer spending was only \$3.5 million on goods and services. The government spent \$13 million on national defense and \$5.5 million on a water storage facility. The only import last year was bottled water. Cosico imported \$16 million of bottled water from a neighboring nation. Due to the drought, there was no available agriculture to export. Total exports were \$0. As expected, investment was very small, with only \$1.4 million invested for the year.

C	=	3.5
I	=	1.4
G	=	18.5
X	=	0
M	=	16
Y	=	\$7.4m

## Gross National Income (GNI)

- GNI measures the total income received by all residents in a country equal to all final goods and services produced by the FOP which are supplied by the country's residents, regardless of location.
- Formerly known as Gross National Product (GNP)
- Examples:
  - the profits earned by a U.S. company such as "Ford" would be included in Canada's GDP.
  - They would not be included in Canada's GNI because Canada does not own the assets.
  - Instead, it would be included in U.S. GNP
- $\text{GNI} = \text{GDP} + (\text{income from abroad} - \text{income sent abroad})$
- There can be discrepancies between GDP and GNI because:
  - Some countries have large multi-national corporations sending profits to their home country (or vice versa)
  - Some countries may have foreign workers "remit" (send back) a portion of their income to a home country (or vice versa).

## Nominal vs Real GDP / GNI

- Nominal: value of goods/services in terms of prices at the last measurement.
- Real: Value that takes into account that prices change over time (eg. keep prices constant, "2015 dollars").
- Nominal GDP measures the value of current prices whereas real output at constant or "base year" prices.

## Calculating GDP and GNI

The following is data from the national income accounts of the country of Atlantis for the year 2021 (the national currency is also dollars!).

Investment Spending	300.7
Net income from abroad	-147.4
Government spending	350.3
Income sent abroad	173.2
Exports of goods and services	95.3
Consumption spending	950.9
Income from abroad	25.8
Imports of goods and services	132.4
Green GDP	850.3

- a) Calculate Atlantis' gross domestic product (GDP) [3 marks]

$$\begin{aligned}
 \text{GDP} &= C + I + G + (X - M) \\
 &= 950.9 + 300.7 + 350.3 + (95.3 - 132.4) \\
 &= \$1,564.8
 \end{aligned}$$

- b) Calculate Atlantis' gross national income (GNI) [2 mark]

$$\begin{aligned}
 \text{GNI} &= \text{GDP} + \text{income from abroad} - \text{income sent abroad} \\
 &= 1564 - 147.4 \\
 \text{GNI} &= \$1417.4
 \end{aligned}$$

- c) Identify two factors that can account for the difference in Atlantis' GDP and GNI. [1 mark]

- large multinational corporations profits /
- foreign workers remit money home /

## Price Deflator: GDP Deflator

- Economists use "price indices" to help convert nominal GDP to real GDP.
- Price index: A measure of average prices in one period relative to average prices in a base year.
- Example:
  - Base year 2022 = 100 or 100% of the prices in that year.
  - Next year 2023 = 110 or 110% of the prices in 2022.
- GDP deflator: price index used to convert nominal GDP into real GDP.
- Example:
  - GDP is \$381 in 2022 (base year)
  - GDP deflator in 2021 =  $\frac{\$381}{\$381} \cdot 100\%$  = 100%
  - Note that GDP deflator for the base year is always 100%. Nominal = real.
  - Assume nominal GDP increases to \$1160 and real GDP becomes \$967 in 2022.
  - GDP deflator =  $\frac{1160}{967} \cdot 100\% = 118.3$  (or 118% of 2022 prices)
- If the deflator ↑, then prices are ↑ on average.  
If the deflator ↓, then prices are ↓ on average.
- The equation can be rearranged:  $\text{real GDP} = \frac{\text{nominal GDP}}{\text{GDP deflator}} \cdot 100$
- Example:
  - If nominal GDP in 2023 is \$1123 and the GDP deflator is 130%, then:  
 $\text{real GDP in 2023} = \frac{1123}{130} \cdot 100 = \$863.85$  in 2021 prices

## Calculating Real GDP / Real GNI using a price deflator.

1. a) 2018 2019 2020 2021 2022  
20.2 20.7 21.4 21.0 21.5
2. b) Real GDP = nominal GDP in base year. Because real GDP calculated relative to base year.  
c) Inflation > GDP growth  
d) Inflation < GDP growth  
    <sup>'2019 (deflator = 100)</sup>
3. e) 2018 2019 2020 2021  
226.0 302.5 367.0 460.5
- f) GNI and GDP both macro measures of economy. Inflation/deflation affects them both. Different in what they measure.

## Drawbacks to GDP

### ① Population Size

- Comparing GDP for different years may be misleading if the population grows substantially.
- Comparing GDP for different countries with a different population sizes may be misleading when looking at the standard of living.

② This is why we have **real GDP per capita =  $\frac{\text{real GDP}}{\text{Population}}$**  and real GNI per capita which provides an indication to how much output/income corresponds to each person in the economy on average.

### ③ Non-market production is not measured

- Output with no \$ value is not counted in GDP/GNI.
- e.g. people who renovate their own homes, homemakers, volunteering, etc.

These omissions weaken GDP as an accurate measure of output.

### ④ Underground Markets

- Illegal transactions (i.e. selling drugs, prostitution, etc).
- "under the table" transactions with no paper trail (cash only) to avoid paying taxes.

Both not included in GDP but could be anywhere from 3% - 20% of GDP.

Types of goods produced.

- Inclusion of all goods and services weakens GDP as a measure of well-being. Also ~~is~~ Examples: guns, bombs, cigarettes.

### ⑤ Leisure

- GDP would ↑ if worked 24 h a day.

This workload would lower the standard of living though.

### ⑥ Environmental Degradation

- Water pollution, air pollution, solid waste →
- Production of goods and services create this, and increase our GDP.
- Environmental disasters (oil, chemical spills) ↑ GDP because money is spent to clean them.

These detract from economic well-being and quality of life.

### ⑦ Distribution of Income

- GDP doesn't take into account how evenly income is actually distributed among citizens. If GDP ↑ so unevenly that only a small part of the population is benefiting, then the standard of living has not ↑ for everyone.

# Grossed Out

## Case Study

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A University of Alberta academic says the GDP is an outdated gauge of economic performance As a global measure of progress, Gross Domestic Product (GDP) has become almost as popular as Coca-Cola. Whenever national economies release their GDP data, financial pundits invariably cheer when the GDP goes up-and boo when it goes down. Mark Anielski doesn't buy into that herd mentality. Together with a growing cadre of North American economists, the 38-year-old director of the Centre for Performance Management at the University of Alberta's faculty of business argues that GDP is not only an anachronism, it's a downright stupid gauge of economic performance. As a senior fellow with Redefining Progress (he's the only Canadian serving on the ten-member San Francisco based think tank), Anielski has played an active role in creating what he says is a better tool for measuring economic well-being: the Genuine Progress Indicator (GPI). Unlike GDP, this alternative yardstick paints a very different picture of prosperity. In fact, 1998's GPI update for the US, penned by Anielski and a colleague, shows a rapid decline in economic health and indicates that our booming neighbour to the south "is living off its capital, social and environmental, as well as financial." The GDP, a legacy of John Maynard Keynes, could never measure the downsides to growth, let alone conceive of such a thing. Way back in 1939, Keynes, a spend-more economist, needed a planning tool-a record of all money transactions to help the British government allocate resources for the war effort, His Gross National Product (GNP) and its successor, the GDP became something of an international happy face in government accounting. But because the GDP works like "a gas gauge that goes up as the car burns gas," Anielski argues, it was always a lopsided measurement. "It only adds and never subtracts." As such, says Anielski, the GDP's ideal ecocer patient going through an expensive divorce whose car is totalled in a 20-car pile up." But no household or business could ever thrive economically by using such bad accounting practices. "Coca-Cola just wouldn't be in business today if it only counted revenue and ignored depreciating assets," Anielski explains. In contrast, the GPI not only adds and subtracts but also considers the future. It still measures growth because growth matters, but it puts a cost

column on the ledger. Good marriages, friendly communities, clean water, leisure time, and wild places are treated as pluses. But when economies spend a lot on crime, pollution, commuting, and family breakdown, those expenditures are counted as negatives rather than more great economic news. Although placing a value on safe communities or clean air stretches the parameters of priced-based thinking, the GPI doesn't blindly assume, as the GDP does, that buying guns, for example, is progress just because money changes hands. For these very reasons, GPI for the US (the Canadian government is now toying with the idea of creating a similar index has been sinking since the 1970s while the GDP has been rising. The negative costs include disappearing natural resources (oil and coal), a downsized middle class, underemployment, ozone depletion, and a drop in leisure time. This last cost means people have less time for kids and families as well as for civic and community needs. That loss, in turn, says Anielski, translates into "a depletion of the social capital upon which an economy depends." Anielski isn't suggesting that a better accounting system such as the GPI might lead to smarter economic policies. But retiring the last of Keynes's economic ghosts would at the very least guarantee that governments get better information. Changing economies, Anielski concludes, simply need accounting tools that keep pace with changing times.

## QUESTIONS

1. What does Mark Anielski mean when he says that the GDP's ideal economic hero is a "chain-smoking terminal cancer patient going through an expensive divorce whose car is totaled in a 20-car pile up"?

- GDP measures economic output and doesn't factor in quality of life

2. What do you think Anielski means by the phrase "a depletion of the social capital upon which an economy depends"? Do you agree with him?

- Social capital refers to social factors like happiness that required for future prosperity.

3. What are some examples of negative costs that the GPI would take into account?

- Crime
- natural resources usage

4. What are some examples of factors that would be considered pluses?

- good marriage
- friendly communities
- leisure time
- clean water

5. A project by the Pembina Institute found that between 1961 and 1999 GDP in Alberta increased by 4.4 per cent annually on average while well-being measured by GPI declined per cent annually. Create a T-chart in your notebook. On one side of the chart, list the arguments that might be made in favour of adopting the GP on the other side, list the arguments that might be made against.



## Other measures of economic well being

Instructions: Read pages 219 (bottom) to 221. Complete the chart below by summarizing how each of the composite indicators attempts to measure economic well being.

Name of the indicator	How it measures economic wellbeing
1. OECD Better Life Index	<ul style="list-style-type: none"><li>- Organisation for Economic Co-operation</li><li>- Comparison of well-being across 11 topics:<ul style="list-style-type: none"><li>- housing</li><li>- income</li><li>- jobs</li><li>- safety</li><li>- community</li><li>- education</li><li>- environment</li><li>- work life balance</li><li>- governance</li><li>- health</li><li>- life satisfaction</li></ul></li></ul>
2. Happiness Index	<ul style="list-style-type: none"><li>- Rank 156 countries by happiness</li><li>- Data from polls<ul style="list-style-type: none"><li>- Gallup World Poll</li></ul></li><li>- Also immigrant happiness.</li><li>- Social Support, GDP per capita, healthy life expectancy, freedom to make choices, - generosity, - Perceptions of corruption</li></ul>
3. Happy Planet Index	<ul style="list-style-type: none"><li>- measures how well planet sustainability is.</li><li>- HPI = <math>\frac{\text{well-being expectancy. inequality of outcomes}}{\text{ecological footprint}}</math> <i>(dropped)</i></li><li>- well-being from you</li></ul>





## Knowledge Questions

1. What does the Happy Planet Index (HPI) consider that the Happiness Index created by the UN does not?

Included environmental damage.

2. Why does the Better Life Index only measure data for 35 countries?

OECD only have 35 countries.



## Inquiry - Application Questions

3. Go to the Happy Planet Index (HPI) Website at <https://happyplanetindex.org/hpi/> and review the top 5 countries on the list for 2019.

Then go to the following website to review the top 5 countries by GDP per capita:  
<https://statisticstimes.com/economy/world-gdp-capita-ranking.php>

- a. Are any countries on the top 5 of both lists? Write your answer below.

Only 1: Switzerland

- b. Why do you think GDP per capita and HPI rankings do not match?

Different requirements

Money vs Sustainability  
Alone included

## Thinking Questions

4. Can you think of any limitations or criticisms of the indexes of the indicators? List them below.

- GDP growth doesn't always result in environmental sustainability

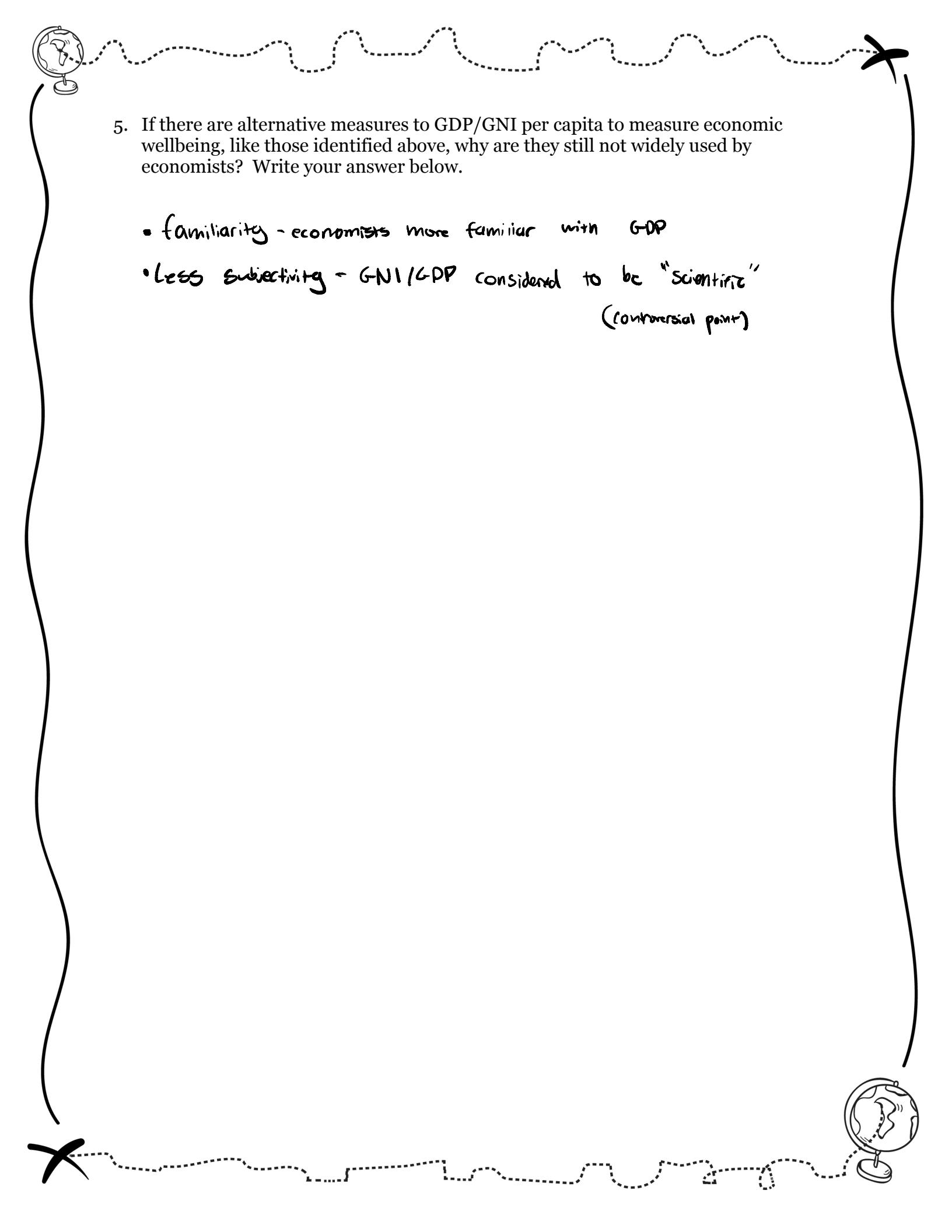
- Subject to government's bias.

- Errors in data collection.

- Subjectivity in data collection.

- Weighting - all measures weighted the same?  
and why?



- 
5. If there are alternative measures to GDP/GNI per capita to measure economic wellbeing, like those identified above, why are they still not widely used by economists? Write your answer below.

- familiarity - economists more familiar with GDP
- Less subjectivity - GNI/GDP considered to be "Scientific"  
*(controversial point)*