



# DP IB Economics: SL



## 3.1 Measuring Economic Activity

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Your notes

## 3.1.1 National Income & The Circular Flow of Income

### An Introduction to National Income

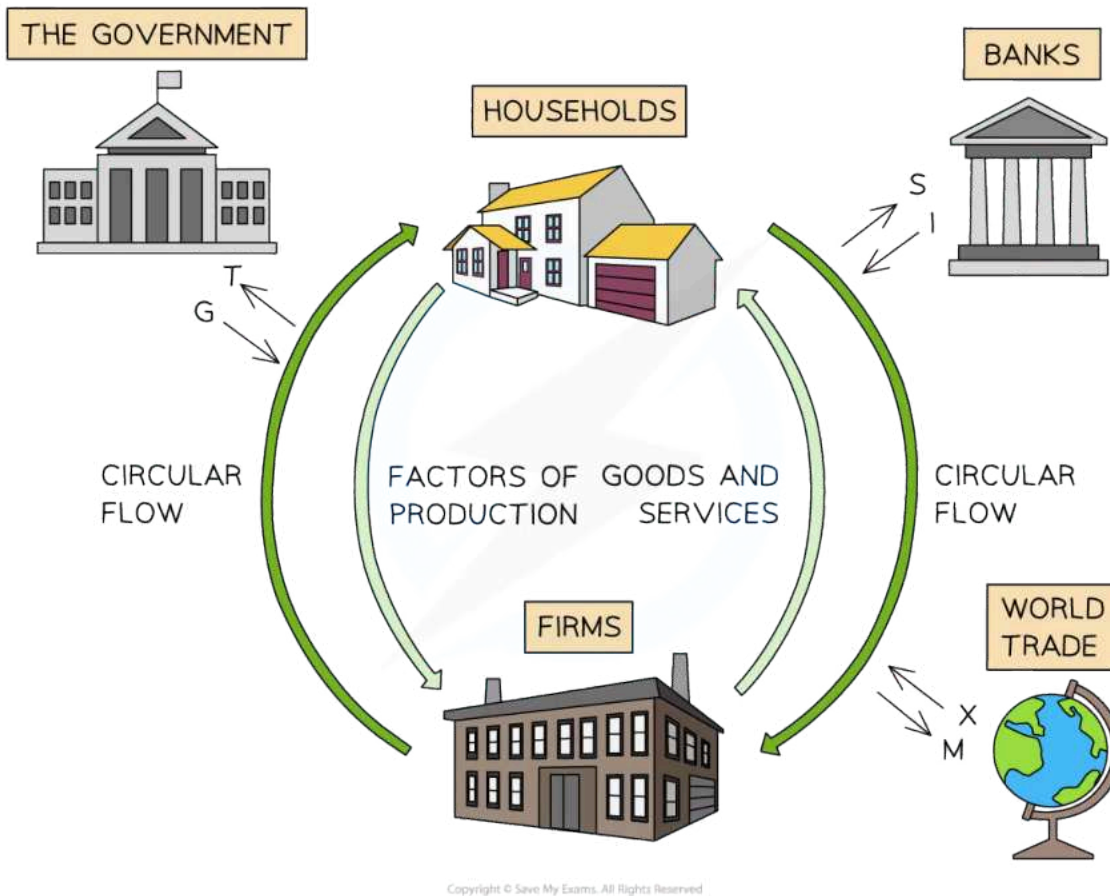
- National income accounting measures the **economic activity** within a country and provides insights into how a country is performing
- One of the main methods to determine **economic activity** is to measure the **rate of change of output** in an economy
- The output of an economy is called **gross domestic product (GDP)**
- **Nominal** GDP is the **value of all goods/services** produced in an economy in a one-year period
- The **circular flow of income model** is used to illustrate **national income** and the flow of money, resources and goods in an economy

### The Circular Flow of Income Model

- **Money** can **enter or leave** the circular flow of income in an economy
- **Injections** add **money** to the circular flow of income and **increase its size**
  - Increased government spending (**G**)
  - Increased investment (**I**)
  - Increased exports (**X**)
- **Leakages** (withdrawals) remove **money** from the circular flow of income and **reduce its size**
  - Increased savings by households (**S**)
  - Increased taxation by the government (**T**)
  - Increased import purchases (**M**)
- There are high levels of **interdependence** between households, firms, the government, the financial sector, and the foreign sector (foreign firms and households)



Your notes



*A diagram that shows the injections and leakages that influence the relative size of the circular flow of income*

## Diagram Analysis

- **Government:** Government spending (G) is an injection and taxation (T) is a leakage
- **Financial sector:** Investment (I) is an injection and savings (S) is a leakage
- **Foreign sector:** Exports (X) is an injection and imports (M) is a leakage
- The relative **size of the injections and withdrawals** impacts the size of the economy:
  - Injections > withdrawals = economic growth and increase in national income

- Withdrawals > injections = economic decline and a fall in national income
- **Changes to any of the factors** that influence government spending, investment, consumption and net exports will **increase/decrease** the relative size of the circular flow of income
  - E.g. An increase in **interest rates** will increase savings (withdrawal), and **reduce consumption** and investment



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### Examiner Tips and Tricks

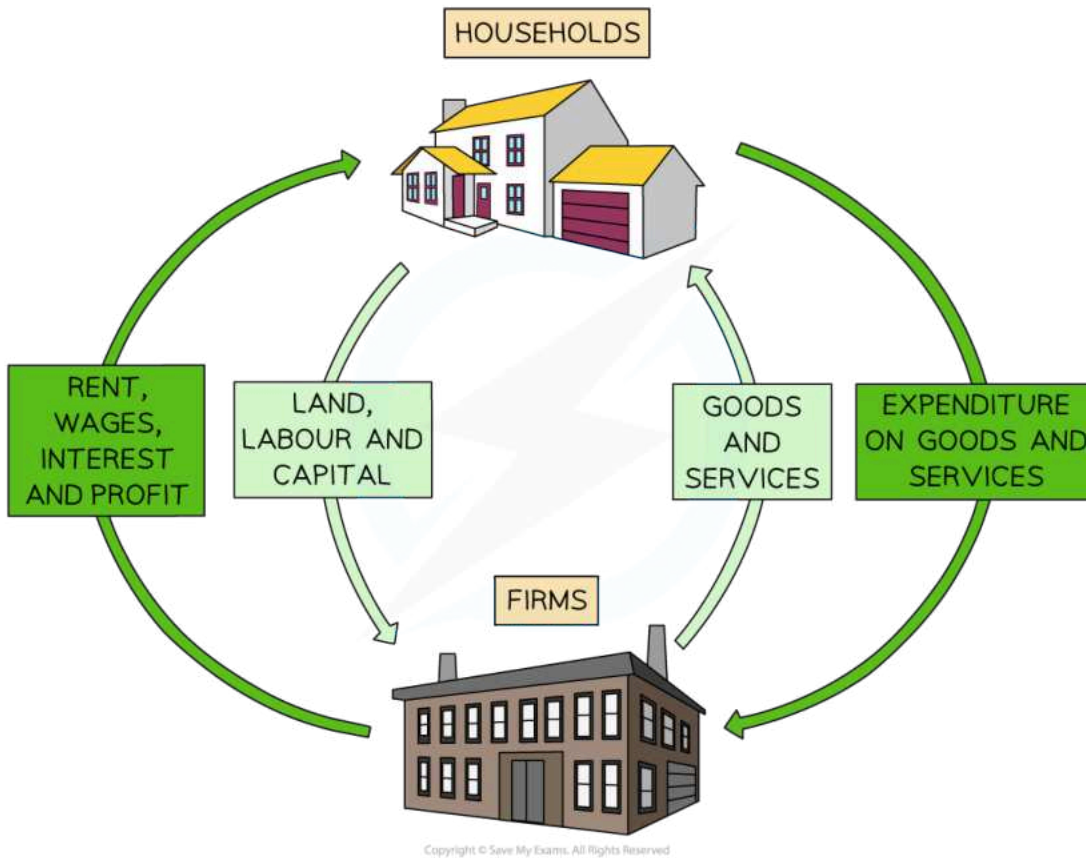
Remember to consider the **net effect and proportionality** of the injections and withdrawals. For example if the size of the government spending is large, it is likely to completely outweigh the combined withdrawals of savings and imports.

## Three Approaches to the Calculation of National Income

- With reference to the **circular flow of income model**, national income can be calculated using three possible approaches



Your notes



*Expenditure, income and output can be illustrated in the circular flow of income model*

### 1. The expenditure approach

- This approach adds up the value of all the expenditures in the economy in a year and includes consumption (C), government spending (G), investment (I) by firms and net exports (X - M)

- **Nominal GDP = C + I + G + (X - M)**

### 2. The income approach

- This approach adds up the payments (rewards) for the factors of production in a year and includes the wages from labour (W), rent from land (R), interest from capital (I) and profit from entrepreneurship (P)

- **National Income = W + R + I + P**

### 3. The output approach



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- This approach adds up the value of all **finished goods/services** produced within the economy each year (national output)
- All approaches should provide the **same figure**
  - One agent's **expenditure** is another agent's **income**
  - The value of finished goods ready for sale is equal to the expenditure paid to acquire them
- The **value of GDP** is different to the **volume of GDP**
  - The value is the **monetary worth**
  - The volume is the **physical number**

## Calculating Nominal GDP Using the Expenditure Approach

- **Nominal GDP** can be calculated using the value of the expenditure in an economy
  - $\text{GDP} = \text{Consumption (C)} + \text{Investment (I)} + \text{Government spending (G)} + \text{Exports (X)} - \text{Imports (M)}$
  - $\text{GDP} = \text{C} + \text{I} + \text{G} + (\text{X} - \text{M})$
  - If any of the components of GDP increase, then economic growth is likely to occur

### The components

- **Consumption** is the total spending on goods/services **by consumers** (households) in an economy
- **Investment** is the total spending on **capital goods** by firms
- **Government spending** is the total spending by the **government** in the economy
  - Includes public sector salaries, payments for the provision of merit and public goods etc.
  - It does not include **transfer payments**
- **Net exports** are the difference between the **revenue gained** from selling goods/services abroad and the **expenditure** on goods/services from abroad



### Worked Example

The table provides national income data for Vietnam in 2019 - presented in US\$. Calculate the nominal GDP using the expenditure method [2]



Your notes

Category	Value in US\$ millions
Consumption	11255
Investment	8927
Income tax	59577
Government spending	15697
Imports	4957
Exports	8532

Answer:

**Step 1: Determine which of the data presented is relevant to the calculation**

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

So income tax is not relevant (it is a leakage)

**Step 2: Substitute the relevant values into the formula**

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

$$\text{GDP} = 11255 + 8927 + 15697 + (8532 - 4957)$$

$$\text{Nominal GDP} = 39,454 \text{ \$m}$$

(Two marks for the correct answer or 1 mark for any correct work in the process)



Your notes

## 3.1.2 National Income Terminology & Calculations

### Nominal Gross National Income (GNI)

- **Nominal GDP** measures the value of production **within a country's borders**
  - However, many countries host multi-national corporations whose profits are included in the GDP figures, even though they usually send their profits out of the country
  - Likewise, citizens of a home nation make profits in other countries (included in their GDP statistics) and return these profits home (**Remittances** can be a significant income source for many developing nations)
  
- **Gross national income (GNI)** is therefore a more relevant metric in that it measures the nominal GDP + the **net factor income earned from abroad**



#### Worked Example

The table provides national income data for Vietnam in 2019 - presented in US\$. Calculate the **nominal GNI** [3]

Category	Value in US\$ millions
Consumption	11255
Investment	8927
Income tax	59577
Government spending	15697
Imports	4957
Exports	8532





Your notes

Net Income	4349
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Answer:

**Step 1: Determine which of the data presented is relevant to the calculation**

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

$$\text{GNI} = \text{GDP} + \text{Net Income}$$

So income tax is not relevant (it is a leakage)

**Step 2: Substitute the relevant values into the GDP formula**

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

$$\text{GDP} = 11255 + 8927 + 15697 + (8532 - 4957)$$

$$\text{Nominal GDP} = \$39,454 \text{ million}$$

**Step 3: Substitute the relevant values into the GNI formula**

$$\text{GNI} = \text{GDP} + \text{Net Income}$$

$$\text{GNI} = 39,454 + 4349$$

$$\text{GNI} = \$43,803 \text{ million}$$

(3 Marks for the correct answer or two marks for the correct GDP or 1 mark for any correct working in the process)

## Real GDP & GNI

- In economics, the use of the word **nominal** refers to the fact that the **metric** has **not been adjusted for inflation**
- **Nominal GDP** is the **actual value** of all goods/services produced in an economy in a **one-year** period
  - There has been **no adjustment** to the amount based on the **increase in price levels** (inflation)
- **Real GDP and GNI** is the **value of all goods/services** produced in an economy in a **one-year** period - and **adjusted for inflation**
  - For example, if **nominal GDP** is £100bn and **inflation is 10%** then **real GDP** is £90bn
- Real GDP and GNI are often calculated using a price deflator known as the **GDP deflator**

- The **GDP deflator** is used to convert nominal GDP/GNI from **current prices** to **constant prices**
- $$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100$$
- **Real GNI = Real GDP + Net income from abroad**



Your notes



### Worked Example

Calculate the real GDP in 2020 and 2021 using the figures in the table below [4]

Year	Nominal GDP (\$ Billion)	GDP deflator
2020	114	102.7
2021	129	98.8

Answer:

**Step 1: Substitute the values from 2020 into the equation**

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100$$

$$\text{Real GDP} = \frac{114}{102.7} \times 100$$

$$\text{Real GDP 2020} = \$ 111 \text{ Billion}$$

(Two marks for the correct answer or 1 mark for any correct working in the process. Answer needs to be rounded to 2 decimal places where appropriate)

**Step 2: Substitute the values from 2021 into the equation**



Your notes

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100$$

$$\text{Real GDP} = \frac{129}{98.8} \times 100$$

$$\text{Real GDP 2021} = \$130.57 \text{ Billion}$$

(Two marks for the correct answer or 1 mark for any correct working in the process. Answer needs to be rounded to 2 decimal places where appropriate)

## Real GDP/Capita & GNI/Capita

- Real GDP per capita = Real GDP / the population
  - It shows the **mean wealth** of each citizen in a country based on the value of GDP
  - This makes it easier to compare **standards of living** between countries
    - E.g. Switzerland has a much higher Real GDP/capita than Burundi
  - If a country has a real GDP value of \$124 billion and its population is 42 million, we can calculate the real GDP/capita as follows

$$\text{Real GDP Per Capita} = \frac{\text{Real GDP}}{\text{Population}}$$

$$\text{Real GDP Per Capita} = \frac{\$124 \text{ bn}}{42 \text{ million}}$$

$$\text{Real GDP Per Capita} = \$2,952.38$$

- Real GNI per capita = Real GNI / the population
  - It shows the **mean wealth** of each citizen in a country based on the value of GNI
  - It provides a better comparison of the **standards of living** between countries than real GDP/capita
  - If a country has a real GNI value of \$129 billion and its population is 42 million, we can calculate the real GNI/capita as follows

$$\text{Real GNI Per Capita} = \frac{\text{Real GNI}}{\text{Population}}$$

$$\text{Real GNI Per Capita} = \frac{\$ 129 \text{ bn}}{42 \text{ million}}$$

$$\text{Real GNI Per Capita} = \$ 3,071.43$$



Your notes

## Real GDP/Capita & GNI/Capita at Purchasing Power Parity (PPP)

- **Purchasing power parity (PPP)** is a **conversion factor** that can be applied to GDP and GNI
- It calculates the relative **purchasing power** of different currencies
  - It shows the number of **units of a country's currency** that are required to buy a product in the **local economy**, as \$1 would buy the **same product** in the **USA**
- The **aim of PPP** is to help make a more accurate **standard of living comparison** between countries where goods/services cost **different amounts**
- If a **basket of goods costs \$150** in Vietnam (once the currency has been converted) and the same basket of goods **costs \$450 in the USA**, the **purchasing power parity** would be 1:3
  - It seems like the **cost of living** is much higher in the USA
  - However, if the **USA's GNI/capita** is more than **three times** higher than the GNI/capita of Vietnam, it could be argued the USA has **better standards of living**
  - Conversely, if the **GNI/capita** in the USA was **less than three times** that of Vietnam, it could be argued that Vietnamese citizens enjoy a **higher standard of living** as they spend **less income** to acquire the same **goods/services**



### Examiner Tips and Tricks

When an exam question uses the phrase '**at constant prices**' it is referring to **real GDP**. For example, a question may read, 'Explain what is meant by a **rise in GDP at constant prices**'. This requires you to define **real GDP** and then explain the rise.

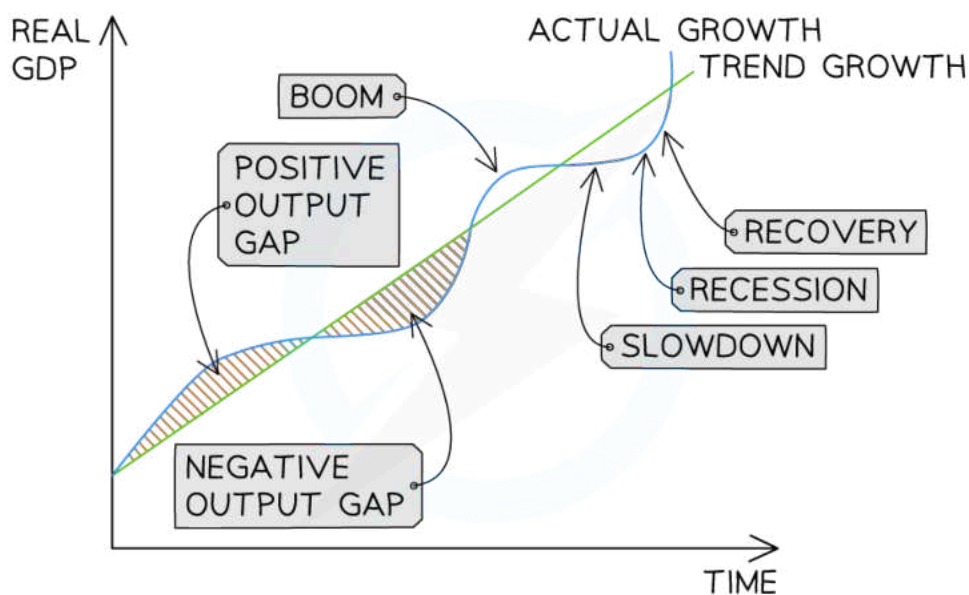


Your notes

### 3.1.3 The Business Cycle

## The Business Cycle

- A **business cycle** refers to the **changes in real GDP** that occur in an economy over time
  - This is the actual growth
- The real GDP will fluctuate above and below the **long-term trend rate of growth**
- There are four recognisable points in the cycle
  - Peak/**boom**; **slowdown/downturn**; **recession**, **recovery**



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*The Business Cycle illustrates the fluctuations of real GDP (actual growth) around long-term trend growth*

### Diagram Analysis

- A **positive output gap** is identified as the growth of real GDP that is **above** the trend
- A **negative output gap** is identified as the growth of GDP that is **below** the trend

- There is often a natural flow through the **different stages** from boom to slowdown to recession to recovery
- This flow of real GDP can be moderated by **government intervention**
  - E.g. increasing taxes in a **boom** period or increasing spending in a **recession**

### The Characteristics of a Boom and Recession

Characteristics of a Recession	Characteristics of a Boom
<ul style="list-style-type: none"> <li>▪ A recession occurs when there are two or more consecutive quarters (6 months) of <b>negative economic growth</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Increasing/high rates of <b>economic growth</b></li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing/high <b>unemployment</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Decreasing unemployment and increasing <b>job vacancies</b></li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing negative output gap and <b>spare production capacity</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduction of <b>negative output gap</b> or creation of a positive gap. Spare capacity is reduced or eliminated</li> </ul>
<ul style="list-style-type: none"> <li>▪ Low <b>confidence</b> for firms/households</li> </ul>	<ul style="list-style-type: none"> <li>▪ High confidence and more <b>risky decisions</b> taken</li> </ul>
<ul style="list-style-type: none"> <li>▪ Low inflation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Increasing rate of inflation - usually <b>demand pull</b></li> </ul>
<ul style="list-style-type: none"> <li>▪ Increase in government expenditure perhaps leading to a great <b>budget deficit</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ An improvement in the <b>government budget</b> as tax revenues rise and expenditure falls</li> </ul>



Your notes



### Examiner Tips and Tricks

You will often be examined on the **characteristics of the trade cycle**. Remember to demonstrate **critical thinking** around the assumptions of the model. For example, some firms may thrive during a **recession** as consumers switch to purchasing inferior goods (e.g. Lidl).

Additionally, the components of aggregate demand do not rise/fall at the same rate. For example, during recovery, consumption may increase well ahead of investment by firms.

An economy may also experience some fundamental **restructuring** during a prolonged recession and the **composition of real GDP growth** may be significantly different to what it was before the recession.



Your notes



Your notes

### 3.1.4 Appropriateness of Using GDP/GNI to Measure Well-being

## Using National Income Statistics to Measure Well-being

- **National income statistics** are useful for making **comparisons between countries**
  - They provide insights into the **effectiveness** of government policies
  - They **allow judgments** to be made about the relative **wealth** and **standard of living** within each country
  - They allow comparisons to be made over the same or **different time periods**
    - For example, the growth of the Asian Economies in the **last 15 years** can be compared to the growth of the **European Economies in the 1990s**
- Using **real GDP** is a better comparison than **nominal GDP**
  - One country may have a much higher rate of economic growth, but also a much higher rate of inflation. Real GDP provides a better comparison
- Using **real GDP/Capita** provides better information than real GDP as it takes **population differences** into account
- Using **real GNI/capita** is a more realistic metric for analysing the **income available per person than GDP/capita**
- Using **real GNP/capita** provides information on the **income** that is actually **within a country's borders**
  - This value can be significantly different from GDP/Capita



### Examiner Tips and Tricks

When studying **national income data** that has been provided for data response questions, you will often see a generalised pattern emerge

- **Developed countries** will have a **smaller gap** between their **GNI and GDP**
- **Developing countries** often have a **higher GDP than GNI** - as much as 6%

The reason for this is usually linked to **multinational companies** involved in **resource extraction**, who then send **income/profits** home





Your notes

# Making Comparisons Between Countries and Over Time

## The Limitations of Using GDP data to Compare Living Standards Between Countries and over time

Limitation	Explanation
Lack of information provided on inequality	<ul style="list-style-type: none"> <li>The <b>distribution of income</b> in an economy is provided as an <b>average</b> (GDP/capita)</li> <li>The <b>differences</b> in the standard of living within the <b>same country</b> can be <b>significant</b></li> </ul>
Quality of goods/services	<ul style="list-style-type: none"> <li>GDP provides no information on the <b>increase/decrease</b> in the <b>quality</b> of goods/services over time</li> <li>If <b>quality worsens</b> but prices are lower, then the standard of living is judged to have increased</li> <li>The <b>poor quality</b> may actually have <b>decreased</b> the <b>standard of living</b></li> </ul>
Does not include unpaid/voluntary work	<ul style="list-style-type: none"> <li>If it included <b>voluntary/unpaid</b> work, then GDP/capita would be <b>higher</b></li> <li>E.g. some economies have a high amount of <b>family childcare provision</b>. This <b>increases standards of living</b> but is not recorded in any way</li> </ul>
Differences in hours worked	<ul style="list-style-type: none"> <li>GDP data does not capture the <b>amount of time</b> taken to produce the GDP/capita</li> <li>In one country, where it takes <b>less time</b> to generate income than in a similar country, the <b>standard of living</b> would actually be <b>higher</b></li> </ul>
Environmental factors	<ul style="list-style-type: none"> <li>GDP does not capture the <b>environmental and health impacts</b> of generating income within a country (externalities)</li> <li>In one country, where there are <b>fewer externalities</b> in generating income the <b>standard of living would be higher</b></li> </ul>



Your notes

### 3.1.5 Alternative Measures of Well-Being

## Alternative Measures of Well-being

- Due to the **limitations of using national income statistics to measure well-being** and compare standards of living, alternative measures of well-being have been developed. These include:
  1. **The OECD Better Life Index**
  2. **The Happiness Index**
  3. **The Happy Planet Index**
- While **GDP focusses on production**, happiness focuses on **health**, relationships, the environment, education, satisfaction at work and **living conditions**
- **National incomes statistics** tend to present more **positive data** while national happiness surveys yield more **normative data**
- There is a link between income and happiness and the **Easterlin Paradox** is often used to explain it. The paradox states that:
  - **Happiness** and increases in **income** have a direct relationship up to a point
  - Beyond that point, the relationship is **less evident**

## OECD Better Life Index

- **The Organisation for Economic and Cultural Development (OECD)** has created an index which aims to measure the well-being of citizens in its 38 member countries
- The **Better Life Index** has 11 variables which it considers essential to the well-being
  - Countries are rated on each variable and then comparisons can be made

### The Eleven Variables of the OECD Better Life Index

Variable	Explanation
Housing	<ul style="list-style-type: none"> <li>▪ This considers <b>living conditions</b> and the proportion of <b>household expenditure</b> spent on housing</li> </ul>
Income	<ul style="list-style-type: none"> <li>▪ This considers the <b>net income</b> and <b>net wealth</b> of households</li> </ul>



Your notes

<b>Jobs</b>	<ul style="list-style-type: none"> <li>This considers <b>job security</b>, the <b>average earnings</b> of the country and the unemployment rate</li> </ul>
<b>Community</b>	<ul style="list-style-type: none"> <li>This considers the <b>social support networks</b> that exist in the economy</li> </ul>
<b>Education</b>	<ul style="list-style-type: none"> <li>This considers the <b>quality of the education</b> with a focus on educational attainment and skills</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>This considers the <b>environmental health</b> with a focus on air pollution and water quality</li> </ul>
<b>Civic Engagement</b>	<ul style="list-style-type: none"> <li>This considers <b>voter turnout</b> and community involvement in creating legislation (laws)</li> </ul>
<b>Health</b>	<ul style="list-style-type: none"> <li>This considers the <b>quality of health</b> with a focus on <b>life expectancy</b> and data from <b>self reported health surveys</b></li> </ul>
<b>Life satisfaction</b>	<ul style="list-style-type: none"> <li>This considers the <b>overall satisfaction</b> that people have with their lives</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>This considers <b>how safe people feel walking alone at night</b>, together with the murder rate in the country</li> </ul>
<b>Work-life balance</b>	<ul style="list-style-type: none"> <li>This considers the percentage of employees who <b>work long hours</b>, together with the amount of <b>time given to leisure</b> and personal care</li> </ul>

## Happy Planet Index

- The Happy Planet Index (HPI) attempts to measure **sustainable** wellbeing
- Countries are ranked by how efficiently they deliver long, happy lives using the earth's scarce resources in a sustainable way
- The HPI scores countries with a lower ecological footprint higher countries with more environmental degradation
- The HPI measures a country's progress using three variables
  - Wellbeing**
  - Life expectancy**

- Ecological footprint

- HPI Score = 
$$\frac{\text{wellbeing} \times \text{life expectancy}}{\text{ecological footprint}}$$



Your notes

RANK	COUNTRY	LIFE EXPECTANCY	WELL BEING	ECOLOGICAL FOOTPRINT	HPI SCORE
1	COSTA RICA	○ 80.4 years	○ 7.00/10	● 2.65 gha/p	62.1
2	VANUATU	● 70.5 years	○ 6.96/10	● 1.62 gha/p	60.4
3	COLOMBIA	○ 77.3 years	○ 6.35/10	● 1.90 gha/p	60.2

150	CENTRAL AFRICAN REPUBLIC	○ 53.3 years	○ 3.08/10	● 1.21 gha/p	25.2
151	MONGOLIA	● 69.9 years	● 5.56/10	○ 10.08 gha/p	24.5
152	QATAR	● 80.2 years	● 6.37/10	○ 15.04 gha/p	24.3

The top 3 and bottom 3 countries on the HPI in December 2022 (Source: [Happy Planet Index](#))

## The Happiness Index

- The Happiness Index is a survey that measures happiness in 10 different areas of a persons life

1. Psychological Well-Being

Optimism, sense of purpose/accomplishment

2. Health

Energy levels and ability to perform everyday activities



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**3. Time Balance**

Enjoyment, sense of leisure, frequency of feeling rushed

**4. Community**

Sense of belonging, volunteer levels, sense of safety in the community

**5. Social Support**

Satisfaction with friends and family, feeling loved, and degree of loneliness

**6. Education, Arts, and Culture**

Access to cultural and educational events and diversity

**7. Environment**

Access to nature, pollution levels, and level of conservation

**8. Governance**

Trust in government, sense of corruption, and competency of authorities

**9. Material Well-Being**

Financial security and meeting basic needs

**10. Work**

Compensation, autonomy, and productivity

(Source: [The Happiness Index](#))