

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

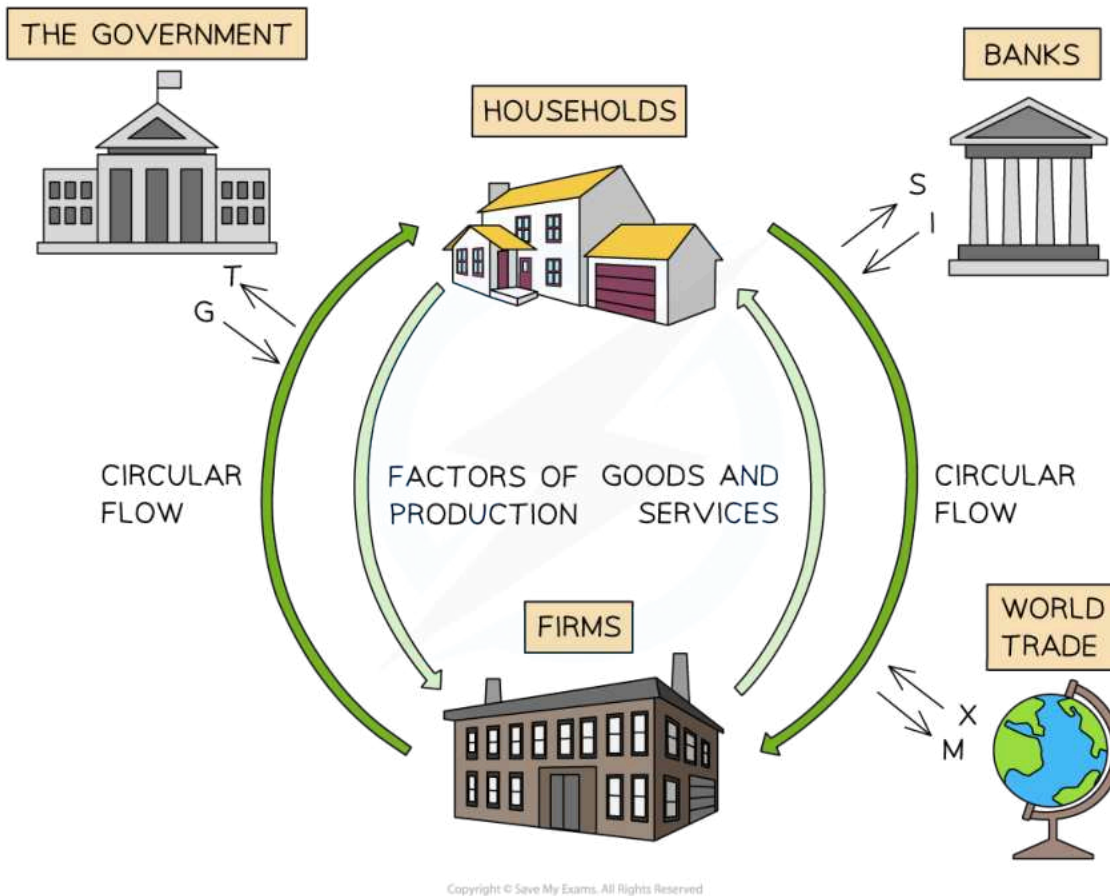
- National income accounting measures the **economic activity** within a country and provides insights into how a country is performing
- One of the main methods to determine **economic activity** is to measure the **rate of change of output** in an economy
- The output of an economy is called **gross 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



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

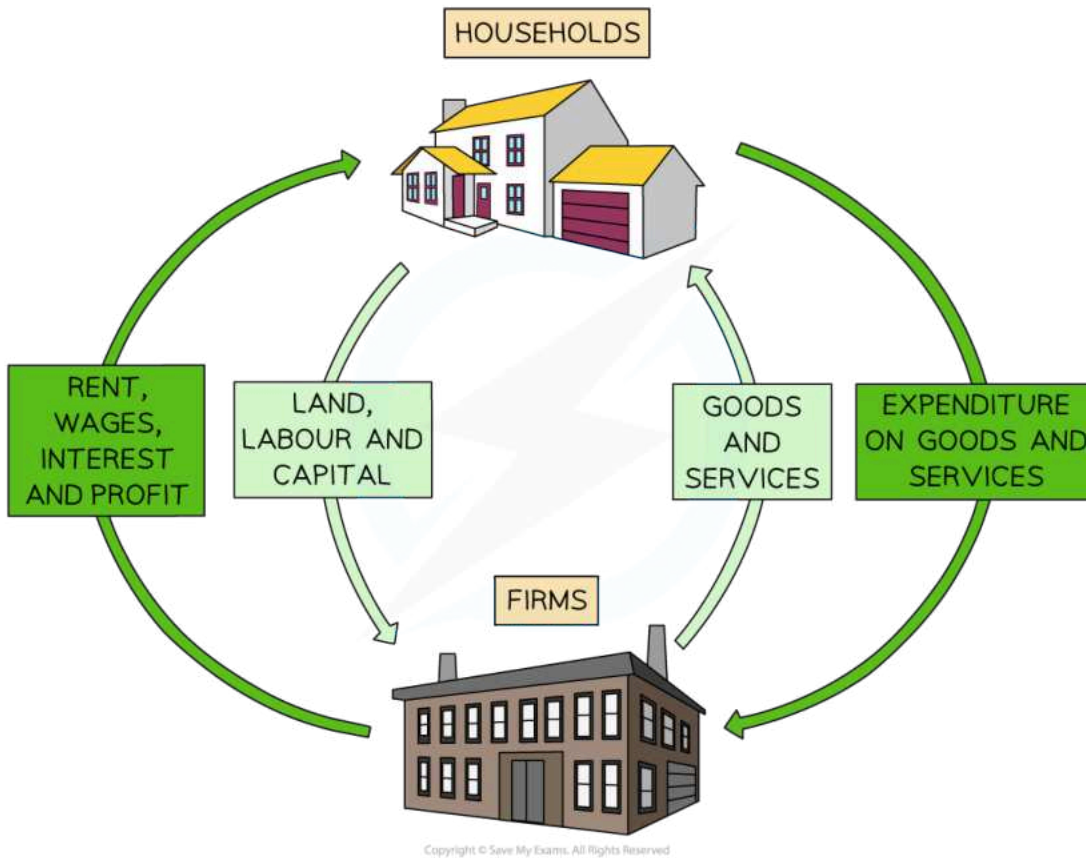
- With reference to the **circular flow of income model**, national income can be calculated using three possible approaches



Your notes



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



Your notes

- 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.

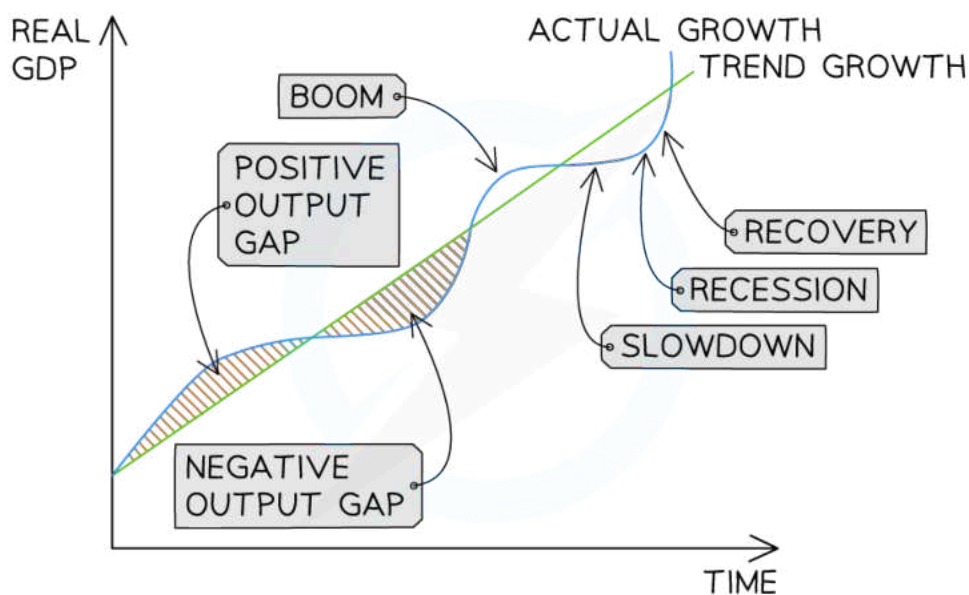


Your notes

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



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



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Making Comparisons Between Countries and Over Time

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

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



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



Your notes

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

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

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



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



Your notes

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](#))