

3.1 Measuring economic activity & illustrating its variations



Learning objectives

3.1 Measuring economic activity and illustrating its variations	Depth	Diagrams and calculations
National income accounting as a measure of	AO2	Diagram: circular flow of income model
economic activity	AO4	showing the interactions between
Equivalence of the income, output and expenditure	AO2	decision makers, leakages and injections
approaches to national income accounting, with	AO4	
reference to the circular flow model		
[Nominal] Gross domestic product (GDP) as a	AO2	Calculation: [nominal] GDP from sets of
measure of national output	AO4	national income data, using the
		expenditure approach
[Nominal] Gross national income (GNI) as a measure	AO2	Calculation: [nominal] GNI from data
of national output	AO4	



Learning objectives

3.1 Measuring economic activity and illustrating its variations	Depth	Diagrams and calculations
Real GDP and real GNI	AO2	Calculation: real GDP and real GNI, using
	AO4	a price deflator
Real GDP/GNI per person (per capita)	AO2	Calculation: real GDP per capita and real
Real GDP/GNI per person (per capita) at purchasing	AO4	GNI per capita
power parity (PPP)		
Business cycle: short-term fluctuations and long-term	AO2	Diagram: business cycle showing short-
growth trend (potential output)	AO4	term fluctuations and long-term growth
		trend (potential output)

Learning objectives

3.1 Measuring economic activity and illustrating its variations	Depth	Diagrams and calculations
Appropriateness of using GDP or GNI statistics to measure economic well-being—use of national income statistics for making: • comparisons over time • comparisons between countries	AO3	
Alternative measures of well-being OECD Better Life Index Happiness Index Happy Planet Index 	AO2	



National income

National income accounting is used to measure a nation's level of economic activity.

There are three equivalent measurements of economic activity expressed in monetary terms:





Which economic model illustrates the equivalence of the 3 methods of measuring national income?



The **circular flow of income** shows the flow of money between different stakeholders of an economy and is also used to illustrate the three methods of national income.

Challenge!

Using the circular flow of income diagram, explain how the three methods of national income accounting is equivalent to one another.



Expenditure approach

Measures the value of total expenditure by all stakeholders in the economy, expressed as GDP = C + I + G (X - M).

As shown, the total expenditure from consumers, the government, the financial sector, and foreign economies goes towards domestic firms.



Income approach

Measures the value of all factor incomes earned in the economy expressed as: GDP = interest + profits + rent + wages

The money domestic firms receive from total expenditure is transferred to households as **factor incomes** in exchange for factors of production.



Output approach

Measures the value of all final goods and services produced in the economy.

Firms use the factors of production to produce goods and services. Therefore, the total value of output of goods and services is equal to the factor incomes used to purchase the factors of production, which is equal to the total expenditure of all stakeholders.



At any given time, the **total expenditure** from all stakeholders is equal to the **total income** generated by households which is equal to the **total output** produced by firms.





Level7 Education

An **injection** refers to the additional money added into the circular flow of income.

A **leakage** refers to a withdrawal of money from the circular flow of income.

If **injections** > **leakages** in the circular flow, national income increases.

If **leakages** > **injections** in the circular flow, national income decreases.



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- [10 marks]
- Paper 1 Exam Practice Question 16.2
- [25 marks]





[Nominal] Gross domestic product (GDP)

Nominal GDP measures the value of all final goods and services produced in an economy within a given time period (typically one year), using **current price levels**. This means that nominal GDP is not adjusted for changes in price levels over time (non-inflation adjusted).

GDP = Consumption + Investment + Government spending + (Exports - Imports)= C + I + G + (X - M)



Real world example – activity

Below are the top 10 countries based on nominal GDP.

Task: rank the following countries from highest nominal GDP to lowest nominal GDP.





Calculation: [nominal] GDP using expenditure approach

Example: calculating nominal GDP

Component of expenditure	\$ (billion)
Consumption	447
Investment	119
Government spending	92
Exports	1,299
Imports	1,259

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

= 447 + 119 + 92 + (1,299 - 1,259)

= \$698 billion

Your turn!

Calculate the value of Country A's imports (M) in 2020 using the figures given below:

	\$ (billion)
GDP	852
Consumption	568
Investment	276
Government spending	89
Exports	1,569
Imports	Μ

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- [2 marks] each







[Nominal] Gross national income (GNI)

Gross national income (GNI) measures the value of all income earned by the country's citizens including income earned from abroad.





Calculation: [nominal] GNI

GNI = GDP + **net income from abroad**

Net income from abroad = Income from abroad - Income sent abroad



Real world example – case study

Source: Subway stores around the world

Subway is an American fast-food restaurant which operates more than 42,000 stores in over 100 countries around the world.

- Would Subway's output in Australia count towards US GDP or Australia's GDP?
- 2. If Subway sends profits back to the US, how would this change the US' GNI?





Calculation: [nominal] GNI

Example – calculating nominal GDP using the expenditure approach

Component of expenditure	\$ (billion)
Consumption	447
Investment	119
Government spending	92
Exports	1,299
Imports	1,259
Net income from abroad	-345

GDP = C + I + G + (X - M)= 447 + 119 + 92 + (1,299 - 1,259) = \$698 billion GNI = GDP + net income from abroad= 698 - 345= \$353 billion





Real world example

Article: Why East Timor's GNP is four times as high as its GDP

GDP and GNI are different measures of a country's

economic activity.



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- [2 marks]





Real vs nominal

Real GDP and real GNI are measures of economic activity which are calculated using **constant prices**, meaning the values are adjusted for changes in price levels over time.

On the other hand, nominal GDP and nominal GNI are measured using **current prices**, thus these values are not adjusted for changes in price levels over time.

An increase in nominal GDP may suggest that output has increased over time, when the rise in nominal GDP may actually be due to inflation. Therefore, real GDP and real GNI are more accurate measures of comparing economic activity.



Calculation: real GDP and real GNI using price deflator

Real GDP and real GNI values are calculated using a price deflator to account for inflation.

Formulae

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

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



Calculation: real GDP and real GNI using price deflator

Example – calculating real GDP using price deflator

Year	Nominal GDP \$ (billion)	Price deflator
2019	287	100
2020	298	102
2021	300	104

The price deflator in the base year is

always equal to 100.

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

Real GDP in 2019: $\frac{287}{100} \times 100 = $287B$

Real GDP in 2020: $\frac{298}{102} \times 100 =$ \$292.2B

Real GDP in 2021: $\frac{300}{104} \times 100 = $288.5B$



Calculation: real GDP and real GNI using price deflator

Year	Nominal GDP \$ (billion)	Price deflator	Real GDP \$ (billion)
2019	287	100	287
2020	298	102	292.2
2021	300	104	288.5

Interpretation

Although nominal GDP increased each year from 2019 to 2021, real GDP only increased in 2020 while falling in 2021.

This means the rate of increase in price levels exceeded the rate of increase in the output of goods and services between 2020 to 2021.

2019 to 2020 shows economic growth.2020 to 2021 shows a recession.



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- [4 marks]





Total vs per capita

Real GDP and real GNI values indicate the overall size of the economy. On the other hand, **per capita** values indicate the average income **per person** in the economy, thus providing a better indication of living standards.

Formulae

Real GDP/GNI per capita = $\frac{\text{Real GDP}}{\text{Population}}$

Real GDP/GNI per capita = $\frac{\text{Real GNI}}{\text{Population}}$





Real GDP = \$183,810

Real GDP per capita = \$18,381



Real world example – data analysis

Source: Nominal GDP vs GDP per capita

Country	Nominal GDP \$ (trillion)	GDP per capita (\$)
United States	19.49	59,939
China	12.24	8,612
Japan	4.87	38,214
Germany	3.69	44,680
India	2.65	1,980

Data Analysis Questions

- 1. What do you notice from the data?
- 2. What questions do you wonder about the data?
- 3. Research information that may help you answer your questions from Q3.
- 4. What conclusions can you make from Q1, Q2, and Q3?





Purchasing power parity (PPP)

Sources: The Big Mac index and TWL #6: Big Mac Economics

- 1. What does the Big Mac index show?
- 2. What do comparisons between the suggested exchange rate and the actual exchange rate indicate about a currency?



Real GDP/GNI (per capita) at purchasing power parity (PPP)

Purchasing power refers to the amount of goods and services that can be bought with one unit of a currency.

Purchasing power parity (PPP) refers to the exchange rate needed to buy the same basket of goods and services in different countries using the same amount of money, i.e., the exchange rate needed for the same purchasing power across countries.

The PPP metric is useful as different countries have different price levels. This metric allows for more accurate comparisons between the value of output produced in different countries.





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- [2 marks]
- Paper 2 and 3 Exam Practice Question 16.9
- [7 marks]





A business/economic cycle illustrates the short-term fluctuations of real GDP over time.

It consists of the following phases:

- Expansion
- Peak
- Recession
- Trough



The long-term growth trend in the business cycle illustrates the **potential GDP** of an economy.



An **expansion** occurs when real GDP increases

over time.

A **peak** is the highest point of a business cycle.

A **recession** occurs when real GDP decreases over time.

A trough is the lowest point of a business cycle.



Task: fill in the missing boxes with the following words: *high, low, increases, decreases.*

Phase	Aggregate demand	Inflation	Unemployment	Business and consumer confidence
Expansion	Increases		Falls	
Peak		High		High
Recession	Decreases			Decreases
Trough	Low	Low	High	



Task: fill in the missing boxes.

Phase	Aggregate demand	Inflation	Unemployment	Business and consumer confidence
Expansion	Increases	Increases	Falls	Increases
Peak	High	High	Low	High
Recession	Decreases	Decreases	Increases	Decreases
Trough	Low	Low	High	Low



Business cycle – output and unemployment

An economy achieves full employment when real GDP = potential GDP (A, B, C, D).

Here, unemployment = the natural rate of unemployment.

An economy experiences an **inflationary gap** when real GDP > potential GDP (A–B, C–D). Here, unemployment < the natural rate of unemployment.

An economy experiences a **deflationary gap** when real GDP < potential GDP (<A, B–C, >D).

Here, unemployment > the natural rate of unemployment.





A higher real GDP/ GNI per capita value usually corresponds to a higher **standard of living**, as the average person will be able to purchase more goods and services. However, there are several reasons why these values may not accurately measure economic well-being.



"The gross national product does not allow for the health of our children, the quality of their education, or the joy of their play."

– Robert F. Kennedy





Real world example

Source: <u>GDP per capita vs. economic inequality</u>

Using examples from the source, discuss why real GDP per capita statistics may not accurately

reflect the differences in standards of living between countries.



Leisure time

Source: Annual working hours vs. GDP per capita

Take Hong Kong and Switzerland for example. The **GDP per capita** in these two countries are similar, which may suggest the living standards are comparable. However, the average person in Hong Kong works 596 hours more than the average worker in Switzerland in a year.

	Working hours (hours per person)	GDP per capita (int\$)
Hong Kong	2,186	56,055
Switzerland	1,590	57,410

Therefore, real GDP/ GNI values do not accurately measure economic well-being as important factors such as leisure time are unaccounted for.



Negative externalities

GDP and GNI statistics do not account for the **negative externalities** which arise with increased production in the economy. As a result, economic well-being may be overstated as environmental costs are not considered.

Green GDP is a measure of economic activity which accounts for environmental degradation and the depletion of natural resources.

Green GDP = GDP - environmental costs of production





Informal activities

GDP/ GNI statistics may be **understated** as they do not account for informal activities involving **non-marketed goods** and those in the **hidden/ underground economy**.



Task: watch the video and answer the following questions

- 1. Comment on the significance of activities in the underground economy to a country's GDP.
- 2. List two examples of non-marketed goods or goods that are sold in the underground economy.



Real world example – case study

Podcast: What Does GDP Not Tell Us?

- 1. When was the GDP statistical tool created?
- 2. What does GDP measure?
- 3. What has GDP become the defining measure of? Why is this a problem?
- 4. What are the three factors which make a 'good society' in the Social Progress Index?





Alternative measures of well-being

- OECD Better Life Index (BLI)
- Happiness Index
- Happy Planet Index (HPI)

Task:

- 1. List the variables which are considered in each of the three indices.
- 2. How is the Happy Planet Index calculated?
- 3. List the top 5 countries for each of the three indices.
- 4. List the bottom 5 countries for each of the three indices.



Real world example – data analysis

Source: <u>Global Happiness: Which Countries are the Most (and Least) Happy?</u>

Data Analysis Questions

- 1. What do you notice from the data?
- 2. What questions do you wonder about the data?
- Research information that may help you answer your questions from Q3.
- 4. What conclusions can you make from Q1, Q2, and Q3?







Test your knowledge on this unit: <u>Kahoot!</u>

