



UNIT 5 – Point 1

Introduction to Open Economy Macroeconomics

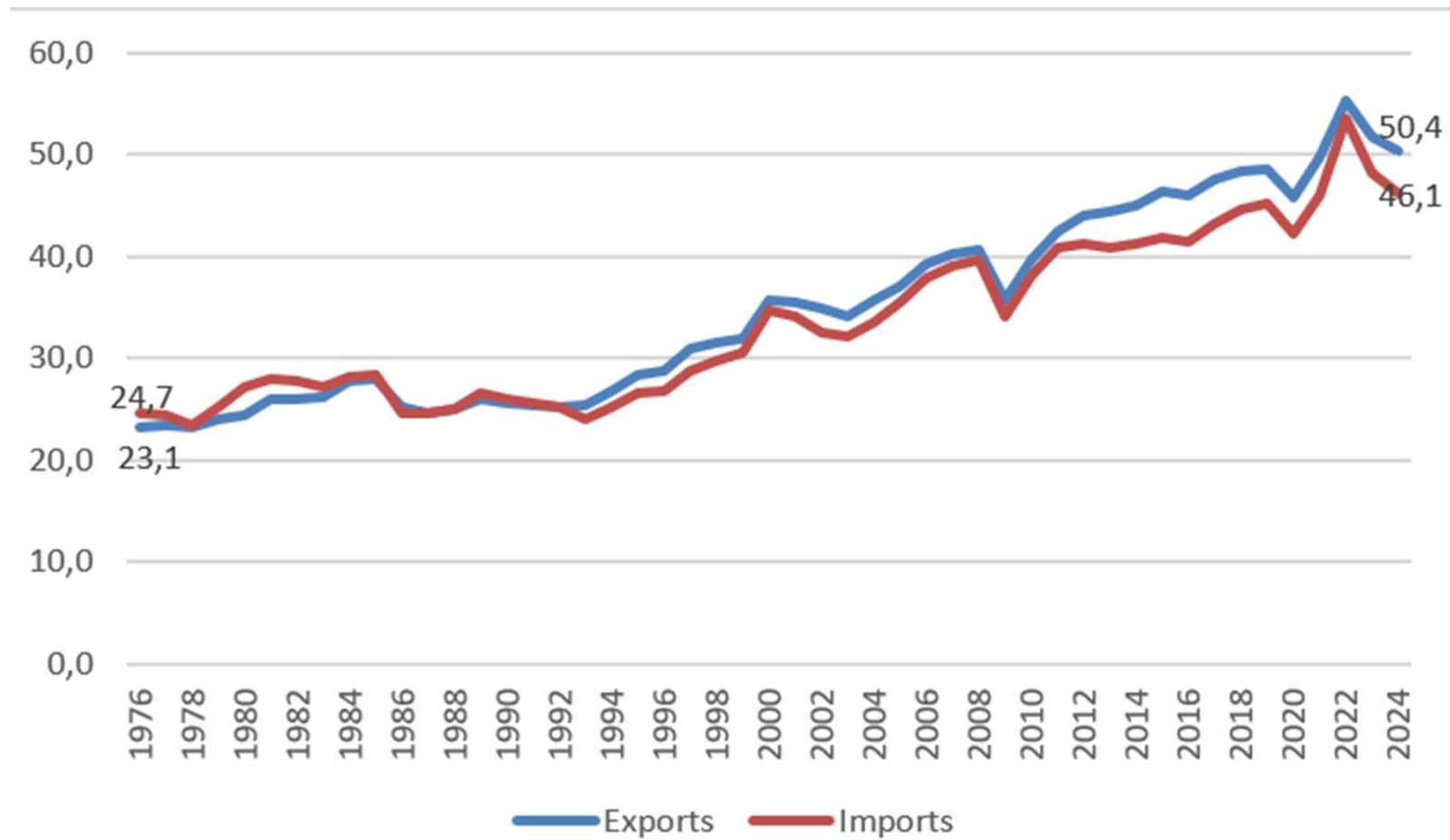
- **Dimensions of openness**
- **Measures of trade openness**
- **Exchange rate concepts**
- **The importance of international financial transactions**
- **Balance of payments accounts and national income and product accounts**
- **Macroeconomic identities in an open economy**
- **Income, expenditure and the Current Account**
- **The disposition of national Savings and the financing of domestic investment.**
- **The composition of the Current Account**

Dimensions of openness

- **Openness in goods markets.**
In an open economy **consumers and firms can choose between domestic and foreign goods.**
- **Openness in financial markets.**
In an open economy **financial investors can choose between domestic assets and foreign assets.**
- **Openness in factor markets.**
In an open economy **firms can choose where to locate production, and workers can choose where to work.**

In the short and medium run, openness in factor markets plays much less of a role than openness in goods and financial markets.
Therefore we will **neglect it**, (except when considering the distinction between GDP and GNP)

EU exports and imports as a % of GDP, (including both intra-EU and extra-EU trade)



Data Source: World Bank, World Development Indicators: <https://databank.worldbank.org/source/world-development-indicators>

EU countries are highly integrated, they trade a lot among themselves. The **largest part of EU international trade is within EU countries** (intra-EU), **rather than extra-EU**.

Example: in 2024 total intra- and extra-EU trade (sum of imports and exports), amounted to 96,5% of EU GDP (according to data in the above graph) while extra-EU trade amounted to 21,4% of EU GDP (according to European Commission data).

Exports as a % of GDP – Selected countries

Years 2015–2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
France	31,7	31,5	32,3	32,9	32,9	28,6	31,3	36,6	34,5	33,9
Italy	29,1	28,8	30,1	30,8	30,9	28,7	31,2	35,1	33,3	32,5
Germany	42,6	41,6	42,2	42,5	42,3	39,1	42,5	45,6	43,0	41,4
Spain	33,3	33,6	34,9	34,9	34,7	30,5	33,8	39,7	37,8	37,1
Japan	17,4	16,1	17,6	18,3	17,5	15,5	18,1	21,5	21,9	22,8
UK	27,9	29,1	31,0	31,9	31,9	29,9	29,3	34,1	31,9	31,0
US	12,5	12,0	12,3	12,4	11,9	10,2	11,0	11,8	11,2	11,1

Source: World Bank, World Development Indicators:
<https://databank.worldbank.org/source/world-development-indicators>

Degree of openness

Selected countries – Years 2015-2024

(percentage ratios)

What is it? It is the ratio between the sum of imports and exports (total trade) over GDP

What does it measure? When comparing countries, higher values are associated with greater international openness.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
France	63,5	63,3	65,4	66,8	66,4	58,8	63,8	76,0	70,6	68,1
Italy	55,4	54,4	57,6	59,3	58,7	53,9	60,3	72,0	65,1	62,8
Germany	77,8	76,0	77,5	79,1	79,1	72,9	79,9	88,8	82,0	79,1
Spain	63,6	63,2	66,2	67,0	66,4	59,4	66,5	78,5	71,8	70,0
Japan	35,4	31,3	34,4	36,6	35,2	31,3	36,7	46,8	45,2	46,4
UK	57,1	59,8	63,2	64,9	65,0	59,2	58,5	69,2	65,0	62,8
US	27,8	26,6	27,3	27,6	26,5	23,4	25,6	27,3	25,3	25,4

Can exports Exceed GDP?

Exports of goods and services (% of GDP)										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Ireland	126,7	129,2	128,5	126,0	131,2	139,8	136,4	139,5	136,5	144,0

Source: World Bank, World Development Indicators: <https://databank.worldbank.org/source/world-development-indicators>



YES!

Imports and Exports include intermediate goods and services!

GDP (total value added) is the value of **final goods** and services **produced in the economy** in a given period.

The value of intermediate goods used in production is already included in the value of final goods. In an open economy, however, some (or all) of the intermediate inputs can be imported, rather than produced domestically. Therefore their value is not part of domestic production, and should not be taken into account when assessing GDP.

Can exports Exceed GDP? Example

A country imports intermediate goods for 1 billion, transforms them into final output whose value is 1,2 billions. Of this final output 1 billion is exported, and 200 millions are consumed domestically.

- What is the value of GDP (=Value Added) in this Economy?
- What is the ratio of exports over GDP?

$$\begin{aligned}\text{GDP} = \text{VALUE ADDED} &= \text{Value of final output} - \text{Imported intermediate inputs} \\ &= 1,2 \text{ billions} - 1 \text{ billion} \\ &= \mathbf{0,2 \text{ billions (200 millions)}}$$

$$\text{Exports/GDP} = 1000/200 = 5 \text{ the ratio of exports on GDP is 500\%}$$

Nominal and Real Exchange Rates

One important factor in determining the choice between domestic and foreign goods is their relative price (the price of domestic goods relative to the price of foreign goods, or vice-versa).

This relative price is known as the **real exchange rate**

*Have you ever heard of real exchange rates?
Have you ever seen it on economic newspapers?*



We must start by introducing the different concepts of nominal and real exchange rates.

Nominal exchange rate

The **nominal exchange rate** is the relative price of two currencies.

It can be expressed as:

We will use this definition

- The price of domestic currency in units of foreign currency

*e.g. dollars per euro (\$/€), yen per euro (¥/€) ...
(base currency=domestic currency)*

E

Or, equivalently:

- The price of foreign currency in units of domestic currency

*e.g. euros per dollar (€/€), euros per yen (€/¥)
(base currency=foreign currency)*

Bilateral and Effective exchange rate

Bilateral exchange rate

E.R. between the domestic currency and any single other foreign currency

Multilateral exchange rate or Effective exchange rate

E.R. *index*, which is a weighted average of indices of bilateral E.R. of the domestic currency against a group of other currencies.

This is the exchange rate concept which is used in macroeconomics

Construction of nominal Effective Exchange Rate Indexes

1. Bilateral nominal exchange rates are converted into indexes, using a common base year.
2. A weight is chosen for each bilateral e.r (usually each country's share of total trade flows)
3. Bilateral exchange rates indexes are averaged using the weights

Several choices have to be made following these steps:

- type of weighting (geometric (better) or arithmetic)
- choice of weights (usually trade shares)
- number of currencies
- base year

Therefore, a variety of effective exchange rates indexes are likely to be in use at any time for a country. Which one to choose depends on the use to which it is to be put.

Nominal Exchange rate movements

- **DEPRECIATION**

a reduction in the value of the currency:

less units of foreign currency to buy a unit of domestic currency (E.R. decreases, in our definition)

or

more units of domestic currency to buy a unit of foreign currency (if one defines the E.R. the other way around)

- **APPRECIATION**

an increase in the value of the currency:

more units of foreign currency to buy a unit of domestic currency (E.R. increases, in our definition)

or

less units of domestic currency to buy a unit of foreign currency (if one defines the E.R. the other way around)

Nominal bilateral exchange rates of the Euro

Euro foreign exchange reference rates

(European Central Bank)

https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html

All currencies quoted against the euro (base currency)

Nominal Effective exchange rate of the Euro

Effective exchange rates

(European Central Bank)

[https://www.ecb.europa.eu/stats/balance_of_payments_and_external/eer/html/index.en.html](https://www.ecb.europa.eu/stats/balance_of_payments_and_external_eer/html/index.en.html)

(Base currency: Euro)

The Real Exchange Rate

It is the ***relative price*** of domestic and foreign goods, and it can be defined as:

Price of domestic goods relative to the price of foreign goods

We will use this definition

ε

Or, equivalently

Price of foreign goods relative to the price of domestic goods

The real exchange rate

Let P be the price of domestic goods (domestic CPI), P^* be the price of foreign goods (foreign CPI) and E be the nominal exchange rate (price of domestic currency in units of foreign currency)

The price of domestic goods expressed in foreign currency is:

$$\longrightarrow E \cdot P$$

And the real exchange rate (price of domestic goods relative to the price of foreign goods) will be:

$$\varepsilon = \frac{E \cdot P}{P^*}$$

Real exchange rate:

Note: ε it is an Index number

Bilateral and effective Real exchange rate

- Also the real exchange rate can be expressed in **bilateral** terms or in **multilateral** (“**effective**”) terms
- **The Real effective exchange rate**
⇒ is the (geometrically) weighted average of the relevant set of bilateral real exchange rates.

Real exchange rate movements

- REAL DEPRECIATION $\epsilon \downarrow$

Domestic goods become cheaper relative to foreign goods.

- REAL APPRECIATION $\epsilon \uparrow$

Domestic goods become more expensive relative to foreign goods

The real exchange rate is an **(inverse) measure of competitiveness**: a real depreciation increase the competitiveness of domestic goods, a real appreciation decreases it.

Euro area Real effective exchange rate, CPI deflated

<https://data.ecb.europa.eu/data/categories/ecbeurosystem-policy-and-exchange-rates/exchange-rates/effective-exchange-rates/real-cpi-deflated-eers?layerType=DL&showDatasetModal=false>

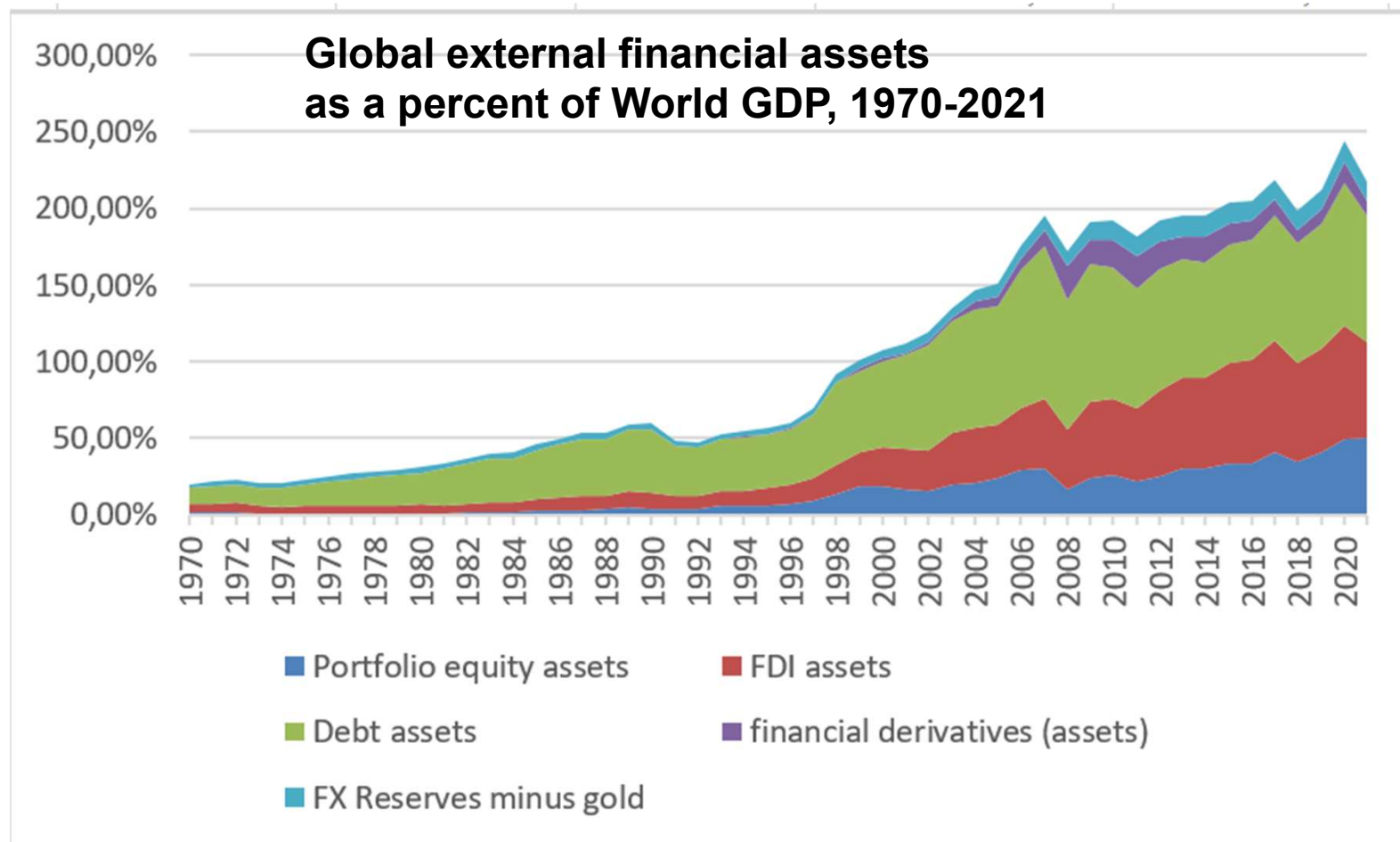
(Base currency: Euro)

Openness of financial markets - 1

The openness of financial markets allows investors to diversify their portfolios by holding both domestic and foreign financial assets, to speculate on fluctuations in interest rates and exchange rates, etc.

Financial markets became steadily more open starting in the '80s, but the degree of financial openness has increased sharply starting in the mid-nineties, and has reached very high levels nowadays.

To get a clue on this, one can for example look at stock data on external financial assets (graph below)



Source: elaborations on data from «[The external wealth of nations database](#)»

Openness of financial markets -2

Another way to get a clue financial openness, could be, for example, to look at international financial flows (the purchases and sales of foreign financial assets) in a given period.

Since the purchases and sales of foreign financial assets involve the purchases and sales of foreign currency, **the volume of transactions in the foreign exchange market reflects the importance of international financial transactions.**

Imports and exports of goods and services also involve the purchase and sale of foreign exchange, but these trade flows are much smaller than financial flows

For example, in **2013 the Euro area's annual imports and exports totalled about €4,000 billion, or roughly €30 billion per day.**

In contrast, **daily euro transactions in foreign exchange markets were about €1,800 billion.**

This means that less than 2% ($30/1800 = 1.67\%$) of euro trading in foreign exchange markets depends on the demand and supply of euros generated by international trade (imports and exports).

More than 98% is driven by financial transactions (international buying and selling of financial assets)

Openness of financial markets - 3

For a country, the **opening of financial markets** has an important consequence: it **allows the country to run trade surpluses or deficits, or more generally, surpluses or deficits in the current account of the balance of payments.**

Why is that so?



A country with a trade deficit buys more from abroad than it sells to the rest of the world. It must therefore borrow the difference between the value of imports and the value of exports.

To do so, it must make it attractive for foreign investors to lend money to the country (by increasing their investments in domestic financial assets).

You have studied the relation between trade flows and financial flows in Unit 1, where Balance of Payments was introduced.

Let us now examine in detail the relation between the Balance of Payments accounts and the National Income and Product accounts.

We will analyze the determinants of international financial flows later on.

Balance of payments and national income
and product accounts

Measuring economic activity in an open economy

3 approaches to measuring economic activity:

- **The expenditure approach**
focuses on the demand side, and measures how much is spent on demand for final goods and services. The key measure is National Expenditure: **C+I+G**
- **The production approach**
focuses on the supply side, and measures the value of all goods and services produced as output net of the value of goods and services used as inputs in production. The key measure is **GDP (value added)**
- **The income approach**
focuses on payment to owners of factors of production, and measures the amount of income they receive. The key measures are Gross National Product (**GNP**) and Gross National Income (**GNI**)
- **In a closed economy: $C+I+G = GDP = GNP = GNI$.**
- **In an open economy, however, this is not true!**

National income and product accounts

Balance of Payments accounts

