



Appunti universitari

Tesi di laurea

Cartoleria e cancelleria

Stampa file e fotocopie

Print on demand

Rilegature

NUMERO: 2350A

ANNO: 2018

A P P U N T I

STUDENTE: Sobrero Giovanni

MATERIA: Business Economics and Organization - Prof. Venuti

Il presente lavoro nasce dall'impegno dell'autore ed è distribuito in accordo con il Centro Appunti.

Tutti i diritti sono riservati. È vietata qualsiasi riproduzione, copia totale o parziale, dei contenuti inseriti nel presente volume, ivi inclusa la memorizzazione, rielaborazione, diffusione o distribuzione dei contenuti stessi mediante qualunque supporto magnetico o cartaceo, piattaforma tecnologica o rete telematica, senza previa autorizzazione scritta dell'autore.

**ATTENZIONE: QUESTI APPUNTI SONO FATTI DA STUDENTIE NON SONO STATI VISIONATI DAL DOCENTE.
IL NOME DEL PROFESSORE, SERVE SOLO PER IDENTIFICARE IL CORSO.**

Business Economics and Organization

Professor Francesco Venuti
Giovanni Sobrero’s Schemes
A.A. 2017 - 2018

Summary

MACROECONOMICS	7
What is Economics	7
Scarcity is not “Poverty”	7
Maslow’s Classification	7
The five “E” of Economics	8
Micro vs Macro-Economics	8
The origins of Economic thought	8
Simplest economic Model or Circular Flow	9
Main characters of economics:	9
1) HOUSEHOLDS: Families (private people)	9
2) FIRMS (or Companies)	10
3) GOVERNMENT (Public Administration)	12
4) REST OF THE WORLD (Overseas sector)	14
5) (CENTRAL BANK)	14
Types of recessions:	14
Economics Crises	15
Crisis in 1929: Black Tuesday	15
Crisis in 1997-1998: Stock Exchange in far East	16
Crisis in 2001: Bubble of Communication	16
Crisis in 2001: Argentina	16
Crisis in 2008 started in U.S.	17
Marshall plan after 2nd W.W.	18
Stages of a financial crisis	18
How do Economies get out of a financial crisis?	18
How U.S. government responded to the great depression?	18
How Governments responded to the 2008 crisis?	18
How U.S. Argentine government responded to the 2001 crisis	19
How East Asian governments responded to the 1997-1998 crisis	19

2) Medium of exchange (mean of payment);	44
3) Store of value;	44
Definitions of money (M1, M2, M3).....	44
In our model we have only two possibilities (people's choices):.....	45
Deriving the demand for money (Md)	45
Why do we demand money?.....	46
1) Transaction motive	46
2) Precautionary motive	46
3) Speculative motive	46
Equilibrium of the LM model.....	47
Determination of interest rate (i).....	47
Monetary policy	48
1) With open market operations.....	48
2) Changing in the amount of reserve requirements of commercial banks	48
3) Changing in the official interest rate in the interbank market	48
Digressions: vertical movements	49
Digression: M. Draghi	49
Balance sheet, Assets, Liabilities	50
Bond prices and interest rate (i).....	51
Summary	51
What Banks do	51
Balance sheet of a commercial bank.....	52
Balance sheet of central bank (CB)	52
Bank runs.....	52
The supply and the demand for Central Bank (CB)'s money.....	52
The demand for CB's currency (CUD)	53
The demand for CB' reserves (Rd)	53
The demand for CB's money (Hd).....	53
The federal Funds Market and the Federal Funds Rate	53
The supply of money and the money multiplier ($M = Ms$).....	54
Real money supply & demand, real income and interest rate	54
IS – LM MODEL.....	55
Endogenous investment	55
New equilibrium condition in the goods market.....	56
Deriving the IS curve and the LM curve	57
Putting the IS and the LM curves together	59

Total cost	73
Average cost	73
Marginal cost	73
Profit	73
Neoclassical theory – profit maximization	73
DERIVATE (open me)	75
EXAMPLE.....	75
Cost – Volume – Profit analysis (CVP analysis)	76
Formulas	76
EXAMPLE 1.....	77
INTERNATIONAL TRADE THEORIES	78
Mercantilism	78
Basic question for trade	78
Trade based on absolute advantage – Adam Smith	79
Trade based on comparative advantage – David Ricardo	80
Production possibilities frontier	80
The basis for and the gains from trade under constant costs	81
Absolute advantage vs comparative advantage	81
Trade Theory	82
Assumptions of the theory	82
Factor intensity	82
Factor abundance	83
Heckscher-Ohlin Theory	84
H-O theorem	84
The sources of comparative advantage	84
Trade barriers: Tariffs, export subsidies and quotas	84
International agreements	84
The Smoot-Hawley tariff law (US June 17, 1930)	84
The General Agreement on Tariffs and Trade (GATT) (US October 30, 1947)	84
The US – Canadian free-trade agreement (January 2, 1988)	84
The North America Free-Trade Agreement (NAFTA) (January 1, 1994)	84
THE GAME THEORY	85
Nobel prize for economics in 2012 – Alvin Roth and Lloyd Shapley	85
Nobel prize for economics in 2017 – Richard thaler's nudge theory	85
About the game theory	85
The grade game	86

Return on investment (ROI)	110
Return on equity (ROE)	111
Analysis of ROE	111
Statement of Cash Flows	112

The five "E" of Economics

Limited means and resources -> Scarcity <- Unlimited wants

-> We must make choices:

-> We have three ways to reduce scarcity:

1 Economic growth

2 Reduce wants

3 Use resources wisely

-> Productive efficiency

-> Allocative efficiency

-> Equity

-> Full Employment

Micro vs Macro-Economics

Microeconomics

It is the study of decisions of individuals, households and businesses in specific markets.

Macroeconomics

It is the study of overall functioning of an economy such as economic growth, unemployment or inflation. It studies the performance of an economy as a whole derived by aggregating performance by households, business firms and governments.

When Macroeconomists study an economy they first look at three variables:

Y = Output, Total income of an Economy, Real Gross Domestic Product (GDP)

U = Unemployment rate

I = Inflation rate

(These are the three basic outputs to study economics in a country)

The origins of Economic thought

The Greek philosopher **Aristotle** questioned whether property was best left to private or public hands.

The Scottish philosopher **Adam Smith** is considered the father of modern economics with his treatise

"the wealth of a nation" (1776)

"Every individual strives to become wealthy by exchanging what he owns with others willing to accept them... By division of labour and free market the public interest is advanced" (Adam Smith).

2) FIRMS (or Companies)

- Economic units, formed by *Profit-seeking*.
- Entrepreneurs who employ resources to produce goods and services for sale.
- A company is a *unit of management*. It is not a unit of production (like a factory, a farm or a mine); one company can own and control one or more units of production.
- **Shareholders** = partners of the firm => they are owners of the firm.
- **Stockholders** = particular kind of shareholders when the company is divided in stocks.
- **Stakeholders** = all the people that have a certain interest for the firm's activity (owners, customers, suppliers, competitors, banks, government, journalists).

They are generally grouped as:

Sole trader (or proprietorship)

- It is the smallest type of company (Small activity).
- A firm with a single owner who has the right to all profits and who bears unlimited liabilities for the firm's debt.

Advantages:

- He doesn't need to make complicated legal arrangements and does not need a lot of money to set up the company;
- He has full control over the business (he takes all decisions);
- He does not have to share the profits with anyone else;

Disadvantages:

- The owner must raise all the money to start business;
- The owner is solely responsible for all debts (risk);
- He cannot count on anyone else's expertise, view of point or capital to help him to run the business;
- He is in troubles if he has health or family problems;

Examples: doctor, electrician, carpenter.

Partnership (or single company)

- A firm with multiple owners who share the firm's profit and each of who bears unlimited liabilities for the firm's debt, according to (a seconda del) the amount of capital they invest.

Examples: Lawyers, medical partnerships.

Stock Exchange

Unlike a vegetable market where anyone can buy what he needs, the Stock Exchange requires the shopping to be done by intermediaries: the **brokers**. There are two main reasons for this:

- Buying and selling at the Stock Exchange is a complex procedure;
- People's savings must be protected from fraudulent or ignorant handling.

The profit of the brokers is a commission charged on the operations.

The "Game" that is played on the Stock Market is to guess (indovinare) which way the prices will move in the immediate future, up or down, on the basis of demand and supply.

Speculators:

Speculators are people who buy and sell **securities** not as long-term investments but for making a profit. Speculators are often referred to bulls, bears or stags.

Bull = stock market optimist.

He buys shares because he believes that share prices will rise.

A market showing rising trends is called bull market.

Bear = stock market pessimist.

He sells shares because he is convinced that share prices will fall.

A market with falling prices is called a bear market.

Stag = day traders who attempts to profit off short-term market moves by quickly moving in and out of positions.

3) GOVERNMENT (Public Administration)

What is the activity of government? It should deal with the market failure.

Market failure: a condition that arises when unrestrained operation of markets yields (produce) socially undesirable results.

- The Government should not act if the market work efficiently.
- In case of market failure, a government intervention could improve society's overall welfare.

The Roles of Government:

- 1 Establishing and enforcing the rules of the game;
- 2 Promoting competition;
- 3 Regulating natural monopolies;
- 4 Producing public goods;
- 5 Rules for externalities;
- 6 Income distribution;
- 7 Full employment, price stability, economic growth;

Deflation: General reduction in the average price level of non-essential goods and services. Companies, failing to sell at initial prices, place goods and services on the market at lower prices. It corresponds to a negative inflation.

Deflation rate: the rate at which the price level decreases.

Deflation brings people to not consume today and wait a decrease of prices with bad consequences for firms' production.

4) REST OF THE WORLD (Overseas sector)

Household, firms and governments in countries all around the world.

Central Bank -> Monetary Policy (of Eurozone) (FED is for USA)

Governments -> Fiscal Policy

P.I.I.G.S : Countries which have a very high public debt. (Portugal, Ireland, Italy, Greece, Spain)

(Example: Argentina, after 2nd W.W., twice declared it was not able to pay its debt!)

SPREAD: difference of interest rates between different countries.

5) (CENTRAL BANK)

It is an independent financial institute which has several objectives: the principal one is to keep inflation rate below a certain level.

The CB does not have relationships with private people but only with other banks.

Vertical movements: If I have a debt, I ask my bank to pay my debt to the bank of my creditor and my bank asks CB to do that => we have almost always vertical movements between commercial banks and CB.

CB deal with the **monetary policy** (expansionary or contractionary).

Types of recessions:

Expansion = period of positive GDP Growth.

Recession = period of negative GDP Growth.

Depression = period of negative GDP Growth with duration more than 6 months.

V – recession: Dramatic fall but quick fall recovery.

U – recession: Worse than V one because it takes more time for recovery.

W – recession: Dramatic fall and dramatic fall recovery (USA).

L – recession: Dramatic fall without recovery (Eurozone).

- In 1997 the crisis broke out because of a revaluating of the dollar and so also of the baht (Thai currency) (the exportations decreased!);
- The loans were to be returned to foreign creditors and this was a problem even if the currency was strong because banks, while borrowing with short-term loans, granted long-term loans to local businesses;
- Therefore, banks were unable to pay the loans;

Response to the crisis in 1998 in far East

- Central banks decided to abandon equality with the dollar and depreciate the local currencies;
- Inflation strongly increased and with the new exchange rate the East Asian countries' economy could slowly restart with exportations.

Crisis in 2001: Bubble of Communication

(Financial crisis, USA)

- In 1994, in U.S., the company Netscape born starting a new economic cycle, defined New Economy;
- The New Economy opposed the Old Economy which was based on the manufacturing sector;
- '94-99 interest rates decreased so it was easier to take loans so new companies born;
- So, in few years many companies developed in internet and IT sector. They are called Dot-com companies;
- The people's euphoria (and so the herding behaviour) for the New Economy led to a financial bubble;
- The bubble burst, causing a recession;
- A lot of just born Dot-com companies failed (~50%);

Crisis in 2001: Argentina

(Economic crisis + financial crisis)

- High public debt accumulated during dictatorships;
- The local currency (peso) was anchored to the U.S.'s dollar (fixed exchange rate) and this favoured the imports;
- New companies did not develop and the production of the existing ones was very low;
- GDP continued to decrease (by 4% in 1999), so companies had to fire employees -> unemployment rate increased (99' recession);
- People, scared by the possibility of the local currency could disengage from the dollar with consequent depreciation (devaluation), started a run to the banks to take their money and invest it in a different way (for example buying dollars);
- Banks were not able to give back money to so many people, so government passed a law to block the withdrawal of savings;
- A popular uprising followed;
- In 2001 government announced the suspension of the deadline of the loans;
- Consequently, the Argentine bonds became waste paper;
- Many Argentine bonds were previously bought by all the world for the high interest rate;
- About 430.000 Italians bought Argentina bonds for an amount of \$12.8 billion;

Response to Argentina's crisis in 2001

- In January 2002, government, to cope with the public debt, abandoned equality with the dollar and depreciated the local currency;
- Inflation strongly increased -> initially many companies failed;
- With the new exchange rate, it was almost impossible to import, but thanks to this, the Argentine economy could slowly restart with exportations.

Stages of a financial crisis

Economic Bubble: increase/rise of prices which is not justified.

- 1) Inflation of a bubble: unsustainable rapid increase of prices.
- 2) The bubble bursts, causing a **recession**. A bubble bursts when people suddenly realize that an increase in financial wealth is an illusion.
- 3) People cut spending.
- 4) **Credit Crunch:** Banks stop giving loans (or reducing the loans) to households and firms.
- 5) Firms cut back even more, creating a downward spiral that can turn a recession into a depression.

Three phenomena:

- Herding = human tendency to follow the crowd;
- Leverage = the ability of demanders to finance the increase in demand;
- Financial meltdown = when a bursting bubble undermines confidence in the entire financial sector;

How do Economies get out of a financial crisis?

- 1) Avoid bank failure because failure of banks is the worst thing which can happen (Triage stage).
- 2) Treatment stage: involves expansionary monetary policy by Central Bank and expansionary fiscal policy by Government.
- 3) Rehabilitation stage: involves the development of regulatory rules that prevent future harmful economic bubbles.

How U.S. government responded to the great depression?

Government response to depression

- 1933 Roosevelt announced the new deal (relief, recovery, reform):
 - printing new money;
 - investment in infrastructures;
- 1933 Glass-Steagall Act: it was the law that established the Federal Deposit Insurance Corporation (FDIC) in the United States of America and introduced banking reforms, some of which were designed to control financial speculation.
- the 2nd W.W. helped economy getting out from the depression because of industrial investment and decrease of population.

How Governments responded to the 2008 crisis?

Response to 2008 crisis

- Since 2008-2009 central banks helped banks not to fail giving liquidity buying bank bonds with very low interest rates (close to zero).
- (Giving liquidity to banks permit banks to grant loans to firms and so restart the production);
- U.S. responded with the *Troubled asset relief program* which saw a financing by FED initially of \$700 billion that became successively of \$7.700 billion.
- In E.U. central banks gave liquidity to banks and some banks were nationalized;
- The *securities regulators* (first the Consob) set more financial regulations (!) such as the prohibition of short securities sale;

Trade deficit

$$TD = IM - X$$

A trade deficit is an economic measure of international trade in which a country's imports exceeds its exports. A trade deficit represents an outflow of domestic currency to foreign markets. It is also referred to as a negative balance of trade (BOT).

Trade Deficit = Total Value of Imports – Total Value of Exports

At the start of 1990s: U.S.'s TD = 1% of GDP

2006: U.S.'s TD = 6% of GDP (approximately \$760 billion)

$X = IM$ Trade balance

$X > IM$ Trade surplus

$IM > X$ Trade deficit

Timothy Geithner suggested limiting surpluses and deficits at 4% of GDP, but, China, Japan, Germany and Russia rejected this idea because they are the ones which have greatest level of exports (X).

Budget deficit

$$BD = S - R$$

A budget deficit occurs when expenditures (S) exceed revenues (R), and it is an indicator of financial wealth. The term is typically used to refer to government spending rather than business or individual spending. When referring to accrued government deficits, the deficits form the national debt.

If $BD \uparrow \Rightarrow$ Public debt \uparrow

At the start of 1990s: U.S.'s BD = 6% of GDP

Since 1992: BD steadily (costantemente) fell.

Since 2001: BD recovered (partially for 2001 (bubble of .com) recession and the event of September 11, 2001);

Considerations:

- Temporary reduction in BD can help to stimulate the economy, but the deficit cannot last forever. Eventually the taxes (T) will increase;
- Crowding-out effect of government deficit;

$S = R$ Budget balance

$R > S$ Budget surplus

$S > R$ Budget deficit

$$R\% = \frac{\$GDP(y) - \$GDP(y-1)}{\$GDP(y-1)} \cdot 100 \quad \text{Percentage of change in GDP from } GDP(y-1) \text{ to } GDP(y)$$

Real GDP (GDP_y^{By} or Y_y^{By})

(GDP in terms of Goods or GDP in constant dollars or GDP adjusted for inflation)

It is constructed as the sum of the quantities of final goods and services ($n_{GDP(y)}$) multiplied by constant prices ($price_{GDP(By)}$).

Therefore, Real GDP measures the value of output with adjustment for the effect of inflation.

NW: "GDP" is referred to Real GDP.

$$GDP_y^{By} = Y_y^{By} = \sum (n_{GDP(y)} \cdot price_{GDP(By)}) = (Y \text{ Real GDP referred to } By \text{ prices})$$

$$R\% = \frac{GDP_y^{By} - GDP_{(y-1)}^{By}}{GDP_{(y-1)}^{By}} \cdot 100 \quad \text{Percentage/rate of change in GDP from } GDP(y-1) \text{ to } GDP(y)$$

Turning Nominal GDP into Real GDP ($\$Y_y \rightarrow Y_y^{By}$)

$$Y_y^{By} = \$Y_y \cdot \frac{\text{Price index } (By)}{\text{Price index } (y)}$$

Limitations of GDP (7):

- Real GDP is not an absolute indication and it cannot be accepted as a standard to measure wealth.
- Real GDP does not take into consideration the fact that the quality of goods is very different for the same product in different years.
- GDP does not take into consideration the underground economy.
- GDP does not consider leisure time (tempo libero).
- GDP does not consider negative externalities.
- GDP consider only "market transaction".
- Exchange rate (power purchase measure) (PPP = purchase power parity: try to find prices of one good in many different countries produced with the same technology and material (not easy!)).

Three approaches to calculate GDP:

1) Product approach (two):

- GDP is the **value** of final goods and services (in the economy during a given period).
- GDP is the **sum of value added** (in the economy during a given period).

2) Income approach:

- GDP is the **sum of incomes (factors of production)** (in the economy during a given period).

3) Expenditure approach:

- We could find out GDP by looking at the Expenditure of different sectors.

National income accounts identity: $GDP = Y = C + I + G + NX$

HDI = Human Development Index (By U.N.): it considers many factors, among which GDP is one.

$$\text{inflation rate} = \text{growth rate} = \frac{P_y - P_{y-1}}{P_{y-1}}$$

P_y could be GDP deflator or CPI.

GDP deflator

- It measures the average price of output.
- It is the ratio of Nominal GDP to Real GDP.
- Sometimes it is multiplied by 100 to make the index base as 100.

$$P_y = \frac{\$GDP(y)}{GDP_y^{By}} = \frac{\$Y_y}{Y_y^{By}}$$

Consumer Price Index (CPI)

- It measures the overall price of a fixed basket of consumer goods relative to the price of the same basket in the base year.
- It is the ratio of Nominal Expenditure to Real Expenditure.

$$P_y = \frac{\$Y_y}{Y_y^{By}}$$

Problems with CPI

- Substitutive Bias

As prices increase for the fixed market basket, consumers buy less of these and more substitutes that may be not part of the market basket.

(Result: CPI may be higher than what consumers are really paying)

- New product

CPI market basket may not include the newest consumer products.

(Result: CPI measures prices but not the increase in choices)

- Product quality

CPI ignores both improvements and decline in product quality.

(Result: CPI may suggest that prices stay the same)

NOTE: The CPI and the GDP deflator move together most of time (differing by less than 1%). There can be exceptions.

The main causes of inflation:

Demand pull inflation

- caused by excess aggregate demand;
- often linked to money and credit boom;
- positive output gap;

Cost push inflation

- rising wage (salariali) costs in labour market;
- increasing raw material and component costs from domestic and overseas suppliers;
- rising import prices due to a falling exchange rate;

Losers:

- Who has fixed income: people who work for themselves;
- Lenders if real interest rates are negative.
- Workers in low paid jobs;

Note: When Y gets closer to $Y_{Full-employment}$ the risk of inflation is very high;

Values of Economic growth, unemployment and inflation around the World

1996 - 2006	USA	EUROPE	CHINA
Economic growth	3.4 %	2%	8.8%
Unemployment rate	5%	8.7%	-
Inflation rate	2%	1.8%	3.3%
2010 – 2013			
Economic growth	2.5%	-0.5%	7.5%

United States

At the start of 1990s: U.S.'s BD = 6% of GDP

Since 1992: BD steadily (costantemente) fell; high growth, low unemployment and low inflation.

Since 2001: BD recovered partially for 2001 crisis of bubble of .com and for the event of September 11, 2001; the rate of growth was negative for ¼ of 2001.

European Union

1974 – 1975: first oil crisis;

1987: second oil crisis;

Problems of EU:

- Low GDP rate;
- High unemployment rate (most economists believe the source of the problem is the **labour market institutions**; others point on the fact that unemployment rate is not high everywhere in Europe);
- Common currency -> exchange rate: creates difficulties for some countries;

China

Since 1980, Chinese output has grown at close to 9.5% per year;

Economic growth (1996 – 2006): 8.8%

Economic growth (2010 – 2013): 7.5%

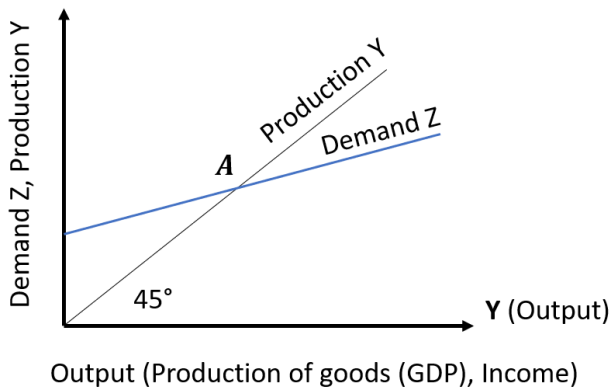
Japan

Since 1960, annual growth rate = 4.7% (1.5% higher than U.S.'s one);

But Japan, in the last two decades, suffers a period of great depression (House bubble);

GOODS MARKET

The demand for goods (Z)



$$Z \equiv C + I + G + X - IM$$

Z = Aggregate demand (Aggregate = entire economic system);
The symbol “ \equiv ” means that the equation is an identity.

C = Consumption (HOUSEHOLDS);

I = Investment (FIRMS);

G = Government spending (PUBLIC ADMINISTRATION);

X = Exports (THE REST OF THE WORLD);

IM = Imports (households, firms, government);

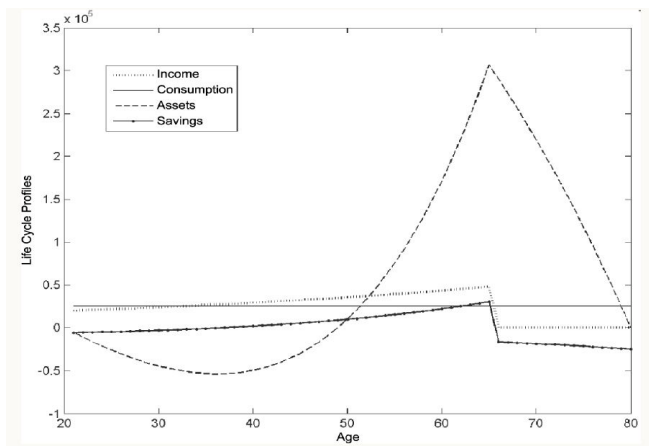
Endogenous variables = variables that depend on other variables within the model.

Exogenous variables = variables that doesn't depend on other variables or that are not explained within model.

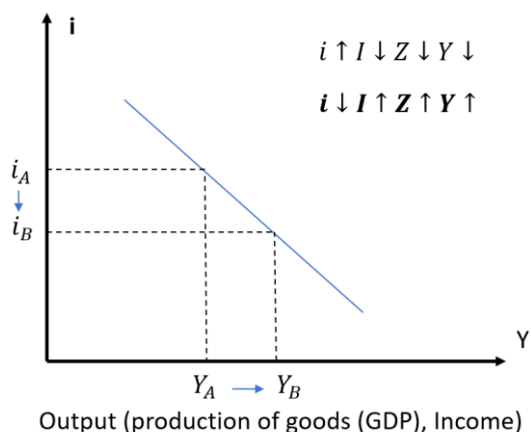
3 Marco Modigliani's Life Cycle Model

Individuals consume a constant percentage of their life income.

Individuals try to stabilize consumption over their entire life time. Individuals save while they work in order to finance consumption after them retire. (focus over wealth)



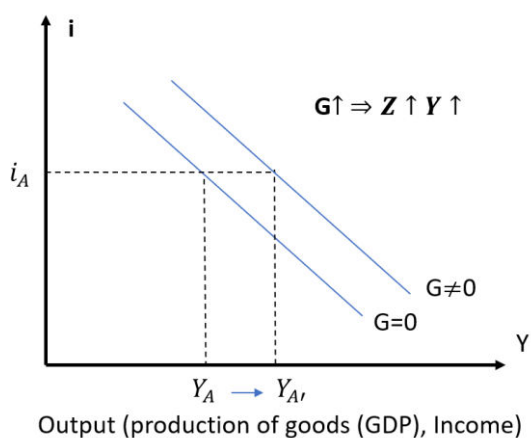
$$i = -\frac{Y}{\mu b_1} + \frac{C_0 + b_0}{b_1}, \mu = \frac{1}{(1 - C_1)}$$



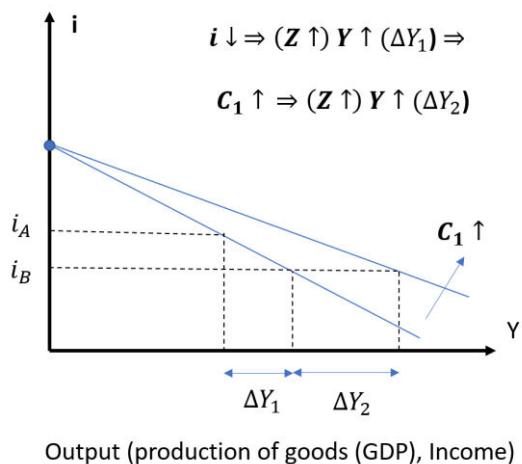
What happens if government spending (G) is increased?

If we consider G, IS relation become:

$$i = -\frac{Y}{\mu b_1} + \frac{C_0 + b_0 + G}{b_1} \quad \text{IS RELATION}$$



What happens if the MPC (C_1) increases?



NW: ΔY increases in a great amount for step 2 rather than step 1.

Government spending (G)

It is the purchase of goods and services by the federal, state and local governments.

Considerations:

- It doesn't include government transfers (TR), nor interest payments on the government debt;
- If the government run a **balance budget**: $T=G$

Exports (X)

X = exports = purchases of goods and services by foreigners;

$X = \bar{X}$ = demand for goods and services from foreigners as exogenous variable;

Endogenous exports:

$$X = X(Y_+, \varepsilon_-)$$

An increase in foreign income (Y_+) leads to an increase in exports (X).

If $\varepsilon \uparrow$ (the value of currency increases): $X \downarrow$

If $\varepsilon \downarrow$ (the value of currency decreases): $X \uparrow$

$$X = X_0 + X_1 \frac{Y^*}{\varepsilon}$$

Imports (I)

IM = purchases of foreign goods and services;

$IM = \bar{IM}$ = demand for goods and services satisfied by foreigners as exogenous variable;

Endogenous imports:

$$IM = IM(Y_+, \varepsilon_+)$$

An increase in domestic income (Y) leads to an increase in imports (IM).

If $\varepsilon \uparrow$ (the value of currency increases): $IM \uparrow$

If $\varepsilon \downarrow$ (the value of currency decreases): $IM \downarrow$

$$IM = m_0 + m_1 Y \varepsilon$$

Net exports (NX)

$$X - IM = NX$$

$X = IM$ Trade balance

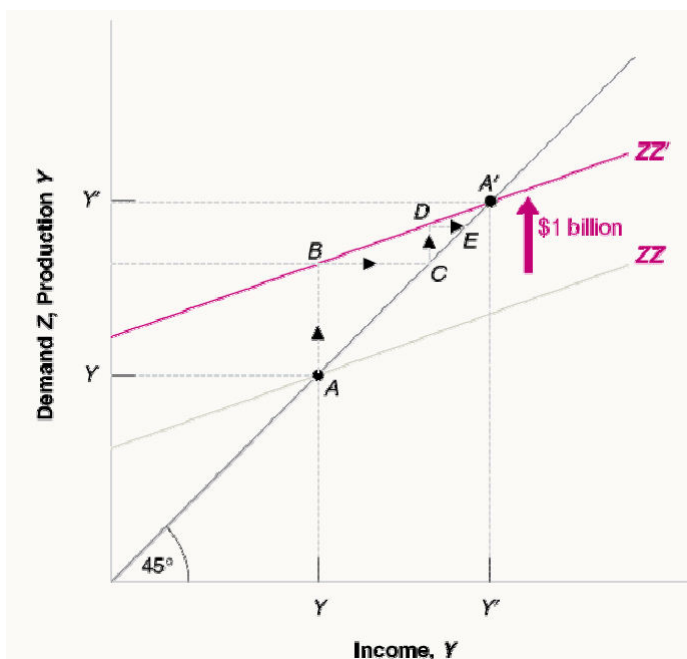
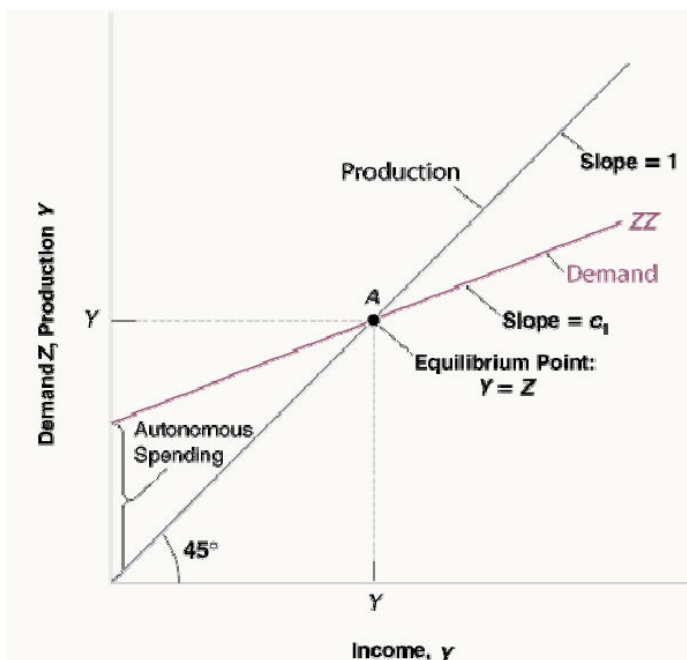
$X > IM$ Trade surplus

$IM > X$ Trade deficit

$$NX = X - \frac{IM}{\varepsilon} = X_0 + X_1 \frac{Y^*}{\varepsilon} - m_1 Y$$

Timothy Geithner suggested limiting surpluses and deficits at 4% of GDP, but, China, Japan, Germany and Russia rejected this idea because they are the ones which have greatest level of exports (X).

2) Using graphs to build the intuition;



First-round:

- AB Increase in autonomous spending leads an increase in demand that we assume to be of **\$1 billion**;
- Increase in demand (AB) leads to an equal increase in production (AB);
- Increase in production (AB) leads to an equal increase in income (BC=AB);

Second-round:

- Increase in income (BC) leads to an increase in demand (CD) equal to: **\$1 billion x MPC**;
- Increase in demand (CD) leads to an equal increase in production (CD);
- Increase in production (CD) leads to an equal increase in income (DE=CD);

Third-round:

- Increase in income (DE) leads to an increase in demand equal to: **(\$1 billion x MPC) x MPC**;

Considering taxation as an endogenous variable

$$T = \tau \cdot Y$$

$$\tau = \frac{T}{Y} \quad \text{Average taxes indices} \quad (0 \leq \tau \leq 1)$$

The demand for goods becomes:

$$Z = C_0 + C_1(Y - T) + I + G = C_0 + C_1(Y - \tau Y) + I + G = C_0 + C_1Y(1 - \tau) + I + G$$

At the equilibrium:

$$Y = Z = C_0 + C_1Y(1 - \tau) + I + G$$

$$Y[1 - C_1(1 - \tau)] = C_0 + I + G$$

$$Y^* = \frac{1}{[1 - C_1(1 - \tau)]} (C_0 + I + G) \quad \text{Production of goods or GDP at equilibrium}$$

NW: when τ increases, the multiplier decreases and the effect of changes in autonomous spending is smaller => it **reduces the power of multiplier**.

- If $T = T_0$ (exogenous element of taxation) + $\tau \cdot Y$ (endogenous taxation)

$$Z = C_0 + C_1(Y - T) + I + G = C_0 + C_1(Y - T_0 - \tau Y) + I + G = C_0 + C_1Y(1 - \tau) - C_1T_0 + I + G$$

$$Y^* = \frac{1}{[1 - C_1(1 - \tau)]} (C_0 - C_1T_0 + I + G) \quad \text{Production of goods or GDP at equilibrium}$$

Considering unilateral transfer (TR)

Government collects taxes (T) and produces services (G) and unilateral transfers (TR)

$$S_{pl} = T - G - TR$$

$$Y_d = Y - T + TR$$

$T = G + TR$ Government Budget balanced

$T > G + TR$ Government Budget surplus

$T < G + TR$ Government Budget deficit

1) Using algebra to make sure that the logic is correct;

$$Y = Z$$

$$TR = 0$$

$$T = \bar{T}$$

$$I = \bar{I}$$

$$G = \bar{G}$$

$$X = \bar{X}$$

$$IM = \bar{IM}$$

$$Y = Z \equiv C + \bar{I} + \bar{G} + \bar{X} - \bar{IM} = C_0 + C_1(Y_d) + \bar{I} + \bar{G} + \bar{X} - \bar{IM} = C_0 + C_1(Y - \bar{T}) + \bar{I} + \bar{G} + \bar{X} - \bar{IM}$$

$$Y(1 - C_1) = C_0 - C_1\bar{T} + \bar{I} + \bar{G} + \bar{X} - \bar{IM}$$

$$Y^* = \frac{1}{(1 - C_1)} (C_0 - C_1\bar{T} + \bar{I} + \bar{G} + \bar{X} - \bar{IM}) \quad \text{Production of goods (Y)}$$

Production of goods = Multiplier · Autonomous spending

Y^* is the value of GDP for which we have equilibrium in the good's market;

Being the MPC a number $0 \leq C_1 \leq 1$, the multiplier is a number ≥ 1 ;

From another point of view:

$$Y + IM = C + I + G + X$$

Resources (debit side) = Uses (credit side)

Considerations:

- There is a strong connection between X and IM: the trend of X and IM is almost the same, as a function of GDP;

$\frac{X}{GDP}$ can change very much: for USA it is 11%, for Belgium it is 92%, why?

- Big countries have a lot of resources and so $\frac{X}{GDP}$ is much lower;

- Belgium (like Switzerland) is in the centre of Europe and so the rate of imports/export is greater;

X = IM Trade balance

X > IM Trade surplus

IM > X Trade deficit

Timothy Geithner suggested limiting surpluses and deficits at 4% of GDP, but, China, Japan, Germany and Russia rejected this idea because they are the ones which have greatest level of exports (X).

NW: If a country has a low currency (low exchange rate), exports (X) is favoured: Timothy Geithner's proposal was directed to stop China's currency to depreciate ($\varepsilon \downarrow X \uparrow$);

NW: Can exports (X) exceed GDP? Yes. Countries can have export ratios larger than the value of their GDP because exports and imports may include exports and imports of **intermediate goods**.

Exports (X)

X = exports = purchases of goods and services by foreigners;

$X = \bar{X}$ = demand for goods and services from foreigners as exogenous variable;

$$X = X(Y_+^*, \varepsilon_-)$$

An increase in foreign income (Y_+^*) leads to an increase in exports (X).

If $\varepsilon \uparrow$ (the value of currency increases): $X \downarrow$

If $\varepsilon \downarrow$ (the value of currency decreases): $X \uparrow$

$$X = X_0 + X_1 \frac{Y_+^*}{\varepsilon}$$

Imports (I)

IM = purchases of foreign goods and services;

$IM = \bar{IM}$ = demand for goods and services satisfied by foreigners;

$$IM = IM(Y_+, \varepsilon_+)$$

An increase in domestic income (Y) leads to an increase in imports (IM).

If $\varepsilon \uparrow$ (the value of currency increases): $IM \uparrow$

If $\varepsilon \downarrow$ (the value of currency decreases): $IM \downarrow$

$$IM = m_0 + m_1 Y \varepsilon$$

Net exports (NX)

$$X - IM = NX$$

X = IM Trade balance

X > IM Trade surplus

IM > X Trade deficit

$$NX = X - \frac{IM}{\varepsilon} = X_0 + X_1 \frac{Y_+^*}{\varepsilon} - m_1 Y$$

Timothy Geithner suggested limiting surpluses and deficits at 4% of GDP, but, China, Japan, Germany and Russia rejected this idea because they are the ones which have greatest level of exports (X).

NW: If a country has a low currency (low exchange rate), exports (X) is favoured: Timothy Geithner's proposal was directed to stop China's currency to depreciate ($\varepsilon \downarrow X \uparrow$);

NW: Can exports (X) exceed GDP? Yes. Countries can have export ratios larger than the value of their GDP because exports and imports may include exports and imports of **intermediate goods**.

Equilibrium in goods (open) market considering the exchange rate (ε)

$$Y = Z = C(Y_d^+) + I + G + NX(Y_-, Y_+^*, \varepsilon_-)$$

$$I = Y - C - G - NX$$

$$Y_d = Y - T + (TR) \Rightarrow Y = Y_d + T - (TR)$$

$$I = Y_d + T - (TR) - C - G - NX = S_{pr} + [T - G - (TR)] + (-NX) = S_{pr} + S_{pl} + S_{NX}$$

FINANCIAL MARKET

IS Model = Investment saving model

Equilibrium in the goods market: demand and supply of goods are equal.

LM Model = Liquidity money model

Equilibrium in the financial market: demand and supply of money are equal.

What is Money?

Once upon a time: gold, silver, sheeps, salt, seashells...

Then: coins, banknotes, deposits...

“Money is what money do”

“Money is defined by its functions” (Hicks)

What are the functions of money?

1) Unit of account;

Money serves as numeraire (numerario) or a benchmark (segno di rif.) in which all other goods are priced.

- Unit at which prices are quoted;
- Unit at which accounts are kept;

2) Medium of exchange (mean of payment);

We accept money not to consume it directly but because it can sub sequentially be used to buy things that we wish to consume.

So we solve the problem of the double coincidence of wants (to sell our apples we need someone who wants to buy our apples!) and the discretization problem (1 sheep = 100 oranges but we want only 50 oranges...!)

In a **barter economy** there is no medium of exchange => Trade is very expensive!

In a barter economy we have two problems:

- Problem of the double coincidence of wants;
- Discretization problem;

3) Store of value;

- It is an asset and it is one way of holding wealth;
- It can be used to make purchases in the future;
- it is a transfer resource from the present to the future for later consumption or further wealth accumulation;

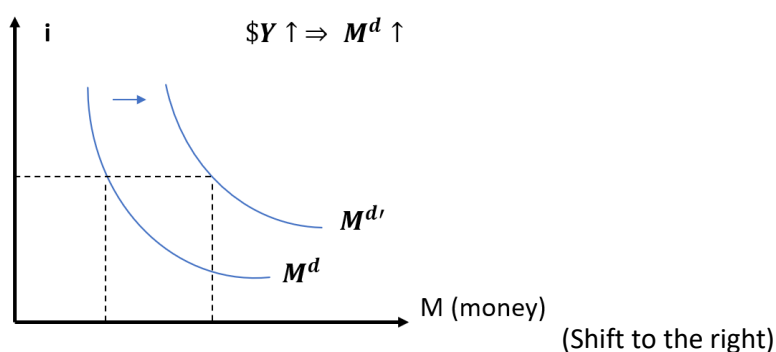
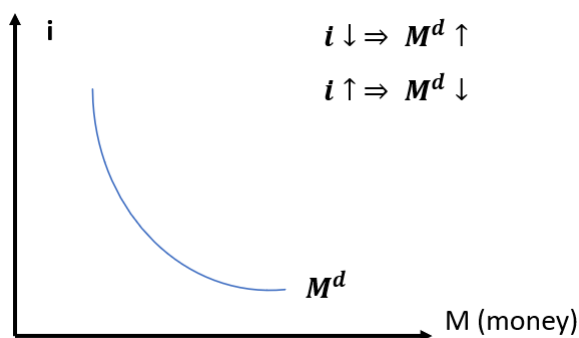
Definitions of money (M1, M2, M3)

M1 (narrow)= currency (coins, banknotes) + sight deposits (bank accounts payable on demand) overnight d.

M2 (intermediate money) = M1 + short-term time deposits at banks with unrestricted access.

M3 (broad money) = M2 + other short-term time marketable instruments.

$$M^d = \$YL(i)$$



Why do we demand money?

1) Transaction motive

- Money is a medium of exchange, so people hold money to buy goods and services (day to day transactions);
- People prefer to have liquidity to assure basic transactions, because their income is not always available;
- The amount of liquidity demanded is determined by the level of income: the higher the income, the more the money demanded;

2) Precautionary motive

- People hold money for emergencies or social unexpected problems that need unusual costs;

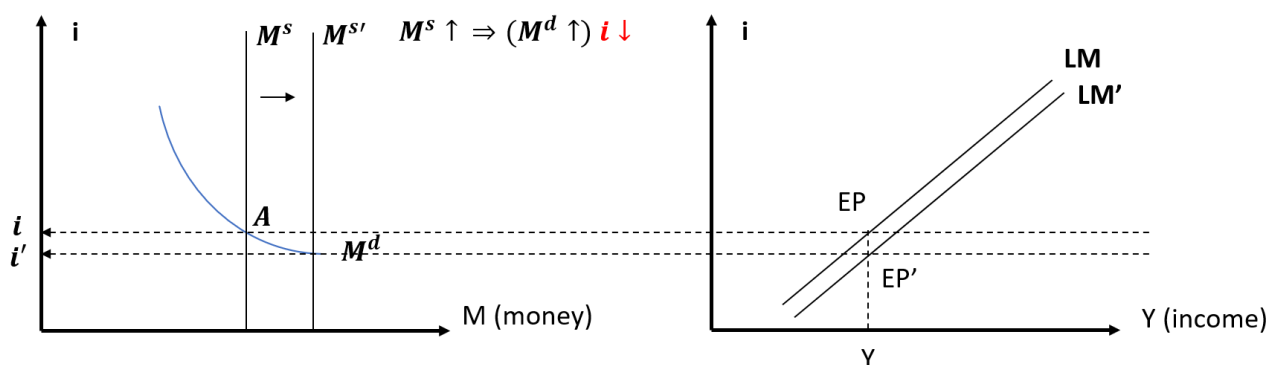
3) Speculative motive

- Money is also a way for people to store wealth;
- People retain liquidity to speculate that bond prices will fall;

When interest rates are low, they would be expected to rise in the future and thus bond prices would be expected to fall. So, money is more attractive than bonds when interest rates are low $i \downarrow \Rightarrow M^d \uparrow$

NW: The fact that money demand can depend on expectations of the future interest rates causes money demand to be quite instable.

If the money supply (M^S) increases (expansionary monetary policy):



Monetary policy

The CB can affect money supply (M^S)

1) With open market operations

Open market operations = financial operations taking place in the open market (stock exchange).

Expansionary open market operation:

CB buys bonds $\leftrightarrow M^S \uparrow \Rightarrow i \downarrow \Rightarrow$ *bond prices* \uparrow

Contractionary open market operation:

CB sells bonds $\leftrightarrow M^S \downarrow \Rightarrow i \uparrow \Rightarrow$ *bond prices* \downarrow

2) Changing in the amount of reserve requirements of commercial banks

Reserve requirement (or cash reserve ratio): it set the minimum fraction of customers deposits that each commercial bank must hold as reserve (rather than lend out).

These required reserves are normally in the form of deposits made with a central bank or cash stored physically in the bank vault (vault cash).

The CB does not have relationships with private people but only with other banks.

Expansionary policy: CB decreases the percentage of customer deposits kept in the banks $\Rightarrow M^S \uparrow$

Contractionary policy: CB increases the percentage of customer deposits kept in the banks $\Rightarrow M^S \downarrow$

3) Changing in the official interest rate in the interbank market

Official interest rate (or interbank rate): it is the interest rate charged on short-term loans between banks.

Interbank lending market: it is a market in which banks extend loans to one another for a specific term. Most interbank loans are for maturities of one week or less (the majority is overnight).

Banks borrow and lend money in order to manage liquidity and satisfy regulations such as reserve requirements.

Balance sheet, Assets, Liabilities

Balance sheet: of a bank (or a firm) is a list of its assets and liabilities at a point in time (stock variable).

Assets: (Risorse): are the sum of what the bank (or the firm) owns and what others owe to the bank.
(For us Assets = Money and bonds)

Liabilities: are the sum of what the bank owes to others.

BALANCE SHEET	
Assets	Liabilities Net Equity

Assets = Liabilities + Net equity

Financial Wealth = (stock variable): it is the value of all **your financial assets** *minus* **your financial liabilities**;

Central Bank (CB) and Commercial Bank's Balance sheets:

CENTRAL BANK BALANCE SHEET		COMMERCIAL BANK BALANCE SHEET	
Assets	Liabilities	Assets	Liabilities
FOREIGN ASSETS	RESERVES OF COMMERCIAL BANK	RESERVES AT CENTRAL BANK	LIABILITIES TO CENTRAL BANK
LOANS TO COMMERCIAL BANK	BANKNOTES HELD BY NON-BANKS	LOANS TO PRIVATE SECTOR	DEPOSITS OF PRIVATE SECTOR
CLAIMS ON GOVERNMENT	DEPOSITS OF GOVERNMENT	SECURITIES (BONDS)	NET WORTH
	NET WORTH		

Central Bank (CB)'s balance sheet:

Balance Sheet	
Assets	Liabilities
Bonds	Money (currency)

- Many assets of CB are the bonds it holds.

Effects of a CB's open market operation:

The Effects of an Expansory Open-Market Operation	
Assets	Liabilities
Change in bond holdings: +\$1 million	Change in money stock: +\$1 million

- CB buys bonds: both assets and liabilities increase by the same amount.

Balance sheet of a commercial bank

Banks	
Assets	Liabilities
Reserves Loans Bonds	Checkable deposits

Balance sheet of central bank (CB)

Central Bank	
Assets	Liabilities
Bonds	Central Bank Money = Reserves + Currency

Bank runs

Rumours that a bank is not doing well, and some loans will not be repaid, will lead people to close their accounts at the bank. If people do so, the bank will run out of reserves: a bank run.

-> To avoid bank runs, government usually provides **Federal Deposit Insurance**.

-> An alternative solution is **narrow banking**, which would restrict banks to hold liquid, safe, government bonds such as T-bills.

The supply and the demand for Central Bank (CB)'s money

- The demand for central bank money is equal to the demand for currency by people + the demand for reserves by banks;

- The supply of CB's money is under the direct control of the central bank (CB);

- The interest rate (i) is such that the demand and the supply for central bank money are equal;

When people can hold both currency and checkable deposits, the demand for money involves two decisions:

1st People must decide how much money to hold;

2nd People must decide how much of this money to hold in currency and how much to hold in checkable deposits;

The supply of money and the money multiplier ($M = M^s$)

$$H = H^s = H^d = CU^d + R^d = cM^d + \theta(1 - c)M^d = [c + \theta(1 - c)]M^d = [c + \theta(1 - c)]Y_L(i)$$

$$M = M^s = M^d = \frac{1}{[c + \theta(1 - c)]}H \quad \text{with} \quad \frac{1}{[c + \theta(1 - c)]} = \text{money multiplier}$$

- The overall supply (M) of money is equal to central bank money (H) times the money multiplier;
- **High – powered money** is the term used to reflect the fact that the overall supply of money depends in the end on the amount of CB's money (or monetary base) (H).
- We can think of the ultimate increase in the money supply (M) as the result of successive rounds of purchases of bonds, the first started by the FED in its open market operation, the following rounds by banks (understanding the money multiplier).

Real money supply & demand, real income and interest rate

$$\text{GDP deflator: } P = \frac{\$Y}{Y}$$

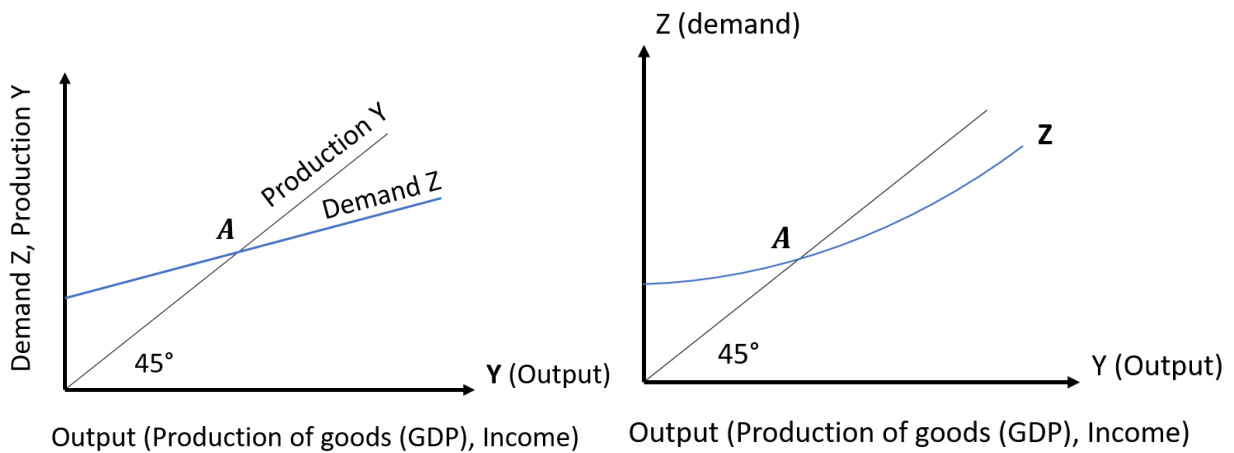
In equilibrium, the real money supply is equal to the real money demand which depends on real income (Y) and the interest rate (i).

$$M = M^s = M^d = Y_{PL}(i)$$

New equilibrium condition in the goods market

$$Y = C + I(Y, i) + G$$

For a given value of the interest rate (i), demand for goods (Z) is an increasing function of output.



- Because it is assumed that the consumption (C) and investment (I) relations are linear, the demand for goods (Z) is a curve rather than a line.
- Demand for goods (Z) for a given value of interest rate (i).
- Z is drawn flatter than a 45° line because it is assumed that an increase in Output (Y) leads to a less than one-for-one increase in demand (Z).

Real money supply & demand, real income and interest rate

GDP deflator: $P = \frac{\$Y}{Y}$

In equilibrium, the real money supply is equal to the real money demand which depends on real income (Y) and the interest rate (i).

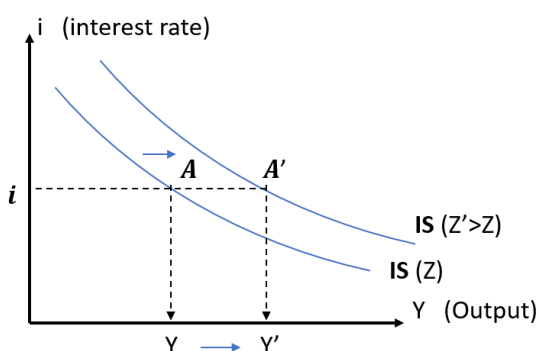
$M = M^s = M^d = YPL(i)$

$\frac{M}{P} = YL(i)$ *LM relation in the real economy*

Shifting of the IS curve f(Z)

$Z \uparrow \Rightarrow \text{DX} (Y \uparrow)$; $Z \downarrow \Rightarrow \text{SX}$

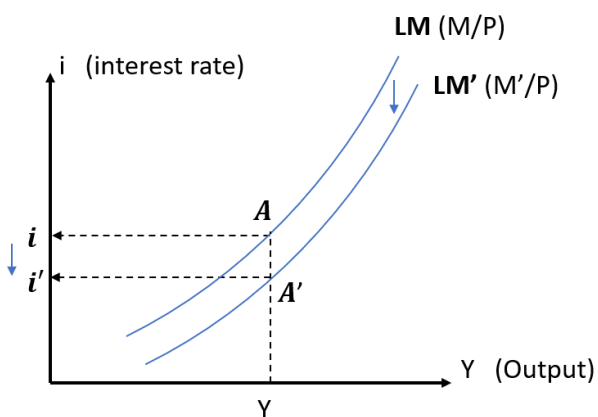
Changes in factors that increase the demand for goods (Z), given the interest rate (i), shift the IS curve to the right (DX). Changes in factors that decrease the demand for goods (Z), given the interest rate (i), shift the IS curve to the left (SX).



Shifting of the LM curve f(M)

$M^s \uparrow \Rightarrow \text{Down (DX)} (i \downarrow)$; $M^s \downarrow \Rightarrow \text{Up (SX)}$

An increase in the money supply (M), given the level of output (Y), shift the LM curve down (DX). A decrease in the money supply (M) shifts the LM curve up (SX).



Why there can be insufficient demand?

- Criticism of say's law: uncertainty can lead to precautionary saving rather than consumption.
- Monetary criticism: the preference for liquidity can lead to underinvestment as savings are kept in the form of liquidity.

Fiscal policy

The government deals with the fiscal policy: changes in government spending (G), Taxes (T), or other components of autonomous spending.

Expansionary fiscal policy: it increases the budget deficit. It shifts the IS curve to the right.

Contractionary fiscal policy (or fiscal consolidation): it decreases the budget deficit. It shifts the IS curve to the left.

Monetary policy

The Central Bank deals with the monetary policy: changes in the nominal money supply (M).

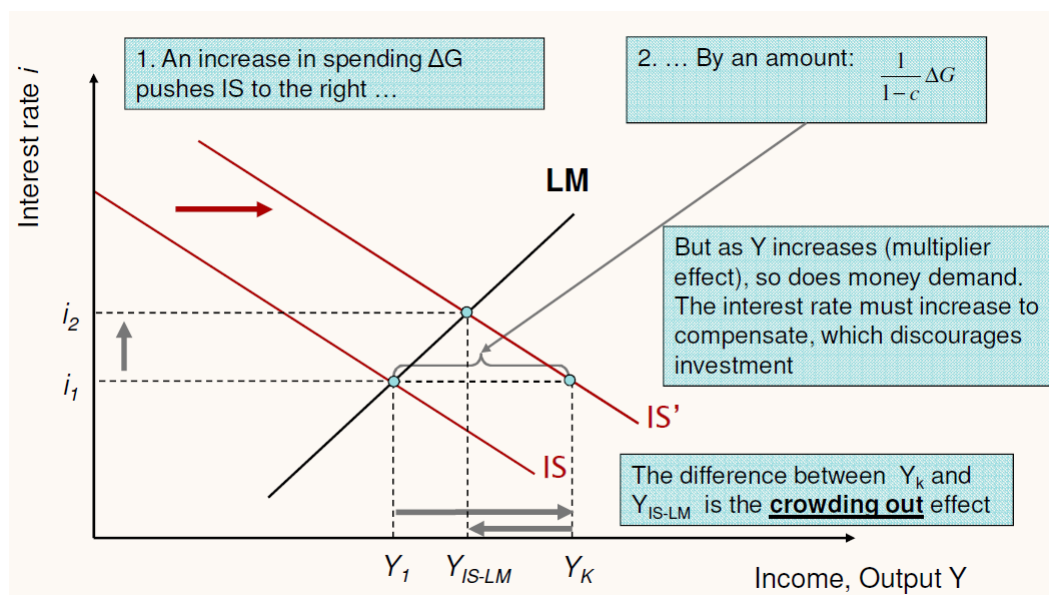
Expansionary monetary policy: it increases the money supply (M). it shifts the LM curve down (DX).

Contractionary monetary policy: it decreases the money supply (M). it shifts the LM curve up (SX).

The effect of an expansionary fiscal policy

The equilibrium condition of the economy can be expressed as:

$$G - T = S(Y) - I(i)$$



If $(G - T)$ increases the economy attempts to correct the disequilibrium by:

- increasing S (multiplier effect on output);
- Reducing I (crowding out on private investment);

Policy mix

It is a combination of fiscal and monetary policies.

- Sometimes, the right mix is to use fiscal and monetary policies in the same direction.
- Sometimes, the right mix is to use fiscal and monetary policies in opposite direction.

Always there are not independent as they both affect the endogenous variable (interest rate and income).

Central Bank (monetary policy)'s response to government expansionary fiscal policy ($\Delta G > 0$)

Let's suppose the government increases spending (G).

The possible CB's responses are:

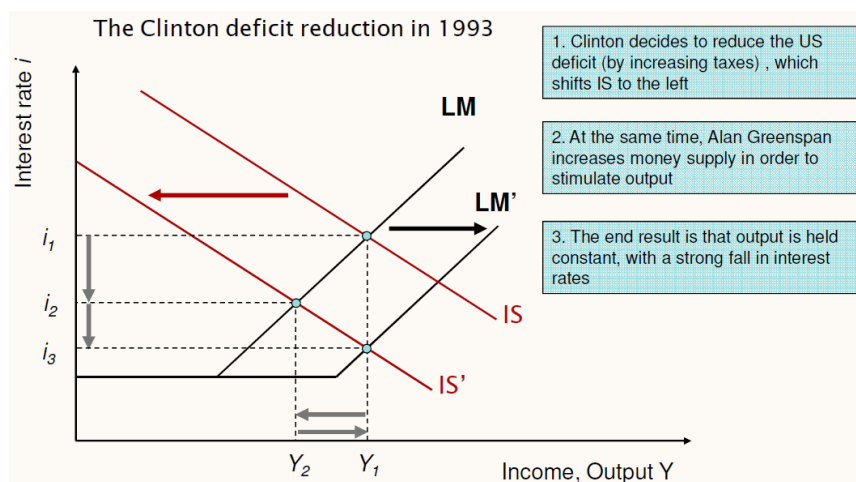
- 1) Hold M = constant $\Rightarrow \Delta Y = (Y' - Y) > 0 ; \Delta i = (i' - i) > 0$
- 2) Hold i = constant \Leftrightarrow CB increase M $\Rightarrow \Delta Y = (Y' - Y) > 0 ; \Delta i = (i' - i) = 0$
- 3) Hold Y = constant \Leftrightarrow CB decreases M $\Rightarrow \Delta Y = (Y' - Y) = 0 ; \Delta i = (i' - i) > 0$

Examples of policy mix issues

- The good: Clinton deficit reduction in 1993.
- The bad: German reunification in 1992.
- The current debate on liquidity Trap.
- The US recession of 2001.

The Clinton – Greenspan policy mix

- 1992 Clinton was elected;
- US Budget deficit;

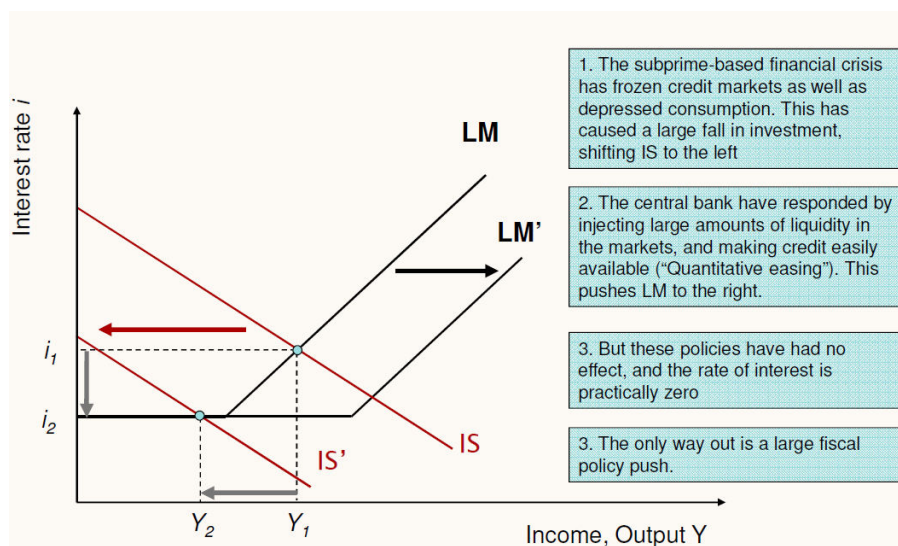


1. Clinton decided to reduce the US budget deficit by increasing taxes. (Contractionary fiscal policy which shifts IS curve to the left)
2. At the same time, Alan Greenspan increased money supply in order to stimulate Output. (Expansionary monetary policy which shifts the LM curve to the right (down))
3. The end result is that output is hold constant ($\Delta Y = 0$) with a strong fall in the interest rate (i).

The liquidity Trap – ineffective monetary policy

(investment is not sensitive to the interest rate. If investment does not respond to interest rate changes (the curve is steep = ripida), monetary policy is ineffective in changing output)

If increases in the monetary supply fail to lower interest rates, monetary policy is ineffective in increasing output.



1. The subprime based financial crisis has frozen credit markets as well as depression as well as depressed consumption. This caused a large fall in investment (I), shifting IS curve to the left.

2. The CB responded by injecting large amounts of liquidity in the markets and making credit easily available ("Quantitative Easing"). This pushes LM to the right.

3. But these policies have had no effect, and the interest rate is practically zero.

=> The only way out is a large fiscal policy push.

What is the FED's policy instrument?

What the newspaper says:

"The FED lowered interest rates by one-half point today."

What is actually happened:

The FED conducted expansionary monetary policy to shift the LM curve to the right until the interest rate fell 0.5 points.

=> The FED targets the Federal Funds Rate: it announces a target value and uses monetary policy to shift the LM curve as needed to obtain its target rate.

Why does the FED target interest rates instead of the money supply?

1) They are easier to measure than money supply.

2) The FED might believe that LM shocks are more prevalent than IS shocks.

If so, then targeting the interest rate stabilizes income better than targeting the money supply.

Openness in goods and financial markets

Openness in goods markets

- Consumers and firms can choose between domestic goods and foreign goods.
- In no country this choice is completely free of restrictions.
- Free trade restrictions include Tariffs (taxes on imported goods) and quotas (restriction on the quantity of goods that can be imported).

Openness in financial markets

- It is possible to choose between domestic assets and foreign assets.
- Capital controls place restrictions on the ownership of foreign assets.
- These restrictions are rapidly disappearing in many countries and the financial markets are becoming more and more closely integrated.

Openness in factor markets

- it is possible for firms to choose where to locate the production, and for workers to choose where to work.
- North America Free Trade Agreement (NAFTA), signed in 1992.
- Transatlantic Trade and Investment Partnership (TTIP).
- Trans-pacific partnership (TPP), signed in 2015.

Openness in financial markets

The balance of payments

- The balance of payments account summarizes a country's transactions with the rest of the world.
- Transactions above the line are current account transactions.
- Transactions below the line are capital account transactions.
- The current account balance and the capital account balance should be equal, but because of data gathering errors they don't. for this reason, the account shows a statistical discrepancy.

Table 18-3 The U.S. Balance of Payments, 2006 (in billions of U.S. dollars)

Current Account		
Exports	1,436	
Imports	2,200	
Trade balance (deficit = -) (1)		-763
Investment income received	620	
Investment income paid	629	
Net investment income (2)		-9
Net transfers received (3)		-84
Current account balance (deficit = -) (1) + (2) + (3)		-856
Capital Account		
Increase in foreign holdings of U.S. assets (4)	1,764	
Increase in U.S. holdings of foreign assets (5)	1,049	
Capital account balance (deficit = -) (4) - (5)		715
Statistical discrepancy		141

The current account (openness in goods market)

- The transactions above the line record payments to and from the rest of the world are called current account transactions.
- The first two lines record the exports and imports of goods and services.
- US residents receive investment income on their holdings of foreign assets and vice versa.
- Countries give and receive foreign aid: the new value is recorded as net transfers received.

Current account surplus: the sum of net payments in the currency account balance is positive.

Current account deficit: the sum of net payments in the currency account balance is negative.

The capital account (openness in financial markets)

- The transactions below the line are called capital account transactions.

Capital account surplus: foreign holdings of US assets are greater than US holdings of foreign assets.

Capital account deficit: foreign holdings of US assets are lower than US holdings of foreign assets.

Statistical discrepancy

The numbers for current and capital account transactions are constructed using different sources: although they should give the same answers, they typically do not. The difference between the two is called the statistical discrepancy.

MICROECONOMICS:

BUSINESS ADMINISTRATION

Concern

In English there are many words and expressions, but none translates exactly the Italian “azienda”.

The closest term to “azienda” probably is “concern”.

Concern = “azienda” = it is the economic order of an institution.

Firm (or Enterprise) = “impresa” = production concern.

Business = production concern.

Concern economics = it is the science that investigates and proposes solutions for economic problems of an institution (private or public); it does not deal with national or territorial economics.

Business administration = it is only a part of concern economics.

The concern (or business entity) is:

1) System

A system is a set of interacting or interdependent components, forming an integrated whole. This definition leads to a holistic perspective.

Holism: (from Greek ὅλος holos "all, whole, total, entire") it is the idea that all the properties of a given system cannot be determined or explained by its component parts alone. The general principle was concisely summarized by Aristotle in the metaphysics: “The whole is more than the sum of its parts”.

All the elements of a concern are connected with each other.

The elements are:

- **Human resources:** not only single workers but also group of people with their knowledge, abilities, expectations, emotions, feelings...
- **Technical tools:** tangible, intangible and financial resources used for all the different activities.
- **Organization (or entrepreneurship):** the ability to coordinate and manage the human resources over the technical tools.

2) Social

The business entity is called “social” because its activities are managed by people (human resources).

Neo-classical model of the firm

- 1) The firm is a profit-maximiser;
- 2) The firm can be treated in a holistic way;
- 3) There is perfect certainty (perfect information) and perfect competition;

The classical theory of the firm wants that:

- Firms are small, owner-managed organizations, such as proprietorships, operating in highly competitive markets whose demand functions are given and where only normal profits can be earned.
- If the firm did not maximise profits it would fail to survive under these conditions.

Definitions

Variable and fixed cost

	If activity volume increases or decreases:	
	TOTAL COST	COST per UNIT of activity volume
FIXED COSTS	No change	decrease or increase
VARIABLE COSTS	Increase (or decrease)	No change

Variable cost: changes in total cost to changes in the total activity or volume.

Fixed cost: is not affected in total by a decision to change the total activity or volume.

NW1: "variable" or "fixed" characteristic of a cost relates to its total dollar amount and not to its per-unit amount! A variable cost (i.e. 20% sales commission) is constant per unit, and its total dollar amount changes in activity or volume. A fixed cost (i.e. factory rent) is constant in total dollar amount but become smaller on a per-unit basis as volume increases.

NW2: A fixed cost is fixed only in relationship to a given time and a given relevant range of activity (a relevant range is the expected band of activity volume in which a specific form of sales and costs relationships will be valid).

Total revenue

$$TR = p \times q \quad R(q) = p(q) \cdot q$$

The price of goods and services multiplied by the quantity sold.

Average revenue

$$AR = \frac{TR}{q} = p$$

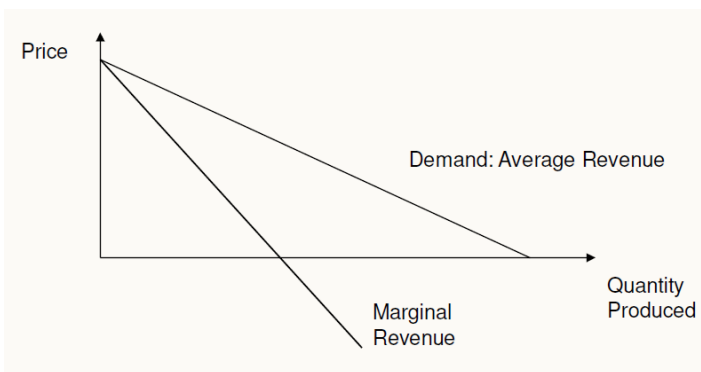
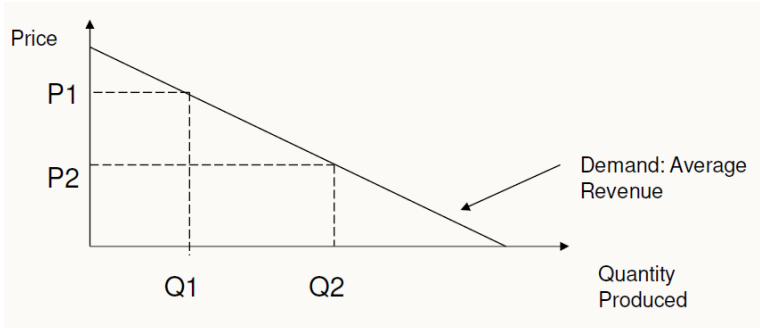
Marginal revenue

$$MR = \frac{\Delta TR}{\Delta q} = \frac{\Delta R}{\Delta q} = \frac{dR}{dq}$$

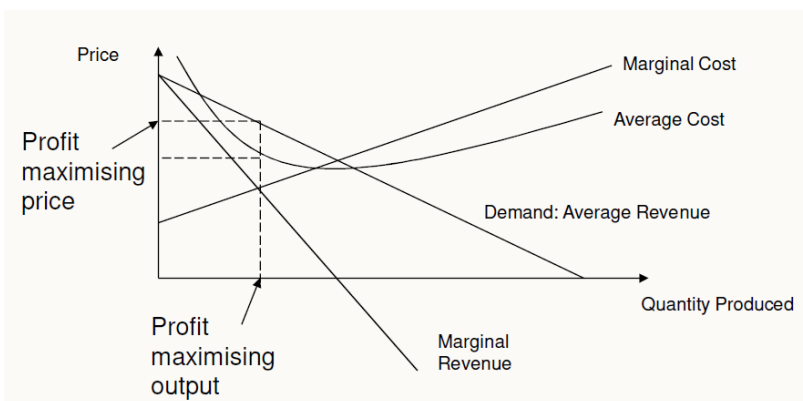
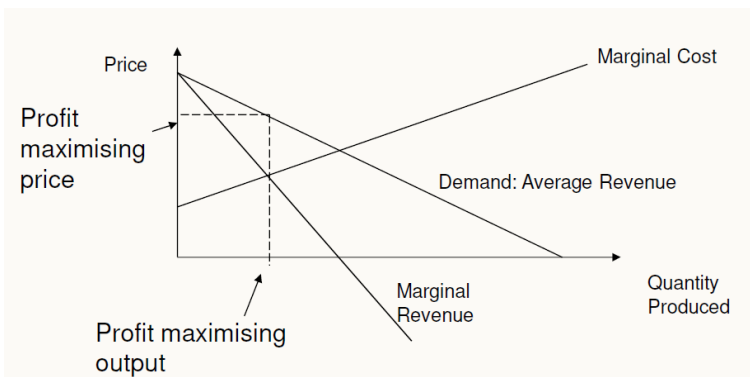
It is the change in total revenue associated with change in quantity. It is the additional revenue from selling one more unit of output.

- The supplier will continue to produce as long as MC is less than MR.
- The supplier will cut back on production if MC is greater than MR.

The firm aims to maximize profit by choosing the level of output which gives the biggest difference between revenue and cost.



What is the equilibrium? (MR=MC)



EXAMPLE

Data: $q = 100 - 10p$; $MC = 4$; $q = ?$

$$MR = \frac{\Delta R}{\Delta q} = \frac{dR}{dq}$$

$$R = p \cdot q$$

$$p = 10 - \frac{q}{10}$$

$$R = p \cdot q = 10q - \frac{q^2}{10}$$

$$MR = \frac{\Delta R}{\Delta q} = \frac{dR}{dq} = 10 - 2 \frac{q}{10} = MC = 4$$

$$q = (10 - 4)5 = 30$$

Cost – Volume – Profit analysis (CVP analysis)

It is the study of revenues (R) (sales), expenses (C) (costs) and net income (net profit).

Formulas

1. Total revenue

$$TR = R = p(q) \cdot q = p \cdot q$$

2. Average revenue

$$AR = p$$

3. Marginal revenue

$$MR = \frac{\Delta TR}{\Delta q} = \frac{\Delta R}{\Delta q} = \frac{dR}{dq}$$

4. Total cost

$$TC = FC + VC = FC + p \cdot q_s$$

5. Average cost

$$AC = \frac{TC}{q}$$

6. Marginal cost

$$MC = TC_n - TC_{n-1} = \frac{\Delta TC}{\Delta q} = \frac{\Delta C}{\Delta q} = \frac{dC}{dq}$$

INTERNATIONAL TRADE THEORIES

Mercantilism

- Economic philosophy in 17th and 18th centuries, in England, Spain, France, Portugal and Netherlands.
- Mercantilism measured the wealth of a nation by stock of precious metals it possessed.
- Exporting causes precious metals to flow into a country.
- Belief that a nation could become wealthy and powerful only by exporting more than by importing.
- Thus, trade policy was to encourage exports and restrict imports.
- Thus, one nation can become wealthy (gain = guadagnarci) only at the expense of another.

Today, we measure the wealth of a nation by its stock of human, man-made and natural resources available for producing goods and services (country's ability to produce goods and services to improve the quality of life).

Basic questions for trade

Assumption: we assume two-nation, two-good world.

What is the basis of trade (for mutually beneficial trade)?

- Absolute advantage (Adam Smith);
- Comparative advantage (David Ricardo);

What are the gains (utili) from trade?

- The gains from trade are the **increased consumption gained through specialization in production and trade.**

What is the pattern (modello) of trade?

- What determines the pattern of specialization that drives international trade?

Trade based on comparative advantage – David Ricardo

Even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in production of both commodities, there is still a basis for mutually beneficial trade.

The original idea of the comparative advantage was based on the **labour theory of value**:

“The value or price of a commodity depends exclusively on the amount of labour used to produce it.”

We can use the **opportunity cost theory** to explain comparative advantage:

“The cost of a commodity is the amount of a second commodity that must be given up to release (disimpegnare) just enough resources to produce one additional unit of the first commodity.”

EXAMPLE

	U.S.	U.K.	
Wheat (bushels/labor hour)	6	1	
Cloth (yards/labor hour)	4	2	
	U.S.	U.K.	
Wheat	$1W_{us} = \frac{2}{3}C_{us}$	$1W_{uk} = 2C_{uk}$	UK has higher opportunity cost than US in Wheat production
Cloth	$1C_{us} = \frac{3}{2}W_{us}$	$1C_{uk} = \frac{1}{2}W_{uk}$	US has higher opportunity cost than UK in Cloth production

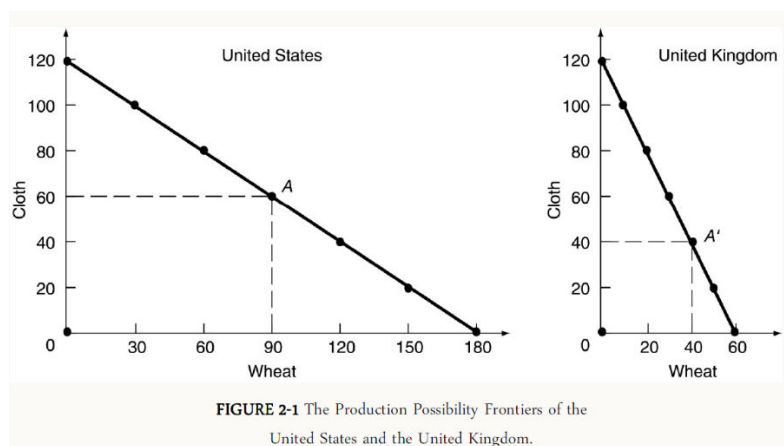
- U.K. has absolute disadvantage in both goods.
- Since U.K. labor is half as productive in cloth but six times less productive in wheat compared to U.S., the U.K. has a comparative advantage in cloth.
- U.S. has comparative advantage in wheat.

Production possibilities frontier

The **production possibilities frontier** is a curve that shows alternative combinations of the two commodities a nation can produce by fully using all resources with best available technology.

The **constant opportunity costs** arise when:

1. Resources are either perfect substitutes for each other or used in fixed proportion in production of both commodities and,
2. all units of the same factor are homogeneous.



Trade Theory

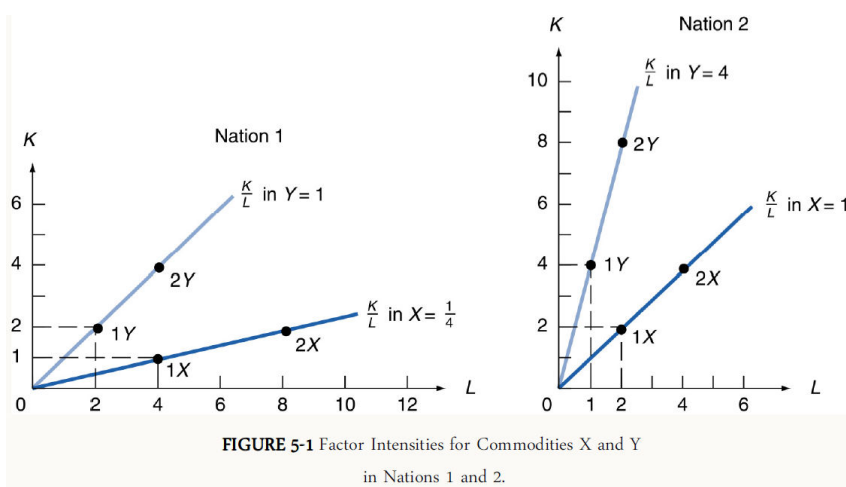
Assumptions of the theory

1. Two nations, two goods, two factors of production;
2. Technology same in both nations;
3. Commodity X is labour intensive; commodity Y is capital intensive in both nations;
4. constant returns to scale for X and Y in both nations;
5. Incomplete specialization in production in both nations;
6. Tastes are equal in both nations;
7. Both commodities and factors are traded in perfectly competitive markets;
8. perfect factor mobility within each nation, but not between nations;
9. No transportation costs, tariffs or other barriers to free trade;
10. All resources are fully employed in both nations;
11. International trade between the nations is balanced;

Factor intensity

- In a two-commodity, two-factor world, commodity Y is **capital intensive** if the capital-labour ratio (K/L) used in the production of Y is greater than (K/L) used in the production of X.

- it is not the absolute amount of capital and labour used in production of X and Y, but the amount of capital per unit of labour that determines **capital intensity**.



Heckscher-Ohlin Theory

H-O theorem

- A nation will export the commodity whose production requires the intensive use of nation's relatively abundant and cheap (economico, conveniente) factor and it will import the commodity whose production requires the intensive use of the nation's relatively scarce and expensive factor.
- In short, the relatively labour-rich nation exports the relatively labour-intensive commodity and imports the relatively...
- It explains comparative advantage rather than assuming it.

The sources of comparative advantage

- The Heckscher-Ohlin theory is a theory that explains the existence of a country's comparative advantage by its factor endowments.
- According to the theorem, a country has a comparative advantage in the production of a product if that country is relatively well endowed with inputs used intensively in the production of the product.

Trade barriers: Tariffs, export subsidies and quotas

Protection: is the practice of shielding (proteggere) a sector of the economy from foreign competition.

Tariff: is a tax on imports.

Exports subsidies: are government payments made to domestic firms to encourage exports. Closely related to subsidies is **dumping**: a firm sells products on the world market at prices below the cost of production.

Quota: is a limit on the quantity of imports.

International agreements

The Smoot-Hawley tariff law (US June 17, 1930)

It was a US law of the 1930s, which set the highest tariff in US history (50%). It set off an international trade war and caused the decline in trade that is often considered a cause of the worldwide depression of 1930s.

The General Agreement on Tariffs and Trade (GATT) (US October 30, 1947)

It is an international agreement signed by the US and other 22 countries in 1947 to promote the liberalization of foreign trade.

The US – Canadian free-trade agreement (January 2, 1988)

It is an agreement in which the US and Canada agreed to eliminate all barriers to trade between the two countries by 1988.

The North America Free-Trade Agreement (NAFTA) (January 1, 1994)

It is an agreement signed by the US, Mexico and Canada in which the three countries agreed to establish all of North America as a free-trade zone.

The grade game

Without showing to your neighbours, write down the letter “ α ” or “ β ”.

The system will randomly pair your choice with the choice of one other neighbour.

Neither you nor your pair will ever know with whom you were paired.

Here is how grades may be assigned for this class:

- If you put α and your pair puts β , then you will get grade A and your pair grade C; (payoff = 3)
- If both you and your pair put α , then you both will get grade B-; (payoff = 0)
- If you put β and your pair puts α , then you will get grade C and your pair grade A; (payoff = 0)
- If both you and your pair put β , then you both will get the grade B+; (payoff = 1)

		MY PAIR	
		alpha	beta
ME	alpha	B -	A
	beta	C	B +

MY GRADES

		MY PAIR	
		alpha	beta
ME	alpha	B -	C
	beta	A	B +

PAIR'S GRADES

		MY PAIR	
		alpha	beta
ME	alpha	B -, B -	A, C
	beta	C, A	B +, B +

1st grade Row player 2nd grade Column player

This is an **outcome** matrix:
It tells us everything that was in the game we saw

- I play α because it is the choice only which makes me get the best choice;
- I play α because so I will never get grade C;

Dominant strategy: α dominates β : no matter what the choice of your pair is, α is better in any case.

“My strategy α strictly dominates my strategy β ; (my payoff from α is strictly greater than that from β , regardless of what others do).”

If you make an agreement to play β , it is still convenient for you to play α but in this way you are betraying (tradendo) your partner.

Right now, we have:

- The players;
- The strategies, that are the actions that the players can take;
- We know the outcomes;

We are missing the objectives:

Payoffs = what the players care about (utilities).

Selfish vs altruistic

In this case, alpha still **dominates**

The fact we (selfish player) are playing against an altruistic player doesn't change my strategy, even by changing the other Player's payoff

		my pair (Altruistic)	
		alpha	beta
Me (Selfish)	alpha	0, 0	3, -3
	beta	-1,-1	1,1

Altruistic vs selfish

- What happened here?
- Do I have a dominating strategy?
- Does the other player have a dominating strategy?

By thinking of what my "opponent" will do I can decide what to do.

		my pair (Selfish)	
		alpha	beta
Me (Altruistic)	alpha	0, 0	-1, -1
	beta	-3,3	1,1

LESSON 3: "Put yourself in others' shoes and try to figure out what they will do."

In realistic settings:

- It is often hard to determine what are the payoffs of your "opponent";
- It is easier to figure out my own payoffs;

In general, we have to figure out what are the probability of my "opponent" being selfish or altruistic.

The prisoners' dilemma

The police have arrested two people, Billy and Bob, for a crime that they have committed. Both can talk to the police or stay quiet.

Players:

- Billy;
- Bob;

Strategies:

- Confess;
- Do not confess;

Outcomes:

- Both confess: both owe 5 years in jail;
- Both do not confess: both owe 1 year in jail;
- Only one confess:
 - Confessed: goes free;
 - Non-confessed: owes 10 years in jail;

Outcomes (payoff) matrix

	Billy confesses	Billy doesn't confess
Bob confesses	(5,5)	(0,10)
Bob doesn't confess	(10,0)	(1,1)

The best answer is for neither Bob nor Billy to confess:

- Both would get only 1 year in jail;

BUT, this would require **cooperation!**

Suppose Bob confesses, reasoning that Billy will confess too:

- Then, if Billy doesn't confess, Bob's outcome is better than he was expecting;

Nash Equilibrium

The "both confess" strategy (or **solution concept**) has the property that neither Billy nor Bob can do better by changing his strategy.

- That is, neither can do better without coordinating a change in strategy with the other player;
- This solution concept is a Nash equilibrium, named after John Forbes Nash discovered it in his 1950 dissertation.

Pareto optimality

Any change in strategy that causes improvement for one player must make it worse for the other player.

	Billy confesses	Billy doesn't confess
Bob confesses	(5,5) <u>NASH</u>	(0,10)
Bob doesn't confess	(10,0)	(1,1) <u>PARETO</u>

“Pick a number” game

Without showing your neighbour what you are doing, write an integer number between 1 and 100.

We will calculate the average number chosen in the class.

The winner in this game is the person whose number is closest to the two-thirds of the average in the class.

EXAMPLE: 3 students

Numbers: 25, 5, 60

Total: 90

Average: 30

2/3 average: 20

25 wins: 1point – $(25-20)/100 = 0.95$

What we know:

- Do not choose a strictly dominated strategy;
- Do not choose a weakly dominated strategy;
- You should put yourself in others' shoes, try to figure out what they are going to play, and respond appropriately;

What did you do in this game?

Let's try to find out whether there are dominated strategies.

If everyone would choose 100, then the winner number would be 66.

So, the numbers > 67 are weakly dominated by 66.

Rationally tells not to choose numbers > 67 .

So, now we have eliminated dominated strategies, it's like the game was be played over the set $(1...67)$.

Once you have figured that nobody is going to choose a number above 67, the conclusion is also strategies above 45 are ruled out because they are weakly dominated (only once we delete 68...100).

HINT (suggerimento): try to identify all dominated strategies at once before you delete, this may save you some round.

This implies rationally the knowledge that the others are rational as well (strong assumption).

Eventually, we can show that also strategies above 30 are weakly dominated, once we have deleted previous dominated strategies. We can go on this line of reasoning and end up with the conclusion that:

1 was the winning strategy!

In practice: the winner number was another one!

Theory vs practice

Why was it, that 1 wasn't the winning number?

-> We need a strong assumption, that is that all players are rational, and they know that everybody else is rational as well.

Definition: weak dominance

We say player i 's strategy S'_i is **weakly dominated** by player i 's strategy S_i if:

$$U_i(S_i, S_{-i}) \geq U_i(S'_i, S_{-i}) \text{ for all } S_{-i}$$

$$U_i(S_i, S_{-i}) > U_i(S'_i, S_{-i}) \text{ for some } S_{-i}$$

No matter what other people do, by choosing S_i , instead of S'_i , player i will always do at least as well, and in some cases he does strictly better.

→ We have explored a bit the idea of deleting dominated strategies:

- Look at the game;
- Figure out which strategies are dominated;
- Delete them;
- Look at the game again;
- ... (and so on);

Conclusions:

- You don't choose a strictly dominated strategy.
- You should never choose also a weakly dominated strategy (from the Hannibal dilemma).
- Iterative deletion of dominated strategies seems a powerful idea, but it is also dangerous if you take it literally (strong assumption) (from the game "Pick a number").
- In some game, iterative deletion converges to a single choice, in others it may not.

From the prisoners' dilemma:

Nash Equilibrium

The "both confess" strategy (or **solution concept**) has the property that neither Billy nor Bob can do better by changing his strategy.

- That is, neither can do better without coordinating a change in strategy with the other player;
- This solution concept is a Nash equilibrium, named after John Forbes Nash discovered it in his 1950 dissertation.

Pareto optimality

Any change in strategy that causes improvement for one player must make it worse for the other player.

	Billy confesses	Billy doesn't confess
Bob confesses	(5,5) <u>NASH</u>	(0,10)
Bob doesn't confess	(10,0)	(1,1) <u>PARETO</u>

While cooperation is collectively rational, defection is individually rational.

The undersupply of cooperation is the "tragedy of the commons" (Garret Hardin, "the tragedy of the commons", 1968).