Macroeconomics

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"The study of economics does not seem to require any specialized gifts of an unusually high order. Is it not, intellectually regarded, a very easy subject compared with the higher branches of philosophy and pure science? Yet good, or even competent, economists are the rarest birds. *An easy subject, at which very few excel!* The paradox finds its explanation, perhaps, in that *the master-economists must possess a rare combination of gifts*. He must reach a high standard in several different directions and must combine talents not often found together. He must be mathematician, historian, statesman, philosopher – in some degree. He must understand symbols and speak words. He must contemplate the particular in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must lie entirely outside his regard. He must be purposeful and disinterested in a simultaneous mood; as aloof and incorruptible as an artist, yet sometimes as near the earth as a politician".
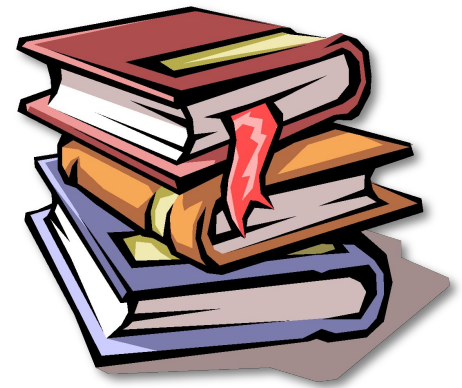
John Maynard Keynes

Do you have any doubts in your capabilities?

Go ahead then!

Lecture 1
Introduction to Macroeconomics

- The Subject Matter of Macroeconomics
- The History of Macroeconomics
- Key Macroeconomic Issues
- Principles of Macroeconomic Analysis
- Macroeconomic Agents and Macroeconomic Markets
- The Model of Circular Flows
- The Macroeconomic System

What is Macroeconomics?

Macroeconomics is the branch of economics.

Economics is a discipline which studies how scarce economic resources are allocated and used to maximize production for a society. It is a *social science* which deals with *economic behavior* of individuals and organizations engaged in the production, distribution and consumption of goods and services.

The study of economics is subdivided into two general fields:

Economics

Microeconomics   **Macroeconomics**
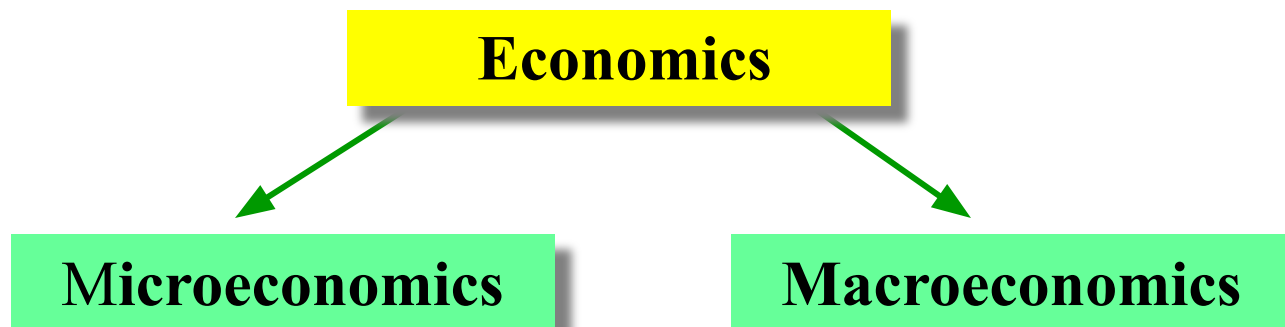
The History of the Term «Macroeconomics»

In translation from Greek

«*micro*» means «*small*»,

«*macro*» – «*large*»;

and «*economics*» – «*housekeeping*»

For the first time the term "macroeconomics" was used in **1933** by the Norwegian economist-matematician **Ragnar Frisch** (Nobel prize, 1969) who introduced the concepts of "microeconomic" and "macroeconomic dynamics".

In **1941 Piet De Wolff** divided economic theory into microeconomics and macroeconomics.

Macroeconomics and **Mi**croeconomics

*M**a**croeconomics*	*M**i**croeconomics*
✔ analyzes the *economy as a whole*;	✔ analyzes *individual* components of the economy;
✔ studies *aggregate economic behavior*, i.e. the behavior of aggregate economic agents on aggregate economic markets;	✔ studies *economic behavior of individual units* (individual firm or individual household) on *markets for particular goods* and services (wheat, computers, oil, bicycles, gold, etc.);
✔ deals with the economic issues that affect the *entire economy* and *most of society*;	
✔ studies *aggregate variables* such as gross domestic product, national income, aggregate demand, aggregate supply, general price level, rate of unemployment, public deficit, exchange rate, etc.	✔ deals with the decision-making of a *certain firm* (a producer) or a *certain household* (a consumer);
	✔ studies such variables as the amount of a firm's output or of a consumer's income, quantities demanded and supplied of particular goods and their prices, etc.

Ma**croeconomics versus **M**i**croeconomics**

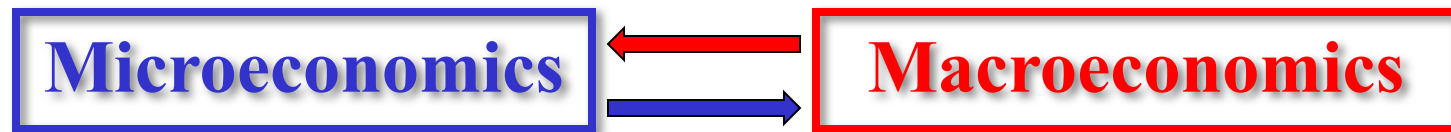|	**M**i**croeconomics**	**M**a**croeconomics**
Subject	**Economic behavior**	**Economic behavior**
Level of analysis	**Individual units**	**Entire economy**
Agents	**Individual**	**Aggregate (sectors of economy)**
Markets	**Particular goods and services**	**Composite**
Prices	**Relative**	**Absolute**
Market Adjustment	**Only via changes in prices**	**In the short run via changes in quantities**

Using Microeconomics in Macroeconomics

Macroeconomics is based on microeconomics
(has <u>microeconomic</u> <u>foundations</u>), because
macroeconomic events are the *result of the decisions
of millions of individual agents*, maximizing their own
welfare and arise from the interaction of many people.

At the same time all the *decisions of individual agents* are made taking into account the *macroeconomic situation*.

Microeconomics	← →	**Macroeconomics**

Macroeconomics as a Special Discipline

But …

✔ despite both disciplines use the same variables, macroeconomic variables are ***not just a simple sum*** of variables that reflect individual decisions (examples: total output, aggregate demand, general price level, etc);

✔ ***not every statement*** that ***is true*** for an individual is always true for the entire economy (example: the paradox of thrift).

Thus, microeconomics and macroeconomics have ***specific subjects*** and ***methods of analysis*** and are based on specific approaches and theories. They are even taught as separate disciplines.

The Founder of Macroeconomics

The founder of macroeconomics as a special part of economics was a prominent British economist, lord **John Maynard Keynes**, who in **1936** published his famous book **«General Theory of Employment, Interest and Money»**.

He showed that macroeconomics has a special subject and some special methods of analysis.

His contribution to economic theory was so large, that it was called the *«Keynesian revolution»*.
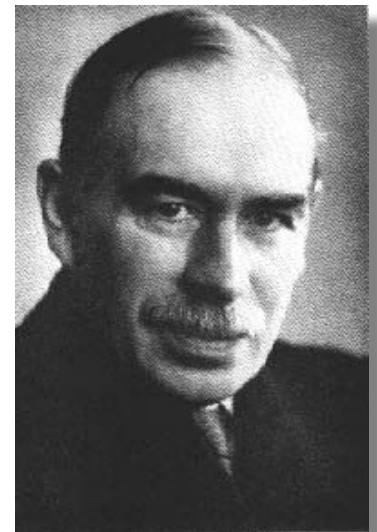
The History of Macroeconomics

The XVIII century – beginning of the XX century – *classical school* in economic theory.

David Hume «*Of the Balance of Trade*», 1752 – the analysis of the relation between the money stock, trade balances and the price level; laid the foundation of the quantity theory of money.

The main ideas and concepts of the classical approach were developed in the works of *Adam Smith* («*An Inquiry into the Nature and Causes of the Wealth of Nations*», 1776), *David Ricardo* («*On the Principles of Political Economy and Taxation*», 1817), *Jean-Baptiste Say* («*Traité d'économie politique ou Simple exposé de la manière dont se forment, se distribuent et se consomment les richesses*», 1803; «*Cours complet d'économie politique pratique*», 1828–1830), *William Stanley Jevons* («*The Theory of Political Economy*», 1871), *Leon Walras* («*Elements of Pure Economics*», 1874), *Alfred Marshall* («*The Principles of Economics*», 1890), *John Bates Clark* («*The Distribution of Wealth*», 1899), *Arthur Pigou* («*The Economics of Welfare*», 1920).

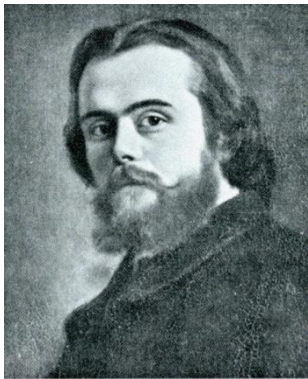# Classical Economists: the Gallery

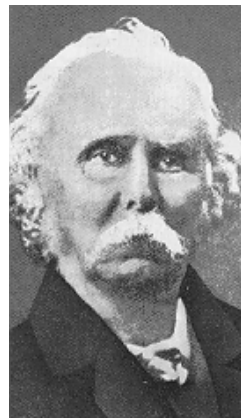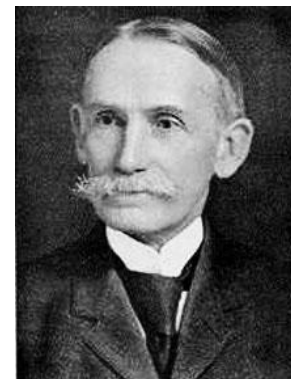David Hume
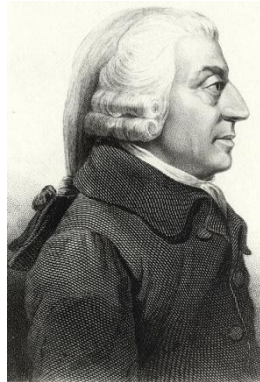
Adam Smith

David Ricardo

Jean-Baptiste Say

Marie-Ésprit-Léon Walras

William Stanley Jevons

Alfred Marshall

John Bates Clark

Arthur Cecil Pigou

Classical School: Basic Propositions

- Economy consists of two separate sectors: the real sector and the money sector $\Rightarrow$ real variables do not depend from nominal variables = the principle of «*classical dichotomy*» and «neutrality of money».

- There is *perfect competition* in all the markets $\Rightarrow$ economic agents cannot influence market prices, they are price-takers.

- All the *prices are flexible* and are set by the relation between supply and demand $\Rightarrow$ the principle of A.Smith's «*invisible hand*» and «*market clearing*».

- Government has no need to intervene in the regulation of the economy $\Rightarrow$ the principle «*laissez faire, laissez passer*».

Classical School: Basic Propositions

- The main economic problem is the *scarcity of resources*, which hence are fully used, and the economy is always at its *potential level of output*.

- The scarcity of resources poses puts in the forefront the problem of production $\Rightarrow$ the analysis of economy's behavior from *aggregate supply* side («supply-side analysis»).

- The «Say's law» acts in the economy: «*supply creates its own demand*», because each economic agent is simultaneously a seller and a buyer.

- The problem of expanding of production possibilities is resolving slowly, the mutual market adjustment is a long-term process $\Rightarrow$ the description of economy's behavior *in the long run* («long-run analysis»).

The History of Macroeconomics

But up to the XX century macroeconomics didn't exist as a separate discipline.

Three events had the fundamental importance for the development of macroeconomics:

- the beginning of the collection of economic information and systematization of *aggregate data* (the period of the I World War) that provided the empirical base for macroeconomic research: 1920-s – the elaboration of the System of National Income and Product Accounts (NIPA) – Simon Kuznets (Nobel prize, 1971) and Richard Stone (Nobel prize, 1984);

- the substantiation of the fact that the *business cycle* is a recurring phenomenon (1920-s – Wesley Clair Mitchell);

- the Great Depression (1929–1933) – *world economic catastrophe* (the Great Crash) that contradicted to the postulates of classical economists about the self-correcting economy.

«Keynesian Revolution»

In **1936** a prominent British economist, lord
John Maynard Keynes published a book
«General Theory of Employment, Interest and Money»,
in which he analyzed the Great Depression and
proved that the change in the macroeconomic situation
needs the new methods of analysis,
different from those used by classical economists.

He criticized the main postulates of the classical school and
gave his own explanation of the macroeconomic phenomena.

Macroeconomics became a special discipline, and
a new approach appeared in economic analysis.

Keynes' Approach: Basic Propositions

- The real sector and the money sector are related to each other ⇒ money affect real variables, the *interest rate* is set in the *money market* rather than in the loanable funds (or capital) market.

- There is *imperfect competition* in the markets.

- *Prices* (nominal variables) are *rigid* («sticky»).

- *Equilibrium* in the markets is settled, but *__not on the full-employment level__*.

- Private sector expenditures are unable to provide the level of aggregate demand required to obtain the potential level of output, and, therefore, *government intervention* and government regulation is needed.

- In the conditions of underemployment of economic resources *aggregate demand* becomes the main problem of the economy («demand-side analysis»).

- Government stabilization policy affects economy in the short run, and price rigidity exists relatively for not long period ⇒ the description of the economy's behavior in the *short run* («short-run analysis»).

The History of Macroeconomics

The central point of Keynes' theory: the market economy does not guarantee the economy's stability, and, therefore, to counteract slumps and recessions and high unemployment *government should intervene* in the economic performance and conduct the *stabilization policy.*

During 25 years after the II World War – the period of fast economic growth in most countries – the belief that government is able to prevent recessions by actively using fiscal and monetary policy.

But in the middle of 1970-x – *stagflation* (the combination of high inflation with stagnation, i.e. low and even negative rates of economic growth and high unemployment) – the conclusion: the key source of instability is the stabilization policy itself $\Rightarrow$ *«Neoclassical counterrevolution»*.

Schools Alternative to Keynesian Approach
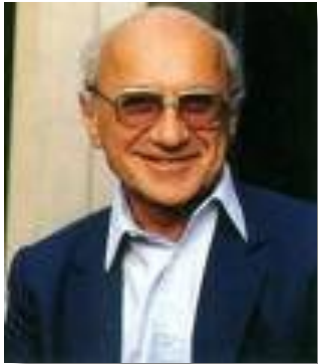
✔ ***Monetarism*** (Milton Friedman, Edmund Phelps)

- the market economy is a self-correcting system and is able to return to the potential level of output by itself;

- economic fluctuations are the result of the changes in the money stock, therefore, to provide stability the Central bank should maintain the constant money growth rate («monetary rule»);

✔ ***New Classical Macroeconomics*** (Robert Lucas, Thomas Sargent, Neil Wallace) (the rational expectations theory)

- if the economic agents' expectations are rational, government policy is ineffective;

✔ ***Real Business Cycle Theory*** (Finn Kydland, Edward Prescott)

- the source of economic disturbances are technological shocks rather than government policy.

✔ ***Supply-side Economics*** (Arhur Laffer)

- government policy should be aimed to stimulate aggregate supply rather than aggregate demand.

Schools Alternative to Keynesian Approach: the Gallery

Monetarism

Milton Friedman, Nobel prize, 1976

Edmund Phelps, Nobel prize, 2006

Real Business Cycle Theory

Edward Prescott, Nobel prize, 2004

Finn Kydland, Nobel prize, 2004

New Classical Macroeconomics

Robert Lucas, Nobel prize, 1995

Thomas Sargent, Nobel prize, 2011

Neil Wallace

Supply-side Economics

Arthur Laffer

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Development of Macroeconomics

Macroeconomics as a science is permanently developing
$\Rightarrow$ changes concern both the sense of issues and problems under study and of answers and remedies proposed.

These changes are the result of the impact of two groups of factors:

The *appearance of new theories*, while old theories are rejected as not consistent with economic reality or as outdated in the light of new concepts.
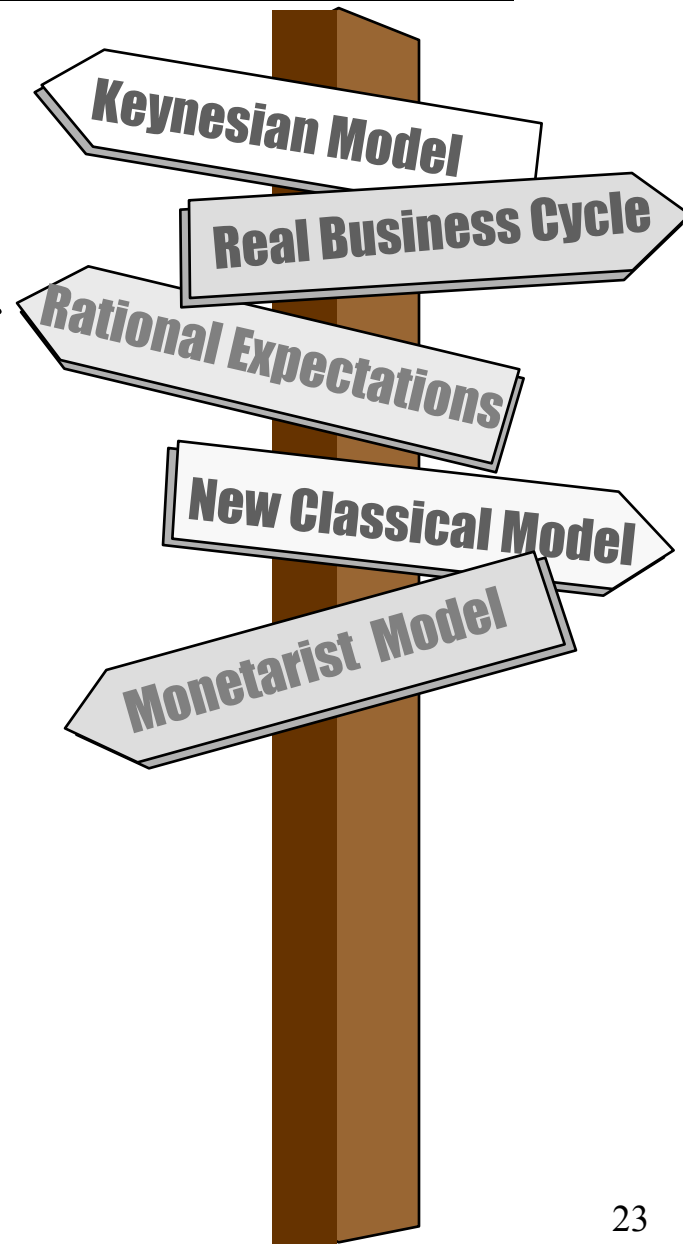
The *permanent development of the economy* itself, that poses new questions and requires new answers.

Diversity of Macroeconomic Theories

The diversity of approaches to the explanation of macroeconomic events and especially problems of macroeconomic policy is caused by the fact that different groups of macroeconomists construct their theories by using *different assumptions*, may differently interpret the same events, and therefore, come to different theoretical and practical conclusions and give different political recommendations.

This diversity of ideas is due to the *complexity of macroeconomic problems* and allows to *examine* them *comprehensively*, thoroughly, and from *different points of view*.

Keynesian Model

Real Business Cycle

Rational Expectations

New Classical Model

Monetarist Model

Key Questions Macroeconomists Try to Answer

✔ Why do incomes grow? Would our children live better than we do?

✔ Why are some countries richer than others? Why do some countries are growing faster than others?

✔ Why recessions and expansions occur in the economy?

✔ Why is there unemployment? Is it a necessary part of economic life? Why unemployment is low in some countries and high in the others?

✔ Why prices grow? What is the cost of inflation for the society?

✔ Is it better for an economy to have budget deficit or budget surplus? trade deficit or trade surplus? to be a lender or a borrower in the world financial markets?

Questions Macroeconomists Try to Answer

✔ Why interest rates fluctuate? What impact have the changes in the money and stock markets on the economy?

✔ What are the determinants of the exchange rates? Is it good to have a strong or a weak domestic currency?

✔ Is government policy able to affect long-term economic growth? Can it eliminate or at least smooth economic fluctuations during the business cycle?

✔ How economic changes in one country effect the situation in others?

Answer: study macroeconomics and be informed!

Key Macroeconomic Issues

- ***Overall output***

    - long-run changes – **economic growth**

    - short run fluctuations – **business cycle**

- ***Unemployment***

- ***Inflation***

- ***Interest Rates***

- ***Government Budget***

- ***Balance of Payments and Exchange Rates***

- ***Macroeconomic Policy***
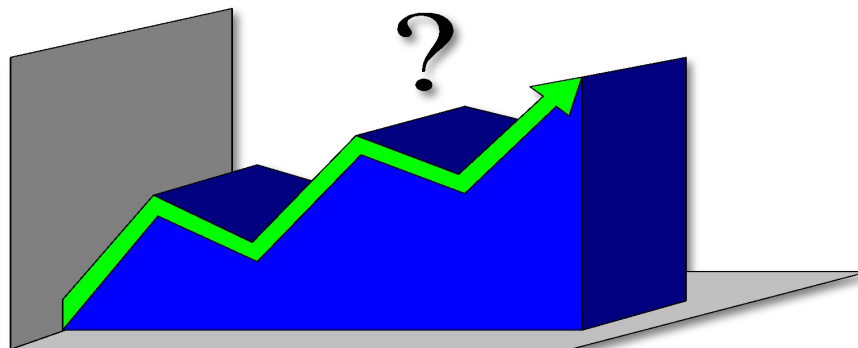
Why to Learn Macroeconomics?

Macroeconomists are concerned with issues important:

❑ for economic health of every nation;

❑ for all economic agent as the base of their decision-making;

❑ to estimate proposals made by politicians and which can have great impact on national and world economy.

The state of the macroeconomy affects:

✔ everyday life and welfare of *everyone*;

✔ economic activity of *every firm*;

✔ political sphere, i.e. *government policy*;

✔ well-being of the *whole society*;

✔ the peace and stability within the country and *in the world*.

It is almost impossible in today's complex world to be a responsible citizen without having some grasp of economic issues and principles.
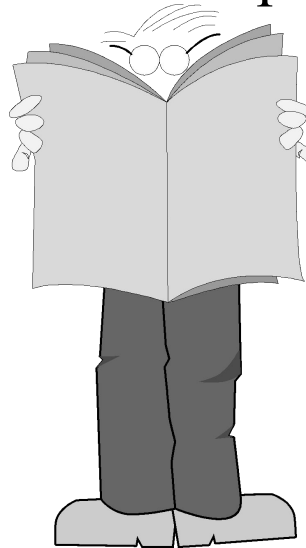
Macroeconomics

The Importance of Macroeconomics

Macroeconomic theory

✔ reveals and explores *the regularities* of macroeconomic processes and events;

✔ aims to *explain* macroeconomic phenomenon;

✔ helps to understand *the cause-and-effect relations* in the aggregate economy;

✔ serves the base for elaboration of *principles*, *tools* and *measures* of *macroeconomic policy* that might prevent or improve economic performance and can in the best way serve to the needs of the society;

✔ provides the framework to *make forecasts* of future economic development, to *predict* future economic problems.

Macroeconomics represents
a *fascinating intellectual* *occupation* that has
great practical *importance*.

Principles of Macroeconomic Analysis

Macroeconomics is the social science and the controlled experiment is impossible. Besides, economic phenomena are very complex. That's why economists use models.

Economic model is a stylized representation of the economy, a generalization and abstraction of reality that seeks to isolate a few of the most important determinants (causes) of an economic event in order to provide a better understanding of that event.

Economic models are constructed and used
- to *simplify* the analysis of complex economic reality;
- to *examine* the relationship between economic phenomena and the regularity of their development;
- to *understand* what goes on in the economy and how the economy works;
- to *develop policies* that might prevent, correct, or alleviate economic problems and improve the situation in the economy;
- to *forecast* future development of economic process.

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Macroeconomic Models

To study the most important elements that explain how the whole economy works, economic models are based on ***assumptions***, which cut off details unimportant for the analysis of a certain economic process or phenomenon and reduce the complexity of economic behavior.

Once modeled, economic behavior may be presented as a relationship between a dependent (endogenous) variable and a few independent (exogenous) variables.

Exogenous (independent) variable is the one whose value is determined by forces **outside** the model.	***Endogenous*** (dependent) variable is those whose value is determined **within** the model.

The value of endogenous variable depends and is determined by the value of exogenous variables.

Exogenous → **MODEL** → **Endogenous**

The Rules of Model Construction

- Frequently, the endogenous variable is presented as depending upon only one exogenous variable, with the assumption that all the other exogenous variables are held constant. This principle is called by the Latin term *ceteris paribus*, meaning «other things being equal».

- Models should be *simple* and focused on the examination of the phenomenon or process under study. They do not need to be «realistic», but should be *consistent with the facts*.

- There must be the possibility of the *transition* from one model to the other depending on the context.

- There can be *no one grand «true» model* that exactly and completely describes the economic reality.

Types of Relationship between Variables

An economic model specifies whether the dependent and independent variables are positively or negatively related.

The relationship between variables is *positive* when the dependent variable moves in the *same direction* as the independent variable.

The relationship is *negative* when the value of the dependent variable *increases* (decreases) when the value of the independent variable *decreases* (increases).

Example: *positive* relation of consumption spending from income.

Example: *negative* relation of investment spending from the interest rate.

Models which specify economic reality provide the framework for organizing data, empirically testing economic hypotheses, and forecasting economic behavior.

Model Presentations

Modeled behavior can be presented by a *function*, an *equation*, a *table* and/or a *graph*. Graphs are useful in that they provide visualization of the relationship between two variables. An equation is a more concise presentation of a relationship and is essential for the forecasting of economic behavior. For example, a relationship of consumption spending (C) from the disposable (after-tax) income (Y_D) can be shown as:

a *function* that reflects a positive rela-tion of C from Y_D :
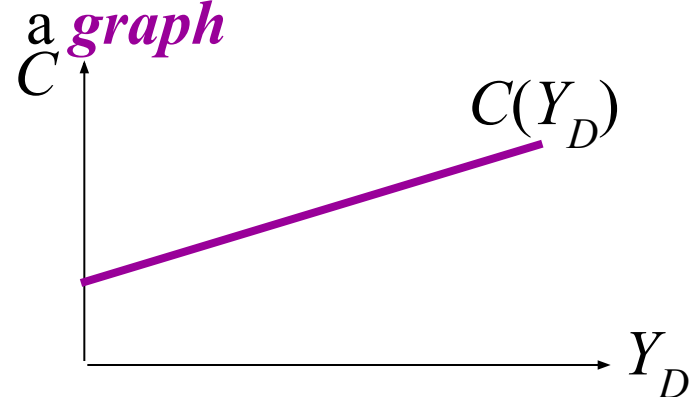$$C = C(Y_D)$$
$$\quad\quad\quad\; +$$

an *equation*, which shows that C positively depends from Y_D, but there are other determinants of consumption, i.e. part of consumption is autonomous from income $\overline{C}$:
$$C = \overline{C} + mpc\,Y_D$$

a *table*

Y_D	400	500	600	700
C	360	440	520	600

a *graph*

Importance of Using Graphs

«Graphs are plotted by economists to confuse students».

A student joke

A graph is a way of:

☐ *visual presentation of the relationship* and links between economic variables or of the behavior of a variable over time;

☐ *visual demonstration of ideas and theories*, which are less clear and even may be misinterpreted or misunderstood, when are only verbally explained;

☐ *visual illustration of models* proposed by economists.

In the course of economics graphs are used for the **better perception of theoretical propositions** by students.

Types of Visual Data Presentation

Pie Diagram

Structure of Consumption Spending, Russia, 2012

- Consumption spending on food goods – 33,8%
- Consumption spending on nonfood goods – 38,6%
- Consumption spending on services – 27,6%
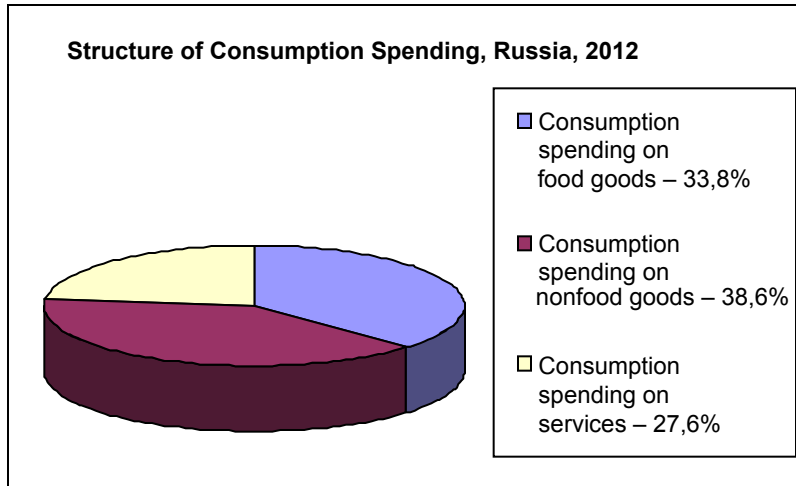
Time Series Graph

Bar Diagram

GDP Growth Rate in Selected Countries

Legend: Luxembourg, United States, Japan

Years: 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005

Scatter Graph

Investment Demand Curve

Interest rate (r)

$I(r)$

Investment (I)
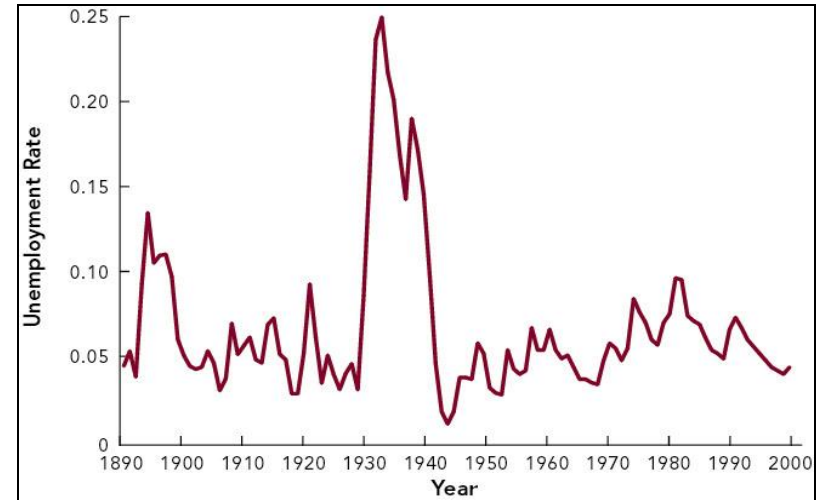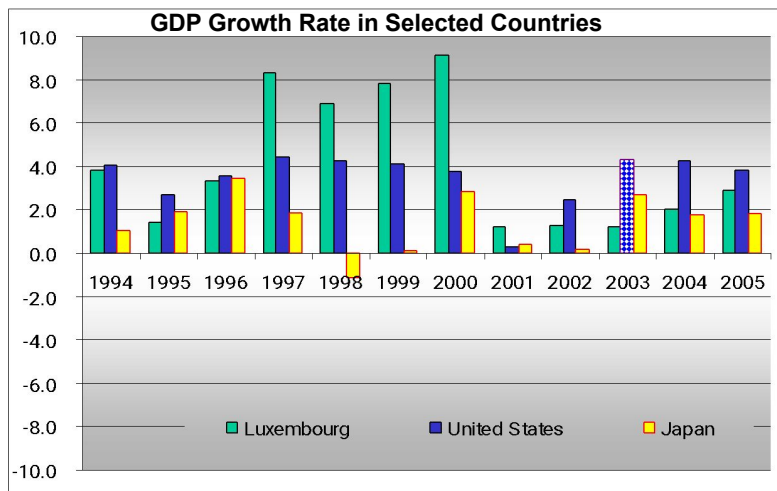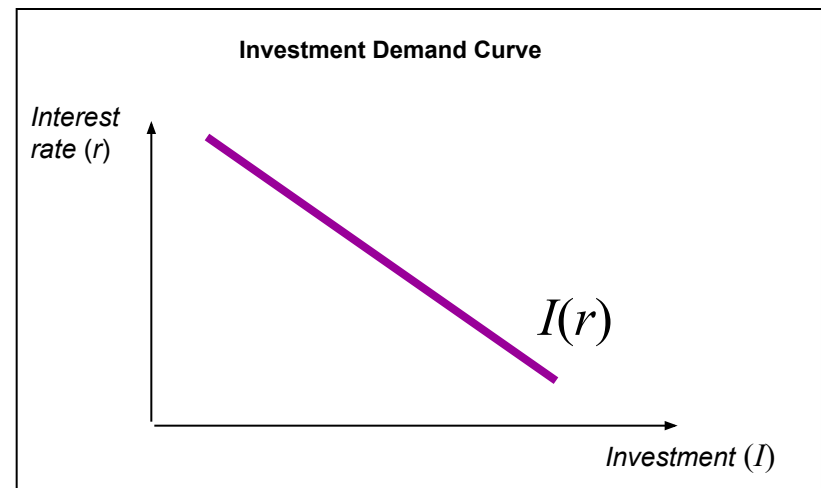
Types of Analysis

Economic analysis is the *combination* of:
- ❏ *functional* (algebraic) *analysis*;
- ❏ *graphical* (visual) *analysis*;
- ❏ *intuitive* (substantial verbal) *analysis*.

In our course of macroeconomics the intuitive analysis (intuition) will be of primary importance, because the main goal of the economist is not simply to declare relations between macroeconomic phenomena, but first of all and what is more – to *explain* its *economic sense*.

Intuitive analysis assumes the study and the *explanation of the mechanism* of macroeconomic phenomena, the *construction of logical chains* of the sequence of macroeconomic events, i.e. examination and *substantiation of the effect of one event* (or the change in one variable) *on the other*, which in turn leads to further changes.

Algebraic and Graphical Analysis: Correlation

For simplicity sake in our analysis we will use the assumption about linear relationship between variables that can be represented by the following equations:

$$y = a + bx \quad \text{or} \quad y = a - bx$$

where

- y – an ***endogenous*** (dependent) ***variable***, which is plotted on one of the axes of the scatter graph, i.e. it is a consequence;

- x – an ***exogenous*** (independent) ***variable***, which is plotted on the other axis of the scatter graph, i.e. it is a cause or a determinant; its change leads to the movement *along* the line;

- a – an ***autonomous variable***, which incorporates *all the other variables* that affect an endogenous variable, and which can be represented as a point of intersection of the line with the axis; its change results in the *parallel shift* of the line;

Algebraic and Graphical Analysis: Correlation

- *signs* «+» or «–» characterize the type of the *relationship* between exogenous and endogenous variable (positive or negative, respectively) that is represented by the *positive or negative slope* of the line;

- *b* – the *sensitivity* (the extent of reaction) of the endogenous variable to the change of the exogenous variable, measured as the tangent of the angle $(b = \dfrac{\partial y}{\partial x})$; its change results in the *change of the slope* of the line.

Consumption line

$$C = \overline{C} + mpc\, Y_D$$

Consumption (C) — vertical axis

Disposable Income (Y_D) — horizontal axis

$\overline{C}$

mpc

Investment line

$$I = \overline{I} - bi$$

Interest rate (i) — vertical axis

Investment (I) — horizontal axis

$-\dfrac{1}{b}$

$\overline{I}$

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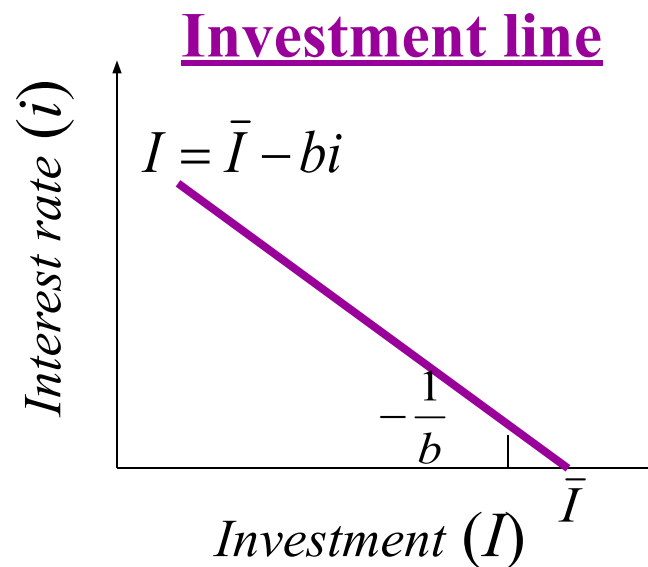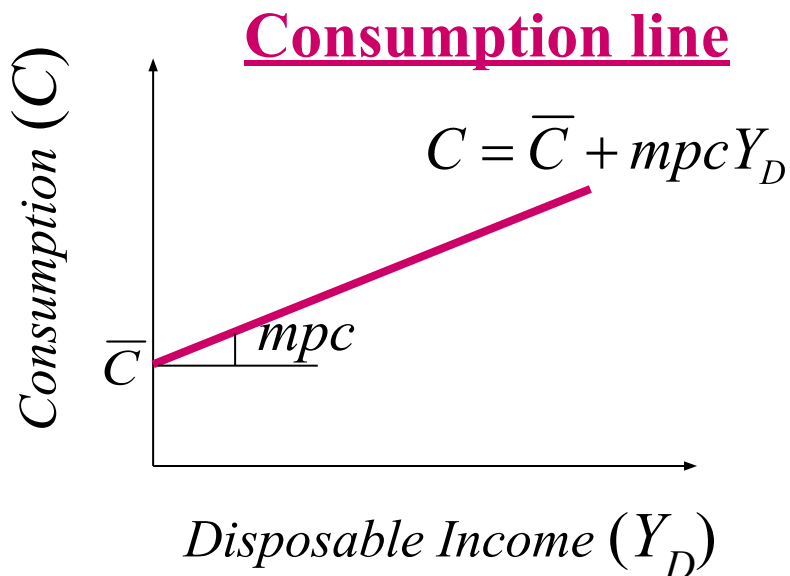
Positive and Normative Economics

Positive Economic Theory	**Normative Economic Theory**
is the *objective* or scientific attempt to describe and *explain* the behavior of the economy and its important variables;	✔ involves *subjective* value judgments about what economy *must be* or what measure *is to be undertaken* on the base of a particular economic concept or theory;
✔ reflects *facts* and studies *actual* economic *performance*;	
✔ is an explanation why the economy *works as it does*;	✔ makes prescriptions *what should be done* in the economy;
✔ is a *basis for predicting* how the economy will respond to changes in circumstances;	✔ offers *recommendations for chan-ges* in economic policy to achieve an optimal and desirable state of affairs;
✔ *free from subjective* value judgments;	✔ is based on *personal* (subjective) *value judgments*;
✔ represents an approach of a *scientist*.	✔ represents an approach of a *politician*.

The Model of Supply and Demand

This is the basic economic model. It describes the ubiquitous relationship between buyers (demanders of goods and services, or consumers) and sellers (suppliers of production, or producers) in the market and serves to determine market equilibrium. *Equilibrium* is the state in the market when *the quantity that consumers wish to purchase exactly equals the quantity producers wish to supply*, and there is *no pressure for change.* Geometrically it is the point of intersection of the market demand curve (D) with the market supply curve (S). The price and the quantity that equate quantity demanded with quantity supplied, are known, respectively, as the *equilibrium price* and the *equilibrium quantity*.

Price (P)

Supply (S)

E

Equilibrium price (P_E)

Equilibrium: Quantity Demanded = Quantity Supply

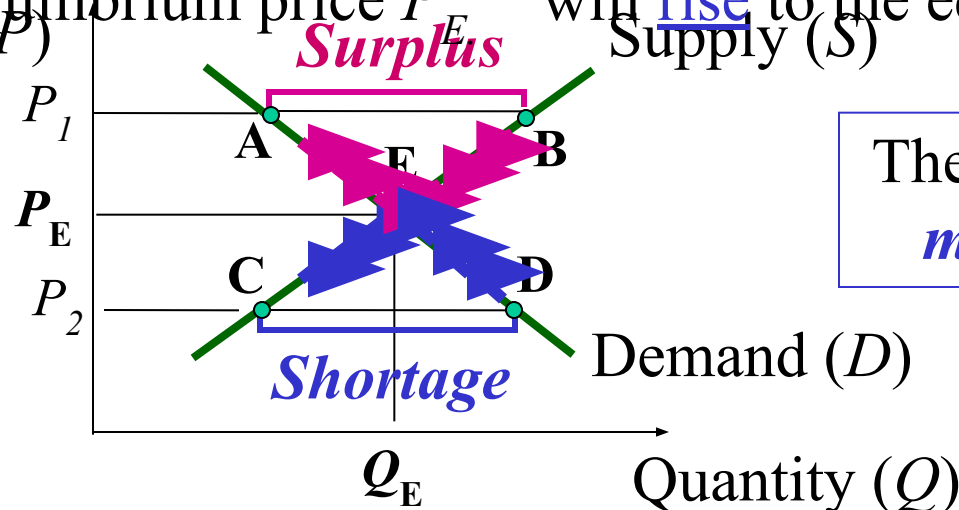Demand (D)

Equilibrium quantity (Q_E)
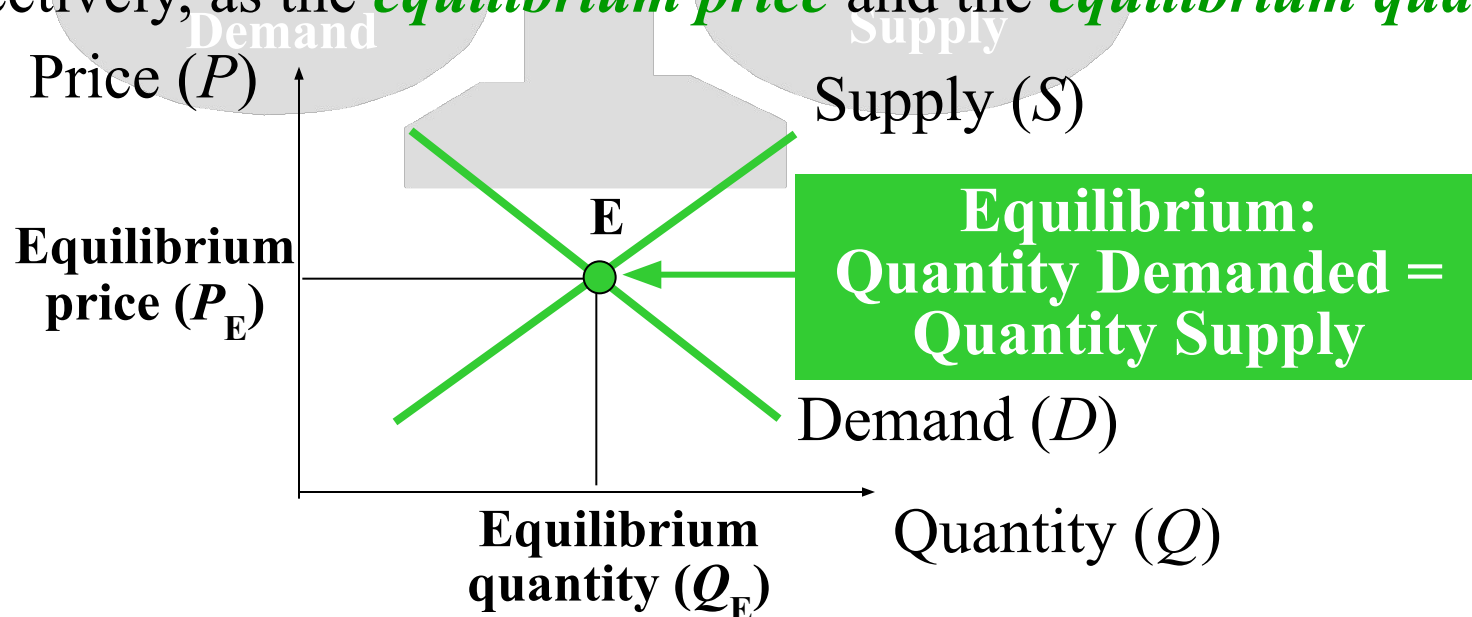
Quantity (Q)

How Market Equilibrium is Reached

When there is the *disequilibrium*, and the price is equal either to P_1 that is higher than P_E, or to P_2 that is lower than P_E, the price will start to change in order to equate the quantity demanded by the buyers with the quantity supplied by the producers.

Under the price P_1, the quantity supplied exceeds the quantity demanded = ***excess supply*** (= *a surplus* = **AB**) $\Rightarrow$ the price will <u>fall</u> to the equilibrium price P_E

Under the price P_2, the quantity demanded exceeds the quantity supplied = ***excess demand*** (= *a shortage* = **CD**) $\Rightarrow$ the price will <u>rise</u> to the equilibrium price P_E

The process is called ***market clearing***.

Price (*P*)

Supply (*S*)

Surplus

P_1

A   **E**   **B**

P_E

C   **D**

P_2

Shortage
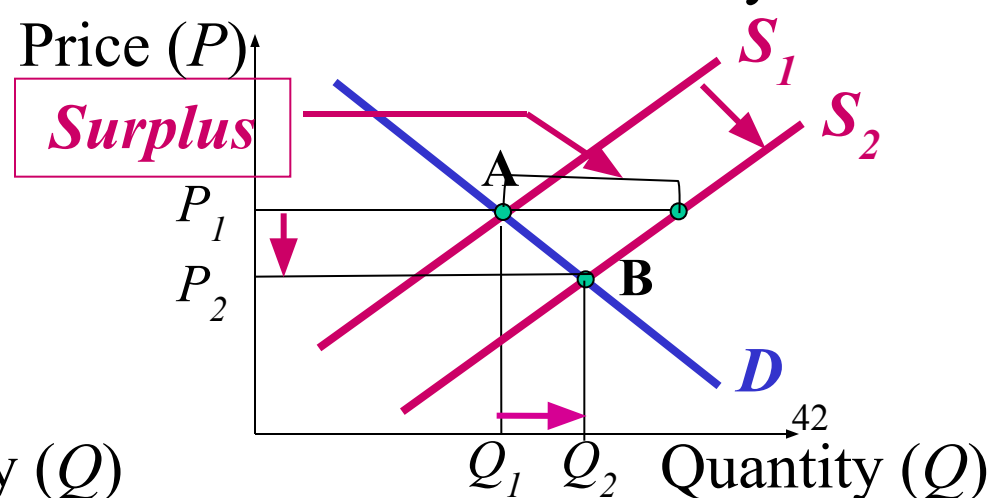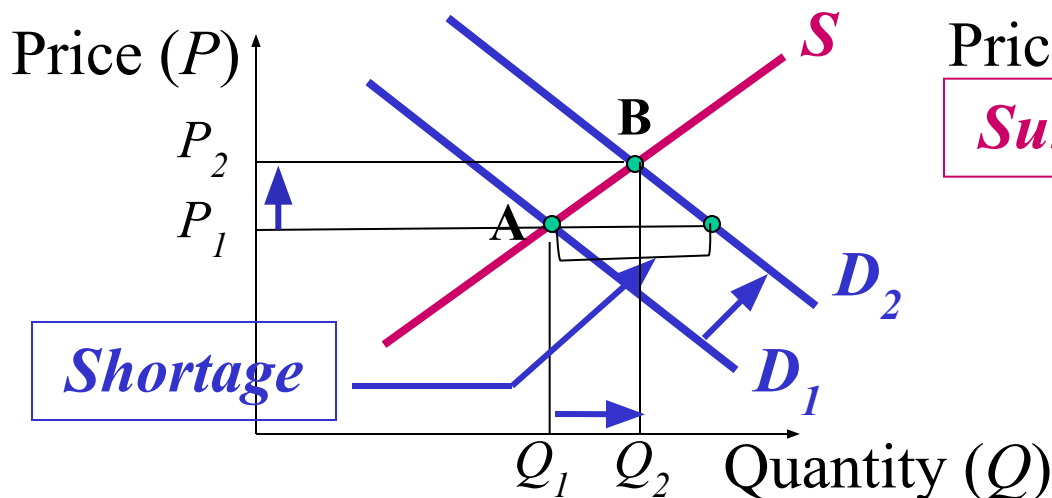
Demand (*D*)

Q_E Quantity (*Q*)

Market Clearing

Market clearing is an alignment process whereby decisions between suppliers and demanders reach an equilibrium.
When there is the *change* either *in the market demand*,   o
in the market supply, the new equilibrium in the market
will be attained via *price adjustment*.

Suppose a sudden increase in demand $\Rightarrow$ ***excess demand*** places a upward pressure on the price from point A to point B since the original price P_1 no longer clears the market.

Suppose a sudden increase in supply $\Rightarrow$ ***excess supply***, on the contrary, places a downward pressure on the price and the new equilibrium price will be P_2.

In both cases market clears by itself.

Price (*P*) — S, B, P_2, P_1, A, D_2, D_1, **Shortage**, Q_1 Q_2 Quantity (*Q*)

Price (*P*) — **Surplus**, S_1, S_2, A, P_1, P_2, B, D, Q_1 Q_2 Quantity (*Q*)

Prices: Flexible versus Sticky

Economists typically assume that the market will go into an equilibrium of supply and demand.

But, assuming that markets clear *continuously* is not realistic. For markets to clear continuously, prices would have to adjust instantly to changes in supply and demand, i.e. must be fully *flexible*.

But, evidence suggests that prices and wages often adjust slowly and in actuality, some of them are *sticky*.

The difference between macroeconomic theories is primarily based on the assumption of how quickly the prices change and thus how quickly all the markets clear.

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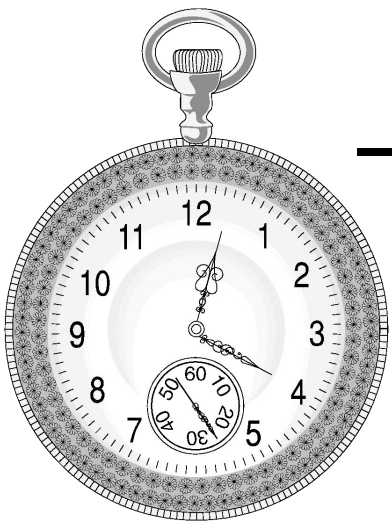
Long-run and Short-run Analysis

Time factor is of great importance in macroeconomics. Macroeconomists usually distinguish the **short-run** and the **long-run** behavior of aggregate economy.

- **Long-run** issues are analyzed under the assumption of *flexible prices* (market clearing). The level of output is determined by the amount of all available economic resources and by the existing in the economy technology (i.e. by the *production function* or *aggregate supply*). Such level is called *potential output*. Its changes are associated with the long-run *economic growth*.

- **Short-run** issues are analyzed under the assumption of *rigid* (or sticky) *prices*. The level of output is mainly determined by the aggregate expenditures in the economy (or *aggregate demand*). Such level is called *actual output*. Its changes are associated with the *business cycle*.

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Long-run Growth versus **Business Cycle**

Aggregate
Output

Economic Growth
(*potential output*)

Business Cycle
(*actual output*)

Time (years)
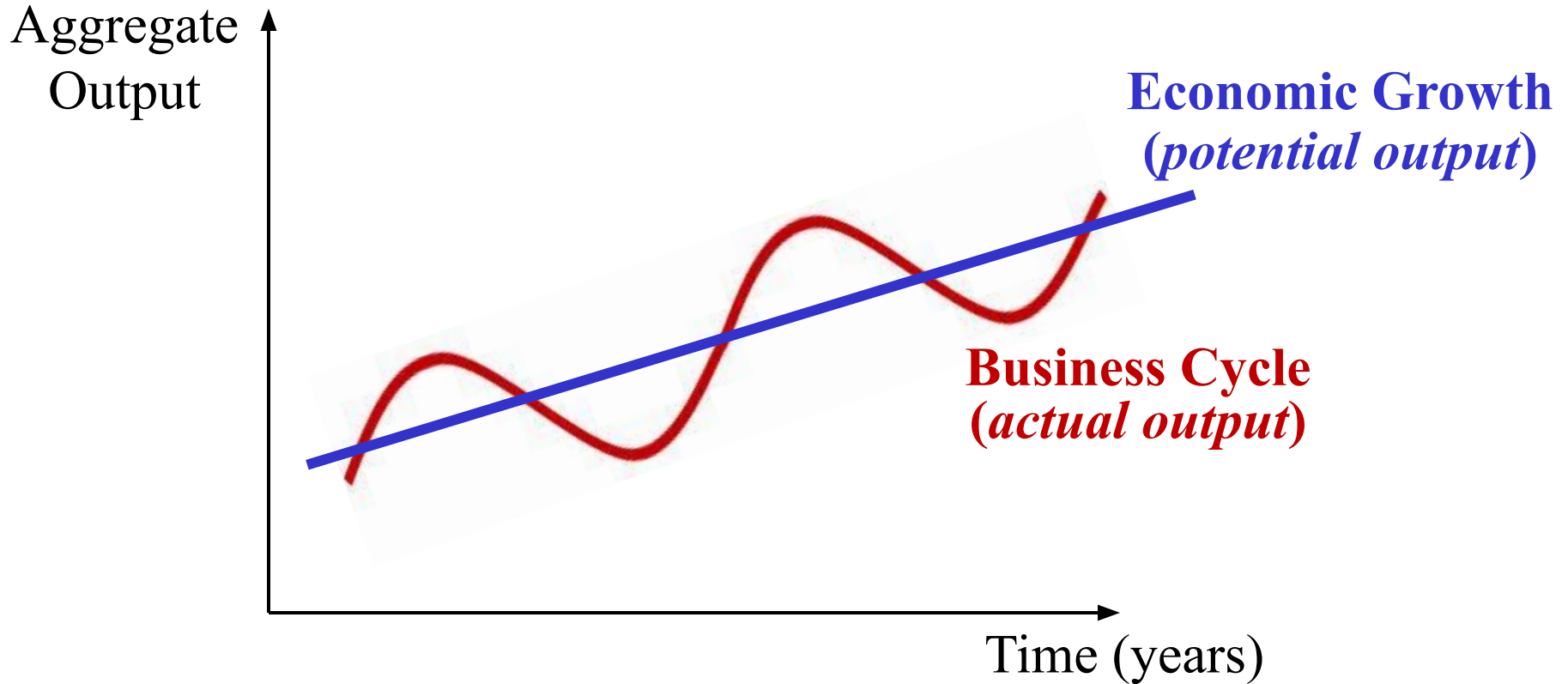
Types of Economic Resources

The amount of output that can be produced in the economy is determined by the quantity, quality and productivity of economic resources, or factors of production, that are commonly separated into four groups:

- *Labor*: the physical and mental effort of people. This can be increased by education, training and experience (human capital);

- *Physical capital*: the stock of manmade equipment (like machinery, tools, vehicles, computers) and structures (buildings, constructions, real estate) that are used to produce goods and services;

- *Land or Natural resources*: inputs provided by nature, such as land, rivers, mineral deposits, oil and gas reserves. They come in two forms: renewable and non-renewable.

- *Entrepreneurial ability*: the ability to identify opportunities and organize production (that is the effort and know-how to put the other resources together in a productive venture), and the willingness to accept risk in the pursuit of rewards.

Time Intervals in Macroeconomics

Olivier Blanchard in his textbook distinguishes
three time periods:

Short-run	**Medium-run**	**Long-run**
the analysis of what happens in the economy *from year to year*	the analysis of what happens in the economy during approximately *one decade*	the analysis of what happens in the economy during *50 years and more*

According to these time intervals the *accent* is put
on the study of *different macroeconomic problems*, and
the analysis is based on *different models*.

Aggregation

The main principle of macroeconomic analysis is aggregation.

Aggregation means putting all the units together.
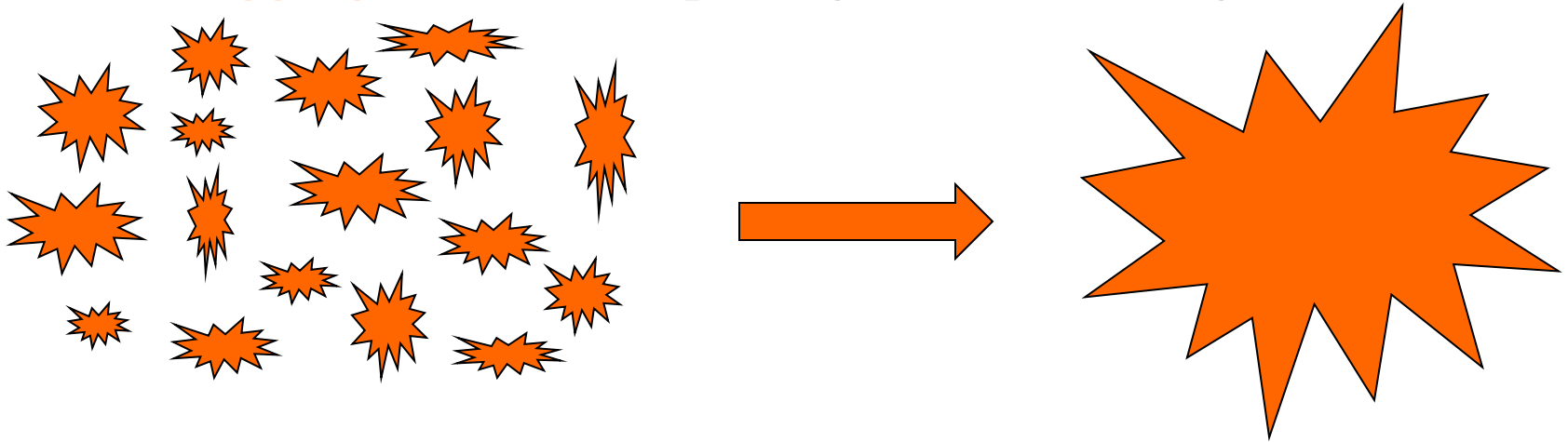
The subject matter of macroeconomics is to study **aggregate economic behavior**, i.e. behavior of **aggregate** (macroeconomic) **agents** on **aggregate** (macroeconomic) **markets**.

There are four macroeconomic agents and four macroeconomic markets.

Macroeconomic Agents

Households

✔ the owners of economic resources (suppliers of factors of production);

✔ the earners of national income;

✔ the main consumers of goods and services (demanders for aggregate output);

✔ the main savers (lenders).

Firms

✔ the main producers of goods and services (suppliers of aggregate output);

✔ the main demanders for economic resources;

✔ the consumers of the part of aggregate output (demanders for investment goods);

✔ the main borrowers.
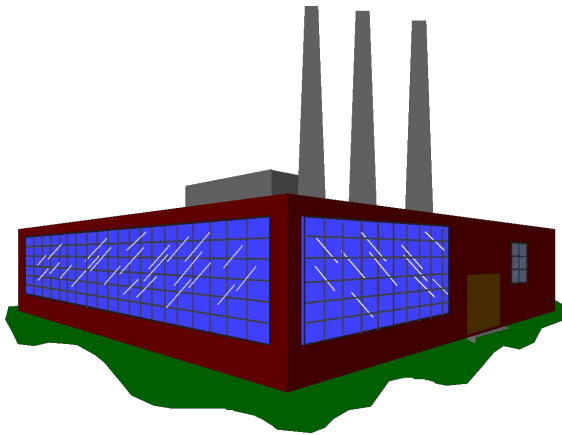
Households and firms form the ***private sector*** of the economy.

Macroeconomic Agents

Government

✔ the producer of public goods;

✔ the consumer of the part of aggregate output (purchaser of goods and services);

✔ the redistributor of national income (through collecting taxes and making transfer payments);

✔ lender or borrower in the financial markets (depending on the state of government budget);

✔ the regulator of economic activity:

- establishes and supports institutional basis for the economic performance ("rules of the game");

- conducts macroeconomic policy.

Private and government sectors form the ***closed economy*** (or the mixed closed economy), that is the economy not interacting with other economies.

Macroeconomic Agents

Foreign sector

interacts with the national economy through **two channels**:

international trade	*capital flows*
exchange of goods and services	exchange of assets, primarily financial (bonds and shares)
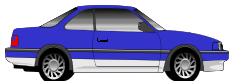
Economy that interacts with other economies
(with the rest of the world) is called
the ***open economy***

Macroeconomic Markets

- **Goods (or product) market**
- **Resource (or factor) market**
- **Financial market**

which consists of two segments:

money market   *bonds market*

- **Foreign exchange market**

Price (P)

Supply (S)

E

Equilibrium price (P_E)

Equilibrium: Demand = Supply

Demand (D)

Equilibrium quantity (Q_E)

Quantity (Q)
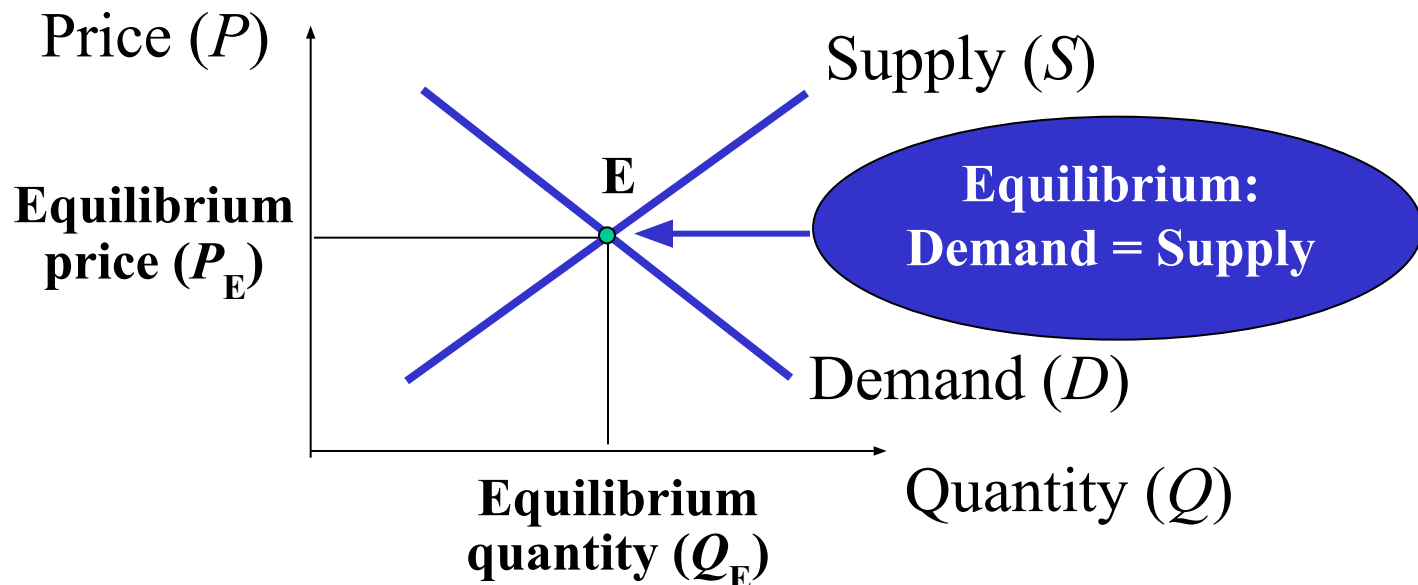
Model of Circular Flows
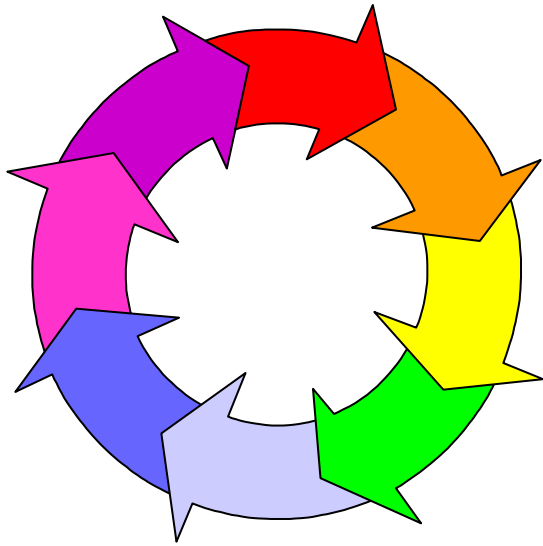
In order to understand how the aggregate
economy works and to analyze the aggregate
economic behavior economists use
the model of circular flows, that represents

*the interaction between macroeconomic
agents through macroeconomic markets*.

We begin with the simple or private or two-sector model,
consisting of two macroeconomic agents
(households and firms)
and two macroeconomic markets
(goods market and resource market).

Simple (Private Sector) Diagram of Circular Flows

Expenditures → **Goods Market** → Revenues

Goods and Services Purchased

Goods and Services Sold

Households

Firms

Land, Labor, Capital, Entrepreneurship

Inputs (Factor Services)

Resource Market

Incomes

Factor Payments (Wages, Rents, Interest, Profits)

Flow of money

Flow of goods and services and of economic resources
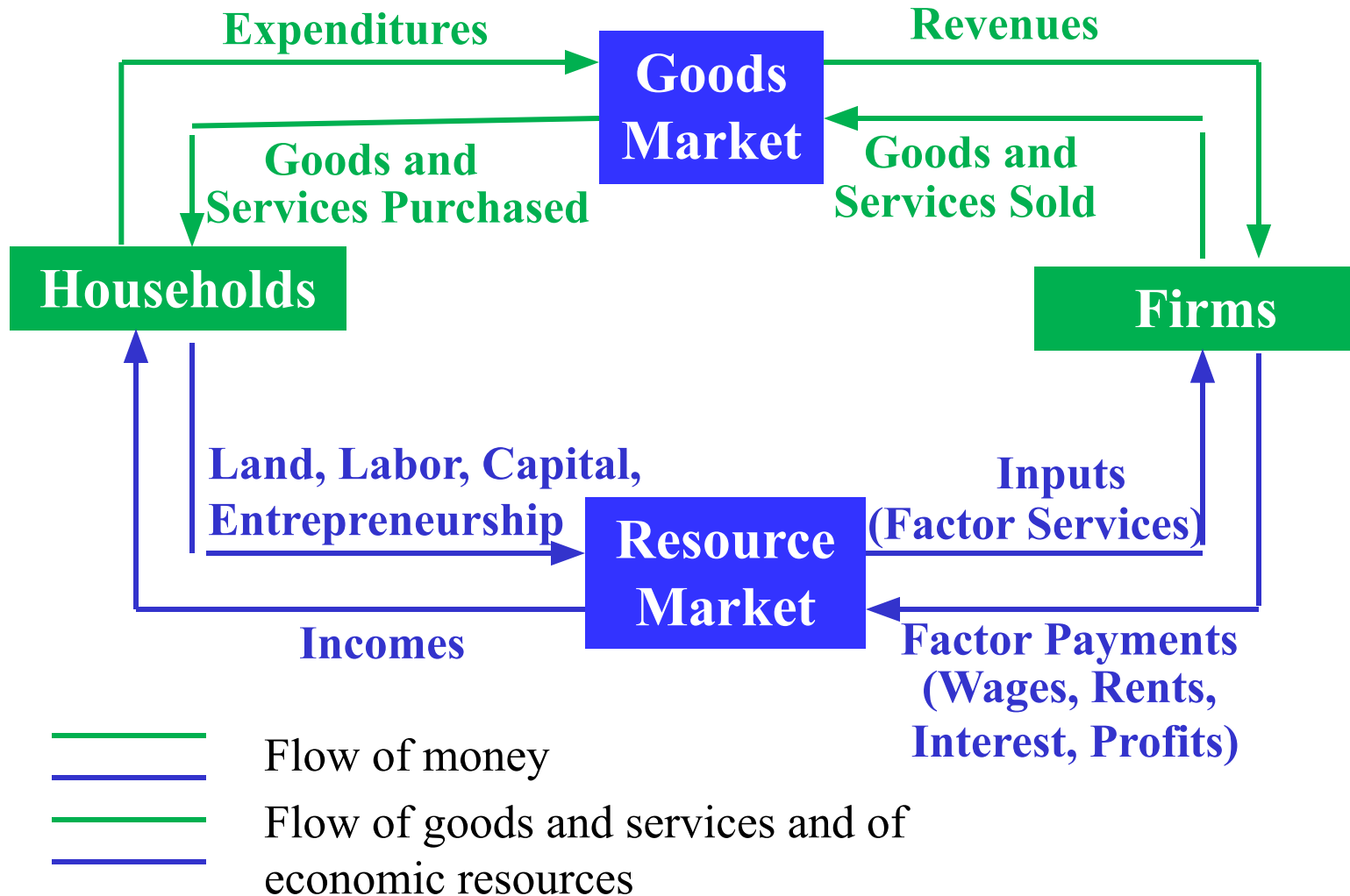
Private Sector Model
of Circular Flows

Goods flow from firms to households through the goods (product) market and economic resources flow from households to firms through the resource (factor) market.

Firms pay factor incomes (wages, rent, interest and profits) to households - the owners of economic resources and households spend their incomes buying goods and services. Hence,

- **aggregate income is <u>equal</u> to aggregate expenditures**
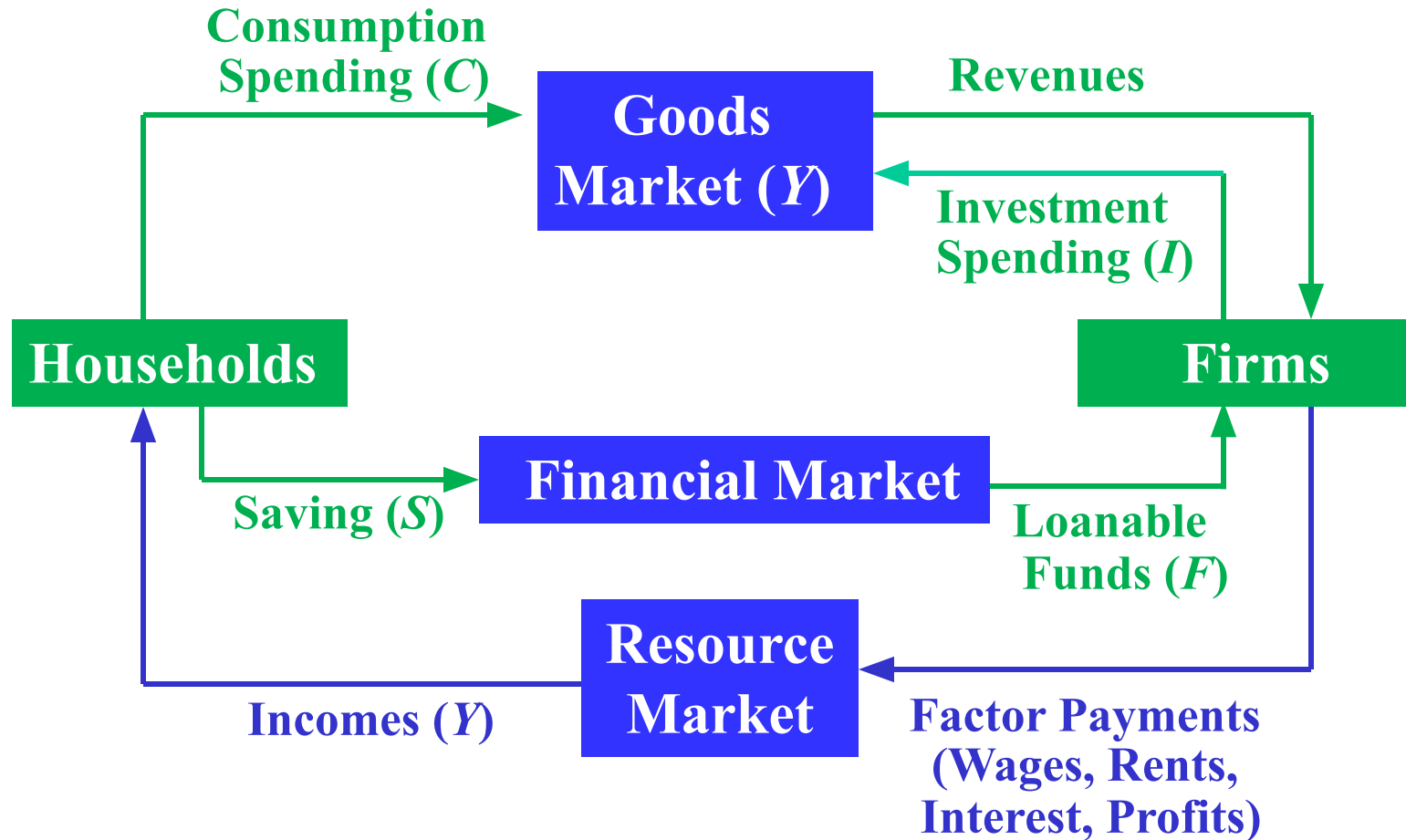
  (all income is spent, all expenditures translate in somebody's income);

- **aggregate expenditures are <u>equal</u> to aggregate product**

- **aggregate product is <u>equal</u> to aggregate income**.

  Movement of income, expenditures and product form a circle.

  Thus, we have *circular flows*.

Private Sector Diagram of Circular Flows with Financial Market

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The Role of Financial Markets

Being rational, households spend only part of their income, the rest they **save**, because saving can bring *extra income*, if money is used in the financial markets in the form of:

- a **deposit** in a bank, or

- a **purchase of a security** (an equity or a bond), issued by firms.

Saving of households are used by firms to buy investment (or capital) goods (equipment and structures), necessary to maintain and to expand the level of output.

Spending, made by firms for the purchase of investment goods, are called **investment spending**. To obtain funds, firms take loans from the banks or issue and sell securities to households.

Financial markets connect saving and investment.

Expenditures and Income in the Private Sector Model

Expenditures are now divided into two parts:

- consumption spending of households (*C*);

- investment spending of firms (*I*).

$$AE = C + I$$

Income is also divided into two parts:

- consumption spending (*C*);

- saving (*S*).

$$Y = C + S$$

Private Sector Model of Circular Flows with Financial Market

The equalities between aggregate expenditures (*AE*) and aggregate income (*Y*), and between aggregate income and aggregate product are still held:

$$AE \equiv Y$$

or

$$C + I \equiv C + S$$

thus

$$I \equiv S$$

It means that injections are equal to leakages.

Injection is something that increases the flow of spending and leads to the increase in output and income	*Leakage* is something that withdraws from the flow of spending and can cause the decrease in output and income

Investment is an injection, saving is a leakage.

The Role of the Government

Adding government to our analysis, we get a three-sector model. The influence of the government sector is executed through:

Purchases of goods and services (G)	**Transfers to households (Tr) & subsidies to firms (Sb)**	**Taxes (Tx)**
which include: goods purchased to run government and the military; payments to govern-ment employees and the military for their	which are government payments that involve no direct service by the recipient. Transfers include: unemployment insurance payments; welfare payments to households. In addition to transfers persons receive interest on public debt ($i \times B_{Gov}$).	which are imposed upon property and income (direct taxes); upon goods and services (indirect taxes, such as VAT, sales and excise taxes) in order to pay for all the expenditures of the government.

Diagram of Circular Flows with Government (Mixed Closed Economy)

Consumption Spending (*C*)

Revenues

Goods Market (*Y*)

Investment Spending (*I*)

Government Purchases (*G*)

Taxes (*Tx*)

Taxes (*Tx*)

Government

Transfers (*Tr*)

Subsidies (*Sb*)

Households

Firms

Loan to the Government (if *G* + *Tr* > *Tx*)

Financial Market

Loanable Funds (*F*)

Saving (*S*)

Resource Market

Incomes (*Y*)

Factor Payments (Wages, Rents, Interest, Profits)

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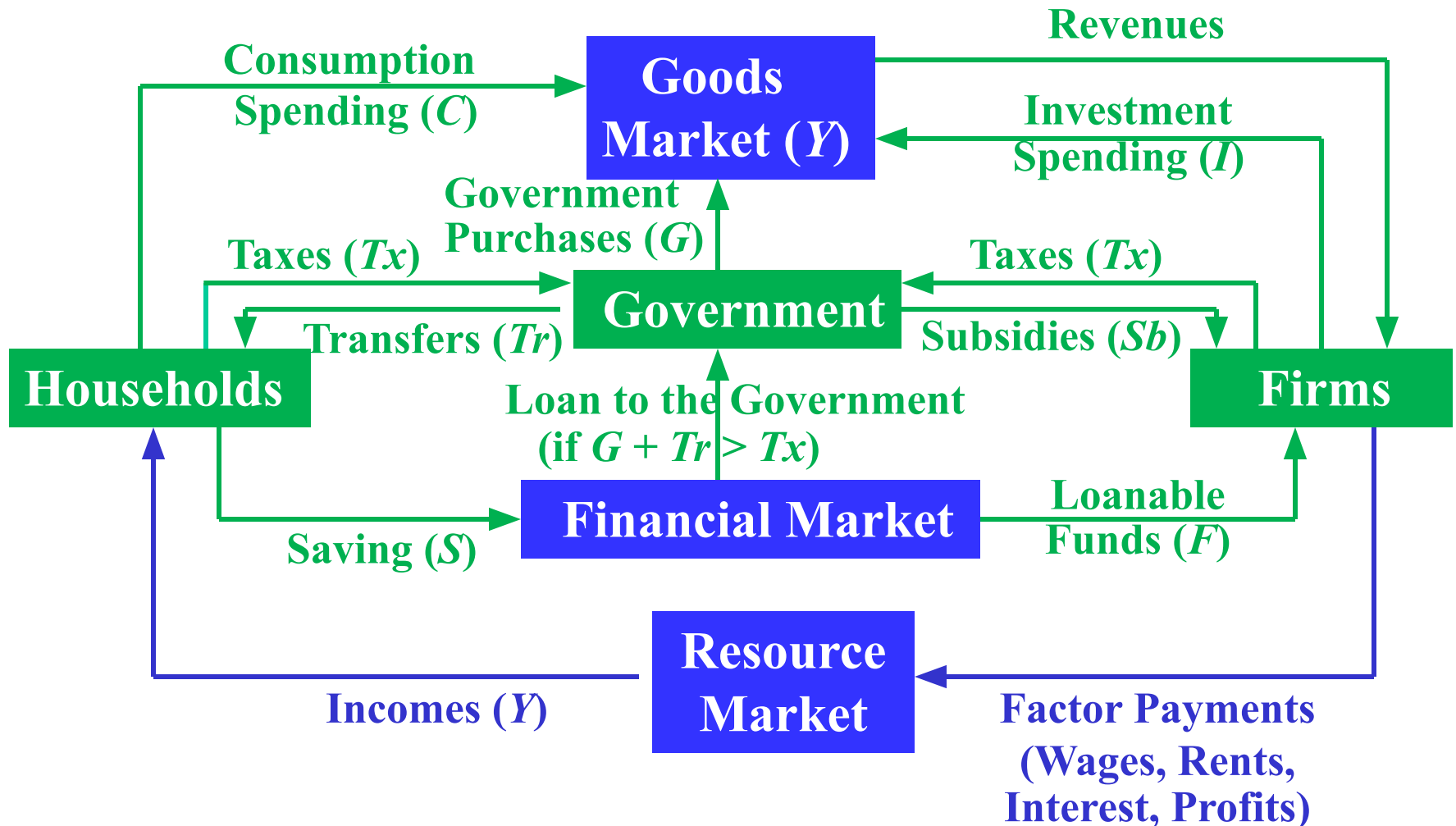
The Three-Sector Model of the Economy

Now the sum of aggregate expenditures consists of three elements:

$$AE = C + I + G$$

and aggregate income

$$Y = C + S + Tx - Tr$$

We get two injections – G and Tr and a leakage – Tx:

$$AE \equiv Y \implies C + I + G \equiv C + S + Tx - Tr$$

$$\implies I + G + Tr \equiv S + Tx$$

With the appearance of the government sector aggregate income, earned by households, (national income Y) differs from the income that they can use for consumption and saving (disposable income Y_D):

$$Y_D = Y - Tx + Tr$$

$$Y_D = C + S$$

Government Budget

Taxes represent the revenues of the government. Government purchases of goods and services and transfers are its expenditures.

The balance between the government revenues and expenditures is called **government (**or **public) budget**.

- If revenues exceed expenditures (*Tx > G + Tr*), there is **budget surplus**.
- If they are equal (*Tx = G + Tr*), the **budget** is **balanced**.
- If expenditures exceed revenues (*Tx < G + Tr*), government runs **budget deficit**.

To finance budget deficit government either takes a loan (borrows funds) from financial market, issuing and selling government bonds to the public or prints money.

If there is budget surplus, government is a saver. The excess of government revenues over government expenditures is called **public** (or government) **saving** (S_G):

$$S_G = Tx - (G + Tr)$$

Diagram of Circular Flows with Government and with Foreign Sector (open economy)
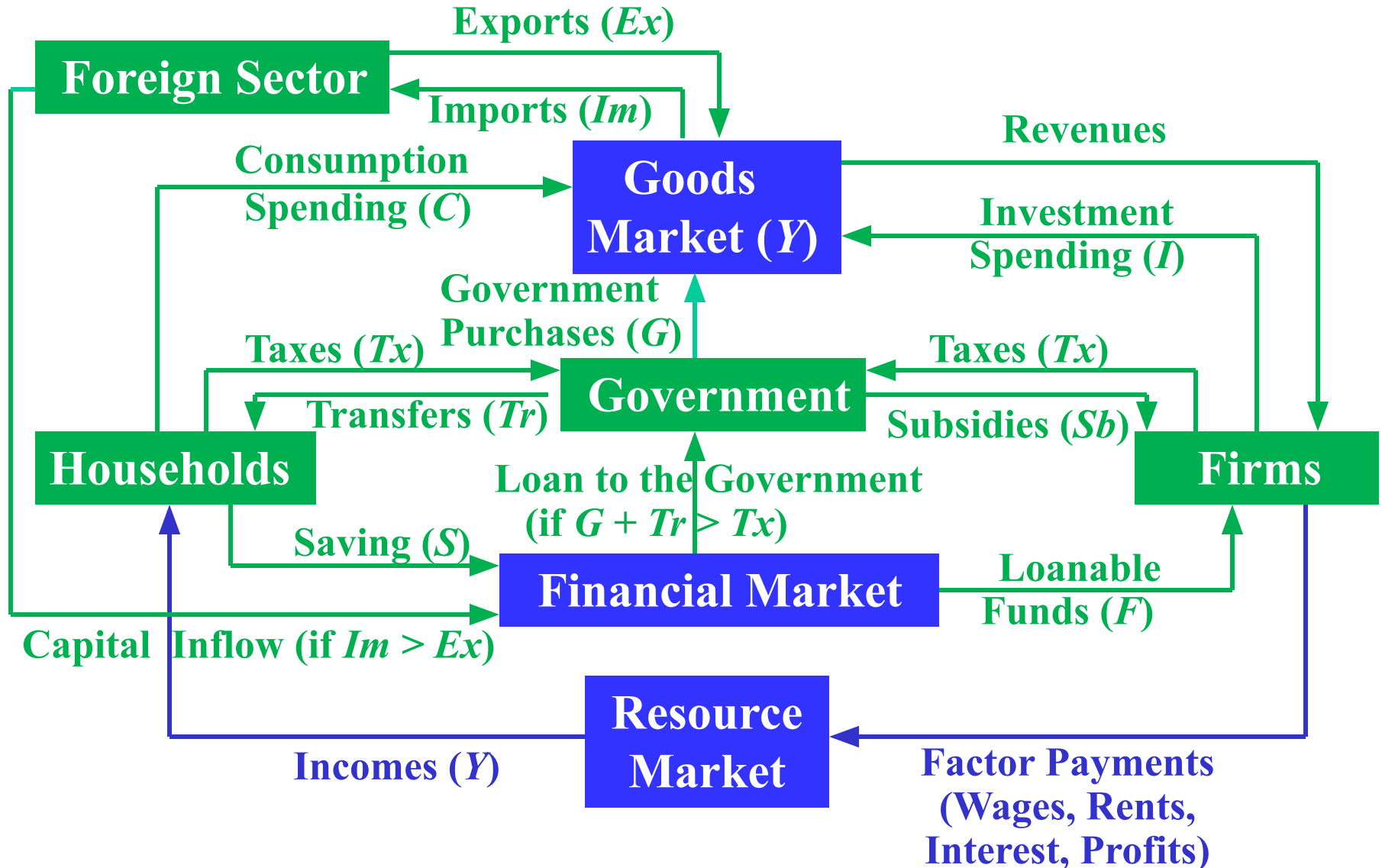
The Role of the Foreign Sector

Adding foreign sector, we get new flows.

A country **exports** domestic goods and services (*Ex*) and **imports** foreign-made goods and services (*Im*).

Now aggregate product
$$Y \equiv C + I + G + (Ex - Im)$$

This equation is known as the ***national accounts identity***

Difference between exports and imports is called net exports (*NX*)
$$NX = Ex - Im$$

and represents country's ***trade balance***.

The country can have **trade surplus** (*Ex > Im*)

or **trade deficit** (*Im > Ex*).

In the case of trade surplus the country is a **saver** (a lender) and there is **capital outflow**.

In the case of trade deficit the country is a **borrower** and there is **capital inflow**: foreign sector saving (S_F) move to the country's economy. $$S_F = Im - Ex$$

Net Foreign Investment

Net foreign investment = the purchase of foreign assets by domestic residents – the purchase of domestic assets by foreigners

= capital outflow – capital inflow.

When a domestic resident

☐ **buys and controls capital** in a foreign country, it is known as *foreign direct investment*;

☐ **buys stock** in a foreign corporation, but has **no direct control** of the company, it is known as *foreign portfolio investment*.

Net foreign investment (*NFI*) always equals net exports (*NX*):

$$NFI = NX \quad \text{or} \quad –NFI = –NX$$

When net exports is positive (*Ex – Im* > 0), net foreign investment is positive (= net capital outflow).

When net exports is negative (*Ex – Im* < 0), net foreign investment is negative as well (= net capital inflow).

The Four-Sector Model: Important Identities

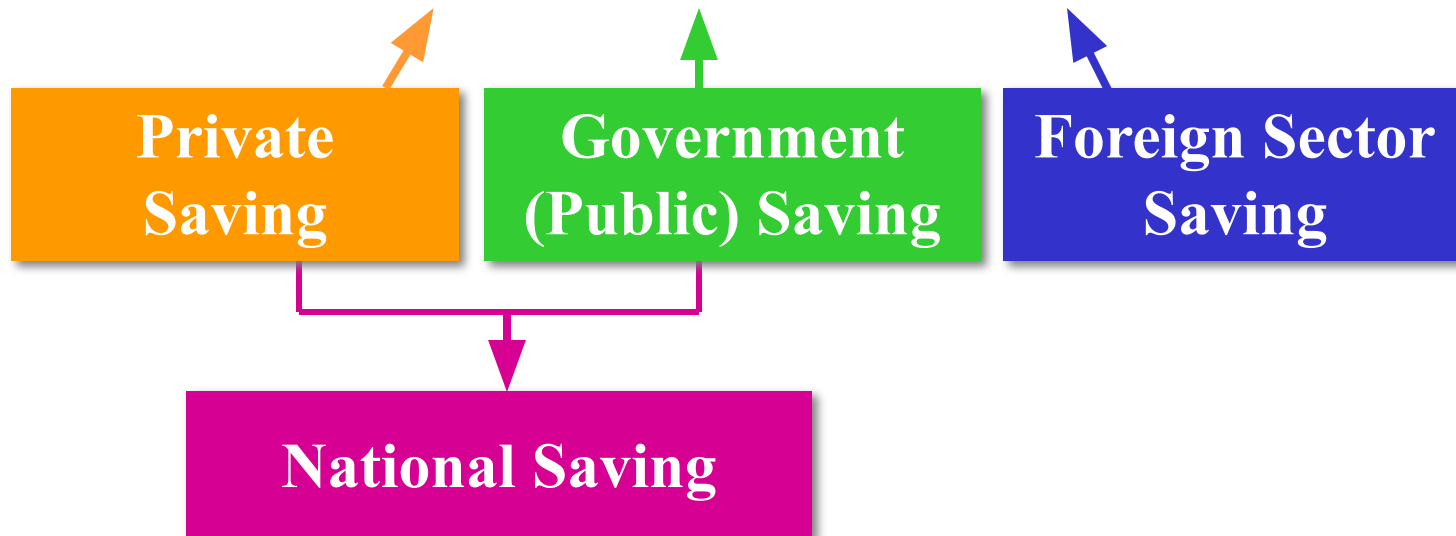In the open economy the expenditure-income identity is

$$C + I + G + (Ex - Im) \equiv C + S + (Tx - Tr)$$

As now we get an extra injection (Ex) and an extra leakage (Im), then the injections-leakages identity will be

$$I + G + Tr + Ex \equiv S + Tx + Im$$

Total investment are identically equal to the sum of total saving:

$$I \equiv \underline{S} + \underline{(Tx - G - Tr)} + \underline{(Im - Ex)}$$

Private Saving	**Government (Public) Saving**	**Foreign Sector Saving**

National Saving

This last equation is called the *capital formation equation*.

The Four-Sector Model: Important Identities

From the injections-leakages identity we can also get

uses-of-private-saving identity:

$$S \equiv I + (G + Tr - Tx) + (Ex - Im)$$

| **Financing of Domestic Investment** | **Financing of Budget Deficit** | **Loan to the Foreign Sector** |

budget deficit financing identity:

$$(G + Tr - Tx) \equiv S - (I + NX)$$

| **Government Budget Deficit** | **Private Sector Saving** | **Fall in Domestic Investment** | **Loan from the Foreign Sector** |

Stock and Flow Variables

Macroeconomic variables can be divided into stocks and flows.

|	
A **flow** is an economic magnitude measured *per a given period of time* (a year, a week, an hour). All the variables in the model of circular flows (output, income, consumption, saving, investment, taxes, budget deficit, trade surplus and others) are flows.	A **stock** is an economic magnitude measured *at a particular point of time* (on November 1st, 2015). Examples: wealth, savings, government debt, capital stock, money supply, number of unemployed, etc.

Flows add to or diminish stocks.

For example, the flow of investment changes the stock of capital; the flow of budget deficit increases the stock of government debt; the flow of saving affects the stock of wealth.

Stocks and Flows
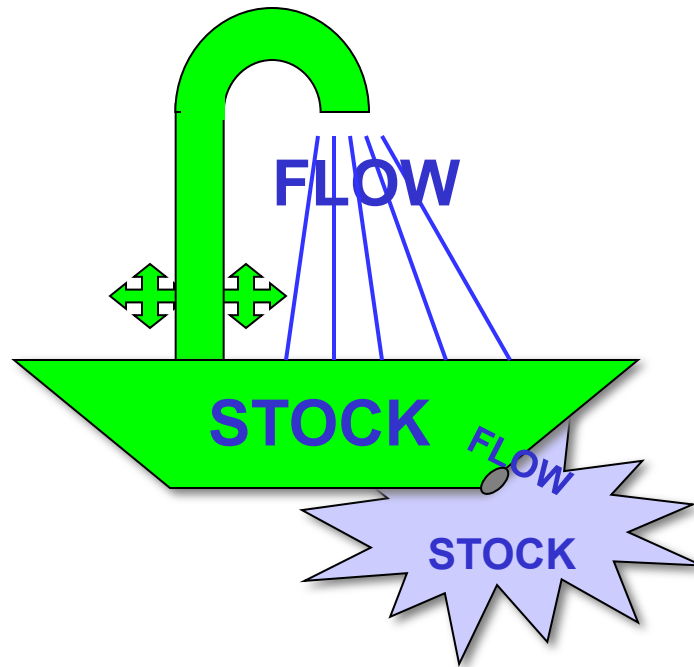
The Image of the Macroeconomic System

External Factors

Objectives

Instruments

P

LRAS

SRAS

SRAS

AD

Y
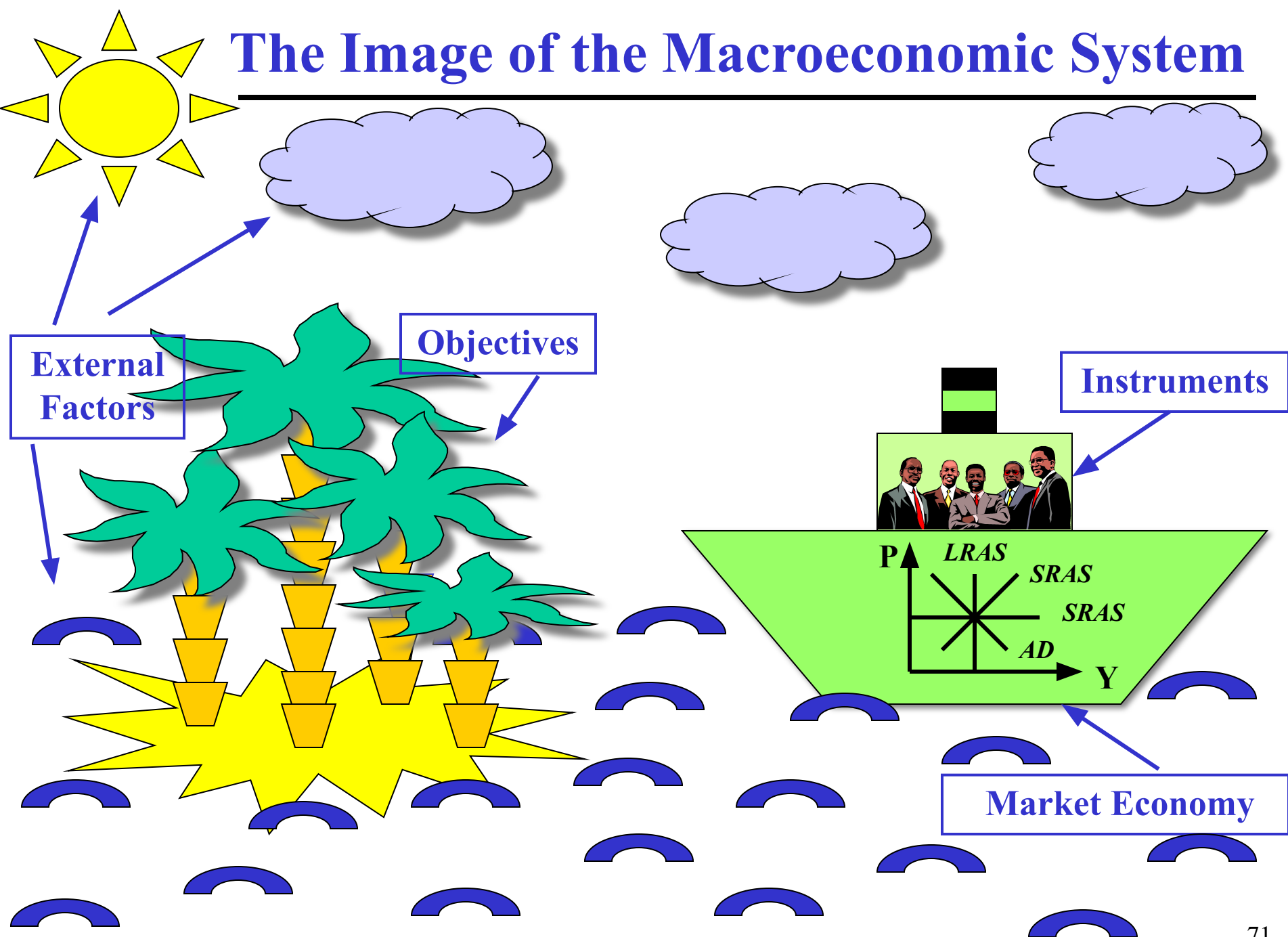
Market Economy

The Macroeconomic System

It is a **market economy** which

✔ is influenced by **external** (exogenous) **factors**:	✔ has **objectives** (induced variables):	✔ use **instruments** (policy variables):
▪ *natural* (weather, earthquakes, spots on the sun, tsunami, eruptions, etc);	▪ economic growth;	▪ fiscal policy;
▪ *social* (revolutions, wars, overturns, etc)	▪ high employment;	▪ monetary policy;
	▪ stable prices;	▪ income policy;
	▪ balance of payments equilibrium.	▪ foreign trade and exchange rate policy.

Macroeconomic Policy

Macroeconomic Policy

Economic Growth Policy

Stabilization Policy

- is aimed to stimulate economic growth in the <u>long run</u> and to affect productive possibilities of the economy;
- suggests changes primarily in <u>aggregate supply</u>.

- is aimed to smooth out business cycle in the <u>short run</u> and to diminish the depth of recessions and the height of booms;
- suggests changes primarily in <u>aggregate demand</u>.

Market Economy: the Key Concepts

Aggregate Demand   and   Aggregate Supply

Consumption

Investment

Government Spending

Net Exports

→ **Aggregate Demand**

Aggregate Supply ←

Equilibrium Aggregate Output

Equilibrium General Price Level

Cost of Human Resources

Cost of Capital Resources

Cost of Natural Resources

Technology

P — *AD* — *Y*

P — *LRAS* — *SRAS* — *SRAS* — *Y** — *Y*