



Course: World economy

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Contents: The aim of the course is to acquaint students with the two-sector model of the economy, defining the consumption function and the saving function and define the concept of a multiplier.

Model two-sector economy is model that describes the process of creating a steady income in an economy that is represented by only two sectors, namely household sector and the business sector. (2)

Total aggregate costs of production (AE) are so in this case consist of only final consumption expenditure of households and expenditures on gross investment companies:

$$AE = C + I$$

The starting point for the determination of the equilibrium theory of production is the fact that actual expenditures may vary from the planned expenditure, respectively. Planned. For further analysis we accept the premise that only capital expenditures may vary from the planned investments. Real consumer spending will always be equal to the planned consumer spending. (2)

In the case of final consumption expenditure, the authors of this model are based on the assumption that real household spending will always correspond to the planned expenditure, whereas the gross investment assume that the actual and planned capital expenditures of firms can vary. For this reason, the actual capital expenditures divided by capital expenditures planned (I_p), that equates to expenditure on gross fixed capital formation and unscheduled (I_U), which identify the expenditures that are associated with the change in inventories:

$$I_g = I_p + I_u \quad (1)$$

The total amount of expenses that they want (plan, intend) people spend only includes planned expenditures that make up the aggregate demand (AD). The economic concept of planned (planned) aggregate expenditures on production we call aggregate demand and indicate AD. Where we will keep in mind the actual

aggregate spending, respectively real aggregate demand. The actual aggregate spending, respectively real aggregate demand is denoted by AE. Aggregate demand is the total planned (intended) the amount of goods and services demanded in the economy at a given price level. (2)

If we know that within a simple model of the economy is the aggregate demand (AD) is viewed from the perspective of "ex ante" as the total amount of spending by individual businesses plan at a given price level to spend on buying goods and services, then it is obvious that its value can in this case be identified with the value of total projected aggregate expenditure on production (AEP):

$$AD = AEP \text{ respectively } \mathbf{AD = C + I_p}$$

If we assume that the two-sector economy equilibrium is reached only applies if the "ex post" identity, which says that the value of output produced is equal to the value of production sold, then it is obvious that in this situation, the total output (Y) correspond to the actual aggregate expenditure:

$$\mathbf{Y = AE}$$

In the two-sector economy, so a balance only equal if the total sum of actual production companies of household final consumption expenditure and actual gross investment companies:

$$Y = C + I_g \text{ optionally } \mathbf{Y = C + (I_p + I_u)}$$

When comparing these two equations , we can see that they are in an economy unplanned investment:

- Zero ($I_u = 0$), then the companies that operate here , offering exactly the volume of production, which is demanded by other economic entities, ie aggregate demand equals output (aggregate supply).
- Positive ($I_u > 0$), in this economy there is unplanned inventory accumulation, which means that the market for goods and services leads to excess aggregate supply (production) of the aggregate demand.
- negative ($I_u < 0$), then in the country, the unplanned withdrawal from stocks, implying that there operating companies manufacture small production volumes than

the market demanded, ie aggregate demand exceeds aggregate production (aggregate supply). (1)

In the two-sector economy always apply ex post accounting identity is crucial that the output produced is equal to the production sold. Production sold can be written as the sum of consumption and investment spending :

$$Y = C + I$$

where C is real consumption spending and I are real investment spending. Identity always apply ex post, because if a company produces a greater volume of production as they can sell products accumulate in unsalable inventory. Unplanned inventory accumulation is part of the actual investment. Therefore, ex post always, the production is consumed or invested .

Assumptions under which the analysis is performed determining the equilibrium production in a two-sector economy Three-sector:

1. price level is fixed, so the price level does not affect aggregate demand.
2. capital reserve is insufficient, so that it can be produced output that is demanded.
3. job on the labor market enough so that it can be produced output that is demanded at the fixed nominal wage rate.
4. All nominal variables are real variables.
5. assume a closed economy.

Also, the assumption 2 and 3 shows that the economy exists output gap, ie potential output is greater than the actual product. (2)

Consumption function

Consumption function in this case is a positive functional relationship between final consumption expenditure of households and the total amount of their income (Y)

$$C = f(Y)$$

Specify the consumption function, so that the relationship between consumption and income is linear. Writes:

$$C = C_a + cY$$

The equation expresses the Keynesian consumption function.

Although the foregoing that household spending is fully dependent on the amount of pension that, these businesses available, we will, in the case of total household expenditure on final consumption distinguish between:

- expenditure on final consumption autonomous (CA), which include only those household spending on goods and services, the amount of which does not depend on the size of their disposable income. In other words, households must spend these funds even if their total income is zero. Part of autonomous consumption are thus mainly of expenditure on rent, basic food and clothing.
- the expenditure on final consumption induced (CI), which in turn are part of household expenditure on goods and services that are fully dependent on the amount of income of these businesses. From this definition it is clear that with the increase in disposable income also increases induced by household consumption, and this growth is not only dependent on the amount of additional income, but also on households' marginal propensity to consume. Let us therefore now define this indicator. Marginal propensity to consume (MPC) is the change in expenditure on final consumption of households induced induced by a unit change in household disposable income:

$$mpc \text{ CI} = \Delta / \Delta Y$$

Saving function

In the two-sector economy, households use their income to market goods purchased goods and services, while total expenses that are associated with these purchases, do not necessarily reflect the value of their retirement. If households in a given market to spend an amount that is generally lower than the value of their retirement, these entities will save part of their income. From that it is clear that household savings (SH) can be defined as that portion of total household income by the following operators apply to the purchase of goods and services. If we go by this definition, the value of household savings is determined as the difference between their income and final consumption expenditure:

$$\text{SH} = Y - C \text{ or } (S = - S_a + sY)$$

Autonomous savings so we can define as household savings, the amount of which is dependent on the size of their disposable income ($- S_a$) and S_y are induced savings.

Given that the two-sector economy divide their household income only between consumer spending and saving, the difference between the leader and the marginal propensity to consume defined as the marginal propensity to save (MPS):

$$\text{MPS} = 1 - \text{MPC}$$

The induced part of the total savings is dependent on the amount of disposable income. (2)

The equilibrium production

Production is in its equilibrium level when equals aggregate demand. Therefore, you can write that:

$$Y = AD$$

In the equilibrium level of output is unplanned inventory investment equal to zero ($U = 0$). When aggregate demand is equal to the production, created unplanned inventory (IU). It can therefore write that:

$$IU = Y - AD \text{ implying } Y = AD + IU$$

Aggregate demand thus determines the equilibrium level of output, respectively retirement.

Determinants balance of the economy Aggregate demand is the sum of consumption and investment demand:

$$AD = C + I$$

$$AD = Ca + cY + I$$

Aggregate demand is greater (smaller) the greater (smaller) is an autonomous level of consumption of Ca and autonomous investment (I) and the larger (smaller) the marginal propensity to consume. Total autonomous consumption and autonomous investment denoted as autonomous spending, respectively. Planned autonomous expenditure (A), so:

$$Ca + I = A$$

Then aggregate demand in the two-sector model specified as

$$AD = A + cY$$

Part of aggregate demand ($A = Ca + I$) is independent of the level of income is autonomous. The second part, induced consumption, ie cY) is dependent on the level of production, respectively retirement. Aggregate demand increases with income growth, as induced consumption increases with income growth.

$$AD = Y = A + cY$$

The solution for the equilibrium level of output , which we denote Y_0 we get

$$Y_0 = \frac{1}{1 - c} \cdot A$$

The equilibrium level of output is determined by the two-sector model marginal propensity to consume, c , and autonomous expenditures A . The equilibrium level of income is the greater (smaller) the larger (smaller) is the marginal propensity to consume and the larger (smaller) the level of autonomous spending. (2)

Multiplier

Multipliktor plays an important role in the process of determining the equilibrium production. The equilibrium level of income depends on the level of autonomous expenditures (A) and marginal propensity to save, s , ie $1 - C$. It is assumed that the industries producing capital goods have excess capacity and can offer a supply of capital goods in the period in which are ordered so that the income factor is increased in the same period. There is no time delay in response to a change in consumer spending income, so consumption of the present period is a function of the present retirement period. We assume that the economy is operating below potential, fixed price and a fixed interest rate.

The concept of the multiplier effect is based on the fact that the initial impulse stimulating AD (eg increasing the volume of financial flows in the economy when investment) will increase domestic product to an even greater extent.

The equilibrium level of income depends on the level of autonomous expenditure and marginal propensity to save.

Prerequisites :

- Industries producing capital goods has excess capacity and can offer a supply of capital goods in the period in which they are ordered, so the reward factor is increased in the same period.
- There is no time delay in response to changing consumer spending retired, so the present period consumption is a function of income present period.
- The economy is operating below potential.
- Fixed prices.
- Fixed interest rate.

The equation of equilibrium output is copied to the form:

$$Y = C_a + cY + I$$

$$Y = C + I$$

It is true that

$$Y + \Delta Y = C + \Delta C + I + \Delta I$$

Deducted from the initial equilibrium level equation, $Y = C + I$, we get

$$\Delta Y = \Delta C + \Delta I$$

Consumption function is $C = C_a + cY$, autonomous consumption has not changed.

After consumption is induced by a change in the equilibrium level of production. then

$$\Delta C = c \Delta Y$$

Substituting equation gives

$$\Delta Y = Y + c \Delta Y + \Delta I$$

$$\Delta Y / \Delta I = 1/1-c$$

expression

$$1 / (1 - mpc)$$

is called simply spending multiplier . A simple multiplier because we assume that the increase (decrease) of autonomous expenditures do not change prices and interest rates.

The increase in autonomous consumption can be written:

$$\Delta Y = 1 / 1 - c . \Delta C_a$$

Simple multipliktáro expenditure is greater than one. The larger (smaller) the marginal propensity to save, the smaller (larger) is a multiplier.

A simple spending multiplier is the ratio of increase (change) equilibrium production caused an increase (change) autonomous expenditures (autonomous components of aggregate demand) by unit. (2)

Aggregate supply (AS)

Aggregate Supply (AS) is used to express the extent of the overall domestic product, or if the output market companies. Aggregate supply curve shows the relationship between the total offered quantity of production and the price level in the economy. (Price level we understand the general price level, which is measured by the price index). Aggregate supply curve AS is the result of the aggregation of individual market offers. The shape of the curve AS explaining the School of Economics in different ways. Most economists agree in opinion that in the short run aggregate supply is increasing from left to right in the long run is vertical. (5)

The shape of the AS curve

Keynesian approach

In the short term, the real output is below its potential output, the AS curve is relatively flat, because wages and prices are rigid. In a short period applies existence of the output gap, ie in the economy, there are free resources available. The key point is that some cost items are in short period inflexible and rigid. Firms react to the higher price level of expenditure by increasing the volume of output and prices. If companies want to produce more goods and services increases the cost of production factors due to the law of diminishing returns. When the firm's output close to its maximum capacity, narrowing the space for its increase.

In the long run all resources are used. That the economy is working at its potential level. When the validity of contracts expired, closing a new, customized higher price level. If the price level rises by 10 % due to higher aggregate demand, all expenses will also increase by 10 %. Firms will achieve higher profits due to higher prices and product returns to its original level. (6)

Sources of inflexibility

The causes stupor costs and prices :

1) Wages - employees work with trade unions to them for some time, the employer agreed level of nominal wages (contract). That are fixed for a certain period of time. With the growth of AD firms can raise prices and product without wages respond to changes. Increase your profits.

2) Rent - a company may hire a building in which he carries out his activity. Rent is closed for some time contracted.

3) Material prices - the company has contracts with their suppliers, which fix the prices of materials and components and the prices are fixed at a certain time in advance.

4) Government regulation - some prices are regulated by the state - electricity, water, gas and telephones, etc. (6)

Supply shocks

Short-term aggregate supply function is defined as the dependence of the tendered quantity production at a price level. If the price level increases, increasing the quantity offered, it is a movement along the curve SRAS. If, however, at a constant price level changes offered of production, it is a movement across the SRAS curve, and such cases are known in macroeconomics as supply shocks. SRAS curve may shift to the right or bottom right to top left. We distinguish:

- Positive supply shocks when the SRAS curve shifts to the right down in the economy leads to increase in the volume produced and marketed output and the price level remains unchanged aggregate demand decreases. In other words, we say that SRAS is growing;

- Negative supply shocks when the SRAS curve shifts to the left up in the economy, there is a decrease in the volume produced and marketed output and the price level remains unchanged aggregate demand increases. In other words, we say that SRAS decreases.

In economic theory, we distinguish:

Nominal supply shocks that are associated with a change in the total cost companies, and these changes are usually caused by increasing or decreasing:

- Nominal wage rates, social security contributions from employers or changes in expectations regarding the future development of the price level. For example, a decrease in wage rates in the economy will lead to a decline

in overall business costs and thereby shift SRAS curve to the right down (SRAS increase);

- Prices of raw materials and energy, this change may be associated both with the change of commodity and energy prices on world markets (eg, significant increases in oil prices) and the appreciation or depreciation of the domestic currency, respectively. with the adjustment of the amount of import duties. For example, the drop in prices of raw materials and energy and appreciation (appreciation) of the domestic currency shifts SRAS curve down to the right (SRAS increase);

- Changes in tax rates, as in the case of direct taxes and indirect taxes. Decreases if the rate of value added tax (VAT) will reduce the total cost companies and SRAS curve shifts to the right down (SRAS increase).

Real supply shocks are associated with a change in the production function, which primarily affects the level of growth or decline:

- Labor productivity, which is usually caused by a change in workforce skills. If they raise their qualification employees, then in most cases increase labor productivity, which is when the same amount of costs reflected in the growth of profitable businesses. These companies will be willing at any price level to offer more of their production. Labour productivity growth will lead to a shift of the production function upwards and also to shift the SRAS curve to the right down (SRAS increase);

- Capital stock, ie, expansion or disposal of a manufacturing facility. For example, if the current number of employees in the company will expand its existing production facility, then this change will lead to growth in the volume of manufactured products, which are then reflected in the shift SRAS curve to the right down (SRAS increase);

- Population, this change may be associated with both natural increase or decrease in the population and the influx or outflow of labor. Grows For example, if the population, then this growth will lead to a shift of the production function upwards and also to shift the SRAS curve to the right down (SRAS increase);

- Changes in technological progress, ie changes associated with the improvement of the technical level of production facilities, increasing soil fertility and the transition to higher-quality raw materials. If the company will introduce new production technology, it can be assumed that this change will lead to growth in the volume of manufactured products and the SRAS curve to shift to the right down (SRAS increase). (5)

Aggregate supply in the long term

Aggregate supply in the long term we will refer to the acronym LRAS (LR - Long Run = long term). We understand the course of short-term aggregate supply curve, we can deduce the shape of the long-term aggregate supply curve. Economists are inclined to think that once you cease to be contracted nominal wage force, there is the process of adapting to new pricing sessions. This is a cost- based price change and shift the short- run aggregate supply. Businesses can take advantage of long-term fixed costs and the aggregate supply curve in the long run becomes vertical. Therefore, it is commonly encountered in the analysis of the economy displays two aggregate supply curves: SRAS and LRAS. In the long term performance of the economy is determined by the LRAS line. There is power, which is under the given conditions (quantity of factors of production, quality of production factors and the level of technology) the sustainability and long-term unbreakable. This power is called potential output.

Performance is adequate potential product performance, making full use of productive resources in the economy or power at full employment, performance at the natural rate of unemployment. The maximum and at the same time efficient use of production resources also shows the production possibilities frontier (PPF). If the production possibilities frontier for the economy moves to the right, it means that the economy has the capacity to produce more goods and services - potential output increases. From potential output will show the actual product. Actual product is such that the economy actually achieved in a given time. actual product may indeed be higher than the potential, but not in the long run. This means that potential output is the product of the maximum, but the maximum sustainable product for circumstances. the following picture shows the short-term and long-term

aggregate supply. Long-term aggregate supply curve LRAS determines potential output, which will be denoted by Q^* and Y^* . (5)

The classical approach

He argues that prices and wages are flexible enough to clean up and very quickly come to equilibrium in the market. They point to the auction markets, where shocks on both sides of the market immediately reflected in prices. Short period is very short and therefore negligible. They argue that the economy always operates at full employment and the potential of the product. Short AS curve is therefore identical to the AS curve in the long term, ie vertical. The product does not react to changes in AD. If you are experiencing a decline (or growth) AD, prices and wages adapt quickly. Price level decreased (or increased), but the level of output and employment has not changed. Prices and wages decreased (or increased) to the extent that was sufficient to keep the real costs to the original level. In the current real wage rate will only work those who wish to work. The economy is therefore still on its potential and the natural rate of unemployment. (6)

Aggregate demand (AD)

Aggregate demand is defined as the aggregate or total amount of product that is purchased at a given price. AD measures the total expenditure of the economy, which can be determined by the product of real output (Y) and the price level (P):

$$\mathbf{AD = C + I + G \pm NX}$$

- where C is consumption
- I is investment
- G is government spending on the purchase of goods and services
- NX is net exports (6)

Pigous effect

This effect describes a situation in which there is a decrease in the price level, thus increasing the real wealth of households and vice versa. This effect is also called the effect of real money balances, which does not need the money market. The growth of real wealth will stimulate growth in investment and consumer spending, leading to an increase in aggregate demand, which stimulates the growth of real output.

decrease in P = > Growth W = > Growth I and C = > Growth AD = > Y growth

Effect of foreign trade

If it falls, the price level will increase the attractiveness of domestic production for foreign entities. Households do not need to buy foreign production, as domestic production is cheaper. The lower the import, the better for aggregate demand.

decrease in P => Ex growth and decline Im = > Growth AD = > Y growth

Crowding out effect of private spending by government spending

If the government increases its autonomous expenditure on the purchase of goods and services will increase aggregate demand and real output level. The growth of real output growth leads to transaction demand for money, as businesses may wish to increasing levels of the economy to spend more, and the interest rate increases, which in turn leads to a decrease in investment and consumer spending. The effectiveness of economic policy is weakened, if not merged with the objectives of the Central Bank.

growth $G = >$ Growth $AD = >$ Growth $Y = >$ Growth $L \Rightarrow$ grow $\Rightarrow$ I drop a $C \Rightarrow$ decrease $AD = >$ Y decline

If it changes anything, the price level is a shift in aggregate demand. AD shifts are caused by the demand shocks - a one-off and expected event.

The main causes of demand shocks are :

- variables that affect the level of disposable income - changes in the tax transfers, the social system, etc.
- The central bank - the change in the money supply affects interest rates, which will be reflected in changes in real output,
- psychological factors $\Rightarrow$ optimistic and pessimistic expectations of economic actors - trust in politicians, governments and central banks,
- economic situation abroad affects net exports or NX,
- higher population growth increasing consumption and the number of families increases the demand for investment in housing construction,
- price growth assets (shares and property) to increase the wealth of the owners of these assets, thereby increasing consumption and investment,
- any government action - a change in government spending.

The positive demand shock - a shift of AD up to the right, thereby increasing the efficiency of the economy.

Negative demand shock - AD curve shift down the left, has a negative impact on economic performance.

Adverse fluctuations in aggregate demand can be eliminated variables of economic policy - fiscal and monetary policy. (6)

Conception of macroeconomic equilibrium

Balance or imbalance of the economy is determined by the interaction of aggregate supply and demand. The overall macroeconomic balance determining the aggregate cost of product i is reached where the aggregate supply and aggregate demand intersect. (6)

Macroeconomic equilibrium model captures the AS / AD. Model AS / AD depicts the economy as a whole, on the x-axis is the indication of real output (Q or Y , respectively real GDP) and the axis is indicated by the overall price level, respectively price index (P). Presents the macroeconomic balance point E , which determines the equilibrium output Q^* (It also is potential output of the economy) and the equilibrium price level PE . (5)

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Translated on the basis of Ing. Lenka Brizgalová Ph.D documents.

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