SAMPLE EXERCISES

National accounts

- Consider a closed economy of firms, households and banks. We have the following data on the economy in period t (in billion forints):
- Firms take out 10,000 loans from banks, which they spend with their existing money as follows: they spend 9,500 to repay the overdue loans, they pay 100 to the banks for interest; they buy 2,700 from other firms, of which 2,000 are immediately accounted as a cost. In total they pay out 4260 wages. We also know that the companies' cash reserves have increased by 290, they record 200 depreciation, they do not pay dividends.
- Banks distribute 80% of their profits as dividends each period, all other expenditure is excluded.
- Households always keep half of their total savings in cash and the other half always in corporate bonds. The interest rate on corporate bonds this year is 40.

SAMPLE EXERCISES

Leontief-model

Consider a 2x2 economy with the following coefficients of inputs:

termék	1	2
1	0,3	0,4
2	0,2	0,5

(1) Interpret the elements of the matrix!

(2) Write down the source - use balance of the products if the total final use of the first product is 100 and the second product 200.

(3) Assume that the value of the imports required per unit of output of each branch is, in order, m=(1,2). Determine what the external trade balance would be, all else being equal, if the government's policy of stimulating final consumption led to a 10% increase in the consumption of all products (but no increase in exports). Answer also if only the second branch consumes 10% more of the second product, with final consumption of the first unchanged. The Leontief inverse of R is:

2,307692	3,076923
1,538462	5,384615

4.4.1. Simplified KEYNESIAN MODEL

Income side recording

Total society

Flow type accounts

Records changes in wealth resulting from the activity of the agent in monetary terms

decreases	increases
CI	**TOTAL INCOME = TOTAL PRODUCT**
Balance: ~~$Y=C+I$~~ $GDP=C+I$	**P= CI+C+I**
C	

balance: ***ΔEG=S*** *saving*

Stock type accounts

Records the variation in the form of wealth already acquired in monetary terms

ΔAssets	ΔLiablities
ΔVE=I	**S**

Egyenleg: **0** *(nettó hitelnyújtás/hitelfelvét)*

QUANTITIES EXPRESSED IN MONEY!!

Product side (use-ressource balance) recording

Accounting identity

\+ **BEHAVIORAL RULE** **C(Y) known function,** characteristics:

Marginal prospensity to consume: $c' = \frac{\partial C}{\partial Y} < 1$

There is autonomous consumption $C_0 > 0$

For example: $C(Y) = c'Y + C_0$

Lesson (1): $dY = \frac{1}{1 - c'} dG$

Multiplier effect:

An exogenous increase in demand (C_0 or I) implies a greater increase in gdp than the initial increase. (all in money)

Keynesian view: prices rise less than incomes, therefore increased demand (in Ft) implies also increased production (physical quantity).

New classical view: the increased demand (in Ft) is satisfied at higher prices, the production does not increase.

4.4.1. **Simplified KEYNESIAN MODEL**

Accounting identity **Y= C(Y)+I=S+C(Y)** **S=Y-C(Y),** vagyis **S(Y)**

Lesson (2): **I=S(Y)**

Why not: I=Y-C(Y), i.e. I(Y)

I, C decision variables, S balance (residual variable), which is why this second formalisation does not hold.

Paradox of thrift (widow's cruse)

It is not saving that determines investment, but the other way round!

(If „capitalists" collectively increase their purchases of products, their savings remain unchanged.)

Lesson (3):

No mechanism to achieve full employment equilibrium.

I.e. durable unemployment is possible even in perfect competitive markets ↔ all markets are in equilibirum except for labor market ↔ Walras law does not hold.

Stock type accounts

Records the variation in the form of wealth already acquired in monetary terms

ΔAssets	ΔLiabilities
ΔVE=I	**I=S** **S**

Balance: **0** *(net lending/borrowing)*

How to link to nominal quantities?

Quantities in physical terms

Keynes' solution: relates all nominal quantities to wages

Y= C(Y)+I :W **y=c(y)+i**

The usual solution: linking by price(indexes)

QUANTITIES IN MONEY!!

Switching to real variables using price indices

Y= C(Y)+I ⇨ **y=c(y)+i**

There are problems…

Relationship between nominal and real prices:

		Prices in 2015	$20.000Ft/TV$ $300Ft/kg\ bread$ $350Ft/l\ gasoline$	Price of commodity bundle: 25800Ft$_{2015}$ / bundle
Consumption bundle	$1TV$ $10kg\ bread$ $8l\ gasoline$	Prices in 2016	$19.000Ft/TV$ $350Ft/kg\ bread$ $400Ft/l\ gasoline$	25700Ft$_{2016}$ / bundle

Compared to 2015 prices (base) the price of bundle:

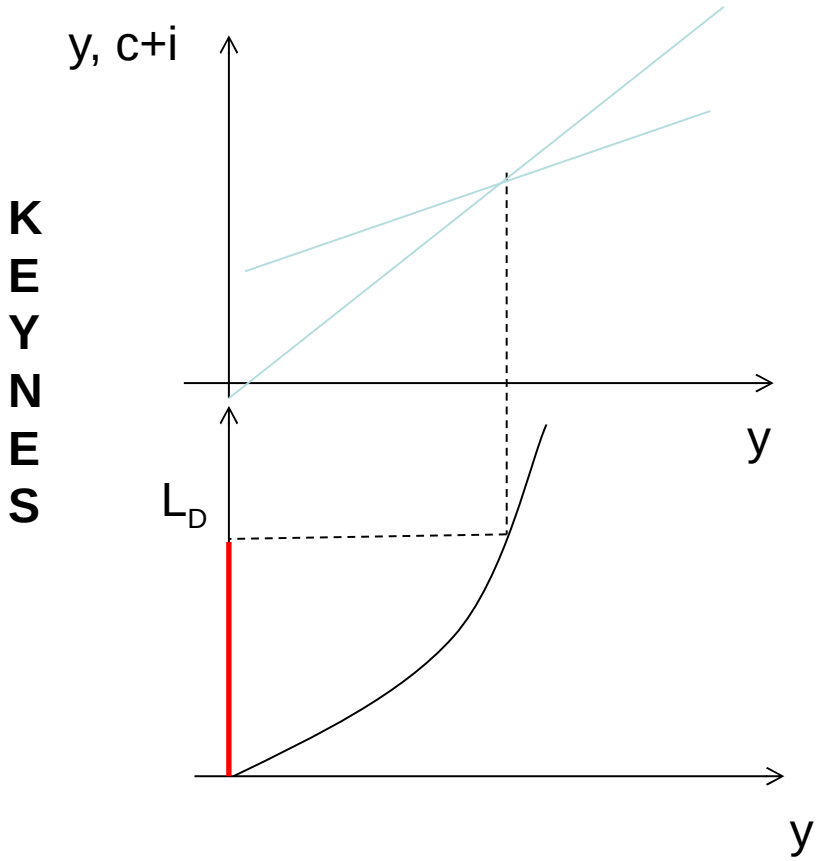
In 2015: $\frac{25800Ft_{2015}}{25800Ft_{2015}}=1$ in 2016: $\frac{25700Ft_{2016}}{25800Ft_{2015}}=0{,}9961$ = **p price level**

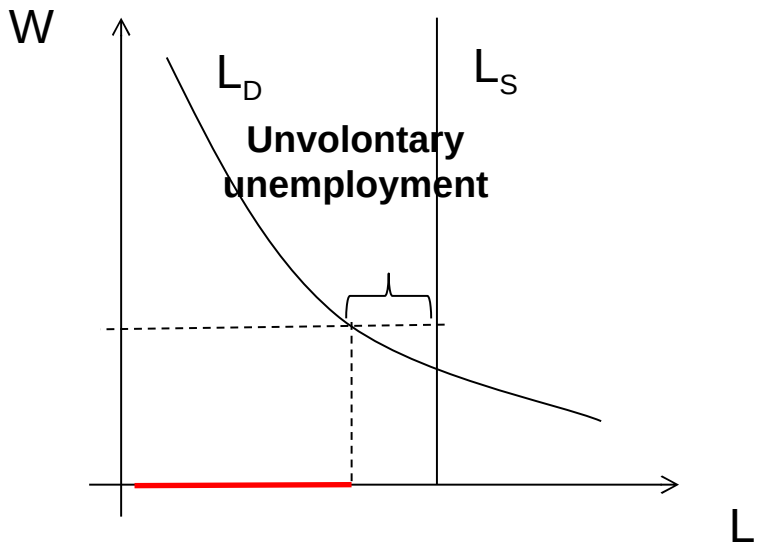
variation: 0,9961-1=**-0,39% = π** **Inflation/deflation**

That is: p=1+π

4.4.1. **Simplified KEYNESIAN MODEL**

Lesson (3): No mechanism to attain full employment euqilibrium





Labour is paid according to its marginal productivity:

$$\underset{y,L}{Max}\ py - WL \qquad y = F(\overline{K}, L)$$

$$\underset{L}{Max}\ pF(\overline{K}, L) - WL \qquad pMP_L - W = 0$$

Labour supply cannot be always adjuted to the desutility of labour. For the sake of simplicity suppose that labour supply is exogeniously given: L_s

Example:

$$\underset{L}{Max}\ p\sqrt{L} - WL \qquad p\frac{1}{2\sqrt{L}} - W = 0 \qquad L_D = \left(\frac{p}{2W}\right)^2$$

SAMPLE EXERICES

Simplied
Keynesian model

1. exercise

A closed economy can be characterised by the production function $y=(KL)^{0,5}$. The stock of means of production (standard: capital stock) at the beginning of the year is 10.000. The GDP is 4200$. Governement deficit is 3% of the GDP. Governement purchase is 470$, housholds' consumtion is 2930$.

How much is the average net tax rate on income?

Write the consumption function of households (i.e. governement excluded), if autonomous consumption is 38$!

What is the minimal labor supply so as the simplified keynesian model can be applied? (i.e. there is no excess demand on the labor market)

By what % the GDP varies between 2019 and 2020, if the price level and employment remain unchanged?

2. exercise

In a closed economy that can be described by the simplified keynesian model, economic agents are aggregated into governement, firms and households. We know the followings: Consumption function is linear, the marginal prospensitiy to consume is 90%, taxe on income is 10%, government deficit is 30$, investment is 1000$ and the autonomous consumption of the private sector always equals with government deficit devided by 2.

1) How much is the multiplier for government expendure?

2) Which level of the government expenditure balances out the governement deficit?