THE ANALYSIS OF MODEL OF GENERAL ECONOMIC EQUILIBRIUM AND FINANCIAL INSTABILITY OF ECONOMIC SYSTEM

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Abstract

The model of the economic system which is discussed in this paper is based on the assumption of the existence of the heterogeneous structure of economic agents. During this assumption, we analyze the general economic equilibrium model with incomplete asset market, the existence of monetary equilibrium and the emergence of financial instability of the economic system, as well as actions that are necessary for overcoming economic instability. The private sector is observed as a set of participants who have different utility functions. Also, it is assumed that there are more commercial banks, where each bank has their own portfolios, which reflect the different preferences the risk / profit. In the market conditions, each bank analyzes the credit worthiness of each borrower, and on the other side each borrower faces different credit markets. Therefore, in this paper, instead of the only market for deposits/loans, development of model will be conducted by analyzing more than one market for deposits and more than one market for loans. The private sector and commercial banks maximize their utility functions, while the role of the Central Bank and the public sector is exogenously given. Further, in the model, we look at money as the conditioned medium of exchange, whereby the Central Bank and the government have a monopoly on the issue of controlled money as a widely accepted method of payment. Also, depending on what is the function of money in the markets funds, we observe the same physical structure as endogenous or exogenous size.

Key words: *The model of general economic equilibrium, incomplete asset markets, monetary equilibrium, financial instability, money.*

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1. Introduction

Modeling of economic system often assumes that all participants in one sector of economic system behaves the same way that in the modeling and analysis of models of economic system provides the opportunity to represent the behavior of participants forming a "representative agent." On the one hand the introduction of the representative agent in the model of economic system significantly simplifies the model and facilitates the analysis, and on the other hand the assumption of the representative agent represents the limiting conditions of the model. Namely, the introduction of a representative agent in the model of economic system hides many relationships that occur within each sector, in other words it excludes the existence of different interests, different preferences and analysis of conflict situations.

Suppose that the banking system is represented by the representative agent, or that the whole banking system is a single bank with a single system of preferences, a single portfolio, and without existence of conflicts. Then in a case of instability of the economic system, the entire banking system can have only two possible outcomes, and that would be failure (collapse), or the entire banking system will survive. In the real economic system, each bank has different portfolios that reflect different preferences towards relation risk / return, in other words the appearance of instability of the economic system has different effects on each individual bank, and thus the analysis is unrealistic to look only two final outcomes as failure or success.

In this study it is assumed that there are more commercial banks, where each bank has their own portfolios that reflect the different preferences of the risk / profit. Also, a non-banking sector is observed as a set of participants who have different utility functions. In the market conditions, each bank analyzes the credit worthiness of each borrower, and on the other side the each borrower faces different credit markets. Further, one can assume that each bank has the same information on each borrower, and then the competition between banks exists to place the funds in H individual markets. Also, it can be assumed that some borrowers have opted for the loan of a particular bank, and then such a commitment of borrowers to a specific type of loan provides specific information to each bank, resulting in an asymmetry of information, and therefore a competitive advantage over other banks. In any of the presented combination of banks and borrowers there are B individual credit markets and a subset of borrowers who were initially accidentally allocated. Therefore, in this article instead of the only market for deposits / loans, the analysis of the model will be conducted by analyzing more than one market for deposits (there are several banks) and more than one market for loans (by borrower and bank).

2. The model of general economic equilibrium and the financial instability

2.1 Basic assumptions of the model of general economic equilibrium

General economic equilibrium model with incomplete asset market (GEI) is analyzed in the two time points, where in the first period there is only one state of the economic system, and in the second period there is an S possible state of the system. In the period $t = 0$ non-bank private sector (NBPS), commercial banks and the public sector (government) are taking their own action rationally expecting a realization of an S possible states of the economic system. In a time period $t = 1$ one of the S possible states is achieved, and then economic actors again take appropriate action. The private sector and commercial banks maximize their utility functions, while the role of central banks and public sector is exogenously given. The private sector organizes the production, trades in goods, financial assets, consumer loans, deposits and shares of commercial banks. Commercial banks take deposits and lend funds to consumers, participate in the interbank credit market, invest in assets and issue shares in primary markets. In further analysis we introduce the basic assumptions that will apply to a set of consumption, the vector of the initial wealth of consumers and consumer utility function, then to the monetary wealth of the bank, bank profits and bank utility function.

Basic assumptions of the model[1]:

(**P1**) $\forall s \in S^* \; i \; l \in L$, $e^h \in R_{++}^{L(S+1)}$ in every state of the economic system the total consumer wealth is strictly positive, in other words all goods are in the economic system

[1] A fuller view of the implications of the basic assumptions is given in Balasko, Y., (1988), *Fundations of the Theory of General Equilibrium*, Academic Press.

(**P2**) $\forall s \in S^* \, i \, h(b) \in H(B),\ e^b \in R_{++}^{H(B)(S+1)}$ **commercial banks have financial wealth (capital) in each state of the economic system,**

where $h \in H = \{1,\ldots,H\}$ **is - a set of economic agents by which we look at households (consumers) and investors, and**

$b \in B = \{1,\ldots,B\}$ **is- a set of commercial banks**

(**P3**) $u^h \in C^2(C,R)$, **where** $C^2(C,R)$ **is asset of functions with** C **domain that take values from the** R **set and at the same place are twice differentiable,**

where $u^h : R_+^L \times R_+^{SL} \to R$ **is a utility function of consumers** $h \in H$

(**P4**) $C = R_{++}^{L(S+1)}$ **where** $R_{++}^{L(S+1)}$ **marks the positive ortrant of commodity space and represents the vector of consumption** l **goods in the** s **state of consumer** $h \in H$ **;**

(**P5**) **for each** $c \in R_{++}^n$, $Du^h(c) \in R_{++}^{L(S+1)}$ **is *Jacobian functions*** u^h,

(**P6**) $c \in R_{++}^n$ **is** $\sum_{j=1}^{n}\sum_{k=1}^{n} h_j h_k \frac{\partial^2 u^h(c)}{\partial c_j \partial c_k} < 0$, **then for each** $h \in R^n$, **and for** $h \neq 0$ **is** $\sum_{j=1}^{n} h_j \frac{\partial u^h(c)}{\partial c_j} = 0$,

where $D^2u^h(c)$ **represents *Hessian functions*** u **at the point** c **.**

(**P7**) $u^b \in M_b^{\,2}(M_b,R)$ **where** $M_b^{\,2}(M_b,R)$ **is a set of functions with a domain** M_b **which take values from the set** R **and at the same are twice differentiable,**

where $u^b : R_+^{M_b} \times R_+^{SM_b} \to R$ **is a utility function of bank** $b \in B$

(**P8**) $M_b = R_{++}^{(S+1)}$ **where** $R_{++}^{(S+1)}$ **marks the positive ortrant of monetary space and represents the vector of profits in state** s **of the bank** $b \in B$ **;**

(**P9**) **for each** $m \in R_{++}^{S^*}$, $Du^b(m) \in R_{++}^{S^*}$ **is *Jacobian functions*** u^h,

(**P10**) $m \in R_{++}^{S^*}$ **is** $\sum_{j=1}^{n}\sum_{k=1}^{n} h_j h_k \frac{\partial^2 u^b(m)}{\partial m_j \partial m_k} < 0$, **then for each** $h \in R^n$, **and for** $h \neq 0$ **is** $\sum_{j=1}^{n} h_j \frac{\partial u^b(m)}{\partial m_j} = 0$,

where $D^2u^b(m)$ **represents *Hessian functions*** u **at the point** m **.**

Commercial banks act as intermediaries between those who invest their resources (money) and those who borrow funds. Therefore, activities of commercial banks can be divided into passive and active banking business. Passive banking transactions relating to the collection of free money from citizens, businesses and government (deposit business).By performing these tasks the bank is in the role of debtors. Active bank jobs are consisted in placing of collected funds, and now the bank is in the role of creditor. By placing funds bank earns the active interest, which is higher than the passive, and that difference makes one of the sources (primary) of the bank's earnings. Since the bank in order for the greater profit may qualify for more funding than they received, they may lead to excessive expansion of money and credit. In order to avoid over-expansion that leads to economic instability, the task of the Central Bank is to take appropriate action to prevent adverse effects on the economic system.

The Central Bank carries out the following actions:

A. Conducting monetary policy in the economic system by the control of money supply, namely:

a) Discount policy, i.e. changing conditions of the loans to commercial banks;

b) By buying and selling government bonds in the money market, i.e. implement a policy of open market operations[2], which affects the money supply, interest rate and overall economic activity. By selling government bonds to commercial banks, the central bank reduces their reserves because banks pay bonds in cash, and under the assumption unchanged rate of required reserves, it operates on a multiplicative contraction of money supply and credit. Conversely, buying government bonds, central bank increases the reserves of commercial banks and so acts on the multiplicative expansion of money supply and credit. By increasing the supply or demand for government bonds, central bank affects the price of bonds and interest rate (bond prices and interest rates are inversely proportional). This further result in the size and method of investment, national income and general economic equilibrium;

c) The direct control of credit and interest rate;

d) By determining the reserve requirement.

B. Control to issue banknotes in the economic system.

C. Provides banking services on behalf of the government by holding government deposits, meets the needs for short-term borrowing by selling government bonds.

D. The Central Bank accepts deposits and provides loans to commercial banks, i.e. all commercial banks hold accounts at the central bank, and thus performs the clearing.

E. Acts as a lender for the financial sector.

F. Control of financial institutions and financial markets.

G. Holds gold and currency reserves and thus operates a policy of international liquidity. In addition, by interventions in foreign exchange markets it affects the stability of the domestic currency.

These activities of the Central Bank are formally given by the following vector

$$\left(M^{CB}, \mu^{CB}, m^{CB}\right), \qquad (2.1)$$

where

M^{CB} - is an amount of funds that the Central Bank spends on buying bonds;

μ^{CB} - is an amount of bonds issued by the Central Bank for the sake of short-term government debt;

m^{CB} - is an amount of loans that the Central Bank gives to commercial banks (rediscounting, advances, and loan) so that the banks provide liquid assets, and fill their reserves.

Vector of regulatory measures of the Central Bank is

$$\left(k, \lambda_{sz}^{h}, \omega\right) \qquad (2.2)$$

where

[2] Open market operations (OMOs)

k - is capital liabilities of commercial banks,

λ_{sz}^{h} - is a penalty to a consumer $h \in H \cup B$ when commitments are not made,

ω - expresses the risk faced by commercial banks because **most of the loans are made by the long-term, and most of the deposit is the short-term or deposits**. Furthermore, changing of the discount rate, change in reserve requirements, and change of interest rates and also control of dispersion of risk affects the level of risk in commercial banks.

Thus, the existence of an interbank market and the implementation of open market operations, equilibrium interbank interest rate are determined by the expression

$$(1+\rho) = \frac{\sum_{b \in B} \mu^{b} + \mu^{CB}}{\sum_{b \in B} d^{b} + M^{CB}} \qquad (2.3)$$

where

ρ is an equilibrium interbank interest,

μ^{b} is an amount of bonds issued by the $b \in B$ bank, i.e. it represents equivalent amount of funds with which the bank wants to borrow in the interbank market,

d^{b} is an amount of funds in the form of deposit of the $b \in B$ bank, i.e. the amount of funds that the bank invest in purchase of bonds,

Z represents the set of all loan and deposit markets, i.e. the credit market, deposit market and the interbank market as well as secondary market funding.

2.2. Defining the market structure of assets, loans and deposits

In the period $t = 0$ commodity markets, asset markets, capital markets (loans) and deposits are considered as well as interbank markets. At the end of the period $t = 0$ consumption and liabilities arising from loans are executed.

In the period $t = 1$ commodity markets and markets of short-term loans are analyzed again. Capital markets (loans), deposits and assets are closed, i.e. the realizations are made. At the end of the second period, consumption and the occurrence of the insolvency of commercial banks are analyzed.

We consider a set of resources $J = \{1, \ldots, J\}$. It is assumed that the assets are sold at a specified price (spot price).The funds are being sold during the period $t = 0$, and contractual obligation are performed within the time period $t = 1$ in one of the possible states of the economic system $s \in S$ .By selling assets $j \in J$, the profits realized, and it is expressed by collection of goods or money to any future state of the economic system, i.e. $A^{j} \in R_{+}^{S(L+1)}$. The market funds may be presented as a matrix V whose dimensions are $\big((L+1)S\big) \times J$.

A values (nominal) dividend matrix $V(s, p)$ with the situation of uncertainty of real assets and two time points is the form of

Time	State	Resources 1	2	...	J
$t=1$	1	$v^1(1)=p(1)a^1(1)$	$v^2(1)=p(1)a^2(1)$	....	$v^J(1)=p(1)a^J(1)$
	2	$v^1(2)=p(2)a^1(2)$	$v^2(2)=p(2)a^2(2)$	....	$v^J(2)=p(2)a^J(2)$
	...	...	...	....	...
	s	$v^1(s)=p(s)a^1(s)$	$v^2(s)=p(s)a^2(s)$	....	$v^J(s)=p(s)a^J(s)$
	...	...	...	....	...
	S	$v^1(S)=p(S)a^1(S)$	$v^2(S)=p(S)a^2(S)$	....	$v^J(S)=p(S)a^J(S)$

and extended a values (nominal) dividend matrix V with the real state of uncertainty means is the form of

Time	State	Resources 1	2	...	J
$t=0$	0	$-q_1$	$-q_2$	....	$-q_J$
$t=1$	1	$v^1(1)=p(1)a^1(1)$	$v^2(1)=p(1)a^2(1)$	....	$v^J(1)=p(1)a^J(1)$
	2	$v^1(2)=p(2)a^1(2)$	$v^2(2)=p(2)a^2(2)$	....	$v^J(2)=p(2)a^J(2)$
	...	...	...	....	...
	s	$v^1(s)=p(s)a^1(s)$	$v^2(s)=p(s)a^2(s)$	....	$v^J(s)=p(s)a^J(s)$
	...	...	...	....	...
	S	$v^1(S)=p(S)a^1(S)$	$v^2(S)=p(S)a^2(S)$	....	$v^J(S)=p(S)a^J(S)$

Market structure is being determined on the basis of ranking value dividend matrix V. Thus, the matrix V generates a subspace of income transfers $\langle V\rangle$, i.e. a subspace $\langle V\rangle$ of space R^S is a linear combination of J columns of matrix V the form of $\langle V(s)\rangle=\left\{r\in R^S \middle| r(s)=V(s)\theta,\ \theta\in R^J\right\}$,

i.e., net income vector $r(s)$ for all the expected state of nature $s\in S_1=\{1,2,\ldots,S\}$, is a linear combination of columns of values dividend matrix $V(s)$. Namely, if the vectors dividend value matrix $V(s)$ with the state of uncertainty

$$v^1 = \begin{bmatrix} v^1(1) \\ \dots \\ v^1(s) \\ \dots \\ v^1(S) \end{bmatrix}, \; v^2 = \begin{bmatrix} v^2(1) \\ \dots \\ v^2(s) \\ \dots \\ v^2(S) \end{bmatrix}, \dots, \; v^J = \begin{bmatrix} v^J(1) \\ \dots \\ v^J(s) \\ \dots \\ v^J(S) \end{bmatrix},$$

are linearly independent[3], then the rank of matrix $V(s)$ is equal to the number of funds, i.e. a subspace dimension of net income transfers $[V(s)]$ with the state of uncertainty is $\dim[V(s)] = J$ .Since the rank of matrix $V(s)$ by the species is equal to the rank of matrix $V(s)$ by columns, and that the dividend values matrix $V(s)$ has the S -type, then the dimension of the matrix $V(s)$ is equal or less than the expected number of states of nature $S_1 = \{1,2, \dots, S\}$, i.e. the rank of the dividend values matrix $V(s)$ is less than or equal to the number of the expected state of nature S , i.e. $rang\, V(s) \le S$ .Since we have determined the rank of dividend values matrix $V(s)$ to the state of uncertainty, we give a complete and incomplete market structure means with the state of uncertainty by the following definition.

Definition 2.1 We observe a set of expected state of nature $S_1 = \{1,2, \dots, S\}$, and let a dimension of subspaces of net income transfers $[V(s)]$ with the state of uncertainty, equal to the expected number of states of nature S , i.e. $\dim[V(s)] = S$,then, such a structure of assets is the complete market structure of assets, i.e., if the number of linearly independent vectors of $v^j, \quad j = 1,\dots J$ is equal to the number of assets J , then such a structure of assets is **a complete market structure of assets.** Conversely, if a dimension of subspaces of net income transfers $[V(s)]$ with the state of uncertainty is strictly smaller than the expected number of states of nature S , i.e. $\dim[V(s)] < S$,

i.e. if the number of linearly independent vectors $v^j, \quad j = 1,\dots J$ is lower than the total of assets J , then such a structure of assets **is an incomplete market structure of assets.**

Since the vector θ is the portfolio of J assets, then, if the subspace of income transfers $\langle V \rangle = R^S$, we can conclude that any net income vector $r(s) \in R^S$ can be obtained by using the appropriate portfolio in the economic system, and in this sense asset markets are complete, otherwise asset markets are incomplete. Incomplete market structure of funds, i.e. situation of incomplete asset markets can and should be considered in reality. The completeness of the market structure of funds requires that $\dim[V(s)] = S$, which in that case means that the value dividend matrix $V(s)$ has full rank and that we must have the $J \ge S$ funds (means the S funds that have linearly independent payment). Consequently, when ever $J < S$, asset markets are incomplete, i.e. we have an incomplete market structure means. On the other hand, if $J \ge S$ and if $\dim[V(s)] = S$ it is not possible to say unequivocally that there is complete market structure of funds because the completeness of the market structure of funds is relatively determined by

[3] Spot prices $p(s)$ for the generated S event in the value of real dividend matrix of the real assets $V(s, p)$ are not proportional.

system of spot price $p(s)$ for each $s \in S_1$, i.e. in this case we can say that asset markets in general (potentially) represent the complete market structure of means. Suppose that all the supplies are expressed in money (cash or deposits and loans).By selling of assets it is realized the cash equivalent that is expressed by the spot price of goods in some of the state economic system. Further more, we assume that the profit from the realization of assets j is nonnegative, i.e. $A^j \geq 0, \forall j \in J$, and that there is perfect competition on the market of assets, whereby for the individual as the owner of the funds, the price of assets is determined on the market.

Let b_j^h represents the amount of money that is offered by the consumers h for the purchase j that is placed on the market of assets. Next, let q_j^h be a proceeds from the sale of asset j that has made the consumer h. Let b_j^b represents the amount of money that is offered by the b bank for the purchase of asset j that is placed on the market funds. Next, let q_j^b be a proceeds from the sale of asset j that has made the bank b. Then, for the asset j , the portfolio of asset is

$$\theta_j = \frac{\sum_{h \in H} b_j^h + \sum_{b \in B} b_j^b}{\sum_{h \in H} q_j^h + \sum_{b \in B} q_j^b} \qquad (2.4)$$

which represents the equilibrium price of asset j for each $j \in J, h \in H, b \in B$.

The scope of business activities on the market funds effect on the overall liquidity of the economic system, as on the other side the liquidity effects on the price of assets. Also, by the monetary policy measures, such as selling or buying of government securities (bonds) on the open market, the Central Bank acts on the money supply and interest rates, and thereby it acts on the functioning of economic systems. In this model, we look at money as the conditioned medium of exchange, i.e. by all goods we are traded for money and also all the activities in the markets of assets shall be made exclusively in cash. In further analysis we assume the theoretical views given by John G. Gurley and Edward S. Shaw[4]. We consider a simple economic system which is closed and consists of three sectors: households, firms and governments. The economic system there is **fiat money**[5] as a widely accepted means of payment, and in doing so the Central Bank and the government (monetary authority) has a monopoly on the issue of funding.

In this example, given in the table 2.1, households have financial wealth in the form of money as cash (money is not real wealth), equity in an enterprise, and bonds issued by companies. Here, households have no obligation, so their net worth is equal to the sum of the amounts of their resources. Assets that are owned by the company consist of money (cash) and real capital. Enterprise funds are financed partly by issuing bonds, and partly by issuing shares. The company is liable to holders bonds, and stocks. Net capital of company has a value of zero.

The monetary authority (Central bank / government) has no real assets, but once in the past it broadcasted funding in the form of fiat (paper) money, and from the accounting point of view issued paper money represents liabilities on the balance of the monetary authority.

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[4] See the paper [23]

[5] Fiat money - controlled paper money (and / or) coins in an economic system (of state) represents the legal tender, with its own has no value, i.e., paper fiat money is based only on the trust of one state. In case of loss of confidence in the economic system, paper money loses its value, i.e. holding reserves of controlled money, in a case of hyperinflation, creates a risk of being worthless paper-fiat money.

In Table 2.1 we give the hypothetical sectorial balance sheets

households			
Means		Passive - debts	
money (cash)	100		
bonds	50		
equity	300		
		net worth	450

monetary authority			
Means		Passive - debts	
		money (cash)	250
		net worth	-250

firms			
Means		Passive – debts	
money (cash)	150	issued bonds	50
real-phisical capital	200	issued shares	300
		net worth	0

Table 2.1

The following table (Table 2.2) presents the consolidated balance sheet of the private sector (households and enterprises).

private sector			
Means		Passive – debts	
money (cash)	250		
Real - phisical capital	200		
		net worth	450

monetary authority			
Means		Passive – debts	
		money (cash)	250
		net worth	-250

Table 2.2

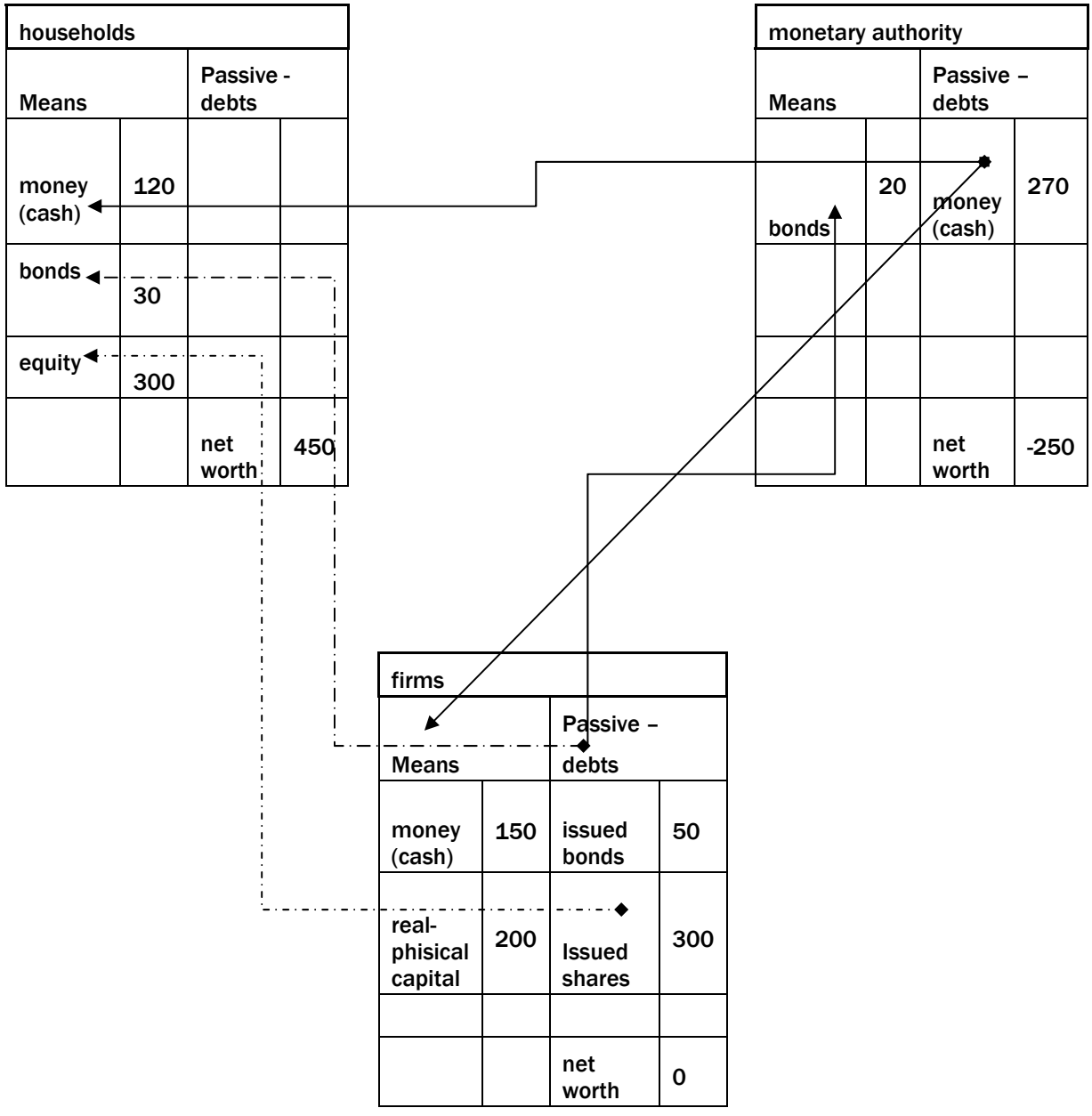

Table 2.3

The bonds in this example are the debtor and creditor relations within the private sector, between the company and / or households. By this the assets and liabilities are balanced, i.e. it is said to be zero. Assets remaining in the balance are the real capital and real money (cash).Money was broadcasted by the monetary authority (Central bank) and can be viewed as a demand from the private sector to the Central Bank. We view these demands, from the private sector to the central bank, as exogenous requirements, and these funds are called exogenous money[6].Our fur-

[6]Exogenous money here we observed as the amount of funds that the monetary authority was broadcasted as legal tender, although there is no intrinsic value and it is not supported by real reserves. Namely the exogenous money refers to the financial reserves that are outside the scope of any degree of responsibility. This type of financial assets can take various forms, such as precious metals or cash in various denominations of foreign currency. With the advent of hyperinflation in the economic system, exogenous money becomes worthless, i.e. the value of exogenous cash is based only on trust in the monetary authority which has broadcasted it.

ther analysis refers to the measures of the Central Bank through the open market operations. Suppose that central bank buys bonds in the amount of 20 monetary units. The results of these changes are given by the balance in the Table 2.3.

If now we compare the results of Table 2.1 and Table 2.3, we see that the central bank bought bonds from households in the amount of 20 monetary units (MU).In addition, the Central Bank liabilities increased by 20 MU. Households continue to dispose of assets in the amount of 450 MU, where now there is a change in the structure of household's portfolio. I.e. the households' portfolio now has 120 MU in money (cash), 30 MU in bonds and 300 MU in the equity. The additional 20 MU in the cash fund (liabilities) of the Central Bank has been created as a result of putting into circulation a new 20 MU. In addition, these 20 MU the Central bank is covered by purchasing securities from the private sector. Therefore, an additional cash balance is based on the internal debts, so these 20 MU represent the endogenous money[7]. If we look at both types of money we can say that it is the same physical object - paper money. But the essential difference between endogenous and exogenous money as an asset consists of different roles in the securities markets. If we look at the economic system that is given by balance in the Table 2.1, it certainly works differently than the economic system that is given by balance in the Table 2.3. Now when it is given a review of what is meant by exogenous and what by endogenous money, in our further analysis the endogenous money we look at like a tool created by the banking sector by issuing loans in the period $t = 0$. Creation of endogenous money partly depends on measures of monetary policy, and also on the settlement of obligations of borrowers to banks. The Central bank buys and sells securities on the "open market". When the Central bank buys securities thereby it increases the reserves of commercial banks and thus it effects on the multiplied expansion of money supply and credit. Commercial banks broadcast loans to borrowers and that is recorded on the assets side as a loan and on the liability side as the increase in demand deposits, because the borrower may use the approved credit (a loan) as the one who has deposited cash and thus earned the right to request to the commercial bank.

We present the balance of commercial banks using the following tables.

COMMERCIAL BANK BALANCE

Assets	Liabilities
Reserves	**Deposits**
Primary	demand
Secondary	time
Loans given to	**Loans**
Companies	from banaks
Population	from Central bank
Banks	capital

Table 2.4

[7]Endogenous money represents the amount of funds that is based on the debtor-creditor relations within the economic system. On one side it is a tool holder, and on the other side it is the obligation of the one who issued it. The net amount of internal money in the economic system is zero. Endogenous money gives the opportunity the financial sector to respond to each situation that arises in the economy.

Commercial bank			
Assets		Liabilities	
money (cash)	100	deposits	100
loans	80		80
total	180		180

party deposited 100 MU

Table 2.4b

In further analysis, we look at the money that passes through three stages in the economic system.

The first phase, through which the money passes in the economic system, is looked at the beginning of period $t = 0$. At this stage, money is the initial wealth of all consumers (agents) and the initial wealth of commercial banks. The consumer $h \in H$ has the initial wealth expressed in cash in the amount m^h, while commercial banks have initial wealth in the form of seed capital in the amount e_s^b.

The initial capital of the bank incurred through the establishment of the bank, where the owners (shareholders) invest a certain capital (the law prescribes a minimum).In addition to equity, the bank receives deposits, where the law stipulates that the bank holds a portion of deposits in reserves in order to preserve its liquidity, and that, in any condition meet the demands of raising the deposit by the depositary. This amount of seed capital of commercial bank is mostly located in bank's vault, and partly on the account at the Central Bank.

The second phase, through which money passes into the economic system, is represented by the mechanisms of the Central Bank in the interbank market. One of the mechanisms of the Central Bank are loans to commercial banks, which are usually made of rediscounting, loans and advances, by which money is injected into the economic system. By rediscounting the Central bank buys securities from the commercial bank, by which the commercial bank comes up to liquidity and fills their reserves and money supply in the economic system is in creased. Further, the Central Bank acts on economic activity in the economic system by the discount policy. Lowering the discount rate the central bank makes loans to commercial banks less expensive and thus it stimulates economic activity. The Central Bank may also affect by the policy of open markets. That is, buying government bonds, the central bank increases the reserves of commercial banks and thus it affects the multiplied expansion of the money supply and credit in the economic system.

The third phase, through which money passes, is looked at when the money supply reduces, i.e. it withdraws from the economic system. By increasing discount rate the Central Bank slows economic activity. By selling government bonds to commercial banks, the Central Bank reduces reserves of commercial banks. Commercial Banks pay bonds in money (cash), so with unchanged rate of reserve requirements, the Central bank effect on the multiplied contraction of money supply and credit. Also, using the settlement of debts by consumers and commercial banks, the money is withdrawn from the economic system.

The issuer $h \in H$ may make deposits to any commercial bank. But, borrowers are associated with some of the commercial banks, which further results in the asymmetry of information that commercial banks have to individual borrowers. This asymmetry of information can cause a variety of interest that commercial banks charge to borrowers. Next, let the borrower h^b borrows the funds μ^{h^b} from the bank $b \in B$, i.e. μ^{h^b} - is the amount of paper money borrowed (the loan amount)by the borrower $h^b \in H^b$ from the bank b.

Next, assuming that all borrowers reimburse (return) the correct amount of credit they owed a commercial bank b, then for each bank we will have

$$1+r^b = \frac{\sum_{h^b \in H^b} \mu^{h^b}}{\bar{m}^b} \tag{2.5}$$

where

$\bar{m}^b$ represents the amount of loans that commercial bank may qualify, and thereby they are dependent on set of capital requirements that are regulated by specific measures of the Central Bank.

r^b is the gross nominal interest rate, i.e. ratio of the nominal value of loans and credit supply, i.e. it represents the nominal interest rate on the placed loans that should provide liquidity and provided premium due to the possible occurrence of insolvency (non-payment) at equilibrium conditions.

Then, assuming that all deposits are returned to all depositors by the commercial bank $b \in B$, we have that

$$1+r_d^b = \frac{\mu_d^b}{\sum_{h \in H} d_b^h} \tag{2.6}$$

where

r_d^b is an interest on invested deposits in the bank $b \in B$

μ_d^b represents an amount of demand deposits by the commercial bank $b \in B$

d_b^h represents a deposit amount that is invested by the custodian $h \in H$ in the bank $b \in B$.

2.3 Management of capital adequacy

Commercial banks manage other people's money and enter into a risk with that money, so it follows that control and regulation of operations of commercial banks are necessary. Control and regulation of commercial banks' business are conducted by the Central Bank. Measures implemented by the Central Bank are related to the granting of licenses to operate, measures relating to the control of interest rates, liquidity control in the form of reserve requirements, control of solvency, expressed as the sufficiency of capital and control of risk dispersion. Therefore, a necessary condition for long-term stability and profitability of each commercial bank is a good asset and liability management of the bank. Good management of the bank can be classified into four groups, namely:

I. Liquidity management, which consists in providing sufficient liquidity in order to settle the obligation in the event of a fall in deposits.

II. Asset management refers to the selection of the most reliable borrowers where the risk of default obligations is minimal, and it refers to the diversification of the portfolio (assets) so, with a given risk the profit is maximized or with a given profit the risk is minimized.

III. Management liability is reduced to minimize the costs of collecting deposits.

IV. Management of capital adequacy represents keeping the size of capital necessary to cover risks due to nonpayment of loans (credit risk), due to reduced value of assets, due to changes in interest rates on deposits (interest rate), due to changes in exchange rates (currency risk), and that thereby the maximum profit is achieved.

Request for capital adequacy is defined by the following expression

$$k_a \le \frac{e_s^b + \sum_{h\in H} \psi_b^h}{\omega_k \cdot \bar{m}^b \cdot \left(1+r^b\right) + \sum_{j\in J} \omega_j \frac{b_j^b}{\theta_j} + \omega_{MB} \cdot d^b \cdot \left(1+\rho\right)} \qquad (2.7)$$

For each $s \in S^*$, and for each $b \in B$

Variable in expression (2.7) are

ω_k - The degree of risk of placing funds through loans

ω_j - The degree of risk of billable resources

ω_{MB} - The degree of risk in the interbank deposit market

ψ_b^h - The amount of their own (joint stock) capital of commercial banks

ρ - The interbank interest rate

e_s^b - The starting (initial) capital of commercial banks (the minimum is prescribed by law)

d^b - The amount of money that is deposited by the bank $b \in B$ on the inter-bank market

Management of capital adequacy is implemented in each time period $t \in T$ and for each bank $b \in B$, at the same, estimates of capital as well the assets with a risk should be conducted in each state $s \in S$ of the economic system. For successful operation it is essential that banks have the capital whose amount is above the minimum capital adequacy, and thereby that amount is different for each bank. Commercial banks we observe in the model because of their role in the transmission of monetary policy, as well as in the role of financial stability of the economic system. The balance of the economic system and the effectiveness of monetary policy depend on the banking sector. The risk that exists in the business of commercial banks has an impact on liquidity and credit expansion, and money supply multiplier depends on the portfolio of the banking sector.

The assumption that there is full (perfect) competition in the banking sector, and there is no market imperfection in capital markets and loans in terms of information. In the event that

happen the loss in business, the bank is forced to pay the expense of capital. The loss of capital causes that a bank can no longer fulfill its obligations and thus becomes insolvent.

The amount of funds invested in the bank $b \in B$ by the lender $h \in H$, the percentage may be given in the expression

$$\text{for each } b \in B, \quad s_b^h = \frac{\psi_b^h}{\sum_{h \in H} \psi_b^h} \tag{2.8}$$

Where

ψ_b^h is the amount of funds invested in the bank $b \in B$ by the lender $h \in H$.

Insolvency can be either strategic or because of funds placed to irresponsible borrowers. Lenders do not make a difference (which is not their responsibility) if the cause of insolvency is because the debtors are not able to perform its contractual obligations or because they do not want (irresponsibility), and if they have the necessary funds. The sentence that follows due to the occurrence of insolvency is proportional to the degree (level) of insolvency. The purpose of punishment is to specify (forced) the debtors to perform their obligations, or to deter them from making promises about the performance of their obligations in the future.

The nominal value of debt of the borrower h which causes insolvency in the credit market can be given by the expression

$$D_{sz}^h = \left(1 - \upsilon_{sz}^h\right) \cdot \mu^{h^b} \tag{2.9}$$

Where

υ_{sz}^h is the rate of debt repayment of the borrower h

μ^{h^b} is the quantity of controlled (paper) money borrowed by the borrower $h^b \in H^b$ (loan) from the bank b.

The nominal value of the b bank debt which causes insolvency resulting market funds and deposit market can be represented by the expression

$$D_{sz}^b = \left(1 - \upsilon_{sz}^b\right) \cdot \mu^b \tag{2.10}$$

Where

υ_{sz}^b is the rate of repayment of b bank debt

μ^b is the quantity of controlled (paper) money borrowed by the bank $b \in B$ (loan) from other banks or from the Central Bank.

The actual functioning of the economic system, the sentence that follows due to the occurrence of insolvency and / or bankruptcy are defined on the nominal value of the debt where it is necessary implement the harmonization with the growth rate in discrete time intervals. In the model we assume that it has been deflation of nominal values, so that the sentences are reduced to realistic amount.

Let for the borrower h, the parameter λ_{sz}^h is the marginal value of lost benefits resulting from the appearance of insolvency for each unit of real debt in the state s.Then, the payments by

the borrower h to investors and to commercial banks in each state $s \in S^*$, are given in the expression

$$\Pi_s^h = u_s^h(c) - \sum_{z \in Z} \lambda_{sz}^h \cdot D_{sz}^h \qquad (2.11)$$

Let for bank b

the parameter λ_{sz}^b represents the bankruptcy punishment, i.e. marginal value of lost benefits resulting from the appearance of insolvency for each unit of real debt in the state s, then the payments by the bank b to investors, to other commercial banks and to the central bank in each state $s \in S^*$, are given in the expression

$$\Pi_s^b = u_s^b(m) - \sum_{z \in Z} \lambda_{sz}^b \cdot D_{sz}^b \qquad (2.12)$$

The requirements for capital adequacy are not seen as constraints in the optimization of operations of commercial bank, i.e. these requirements only represent the possibility for the existence of penalties if a bank fails to comply with certain rules. If the marginal value of lost benefits, resulting from the appearance of insolvency λ_{sz}^b, sought to infinity, then the commercial bank would never violate the capital adequacy ratio. The occurrence of insolvency and seeking the steady state were first presented by Shubik and Wilson[8] in 1997.

But, instead of conducting open market operations and that market mechanisms determine the equilibrium interbank interest rate, there is an option (which is actually a common practice of conducting monetary policy) that the Central Bank determines the interest on borrowing and lending funds of commercial banks. It follows that the Central Bank has one degree of freedom and can choose from two options for implementing the monetary policy.

3. Defining the equilibrium of the economic system

Budget set Q^h of the consumer $h \in H$ for each $l \in L$ and for each $s \in S$, can be defined by the term:

$$Q^h = \left\{ c \in C \left| \begin{array}{l} c_{sl}^h \le e_{sl}^h, \\ \sum_{j \in J} b_j^h + \sum_{b \in B} \psi_b^h + \sum_{l \in L} b_{0l}^h + \sum_{b \in B} d_b^h \le \left(\frac{\mu^{h^b}}{1 + r^b} \right) + \sum_{j \in J} \theta_j q_j^h + m_0^h \end{array} \right. \right\}, \qquad (3.1)$$

where the consumption of goods is smaller or equal to the wealth expressed in goods with which the consumer has, at the same amounts of funds invested in bank shares, purchase of assets, purchase of goods and amounts of funds invested in the form of deposits are smaller or equal to the total available funds, which are composed of borrowed money, the paid realization (sale) of assets and initial monetary wealth.

Budget set Q^b of the bank $b \in B$ for each $s \in S$, can be defined by the term:

[8] See the paper [32]

$$Q^b = \left\{ m \in M_b \left| d^b + \bar{m}^b + \sum_{j \in J} b_j^b \le \sum_{h \in H} \psi_b^h + e_s^b + \frac{\mu^b}{(1+\rho)} + \sum_{j \in J} \theta_j q_j^b + \sum_{h \in H} d_b^h \right. \right\}, \qquad (3.2)$$

where amounts of funds invested in the form of deposits in the interbank market, placed loans and the amount of funds invested in the purchase of assets is less or equal to the total available funds consisting of the share capital, initial capital, the amount of borrowed funds in the interbank market, the charged realization from the sale of assets and the amount of the deposits.

In the previous elaboration of model of the economic system we looked at the private sector, commercial banks and Central Bank. In addition, we introduced the assumption that there is a likelihood of insolvency in the economic system. As in the previous part of the paper formally defined the model of economic system, we can now define the monetary equilibrium of the economic system with the possibility of the appearance of insolvency.

Definition 3.1 Monetary equilibrium of the economic system with the structure of assets, money and state of uncertainty

$$E = \left\{ \left(c^h, u^h, e^h, m^h \right)_{h \in H}, \left(u^b, e^b, m^b \right)_{b \in B}, V, M^{CB}, \mu^{CB}, m^{CB}, k, \lambda, \omega \right\}$$

where every consumer h and every bank b optimizes its functions over the given budget meetings. i.e.

$$\arg\max_{c \in D^h} u^h(c)$$

$$\arg\max_{m \in D^b} u^b(m),$$

exists if and only if there is:

I. goods market equilibrium for all the conditions of nature of economic system $s \in S_0$

$$\begin{aligned} \sum_{h \in H} \bar{c}^h(0) &= \sum_{h \in H} e^h(0) \\ \sum_{h \in H} \bar{c}^h(1) &= \sum_{h \in H} e^h(1) \\ &\vdots \\ \sum_{h \in H} \bar{c}^h(S) &= \sum_{h \in H} e^h(S) \end{aligned} \quad ;$$

II. equilibrium portfolio of assets

$$\text{for each } j \in J,\ \theta_j = \frac{\sum_{h \in H} b_j^h + \sum_{b \in B} b_j^b}{\sum_{h \in H} q_j^h + \sum_{b \in B} q_j^b}, \text{ where } \sum_{j \in j} \theta_j = 0$$

III. $$p(0) \sum_{h \in H} e^h(0) = \sum_{h \in H} m^h(0), \quad \forall s, \quad p(s) \sum_{h \in H} e^h(s) = \sum_{h \in H} m^h(s)$$

IV. equilibrium nominal interest on placed loans

$$\text{for each } b \in B \text{ and } h^b \in H^b,\ 1+r^b = \frac{\sum_{h^b \in H^b} \mu^{h^b}}{\bar{m}^b};$$

V. equilibrium nominal interest rate on invested deposits

$$\text{for each } b \in B \text{ and } h \in H,\ 1+r_d^b = \frac{\mu_d^b}{\sum_{h \in H} d_b^h};$$

VI. sum of the percentage invested assets

$$\text{for each } b \in B,\ \sum_{h \in H} s_b^h = 1;$$

VII. equilibrium portfolio of bank

$$\text{for each } b \in B, \text{ and } s \in S,\ \theta_s^b = \frac{\sum_{h \in H} b_{sb}^h}{\sum_{h \in H} s_{sb}^h V^b}, \text{ where } \sum_{s \in S} \theta_s^b = 0;$$

VIII. equilibrium conditions in the market means

for each $s \in S$, and $j \in J$,

$$R_{sj} = \left\{ \begin{array}{l} if \quad \sum_{h \in H \cup B} \left(q_j^h V^j \right) > 0, \ then, \ \frac{\sum_{h \in H \cup B} \left(\upsilon_{sj}^h q_j^h V^j \right)}{\sum_{h \in H \cup B} \left(q_j^h V^j \right)}, \\ if \quad \sum_{h \in H \cup B} \left(q_j^h V^j \right) = 0, \ then \, arbitrary \end{array} \right\}$$

IX. equilibrium conditions in the deposit markets, in the credit markets and in the interbank market

for each $s \in S$,

$$\bar{R}_s = \left\{ \begin{array}{l} if \quad \sum_{h \in H \cup B} \left(\mu^{h^b}, \left(d^{h^b} \cdot (1+r^b) \right), \left(d^b \cdot (1+\rho) \right), \mu^b \right) > 0, \\ then, \frac{\sum_{h \in H \cup B} \left(\bar{\upsilon}_s \left(\mu^{h^b}, \left(d^{h^b} \cdot (1+r^b) \right), \left(d^b \cdot (1+\rho) \right), \mu^b \right) \right)}{\sum_{h \in H \cup B} \left(\mu^{h^b}, \left(d^{h^b} \cdot (1+r^b) \right), \left(d^b \cdot (1+\rho) \right), \mu^b \right)} \\ if \quad \sum_{h \in H \cup B} \left(\mu^{h^b}, \left(d^{h^b} \cdot (1+r^b) \right), \left(d^b \cdot (1+\rho) \right), \mu^b \right) = 0, \\ then \, arbitrary \end{array} \right\}$$

Suppose there is a monetary equilibrium of the economic system that is given by definition 3.1, in this appearance of insolvency and financial instability of the economic system is manifested as an equilibrium phenomenon. The occurrence of insolvency and financial instability has adverse consequences for the economic system that requires regulatory intervention and active management of crisis situations. If we analyze the monetary equilibriums in the definition (3.1) given by conditions (VIII) and (IX), it is evident that the expected values of assets loans and depo-

sits are equal to the actual values of the equilibrium state of the economic system. But in situations when markets are inactive (no trade), i.e., when

$\sum_{h\in H\cup B}\left(q_j^h V^j\right)=0$ and $\sum_{h\in H\cup B}\left(\mu^{h^b},\left(d^{h^b}\cdot\left(1+r^b\right)\right),\left(d^b\cdot\left(1+\rho\right)\right),\mu^b\right)=0$, then the values are determined arbitrarily. This situation occurs when interest rates are extremely high, which causes that there is no demand for loans. So, this is a situation where the marginal costs of borrowing are greater than the marginal benefit of extra spending.

The emergence of arbitration in situations where markets are inactive cannot represent the equilibrium portfolio. Ross[9] (1976) proved that for equilibrium between economic systems require the existence of arbitrage portfolios. Overcoming this problem first was presented by Dubey and Shubik[10] in the way they introduced the external agent whose task is to provide market funds and loans with a minimum amount of $\varepsilon\to 0$, and thereby is guaranteed never to abolish contractual obligations. This external agent can be government or formed deposit insurance agency that will provide the functioning of the market by minimal intervention, which should prevent the discontinuity of the expected results. In order to prevent the occurrence of inactive markets, in given conditions (VIII) and (IX) it is introduced the hypothesis that excludes the possibility of occurrence of the collapse of the market.

Hypothesis 3.2 Inactive markets[11].When the credit markets and asset markets are inactive, i.e. if the supply of funds, loans and deposits are equal to zero, it is necessary to ensure that the delivery proper values are equal to value of one.

Hypothesis 3.2, introduced in the economic system, is sufficient to provide the benefits of trade, and that is that for each state of the economic system $s\in S$, the initial wealth of consumers and banks $\left(m^h,e^b\right)_{h,b\in H\cup B}$ allows at least δ_s gain from trade in a state s where

$$\delta_s=\frac{\sum_{h\in H}m_s^h+\sum_{b\in B}e_s^b}{M^{CB}} \tag{3.3}$$

By the following theorem we claim that the appearance of insolvency and financial instability does not violate the existence of equilibrium of the economic system.

Theorem 3.3 [see the paper [36]] Economic system with the structure of assets, cash and the state of uncertainty

$$E=\left\{\left(c^h,u^h,e^h,m^h\right)_{h\in H},\left(u^b,e^b,m^b\right)_{b\in B},V,M^{CB},\mu^{CB},m^{CB},k,\lambda,\omega\right\}$$

Where, every consumer h and every bank b optimizes its own functions over the given budget sets, i.e.

$$\arg\max_{c\in D^h}u^h\left(c\right)$$
$$\arg\max_{m\in D^b}u^b\left(m\right)$$

If

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[9] See the paper [31]
[10] Dubey, P and Shubik, M (1978), 'The non-cooperative equilibrium of a closed trading economy with market supply and bidding strategies', Journal of Economics Theory, Vol. 17, pp. 1-20.
[11] See the paper [36]

1. the hypothesis3.2 of the usefulness of trade of inactive markets is sustainable;
2. $M^{CB} > 0$;
3. for each $s \in S^*$ *is* $\sum_{h \in H} m_s^h + \sum_{b \in B} e_s^b > 0$;
4. $\lambda \geq 0$, for each $h \in H$, and for each $b \in B$;

Then there is a balance of economic system E.

The lack of monetary equilibrium of the economic system, given by the definition 3.1, occurs when a significant number of economic entities (non-banking sector) and commercial banks is financially unstable (insolvent), i.e. leads to failure to pay due debts. Due outstanding liabilities results in significantly reducing the overall profitability of the banking sector, which further causes a crisis of the banking sector.

The formal definition of financial instability is:

Definition 3.4[12] Monetary equilibrium of the economic system with the structure of assets, cash and the state of uncertainty

$$E = \left\{ \left(c^h, u^h, e^h, m^h \right)_{h \in H}, \left(u^b, e^b, m^b \right)_{b \in B}, V, M^{CB}, \mu^{CB}, m^{CB}, k, \lambda, \omega \right\}$$

Where, every consumer h and every bank b optimizes its own functions over the given budget sets, i.e.

$$\arg\max_{c \in D^h} u^h(c)$$

$$\arg\max_{m \in D^b} u^b(m)$$

is disrupted, i.e. system is financial unstable for any state s when:

for each $s \in S^*$

1. $$\sum_{h \in H} D_{sz}^h \geq \sum_{h \in H} \bar{D}^h$$
$$\sum_{b \in B} D_{sz}^b \geq \sum_{b \in B} \bar{D}^b$$
2. $$\sum_{b \in B} \Pi_s^b \leq \sum_{b \in B} \bar{\Pi}^b$$

By the Definition 3.4., it is given at the same time increase in insolvency above the threshold that causes instability of the economic system and reduces the overall profitability of the banking sector in relation to the sum of the average profitability. Increase in insolvency itself is a greater risk, which remains a burden on the financial sector in the economic system. On the other hand there is a decrease of profitability which results in the beginning of the recession in the real sector of the economic system.

[12] See the paper [36]

4. Conclusion

Since in the economic system there is the heterogeneity of economic agents, then the balance of economic system does not depend on the aggregate results but from achieved results distributed across all economic agents. States of imbalance of the economic system can be analyzed by multiple flows that cause it. If there is an increase in commissions and other hidden costs of banks then increase in interest arises as a negative effect, which causes further increase in insolvency of borrowers, and thus the insolvency of other sectors of the economic system. Outstanding liabilities of borrowers towards banks still can have the effect that commercial banks do not settle their liabilities in the interbank market, and what is connected to the markets of funds through the non-settlement of received obligations. Commodity markets become imbalanced or through inventory reduction (lower supply of goods) or by reducing demand. The result of this chain of instability is reflected in a reduced liquidity of the economic system. Reduced liquidity has resulted in reduced revenue or increase in expenditures of lenders. All of this, generally speaking, induced reduction of the achieved level of welfare of economic system. To break this chain of financial instability, it is possible to make an urgent intervention to increase liquidity in order to neutralize the reduction in value of loan repayments to commercial banks, as well as actions that should be undertaken in the interbank market by increasing liquidity. Also, the financial instability of the economic system can start by reducing the capital value of the banking sector on the secondary market. The decreased efficiency of the banking sector is transferred to the incomes of investor, i.e. the distribution of profits of investor is determined by participation in the ownership of which is specified in the secondary (banking) capital market. Reduction of loan repayment and funds leads to a reduction in anticipated profitability of the banking sector, which results in reduction of the value of shares (reducing the value of shares owned by banks) of banking capital. Reduced capital value of the banking sector further can be reflected through adverse effects on the markets of funds.

By the monetary policy measures it is possible to try to overcome the caused situations of the financial instability of the economic system. In fact, if you are trying to overcome the financial instability of the monetary policy measures, but without effect on the real sector of the economic system, then as a result we can have an extra increased liquidity in some market of goods and resources. Further, if the amount of exogenous money increases in the system, then to achieve the equilibrium of the economic system it is reflected by the increase in prices, which further results in the mutual convergence of growth of exogenous money and prices to infinity. Violation of proportional relationships between exogenous and endogenous money (exogenous money increased), then the equilibrium of the economic system is unsustainable, and the result is hyperinflation and the collapse of the economic system. As an example of the collapse of economic system, we give an example of impaired relations between exogenous and endogenous money through the transmission of fiat (paper) money without being provided confidence in the money in the economic system of the Federal Republic of Yugoslavia in the period 1992 - 1994. The monetary authority has a duty to support fiat (paper) money in the economic system in order to provide confidence in that money and that fiat money is accepted as the final form of debt repayment. With the guarantee provided by the monetary authority is given a positive signal to investors because by this is ensured that the benefits are greater than interest losses. Interest can be considered as a type of tax imposed by the state authorities in order to ensure confidence in the system that provides asset markets and goods markets.

Attempts to overcome financial instability by the expansionary monetary policy measures in order to increase liquidity may lead to adverse effects. Namely, the starting point is that if interest rates are sufficiently low, than investors can expect their growth in the future, so they will not be interested in investing in the funds (for example, they will not buy bonds), because they expect drop in prices of assets. Investors are further borrowing (it is implemented monetary policy expansion) for speculative purposes, with no impact on commodity prices. Dubey and Geanoko-

plos[13] infer that in the general economic equilibrium model with incomplete asset market, when the benefits are made by the monetary policy measures, then the prices of commodities (commodity markets) are not changed since the extra liquidity is directed to the markets resources. The cons example of the allegations which gave Hart[14] indicated that this option is not valid in general, i.e. it is realized only in the equilibrium state of the funds, and at the same the commodity markets are not in the equilibrium state.

One of the measures of the Central Bank to overcome financial instability may be the elimination of requirements for capital adequacy. Since there are no requirements for capital adequacy, commercial banks increase their credit activity and thus the risk assets. Here are the negative effects occurring in the interbank market and still they are spreading on the markets funds through investing in the markets funds by banks. In this situation, banks are likely to buy funds in the markets of funds with zero risk level (government bonds).Preventing the spread of negative impacts on markets funds can be achieved through the introduction of some form of positive risk that applies to all funds. The second situation assumes that commercial banks must meet capital adequacy requirement. Then the negative effects can be present through excessive activity in capital markets of banks (stock market).Due to the expansion of monetary policy, commercial banks expand their credit markets and during such expansion they spend primary (core) capital of the bank. It is also possible that consumers in anticipation of higher liquidation value of commercial banks can execute the restructuring of their portfolios in secondary markets, thus it have not been overcome the negative effects of financial instability.

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