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ROLE OF THE MONETARY TRANSMISSION MECHANISM EFFICIENCY IN THE PROCESS OF FIGHTING AGAINST CRISES IN ECONOMY

Анотація: *досліджено структуру монетарного трансмісійного механізму, основний внесок в розробку якого здійснили кейнсіанці. У статті доповнено теоретичні напрацювання щодо сутності, особливостей дії трансмісійного механізму в Україні та побудовано модель векторної авторегресії для аналізу його ефективності в процесі подолання кризових явищ в нашій державі.*

Resume: *this article is devoted to the research of the monetary transmission mechanism structure, formulated by Keynesians. There was supplemented some theoretical material about that mechanism essence and the peculiarities of its action in Ukraine. The vector autoregressive model was constructed to analyze the monetary transmission mechanism efficiency in fighting against the crisis in our country.*

Key words: monetary policy, the efficiency of monetary transmission mechanism, transmission channels.

The relevance of investigation. During the global crisis, erupted in the USA in summer 2007, the governments of many countries returned to applying Keynes' principles of macro-economic regulation, intensified to use the fiscal and monetary measures. Monetary policy is a flexible instrument of indirect economic regulation, whose efficiency depends on the accuracy and velocity of monetary impulses conveyance through the transmission mechanism. Therefore, it is important to analyze the effectiveness of monetary transmission mechanism in Ukraine in the process of fighting the world financial crisis.

The analysis of previous studies. The researches by J. M. Keynes [1], F. Modigliani [2], B. Bernanke, M. Gerlter [3], J. Tobin [4], J. Stiglitz [5], F. Mishkin [6] have tried to shed light on the complex interactions underlying the monetary transmission mechanism. Other scientists (T. Unkovska, N. Pohorelenko, T. Slipchenko, S. Moisyeyev) focus their attention on its theoretical aspects and functioning peculiarities in advanced and emerging countries. The representatives of the National Bank of Ukraine – V. Stelmach, V. Mishchenko, A. Somik, A. Petryk – are more interested in practical research of the monetary transmission mechanism action in Ukraine, but these investigations belong to the period before the global financial crisis.

Goals of research: the generalization of scientists' points of view on the structure of transmission monetary mechanism; research its peculiarities in Ukraine and make an econometric analysis of this mechanism efficiency in our country in the period of the world financial crisis.

Economy is a complex dynamic system, in which from time to time crises erupt. R. Harrod, the representative of neo-Keynesian theory, considered that economy was characterized with internal instability and it balanced on a "knife-blade". His like-minded person, A. N. Hansen

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also underlined that a cyclic development of economy was not pathology. That was a peculiarity of dynamic system [7, p.14]. Therefore, the analysis of antirecession regulation becomes a very important and urgent problem. In the period of Great Depression, J. M. Keynes proposed to apply monetary measures in the system of antirecession policy. However, the economist paid much attention to fiscal instruments for fighting against crises.

Nowadays, monetary policy is a significant instrument for achieving macroeconomic stabilization in advanced and many emerging countries. This fact causes a considerable interest to research the transmission of monetary impulses to the real economy.

The first conception of the monetary transmission mechanism was formulated by J. M. Keynes. He explained that mechanism as the system of variables, through which money supply influenced on an economic activity. The fundamental contribution to research the theoretical basis of the monetary transmission mechanism was made by Keynesians.

J. Tobin underlined that the study of transmission mechanism was a substantial task of monetary policy. The exploration of this mechanism and its channels contributes to make a perfect macroeconomic forecast and raise the monetary decisions effectiveness.

Nowadays, the interpretation of the monetary transmission mechanism is differ from the classical Keynesian definition. So, up-to-date explication of this mechanism is defined as the complex of channels, which provides the transmission of monetary policy impulses from the central bank to the economy. [8, p.205], [9, p.38], [10], [11], [12, p.6]. The main goal of the monetary transmission mechanism, according to O. Ovchinnikova, is the cash saturation of domestic demand [13, p. 6]. In our opinion, the key function of this mechanism is to transmit rapidly and correctly monetary impulses to the real sector of economy through the financial market. So, monetary policy indirectly regulates the aggregate demand, in accordance with the phase of business cycle.

In view of the fact, that monetary mechanism is a system of monetary regulation, the monetary transmission mechanism can be explained as a system of monetary impulses transmission through some channels. We assume that the monetary transmission mechanism is a subsystem in the structure of monetary mechanism. It expresses influence of managing system (central bank) to managed one (financial market). The presentation of the monetary transmission mechanism role in structure of the monetary mechanism is in Chart 1.
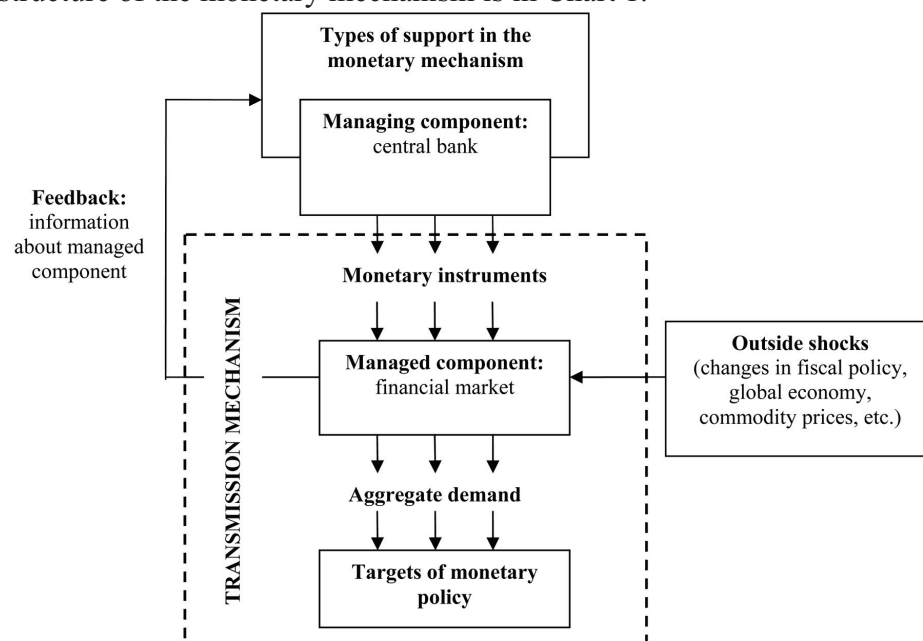

Chart 1 Role of the transmission mechanism in the structure of the monetary one

Monetary policy is always dependent on the nature, size and duration of the shocks hitting the economy. It is a permanent challenge for the central bank to understand which factors are driving price trends in order to find the appropriate monetary policy reaction.

The transmission mechanism is the link between the financial and real sectors of economy. Financial market, the object of direct influence of monetary policy, is characterized by level of interest rates. It is an important factor of investment and consumption process that forms the aggregate demand - the central point in Keynesian theory.

Indirect monetary policy influence on the real sector of economy determines some stages of monetary impulses transmission (chart 2).
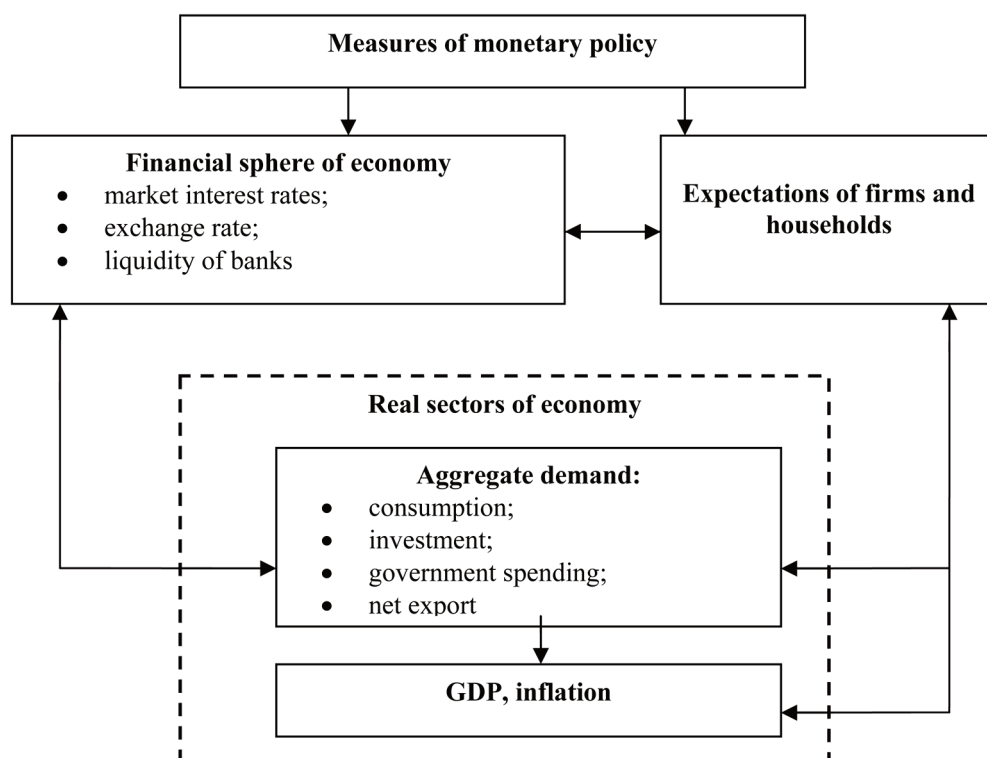
Chart 2 Stages of monetary impulses transmission to the real sector of economy

Analyzing the influence of monetary regulation, we can observe the active role of expectations of the future evolution which impact on the effectiveness of fiscal and monetary policy, in general. Furthermore, J. M. Keynes said that in a dynamic economic system the changing expectations of firms and households could affect the current economic situation [1]. Needless to say, that dynamic state of economy with fluctuated expectations is very dangerous for macroeconomic equilibrium and prevention economic shocks [14, 21]. Thus, expectations of economic entities are essential in investigation of the transmission mechanism action.

Summarizing scientists' points of view the on the nature of the monetary transmission mechanism, we marked out the main channels in its structure. There is interest rate channel (substitution-effect-in consumption channel, income channel), equity price channel (wealth channel, stock price channel, house price channel), lending channel (narrow lending channel, balance-sheet channel or broad lending channel, cash flow channel), exchange rate channel and expectations channel.

It is worth pointing out that imaginary splitting the channels in the structure of transmission mechanism is used for analysis and economic simulation. All channels are interrelated. For instance, interest rate channel influences on equity price and lending channels. Two previous ones are deeply interlaced in countries with high developed financial market. This point can be con-

sidered using US data. In the USA after the period of securitization's expansion and issue of derivatives, slump of securities' prices caused the global crisis in 2007.

In emerging countries undeveloped financial market weakens monetary policy impulses and, sometimes, blocks their transmission to the real sector of economy. The situation in 1996-1998 years in the countries-members of the CIS (Commonwealth of Independent States) is the example of the monetary signals' ineffectiveness. That was the period of wide gap of interest rates in financial market and real sector of economy, where non-payments and barter prevailed.

During the global crisis, erupted in the USA in summer 2007, the governments of many countries returned to applying Keynes' principles of economic regulation.

The frequency of discount rate changes shows the topical character of monetary policy. Since July 2007 the Fed has changed the discount rate 12 times. It was reduced by 5,75 percentage points (p.p.) to 0,75%. Since August 2007 the discount rate of the European Central Bank has been lowered 7 times from 4,25% to 1%. Since August 2007 the Bank of England has diminished its discount rate 10 times to 0,5%.

In order to analyze the efficiency of the interest rate channel action, it is necessary to research inflation, which has been kept at low levels, and growth rate of GDP. Since the end of 2007 GDP has been increasing in the USA. Since the last quarter of 2009 GDP has increased in the euro area and Great Britain. That connected with the "long-term unsteady" lag of monetary influence on the real economy. As M. Friedman and A. Schwartz noticed, that lag was equal to 16 months, in average. In addition, J. Stiglitz and P. R. Krugman prediction means the following lowering of GDP growth rate in the USA. According to the European Commission forecast the similar tendency is expected in the European Union.

The discount rate of the National Bank of Ukraine was reduced on 1 p. p. only in a half-year after the beginning of the crisis in our country. Nowadays it amounts to 10,25%. On the other hand, exchange rate regulation and refinancing operations were implemented intensively. So, the structure of transmission mechanism in Ukraine is set out in simplified, schematic form in Chart 3.
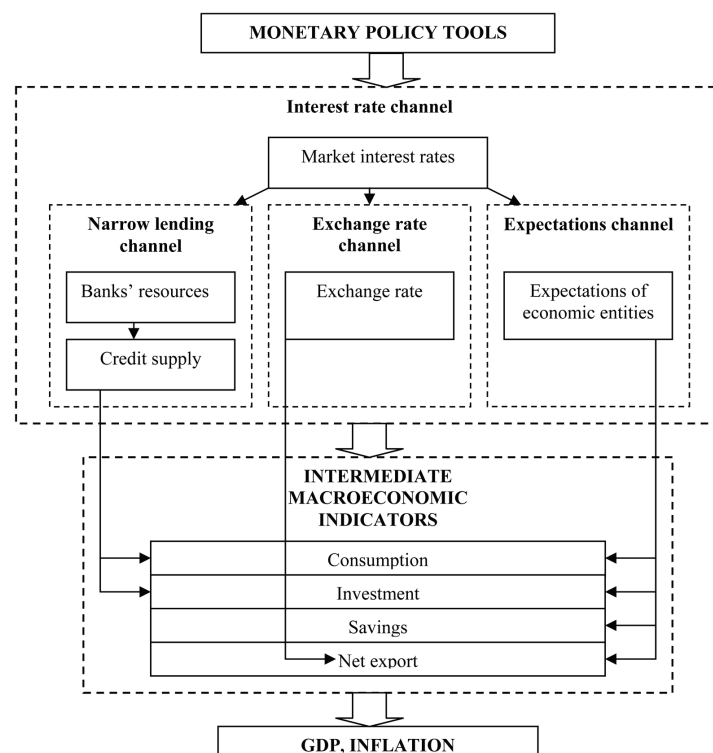

Chart 3 Structure of the monetary transmission mechanism in Ukraine

In our opinion, in Ukraine and other countries the interest rate channel is the fundamental in the monetary transmission mechanism, because the official interest rates of the central bank influence on market interest rates. This impulse applies to other transmission channels. Besides, J. M. Keynes equalized the monetary transmission mechanism with the interest rate channel. Indeed, all transmission channels are the detailing of the interest rate channel.

We propose to analyze the effectiveness of the monetary transmission mechanism through the estimation the accuracy and speed of the monetary impulses' transmission across the interest rate channel. To this end, the vector autoregressive (VAR) model was constructed as a research tool. It allows to estimate the impact of own previous values and other variables' lags on each variable dynamics.

Thus, the following variables were selected to the analyses:
- discount rate as a guide of money resources value;
- average refinancing rate, which is used by the NBU to carry out real operations;
- overnight interest rate, set by banks on short-term loans, at which the largest volume of transactions of interbank market are executed;
- deposit rate, which affects the cost of lending as the price of bank resources attraction;
- interest rate on credits to the real sector of economy as an important factor in regulation of the level of business.
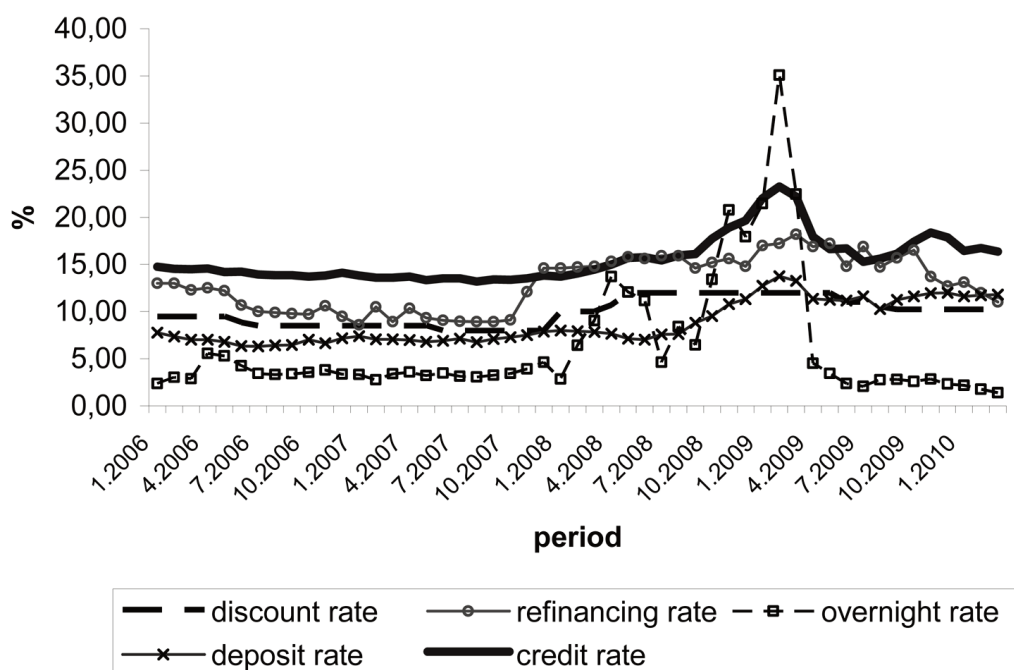
Chart 4 shows the time series of interest rates.

Chart 4 The dynamics of interest rates series in Ukraine from January 2006 to March 2010

The basic requirement to the formation of VAR-models is time series stationarity. According to results of Foster-Stuart test, we make the conclusion about the series stationarity against trend and absence of trend variance, which means permanent dynamics of series.

After that we determine the specification of VAR-model. Because of limited length of the time series, we can construct a VAR-model with maximum lag, which is equal to 7. We analyzed the model quality with different lags and estimated it according to Akaike, Schwarz, Hannan-Quinn information criterions, Final prediction error) (see Table 1).

Table 1 Estimation of VAR-model using different criterias

Lag	Final prediction error	Akaike	Schwarz	Hannan-Quinn
0	188,03	19,43	19,63	19,5
1	0,35	13,14	14,36	13,59
2	0,31	12,96	15,19	13,78
3	0,36	12,99	16,23	14,19
4	0,24	12,33	16,59	13,91
5	0,08	10,8	16,07	12,76
6	0,05	9,54	15,82	11,87
7	0,01*	6,51*	13,81*	9,21*

*Note: the best value of criterias are marked **

Under the information, presented in the Table 1, the model with lag in 7 months is the most adequate. Its structure is below:

$$\begin{cases} Y_{1t} = f(Y_{1t-l}, Y_{2t-l}, Y_{3t-l}, Y_{4t-l}, Y_{5t-l}; u_{1t}) \\ \dots \\ Y_{5t} = f(Y_{5t-l}, Y_{1t-l}, Y_{2t-l}, Y_{3t-l}, Y_{4t-l}; u_{5t}) \end{cases} \qquad (1)$$

$l \in [1;7]$ - lag;

Y_1 - discount rate;

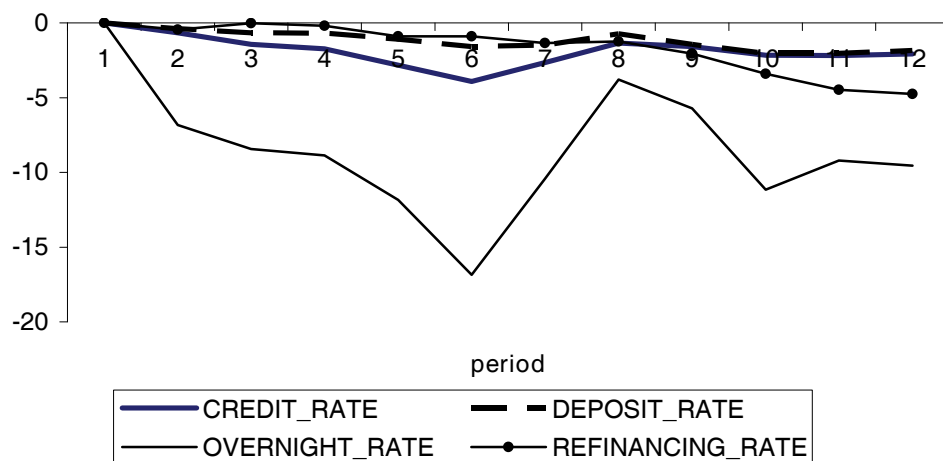Y_2 - average refinancing rate;

Y_3 - overnight interest rate;

Y_4 - deposit rate;

Y_5 - credit rate;

$u_{1t} \dots u_{5t}$ - random variables.

In this research we made the analysis of impulse response of the variables to some shocks. So, using the data of the period covered by the global financial crisis, the response of interest rates to discount rate reducing by 1 p.p. is in Chart 5.

Chart 5 Response of interest rates to discount rate shock

According to the previous chart, we can see that discount rates affect to a large extent the overnight interest rates. During six months the impact of discount rate changing on refinancing rates is weaker than on psychological reaction of credit rates.

In this case, it is also important to analyze, how interest rates depend on the changing of the refinancing rates, used by the National Bank of Ukraine to carry out real operations (see Chart 6).
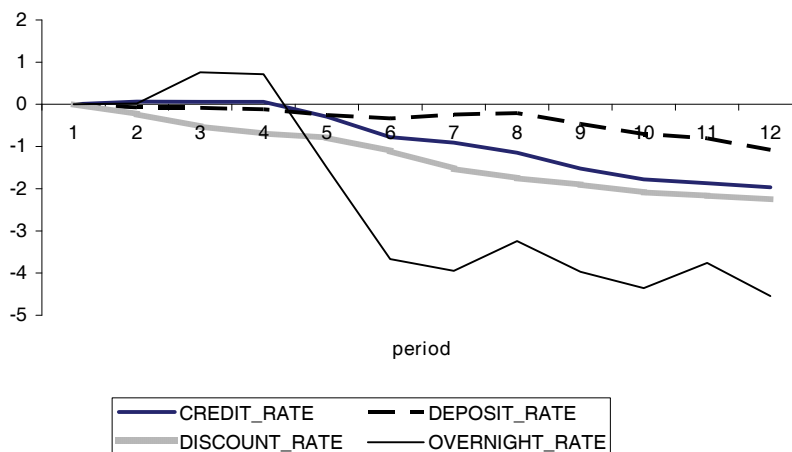

Chart 6 Response of interest rates to refinancing rate shock

Based on data for the period, covered by the financial crisis, the overnight interest rates are the most sensitive to the lowering of refinancing rates by 1 p.p. However, the shock of refinancing rate has small impact on other interest rates. This fact can be explained with some reasons:

- the cost of attracting resources via refinancing operations is significantly higher than resources in the interbank market (see Chart 4);

- the global crisis aggravated the financial situation of economic entities and some borrowers couldn't pay back their loans. That caused overstated credit rates, which became inflexible to the refinancing rates lowering;

- we assume, that substantial share of bank resources, attracted from refinancing operations, was circulated in interbank exchange market. Analizing the finance results of banks in the fourth quarter of 2008, we faced with the fact, that the banks, called "Prominvestbank" and "Nadra", the leaders of attracting resources from the NBU, were the leaders in receiving trade profits in that period too [15]. This profits sizable portion is formed with purchase and sale of foreign currency.

In such situation we decided to assay the impact of overnight interest rates on the other variables (see Chart 7).
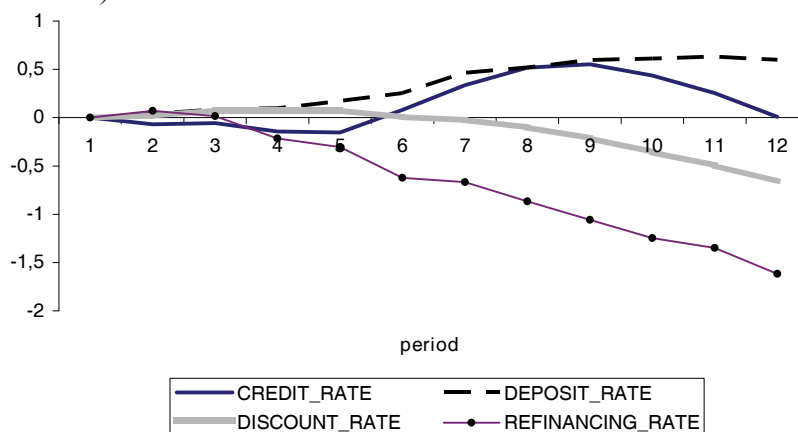

Chart 7 Response of interest rates to overnight rate shock

According to the chart of impulse response, we can say, that during three months the reducing of overnight interest rate by 1 p.p. exerts a minimal influence on the other interest rates.

While impulse response functions trace the effects of a shock of one variable to the other variables in VAR, the variance decomposition provides information about the relative importance of each variable in affecting the others (Chart 8).
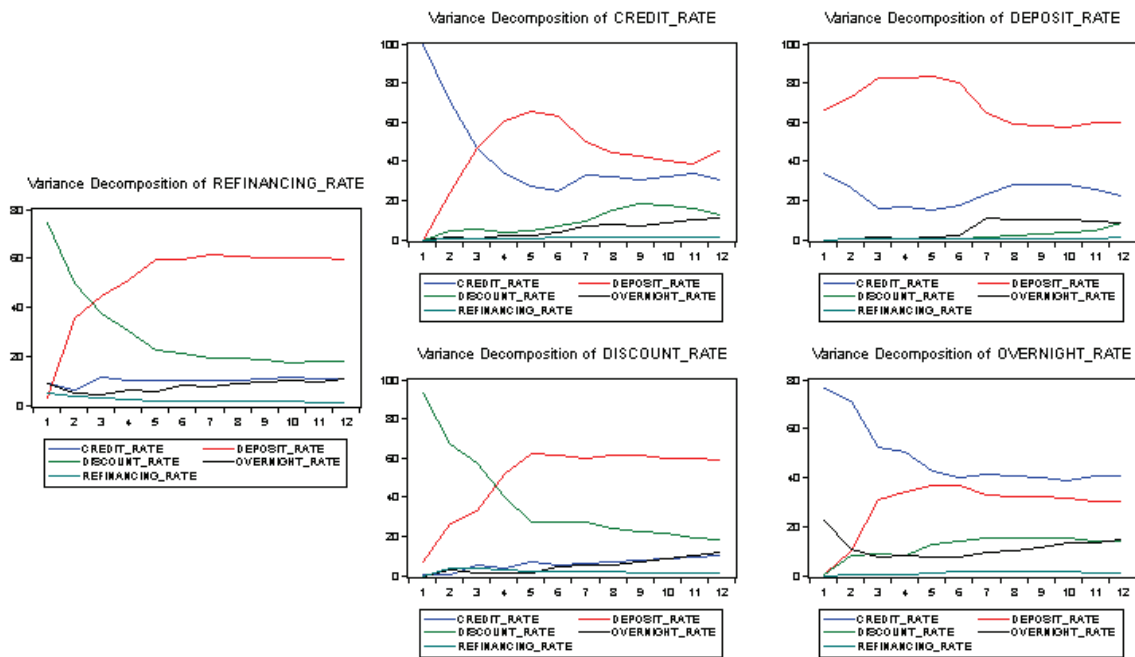

Chart 8 Variance decomposition of the variables

Analyzing the relative indicator - variance decomposition - we notice, that the credit rates values of two previous periods explain more than 90 % of this series dynamics. Among the previous values of other variables, the most significant are the lags of deposit rates, which explain nearly 50% of the fluctuations of credit rates.

The prior values of deposit rates are the most important in their formation. The contribution of credit rates' lags amounts, on average, 30% in dynamics of deposit rates.

According to the variance decomposition, we can say about the feedback between interest rates of real and financial sectors of economy, because the overnight rates mostly depend on the credit and deposit rates.

Speaking about discount and refinancing rates, we can see, that their values of two previous periods declare their dynamics. Besides, the role of deposit rates is essential too. It means that the National Bank of Ukraine takes into account the resources cost for banks from firms and households. In addition, the NBU, establishing their official rates, focuses on the inflation level, the substantial factor of deposit rates determining.

The weakness of interest rate channel in transmission monetary signals can be also explained by the NBU's administrative impact on maintenance of deposit volumes. The real deposit situation in banking system of Ukraine is characterized with unstable dynamics of slow growth. As M. Rothbard said that compulsion in monetary or other fields of human activity provoked conflicts and chaos. Besides, monetary impulses action is neutralized and deformed with expectations of firms and households, especially in Ukraine [16].

Conclusions. During the global crisis, Keynesian conception of active government regulation of economy becomes very important. Monetary policy, combined with fiscal one, is the ir-

replaceable measure. Monetary instruments make smooth impact on the real economy though transmission mechanism, developed by Keynesians. The research of its mechanism is clearly needed, because it influences on the effectiveness of monetary regulation.

Using the VAR-model, constructed with data from January 2006 to March 2010, we make a conclusion, that the interest rate channel is weakly effective in transmission the monetary signals from the official rates of the NBU to the interest rates on credits to the real sector of economy. It can be caused with high level of refinancing rates, high probability of borrows insolvency. Heavy value of credits and their limited supply slows economic growth in our country. It is worth pointing out that GDP of Ukraine has not yet achieved its before-crisis level.

The analyses of Impulse Response and Variance Decomposition functions show that the dynamics of deposit and credit rates are mostly explained with their previous values. Their variation weakly depends on changing in discount, refinancing rates and overnight interest rates of interbank credit market. These results tell us about the severance of interest rates' ties in economic and financial sectors of our country.

Ukrainian executive power should find the ways to form favorable expectations in our society. It is absolutely necessary to stabilize and develop financial sector of economy, which determines the transmission path of monetary impulses. These measures will raise the efficiency of the monetary transmission mechanism and the state policy, in general.

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