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INTEREST RATE AS MAIN DETERMINANTS OF THE ECONOMY

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Abstract. In the context of globalization and post-industrial society the financial sector of economy manages the real sector. And that is why in order to deal with the processes of production and distribution of wealth in society we need to pay much attention to credit and financial system. Banks performs major role in this system, they are a universal institution for provision and flow money into the economy. Without their function any economy cannot exist. The subject of my research is the bank interest. One of the main questions of any economy is what interest rates should be used in lending. Using the teaching of Keynes, Marks, Friedman, Fisher I did a study of economic nature of bank interest. The paper studies how the economic growth depends on level of interest rates, role of bank interest in the formation of inflation, reconsidered Fisher's equation about nominal interest rate. All surveys were conducted on the basis of present economic statistics. On the basis of my research report was made about the level of interest rates on lending that is necessary for economic modernization. The paper presents the methodology for reducing lending interest rates.

Keywords: interest rate, bank interest rate, inflation, Fisher`s equation, the temp of economic development.

Jel classification: E43

1. Introduction

During the evolutionary process of reproduction goods, two sectors of economy became so important. There are financial sector and real sector of economy. The financial sector should serve the real sector, which is involved in the direct creation goods and services for society. However, in the context of globalization and post-industrial society the financial sector gained significant influence over the real economy. The process of globalization has identified practical dependence real sector from the financial sector, direct proof of this is the financial crisis in 2008.

This dependence is realized through a special mechanism, which is a set of forms, methods and tools to influence the economic development of society. These functions are performed by credit-financial system, which is represented by a set of financial intermediaries in the money market.

Banks are leading institutions of financial intermediation. Mainly, credit and financial mechanism of the affect socio-economic development of society is realized through banks. Banks operate on the basis of interest rate. And that is why lending rate is one of the most important financial and credit instruments of influence on the socio-economic development of society.

Thus, the object of my research is banking interest.

In the integral economic system bank interest rate, which reflects the cost of debt capital, affects many macroeconomic processes such as growth, inflation, etc.

Therefore, the purpose of my research is to identify ways of stimulating economic development, and ensuring stability in the integral economic system such a lever of monetary impact as bank interest rate.

There was set following tasks:

1. To investigate the nature of a percent as income's type in the economy.
2. Consider the methodology of how bank interest rates influences on economic growth.
3. Show the role of bank interest in the inflation formation.
4. Perform statistical analysis of correlations between economic development and interest rates in EU.

To perform the tasks we used the following methods: the method of abstraction, economic phenomena, induction and deduction. We used qualitative techniques that helped to define necessary approach, quantitative techniques that made it possible to assess the degree of correlation.

It was explored a model of economic growth Robert Solow for a closed economic system and derived the dependence of the main factors from the banking percent.

Analysis of percent`s economic nature was held through the works of Keynes, Marx, Friedman, Fisher.

2. Economic nature of banking interest rate

By nature income is necessary to analyze as payment for use resources that are offered. Thus, each resource (factor of production) corresponds a particular category of income:

Salary – is paid for work performed;

Entrepreneurial income - is income, operating surplus or mixed income.

Rent – is paid owners of land, natural resources, physical capital that is used. Interest – it's revenues from providing capital to businesses in the form of cash.

Money does not relate to economic resources, but they can borrow to buy or rent the resources used in production. Attracting money capital, entrepreneurs gets the possibility of using real factors of production and receipt income that relates to it. Interest appears separate economic category of income as wages, rents, and profits. In fact, the interest is the price we pay for borrowing a capital.

Accordingly, under the percentage sum is understood that the debtor pays the creditor for a certain period of time without a full or partial repayment of principal in the form of interest or a predetermined amount. Accordingly, under the interest is understood the sum of money, that the debtor pays the creditor for a certain period of time in the form of interest or a predetermined amount of money.

The concept of "interest" includes its manifestation in the form of interest on loans, usury, and other forms. The subject of my work is the lending rate of the economy, which is represented by interest on loans. Loan Interest - the objective economic category, which is a kind of price. Its appearance is due to the presence of commodity-money relations, which in turn is determined by the property relations. Loan Interest appears as the price of loan capital. Its economic nature is determined by productive relations. Karl Marx (2007) called the interest "irrational form of prices".

Loan interest arises under conditions of commodity production on the basis of the credit relationship. It is used in all forms and types of credit. In order to induce the owner of the loan capital to abandon the immediate management of resources, you must reward him for such refusal. Thus, the percentage of a loan makes it possible loan and cannot exist outside of the credit relationship.

Practical expression of the principle under consideration of loan interest is in the establishment of bank interest.

3. Bank interest rate and economic development

Economic development of the country belongs to the most important concepts of macroeconomic research. In the academic literature often use the term "socio-economic development", thus emphasizing the close relationship between the levels of economic development and addressing social problems of the country.

Social and economic development is a process of continuous change of the production's material basis and the whole set of different relations between economic actors, social groups.

3.1. Economic development and economic growth

In the planetary scale occurs a continuous positive development of the economy. It is based on the achievements of science, technological progress, expand their technological application that allows you to update the range of products and services, partially replace scarcity resources to reduce overall production costs, withstand environmental requirements and restrictions that society dictates. All this affects the amount and structure of GDP, and hence the level of aggregate supply.

Under these conditions, aggregate demand becomes more dynamic, and its impulses to production become more palpable. Thus, socio-economic development of long time intervals and scales that exceed one country, is a progressive, progressive process.

Economic growth is considered macroeconomic science as part and one of the most important characteristics of economic development. This concept is associated with quantitative changes in production and consumption of GDP. Economic growth is positive if the actual (comparison) GDP in the analyzed period than its level in the basic year. If it falls to characterize "growth" as a negative.

The concept of "development" and "growth" are together, usually in the ratio: growth in GDP accompanied by changes in technology associated with the emergence of new products and entire industries. In other words, growth causes quailtative changes in the economy, contributes to its overall development. For its part the positive qualitative changes in property relations, distribution and redistribution of income, financial stabilization, actively influence economic growth.

Economic growth is one of the main macroeconomic objectives of any country, which is caused by the need to achieve accelerated growth

of national income compared with the population growth to raise living standards in the country.

The main problem of the theory of economic growth is how to increase capacity or to achieve the increase in potential GDP. Accordingly, economic growth can transmit graphically in two ways:

1) shift to the right line of long-term aggregate supply LRAS from LRAS1 to LRAS2:

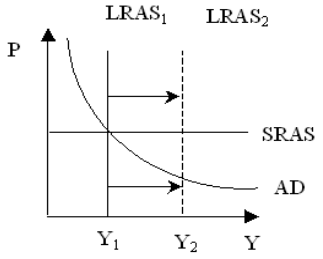

Fig.1. Intersection of supply and demand (Fry 1995)

2) shift to the right frontier of the provisions of AB to the position of CD:

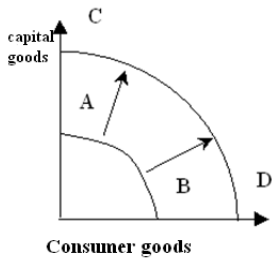

Fig.2. Capital & consumer goods (Fry 1995)

Thus, the process of economic growth reflects the long-term growth of aggregate supply, and this it differs from short-term fluctuations in output under the influence of changes in aggregate demand.

3.2. Model of economic growth by Robert Solow

One of the greatest achievements in the theory of economic growth is the development of Robert Solow's model. The main precondition of economic growth in his model is not the growth of total product, and its amount per employee, i.e. overgrowth productivity.

The main precondition economic growth in his model is not the growth of total product, and its amount per employee, i.e. overgrowth productivity. Labour productivity depends on the size of capital per worker (k), which is the ratio K / L. This dependence is realized on the basis of the production function: y = f (k).

Amount of capital per worker is put in dependence on three factors: capital accumulation, population growth (employees), technical progress.

Solow model algorithm is as follows: certain factors influencing the amount of capital per worker, and productivity, which is an indicator of improving economic growth, depends on amount of capital per worker.

As mentioned three main factors, that affect the amount of capital per worker, are following (Solow 2009):

1. Accumulation of capital;
2. Population growth;
3. Technical progress

Interpretations based on all factors listed in the schedule:

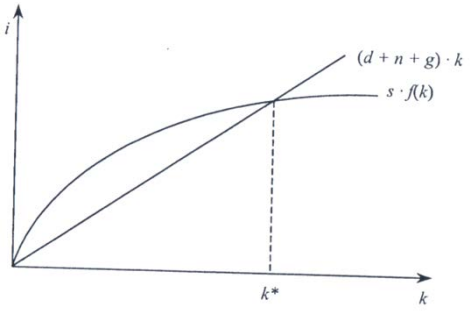

Fig.3. Schedule of capital amount per worker in Solow mode (Solow 2009)

On the horizontal size of the delayed timetable capacity capital of efficient workers ($k = k / L * E$) (1).

On the vertical axis reflected investments (i). Curve $s * f(k)$ (2) is the investment curve, and curve $(d + n + g) * k$ (3) is the marginal investment. Only in k * ensured steady state growth.

3.3. The impact of bank interest

In our opinion, each of the elements that affect the economic development of the country (investment, technological progress, the expansion of its technological application, capital accumulation) is directly or indirectly depending on the level of interest rates, which in practice is expressed through interest on bank lending.

The first factor is the accumulation of capital. Accumulation of capital takes place through a bank by creating deposits. Price of this gained capital (loan capital) is expressed respectively in interest rates on loans. When an entity engages loan capital, he notes that the income from the business that he created on the basis of debt capital would be able to cover the debt and accrued interest. Therefore, the use of these funds depends on

the level of interest rates. This dependence is directly proportional.

The practical expression of this dependence is expressed in quantities use of capital accumulation For example, the ratio of obligations to equity companies in Japan looks like a structure:

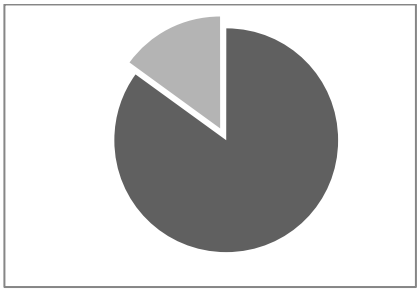

Fig.4. Structure of equity to liabilities in balance sheet of Japan enterprises (Sull 2006)

15 % - equity, 85 % - loan capital.

This is due to very low interest rate on lending (0.5–1 %) in Japan. In Ukraine, where lending rates are within the 25–30 % ratio of equity to liability take the form:

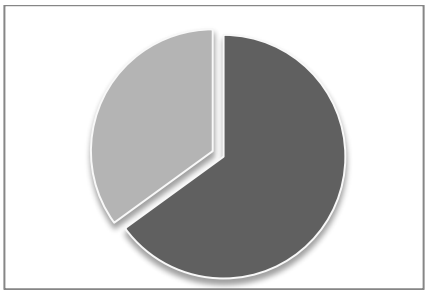

Fig.5. Structure of equity to liabilities in balance sheet of Ukrainian enterprises (Sull 2006)

35 % – loan capital, 65 % – equity.

Accordingly, capitalization and rate of development of Ukrainian enterprises build much lower than Japanese when all other factors remain the same.

The next factor is investment. Dependence of the investment from the interest rate is obvious. The first issue highlighted John Maynard Keynes (born John Maynard Keynes, 1st Baron Keynes). He brought the dependence of the investment level from the interest rates.

Dependence of the investment from the interest rate is showed in the graph schedule. On the horizontal axis of the graph postponed four investment projects whose value is I1, I2, I3, I4, the marginal efficiency of capital which is respectively 20, 18, 12, 8 % on the vertical axis - the interest rate that increases from 5 % to 20 % .

The marginal efficiency of total capital serves upper limit for interest rates, for which the investments are economically viable. It is 20 % and equals to the marginal effectiveness of the first investment project.

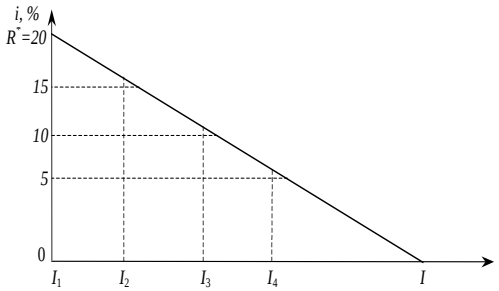

Fig.6. Dependence of investments from interest rate (Keynes 2009)

According to Keynes (from graphics) we can comment as follows: total volume of investments will try to grow as long as there will be more such investment projects, the marginal the effectiveness of which would exceed the interest rate. According to the schedule, if the interest rate is 20 %, the investment demand is zero, since there are no investment projects, the marginal efficiency exceeding such interest rate. When interest rates decrease to 15 %, investments in the first and second projects will be economically viable, the marginal effectiveness of which is respectively 20 % and 18 %, i.e. over 15 %. In this case, investment demand will be $I1 + I2(4)$. Reducing interest rates to 10 % causes an increase in investment demand to $(I1 + I2 + I3)$ (5), and to 5 % according to $(I1 + I2 + I3 + I4)$ (6) (Keynes 2009).

Based on the schedule, we can conclude that the investment demand increases when interest rates decrease. Therefore, investments are reversed depending on the interest rate level which cannot exceed the maximum efficiency of capital.

In practice this means that rational thinking person would compare the profitability of the investment project with the deposit rate at the bank. If the level of profitability (return on investment of the project) will be higher than the interest rate paid on deposits, then the rationally thinking person would use the money as an investment and vice versa, if the rate is above the level of profitability, the money will go into bank deposits.

The dependence of these two factors from the interest rate determines the dependence of technological progress and expansion of its technological application in the real economy from the interest rate. Profitability of the enterprise and its production cycle of goods should be the same in those terms, with which debt capital issued. Otherwise the company cannot pay its obligations.

And so the interest rate, with which lending occurs in the country, will determine the kind of

business, with which the population of the country deals with.

Technologically-production industry (missile, aircraft, automotive, and others) needs a lot of time to start and find the consumer market. The earning capacity of this production is 15–20 % and the production cycle is more than a year. Therefore, the development of such industries is impossible in countries where lending rates are 25 % – 30 %. This is the practical expression of depending on technological progress and expansion of its technological application in the real economy from the interest rate.

So that we can be concluded that pace of economic growth depends on interest rates on deposits and lending indirectly proportional. To modernize the economy, the country's central bank should conduct monetary policy to reduce the refinancing rate of commercial banks.

Statistical data confirm inversely proportional correlation between lending rates and rates of GDP in EU:

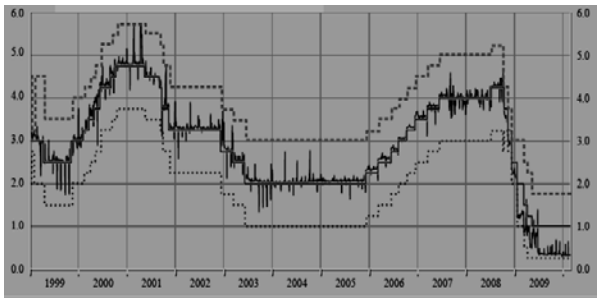

Fig.7. Average lending, refinancing, overnight deposit rates in EU (1999-2009) (Source: www.ecb.int)

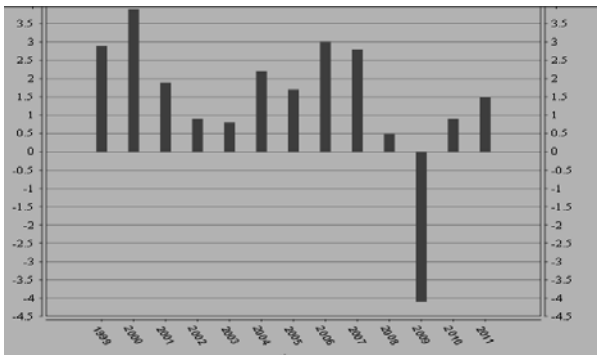

Fig.8. GDP growth in EU (1999-2011) (Source: statistical data of the European Central Bank <www.ecb.int>)

For example, in 2002 the refinancing rate of the European Central Bank was at 3 %, and GDP growth – 1.1 %. Accordingly in 2005 the refinancing rate dropped to 2 %, and the rate of GDP increased to 2.2 %. Of course, there are many other factors, that influence on GDP, but interest rate also carries influence.

So, in order to stimulate economic growth in the integral economic system, government should reduce the refinancing rate of the central bank. Reduction of refinancing rate declaims the bank interest and creates a better environment for economic modernization in conditions of economic turbulence.

4. Inflation and interest rate loans

Any country poses a coherent inter-economic system. In this system there is some circulation of goods and services. In order to ensure circulation of goods and services, it is necessary that there is circulation of money. This function of money is to ensure exchange. Within one economic system any quantity should always be confirmed only one weight of money. If money is more - there is inflation, if less money - there is deflation.

Thus, the economic essence of inflation is exaggerating the quantity of money, without increasing number of goods. Overall, inflation - continued growth in the general level of prices, respectively, is evidence of declining purchasing power of money.

Economists called the bank rate as nominal interest rate, and increasing purchasing power - the real interest rate. The nominal interest rate equals the real interest rate plus inflation, i.e.

$$i = r + p, \qquad (7)$$

where:

i – the nominal interest rate,
r – the real interest rate,
p – inflation

The equation written in this form is called the Fisher equation. According to it, the increase in inflation by 1% leads to higher nominal interest rate by 1%. This relationship between inflation and nominal interest rate is called the Fisher effect (Fisher *et al.* 1977).

Any enterprise which involves loan capital, includes accrued interest in the cost of production. This increases the price of manufactured products. Thus there are inflation costs. To put in another words the price of products that makes the borrower, is directly proportional to the level of interest rates.

Accordingly, it is a factor that stimulates inflation. When inflation increases, nominal interest rate, which is expressed through the bank rate, will go up. This situation is in terms of factor that stimulates inflation in long-term period. Thus, reduction of bank interest is one of the instruments

of influence on inflation within a single economic system.

Using the statistics of the European Central Bank, we can directly comment the presence of proportional correlation between the percentage of banking and inflation in the EU.

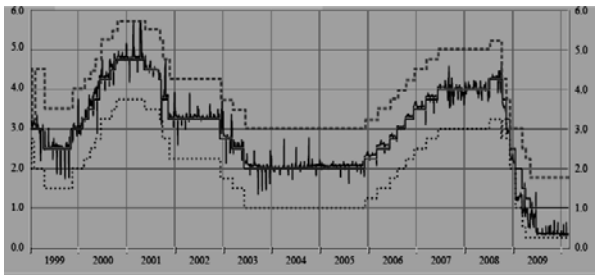

Fig.9. Average lending, refinancing, overnight deposit rates in EU (1999–2009) (Source: : statistical data of the European Central Bank <www.ecb.int>)

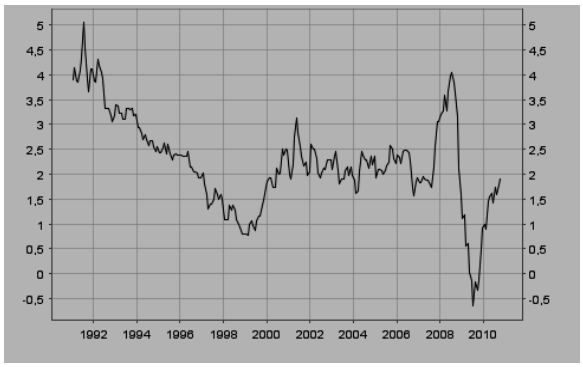

Fig.10. The average inflation rate in EU (1992–2010) (Source: statistical data of the European Central Bank <www.ecb.int>)

For example, in 2005 the rate of refinancing of commercial banks amounted to 2 %, respectively, inflation in EU was 2 %. In 2008 the refinancing rate rose to 4 % (loan to 5 %), in 2008 inflation in EU was 4 %.

So therefore, reduction of bank interest, in particular by reducing the refinancing rate is one of the factors that lead to reducing inflation and increasing purchasing power of money.

5. Interest rate's application as levers of influence in different countries

The basis for the development and stable functioning of the economy is the availability of flexible monetary mechanism for regulating macroeconomic processes, which is occurred by the central bank. Therefore, the overall rate on lending in commercial banks is determined by central bank monetary policy.

One of the key elements of monetary policy is the refinancing of commercial banks. The essence of this tool is that credit and banking institutions that are experiencing temporary financial difficulties can apply to the Central Bank for obtaining loans. Commercial Bank in determining the level of deposit and lending rates will pay attention to the refinancing rate established by the central bank. In general, lending rates in the country depend on the rate of central bank refinancing.

Table 1. Refinancing rate in countries (Source: Statistical data from Web page of central banks: *Bank of Japan*: <www.boj.or.jp>; *European Central Bank*: <www.ecb.int>; *Swiss National Ba*nk: <www.snb.ch>; *Asian Development Ba*nk: <www.adb.org>; *The Central Bank of the Russian Federation*: <www.cbr.ru>)

refinancing rate		
Central Bank	date	rate
EU	08–12–2011	1.000 %
Japan	Oct 05 2010	0.10 %
USA	Dec 16 2008	0–0.25 %
Switzerland	Aug 03 2011	0–0.25 %
Ukraine	Jan 01 20112	10.25 %
Russia	Dec 23 2011	8.00 %
China	Jul 06 2011	6.56 %

We can comment on that all highly developed countries maintain low refinance rates. Accordingly, inflation in these countries is very low. If we talk about post-Soviet countries, the refinancing rate at a sufficiently high level and inflation is on the same level. For example, in Ukraine the rate of refinancing of commercial banks is 10.25 in 2011. Average inflation persistence in 2011 is 9 % (data from State Statistics Committee of Ukraine). Thus, lending rates affect the overall economic development of the country, its financial stability. The mechanisms, through which interest exercises influence rate, are applicable. This way of influence was shown in the preceding paragraphs of paper

To exit from the financial turbulence that caused the mortgage crisis in 2008, many countries have reduced the refinancing rate. EU is an example of this.

These statistics show us that the financial turbulence, or instability, caused by the economic crisis of 2008, was accompanied by higher interest rates up to 3.25 %. Stabilization of the financial environment in 2010–2011 brought on by the lower interest rate to 1 %. According to these statistics we consider reduction in refinancing of commercial banks.

Table 2. CB refinancing rate changes (Source: statistical data of the European Central Bank)

08–12–2011	1.000 %
03–11–2011	1.250 %
07–07–2011	1.500 %
07–04–2011	1.250 %
07–05–2009	1.000 %
02–04–2009	1.250 %
05–03–2009	1.500 %
15–01–2009	2.000 %
04–12–2008	2.500 %
06–11–2008	3.250 %

An example is also the Russian Federation:

Central Bank of Russian Federation in the period from 2009 to 2011 completely reduced the refinancing rate, to exit the conditions of economic instability caused by the financial crisis of 2008.

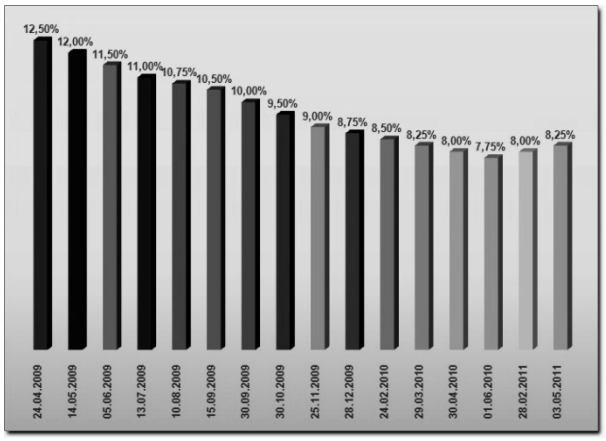

Fig.11. Central Bank refinancing rate of the Russian Federation (Source: State Committee for State Statistics of the Russian Federation)

Thus, the rate of refinancing is an important mechanism of monetary policy, which can affect the financial stabilization in the country and stimulate the real economy. Many countries have used interest rate reduction for the exit of the conditions of economic turbulence after the economic crisis of 2008. To stimulate economic development and creating a better environment for business development country should conduct monetary policy to reduce the refinancing rate, which will lower overall rates on loans.

6. Conclusions

In the context of globalization and post-industrial society the financial sector gained significant influence over the real economy. The process of globalization has identified practical dependence real sector from the financial sector, direct proof of this is the financial crisis in 2008.

The lending rate is one of the most important financial and credit instruments of influence on the socio-economic development of society.

The economic nature of bank interest lies in the concept of percent as type of income. Three factors that affect the Solow model of economic growth are directly or indirectly depending on the level of interest rates, which in practice is expressed through interest on bank lending.

In order to stimulate economic growth in the integral economic system, government should reduce the refinancing rate of the central bank. Reduction of refinancing rate declaims the bank interest and creates a better environment for economic modernization in conditions of economic turbulence.

So therefore, reduction of bank interest, in particular by reducing the refinancing rate is one of the factors that lead to reducing inflation and increasing purchasing power of money.

The rate of refinancing is an important mechanism of monetary policy, which can affect the financial stabilization in the country and stimulate the real economy. Many countries have used interest rate reduction for the exit of the conditions of economic turbulence after the economic crisis of 2008. To stimulate economic development and creating a better environment for business development country should conduct monetary policy to reduce the refinancing rate, which will lower overall rates on loans.

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European Central Bank: <www.ecb.int>

Swiss National Bank: <www.snb.ch>

Bank of Canada: <www.bank-banque-canada.ca>

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