

Payment (price) for labor is in the form of monetary compensation, which the employee receives in exchange for his labor for his personal professional characteristics, working conditions. Instead, the cost of labor reflects the cost of human resources used to produce any product or service. Factors such as quality of labor, child labor and labor of migrants, labor productivity, new needs, the rise in prices of various services are most evident in the increase or decrease in real wages as a monetary expression of labor cost and labor cost and productivity.

Having analyzed the situation on the Ukrainian labor market in 2006-2017 years, it is proved that GDP per 1 worker, ie productivity, does not correspond to the size of the average monthly wage, but there is a correlation between them.

Proper stimulation of work in the enterprise, in turn, will lead to increased productivity, which will increase the real product and income. And an increase in GDP per capita means an increase in consumption and, consequently, in the standard of living of the country's population.

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Sverenko Kamila  
*Master student, NaUKMA*

## **MODELING THE MECHANISM OF INTEREST RATE FORMATION ON BANK LOAN USING SYSTEM DYNAMICS METHODS**

Features of modern development of Ukrainian banks are intensification of banking business, actualization of competition in banking and, at the same time, increase of threats to credit security. Such processes create challenges for banks to maintain financial sustainability and to obtain a market level of profit. Unauthorized pricing decisions for banking products and services may impair the bank's position in the market. As a result, there is a need for the organization and effective management of the bank's pricing policy.

To date, the main characteristic of pricing in commercial banks of Ukraine is the lack of a clear correlation between the consumer value of the banking service and its price. In these circumstances, the bank has the ability to maneuver prices across wide limits, pursuing different pricing policies for different clients, using prices as an important means of attracting customers and promoting services. Pricing is one of the most important aspects of a bank's marketing activities, a management lever that allows it to shape the bank's profit.

First step in modeling the pricing decisions on banking loans is to figure out the main parameters, which affects this kind of decisions. To begin with, the concept of a future model of system dynamics (Figure 1) should be created, distinguishing the main cause and effect relationships of the factors studied. Then, based on the concept, we build a credit-pricing model (Figure 2) with a focus on metrics that can be expressed endogenously.

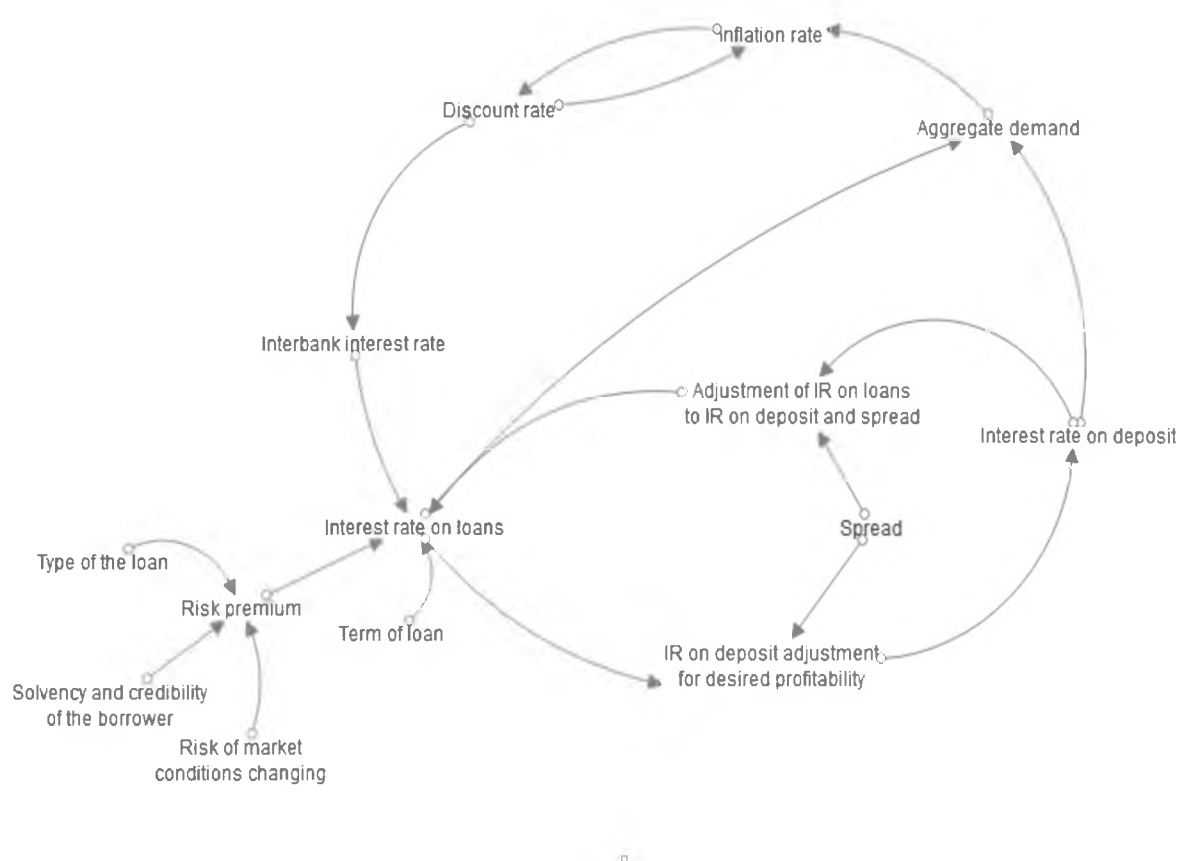
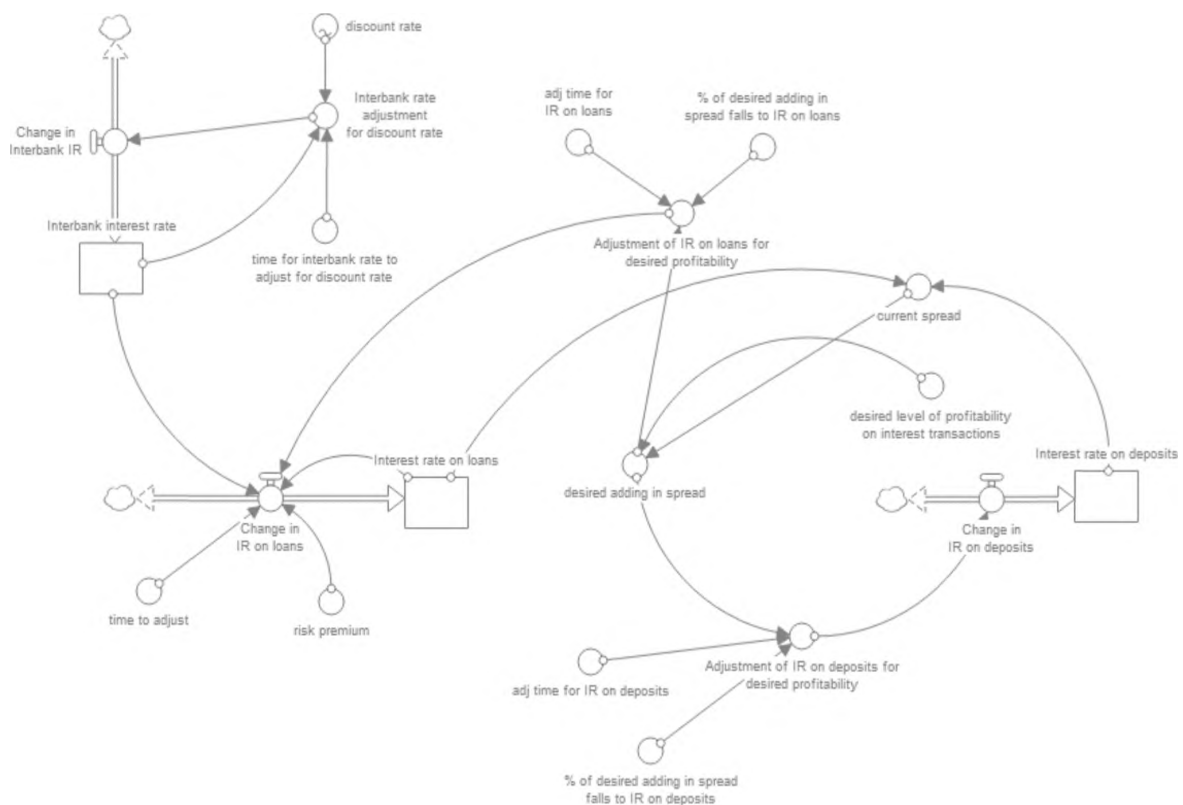


Figure 1 shows us the change in aggregate demand affects the inflation rate in the country, which is reflected by the change in the interest rate (depending on the current policy of the NBU). The interest rate directly affects the price of credit resources in the banking market (interbank interest rates), which in turn changes the

interest rate on loans. However, the interest rate on the loans also depends on the risk premium, which collects information about the riskiness of individual loans, including such basic characteristics as the type of loan, the borrower's creditworthiness and the risk of market conditions changing. Interest rates on loans and deposits have a reciprocal effect. The interest rate on loans affects the interest rate on deposits through adjustments to the desired level of profitability. In fact, the volatility of interest rates on loans and deposits mainly depends on changes in interbank rates (macro-levels), followed by weighing the desired level of profitability on active and passive operations of a commercial bank.

After the conceptualization phase, we proceed to build a model of system dynamics, identifying the major exogenous and endogenous factors, estimating the latter through equations. The constructed model of the mechanism of the interest rate formation for banking loan is shown in Figure 2. This model can be considered simplified, the discount rate is expressed by an exogenous variable (actual NBU data for the period 2005-2019 are used to reflect the behavior of the discount rate time series).

Figure 2 shows that the discount rate affects the interbank rate with some adjustment, and due to this, it reflects the change in interbank rate on an annual basis.



**Figure 2. Simplified model of mechanism of interest rate formation on banking loans**

The interbank interest rate, together with the risk premium, is already the basis for the interest rate on loans. Such impact also comes with a time to adjust. At the

same time, the bank determines the allowance for this rate (adjustment of IR on loans for desired profitability), which depends on the level of the margin to maintain the profitability of banking (desired adding in spread in the model). The model yield adjustment is as follows: there is a desirable margin level that the bank wants to obtain from the desired spread of interest and a current spread, calculated as a loan rate minus the interest rate on deposits. Then we calculate the desired margin addition (desired adding in spread). This indicator influences the change in interest rates on loans and deposits, divided into two parts in a certain ratio: depending on the competitive market conditions, some of the preferred rate falls on the adjustment of the deposit rate, and the other part on the adjustment of the loan rate.

To conclude with, the built model of system dynamics allows reflecting in a simplified form the mechanism of pricing for loans of commercial banks. In addition, the developed model allows not only reproducing the historical development of the studied indicator; it can serve as a basis for revealing the power of the influence of individual means of regulation on the behavior of the system.

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Sysa Maryna  
*Master student, NaUKMA*

## **SYSTEM DYNAMICS MODELING OF MIGRANT REMITTANCES' INFLUENCE ON THE ECONOMIC GROWTH**

The continuous flow of migrants from third countries, developing countries, and countries that are involved in various conflicts like political, social, and economic, is of particular relevance. That leads to the inevitable long-term imprints on the economy of different states. IZA World of Labor represents a global perspective. They estimated that a 10% increase in emigration rate leads to a 4% growth of wages in the country of origin on average. In addition, according to the WTO statistics over the last 30 years, the number of free trade agreements worldwide