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UDC 336.774

**N. V. Tkachenko**, Doctor of Economic Sciences, Professor,  
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THE LIFE-CYCLE CUSTOMER**

**Abstract.** *In the article the necessity of determining the optimal size of the interest rate in modeling the credit product. It is proved that the banking institutions in their lending activities must find the optimal value of the interest rate, taking into account the interests of participants of credit relations, in particular because of their differentiation in certain areas. The estimation of the feasibility of the introduction of a new credit product for annuity and differentiated scheme of repayment of debt.*

**Keywords:** *retail credit; interest rate; life cycle; loan product; annuity payment; differentiated payment; construction of retail loan products.*

**Н. В. Ткаченко**, д. е. н., професор,  
**А. М. Харченко**, к. е. н.**МОДЕЛЮВАННЯ РОЗДРІБНОГО КРЕДИТНОГО ПРОДУКТУ НА ОСНОВІ  
ЖИТТЄВОГО ЦИКЛУ КЛІЄНТА**

**Анотація.** *В статті обґрунтовано необхідність визначення оптимального розміру процентної ставки при моделюванні кредитного продукту. Доведено, що банківські установи у своїй кредитній діяльності повинні знаходити оптимальну величину процентних ставок, що враховує інтереси учасників кредитних відносин, зокрема через їх диференціацію за окремими напрямками. Здійснено оцінку доцільності впровадження нового кредитного продукту за анuitетною та диференційованою схемами погашення боргу.*

**Ключові слова:** *роздрібний кредит; процентна ставка; життєвий цикл; кредитний продукт; анuitетний платіж; диференційований платіж; конструювання роздрібних кредитних продуктів.*

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ЖИЗНЕННОГО ЦИКЛА КЛИЕНТА**

**Аннотация.** *В статье обоснована необходимость определения оптимального размера процентной ставки при моделировании кредитного продукта. Доказано, что банковские учреждения в своей кредитной деятельности должны находить оптимальную величину процентных ставок, учитывающий интересы участников кредитных отношений, в частности из-за их дифференциацию по отдельным направлениям. Осуществлена оценка целесообразности внедрения нового кредитного продукта по аннуитетной и дифференцированной схемам погашения долга.*

**Ключевые слова:** *розничный кредит; процентная ставка; жизненный цикл; кредитный продукт; аннуитетный платеж; дифференцированный платеж; конструирование розничных кредитных продуктов.*

**Background research.** Retail banks market products currently one of the fastest growing and promising, due to the creation of banks broad product line and adding new sales channels. At the same time increased demands on the quality of retail loan products, which in turn leads to the search

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and implementation of the specific characteristics of individual products to their allocation among broad palette product range offered by banking institutions competing.

**Formulation of the problem.** Against the background of constant increased competition, the emergence and implementation of technological and product innovation, improve the efficiency of banks is possible by providing demand for banking products and improve satisfaction by them from customers, primarily due to the configuration of the product range under their changing needs and requirements.

**Analysis of recent research and publications.** The issue of bank loans received considerable attention in terms of research interests of the community of domestic and foreign scientists. In particular, clarification of economic content, features and classification of retail bank lending devoted to research A. Bahshiyana [1], W. Borowski [2], Ivasiv I. [3] A. Komisarchyk [4] A. A. Yepifanova and TA Vasilyeva [5] and others. However, special attention needs constant diagnosing the efficiency of retail lending and, consequently, an in-depth study of issues related to the construction of retail credit products.

**Setting objectives.** The article is to develop an approach to designing retail loan products that will help expand their product range and developing sales channels. This will allow banks to expand the range of services provided to customers, due to the impact of technological change and increased financial literacy clients.

**Presenting main material.** Life Cycle Analysis provides retail credit product, first at the stage of research - product development, assess its competitiveness and making the decision to offer to the market; Secondly, during the market launch - the implementation of test sales organization incentives and sales support; Thirdly, the stage of growth - life cycle assessment, finding ways to modify a product, new customers and areas of use; Fourth, at the stage of maturity - the efficient sales promotion and corrective marketing policy; during the recession - a decision on further policy bank on a particular product (Pic. 1). However, special attention should be given to the fifth stage, which involves the modeling of credit product. This is because the typical banking products such property as the speed of copying competitors in the market and the need to adjust to constantly changing demands of consumers of banking services. Hence, there is a need to carry out simulations based loan product lifecycle customer strategies to attract and retain customers using alternative distribution channels.

An important issue that needs to be addressed in modeling credit product is to determine the optimal interest rate for retail credit. The risks of retail lending is largely due to the fact that the bank knows the customer and lays in the interest rate risk of default loans. Most banks differentiated interest rates depending on the currency of the loan term and loan amount. Some banks take into account the status of the borrowers (borrowers conscientious participants of salary projects, employees of budget organizations and others). Risk reduction can be achieved by implementing credit scoring models that take into account the specificity of interaction with customers.

The banks in their lending activities must find the optimal value interest rate that takes into account the interests of all participants of credit relations, that is able to provide borrowers reduce credit burden while achieving efficiency lending operations of the bank. The interest rate on the loan has its economically reasonable lower limit, which is determined by the rate of return objective of the bank.

The process of loans exposed to direct government regulation that has a direct impact on the financial results of banks and, consequently, the process of pricing on loan products sold by them by setting, norms of reserves for possible losses on loans, capital adequacy ratios, discount rate, etc.

Interest rates on loans are influenced by many factors - the cost involved Bank resources, the operating costs for customer service, provisioning for possible losses, taking into account the rate of inflation; of the market lending, and so on.

We believe that it is necessary to use interest rates to stimulate retail lending, which is possible due to their differentiation in the following areas: the gradual decline in interest rates in the case of fair payment of the loan within a certain period; establishing specific target rates for loans related to human resources borrowers (loans for education, treatment, better housing, etc.), with focus on their minimization; setting value rates based on their commitment to the bank (the borrowers who take credit for the first time, and, borrowers who take credit again). In addition, increased incentive-based interest rates can be achieved by giving borrowers the choice of loan repayment scheme - or differentiated

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<p><b>1. Stage research and development</b></p>	<p>Development of a new banking product Evaluation of the economic effectiveness of the implementation of the product Evaluation of competitiveness of new product Development of the test product and sample sales The withdrawal of the new product on the market Company sales promotion product Support product sales</p>	<p>The identify ideas about new products. Ranking and selection of ideas. Development of new products The analysis capabilities of the bank. Development of marketing strategy. Calculation of economic efficiency products Comparative analysis of the product from similar products of competitors. The decision to develop a banking product Product development. Test for loyal customers Organization of work. Personnel training. Provision of technical readiness. The launch of the project. formation of demand Promotional activities aimed at stimulating sales of the product Evaluation results of the implementation of the product. Changes in product sales process Monitoring of sales of the product. Research thoughts on customer product quality Marketing researches. Improving product to ensure product competitiveness Segmenting customers. Guidelines for creating demand for the product Promotional activities aimed at highlighting the benefits of the product</p>
<p><b>2. Stage to market</b></p>	<p>Monitoring of sales of products Find ways to modify product Search for new consumer products, new areas of use Organization of effective advertising campaigns</p>	<p>Monitoring of sales of the product. Organization of market research to determine customer satisfaction product Actions to stimulate product sales The study products, the competition. Specification pricing. Changes in advertising campaign Monitoring sales. Research the causes reduction in volume. Evaluation of the competitiveness of the product</p>
<p><b>3. Growth Stage</b></p>	<p>Monitoring of sales of products Find ways to modify product Search for new consumer products, new areas of use Organization of effective advertising campaigns</p>	<p>Monitoring of sales of the product. Organization of market research to determine customer satisfaction product Actions to stimulate product sales The study products, the competition. Specification pricing. Changes in advertising campaign Monitoring sales. Research the causes reduction in volume. Evaluation of the competitiveness of the product</p>
<p><b>4. Stage of maturity</b></p>	<p>Monitoring of sales of products Product Promotion Changes in bank marketing policy</p>	<p>Monitoring of sales of the product. Organization of market research to determine customer satisfaction product Actions to stimulate product sales The study products, the competition. Specification pricing. Changes in advertising campaign Monitoring sales. Research the causes reduction in volume. Evaluation of the competitiveness of the product</p>
<p><b>5. Step recession</b></p>	<p>Monitoring of sales of products The decision to change the product</p>	<p>Monitoring sales. Research the causes reduction in volume. Evaluation of the competitiveness of the product Deciding on a new replacement product or its improvement with the new requirements and technologies</p>

**Fig. 1. Stages of the life cycle of the loan product**

Source: compiled by the author [6]

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annuity payments. This will allow increasing the attractiveness and availability of consumer loans for borrowers - individuals will give them the opportunity to maneuver in choosing the most convenient for them credits from the point of distribution of credit burden, facilitate the receipt and repayment.

For example, changing the frequency of payments on principal debt repayment provides three options with varying periodicity: quarterly maturity every six months, at the end of use. However, using these options increased credit risk.

Perhaps the progressive increase in payments for principal debt, with monthly interest payments will depend on the actual balance of debt, respectively, their size decrease, while the monthly payment. On the loan as a whole (principal and interest) will remain unchanged throughout the period of maturity. The progressive increase in the monthly payment provides that the payments for principal debt will increase so that the monthly loan payment (principal and interest) will increase to a pre-set value, for example, the average projected inflation rate.

There may be differences in the way of collecting interest payments on the loan governing the repayment of the loan and significantly affect the amount of the loan burden of the borrower. In banking practice, mainly used two methods of calculating interest payments on the loan - annuity and differentiated.

The advantages of an annuity scheme repayment of bank loans for borrowers is the simplicity of the scheme and the possibility of planning credit payments as a loan for the duration of repayment is paid in equal installments; for long-term loans - reducing the loan burden of the borrower, taking into account the effects of inflation. When annuity scheme charges and interest cost of credit is higher than with differentiated payments.

It should, for example, to develop retail loan products that combine not just one loan, but deposit, settlement, payment and other banking operations and services on more beneficial for the bank and the borrower conditions. For example, to expand ways to meet the needs of individuals who do not have savings at the time of lending, commercial banks can offer savings to the borrower prior lending. Then the source of repayment of interest on the loan will not only future income of the borrower from work, but also the accrued interest on the deposit. Moreover, establishing attractive interest rate on the loan so borrowers will partially reduce the burden of payments on the loan on the family budget, save, save the borrower without reducing its consumption or increase consumption, not having sufficient own funds.

It should be borne in mind that the range of services provided to individuals, constantly expanding. This allows banks to move from several offers standardized services unrelated to the formation of individual "packets" that best meet customer needs. The value of packet services in different advantageous for the client side and set below the arithmetic result of adding the cost of individual services. The basic (minimum) package of retail products may include: credit card, access to remote banking and overdraft.

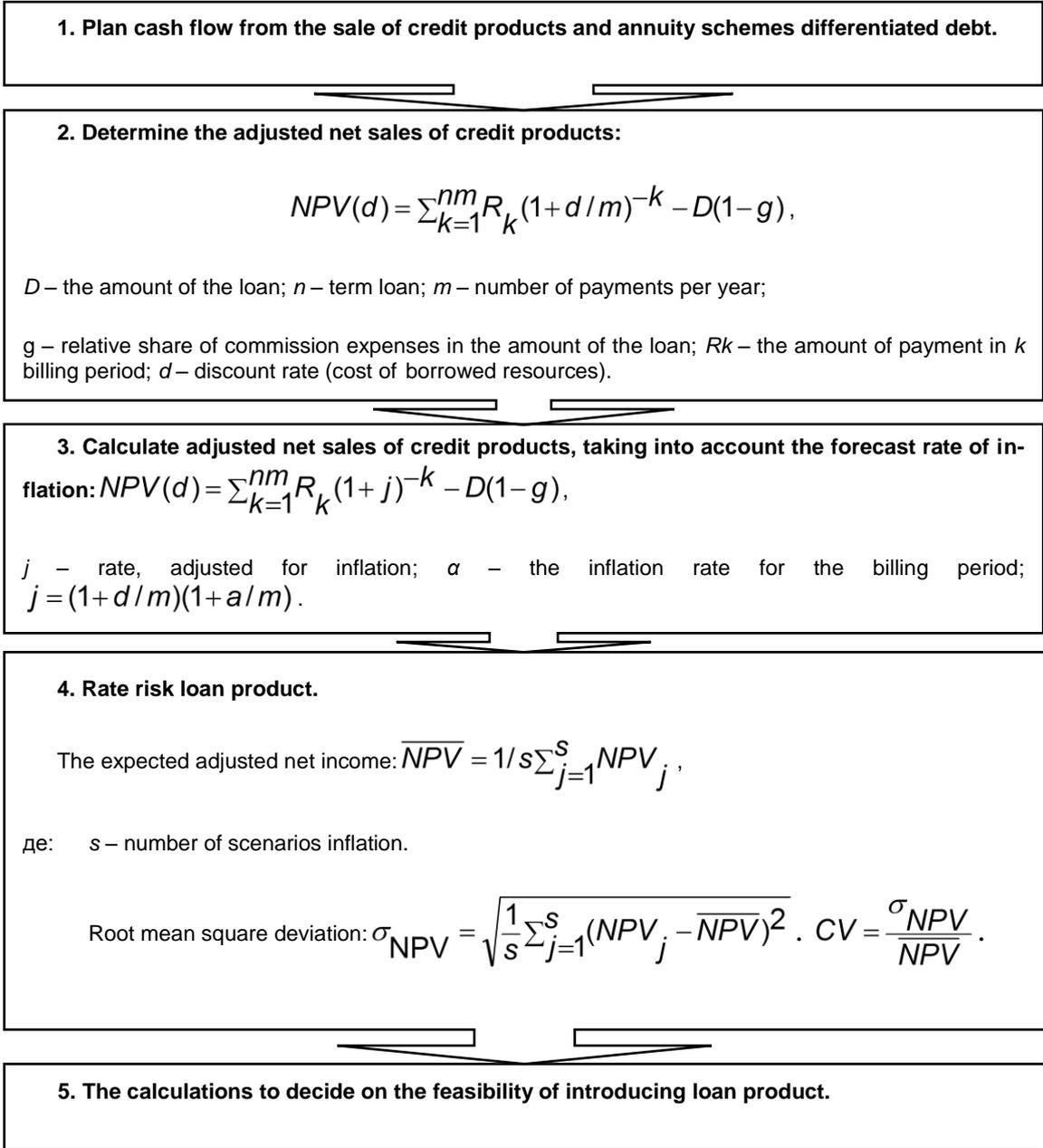
Package sales must be accompanied by a personal manager who is assigned to the client and maintains all of its operations, has information on past cooperation with clients and acts as his personal financial adviser. This practice creates conditions for changing the system of education and training of banking experts - knowledge of specialized programs to study the comprehensive range of retail banking products.

When selling the public banking is also important to use different forms of joint selling. For banks, the main reason to use compatible sales is that these sales generate more profit than the individual, both in the short and in the long run. Also, it allows banks to reduce costs, stimulate demand, retain customers, improve product features and differentiate product offerings.

For customers consistent sales - a convenience, efficiency for services, reducing costs. Along with the characteristics of credit product (amount, price, dates, etc.), the client is important and quality of banking services in the purchase and use of this product. Credit services for specific indicators of quality of service are: providing services in exactly the specified period, the possibility of consultations (including using interactive channels), ease of repayment of the loan.

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In addition to upgrading current products can not be overlooked and the need for evaluating the effectiveness of implementation of new credit products for structural and logical scheme presented in Pic. 2.



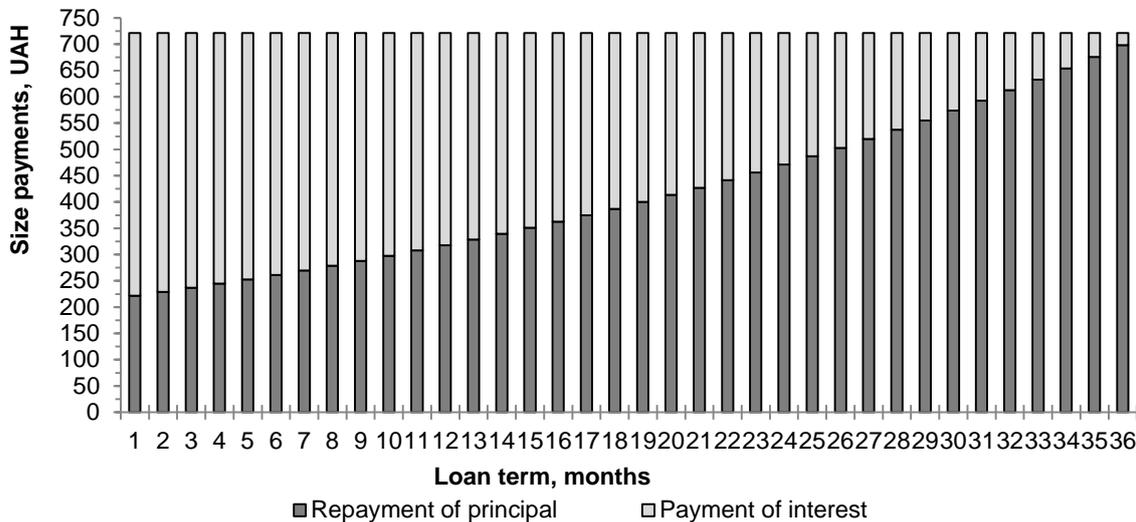
**Fig. 2. Structural-logical scheme feasibility assessment implementation of a new credit product**

Source: compiled by the authors

We estimate the feasibility of implementing a new loan product for example. The banking institution plans to introduce a new retail credit product with the following parameters: loan amount - 15 thousand. UAH., Loan term - 3 years, the annual rate of compound interest - 42%, the number of payments per year - 12; one-time fee for granting the loan - 0.1% monthly commission when repaying the loan - 0.1%.

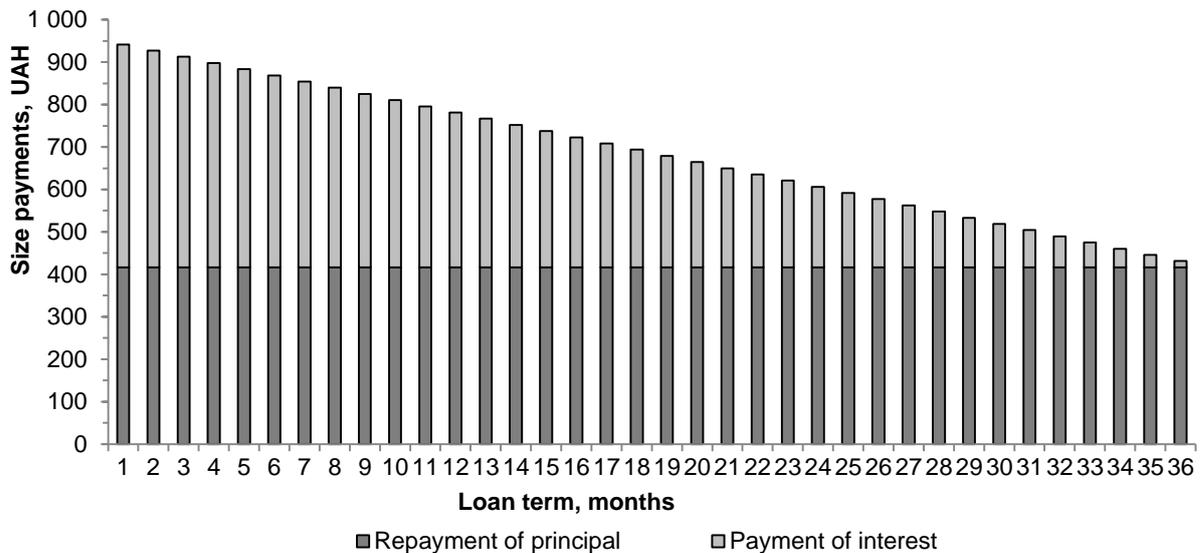
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The results of calculations of cash flows from the sale of credit products and differentiated annuity repayment schemes are summarized graphically in pictures 3 and 4.



**Pic. 3. Cash flows annuity scheme repayment**

Source: Calculations of authors'

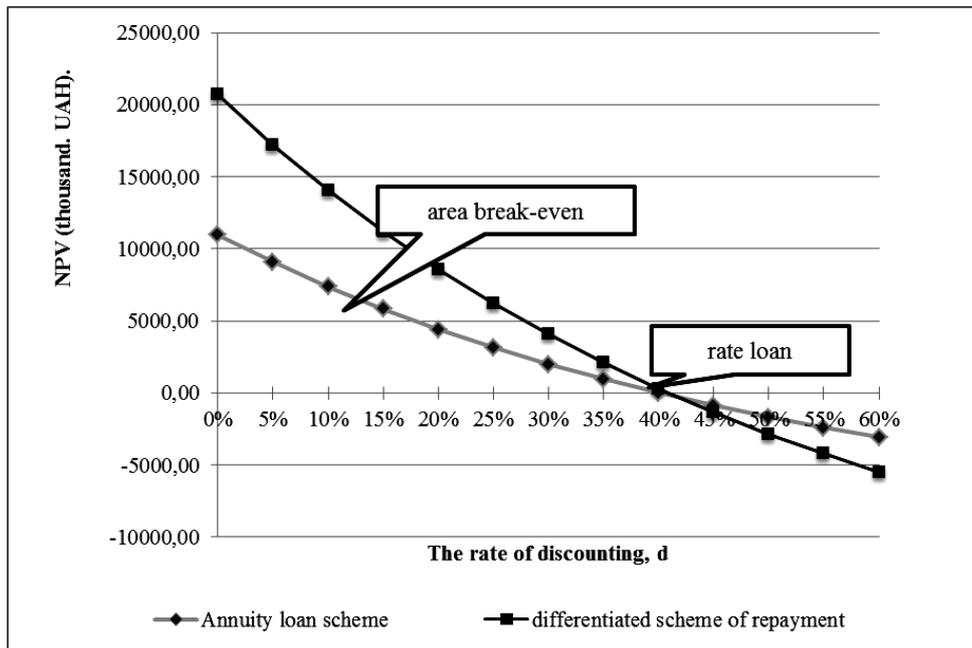


**Pic. 4. Cash flows differentiated scheme of repayment**

Source: Calculations of authors'

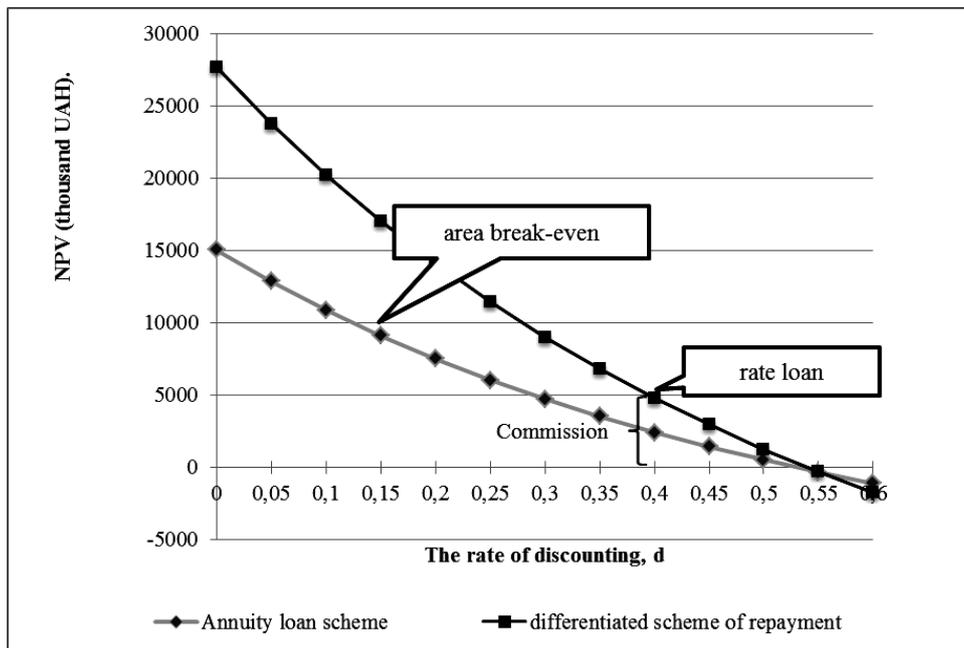
The results of calculations of net present revenue from the sale of credit product depending on the value of attracted resources (discounting rules) for various schemes of debt, net of fees and commissions from their view are respectively shown in pictures 5 and 6.

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**Pic. 5. The net reduced income loan product depending on the value of attracted resources, excluding commission payments**

Source: Calculations of authors'



**Pic. 6. The net income reduced credit product depending on the value of attracted resources, subject to commission payments**

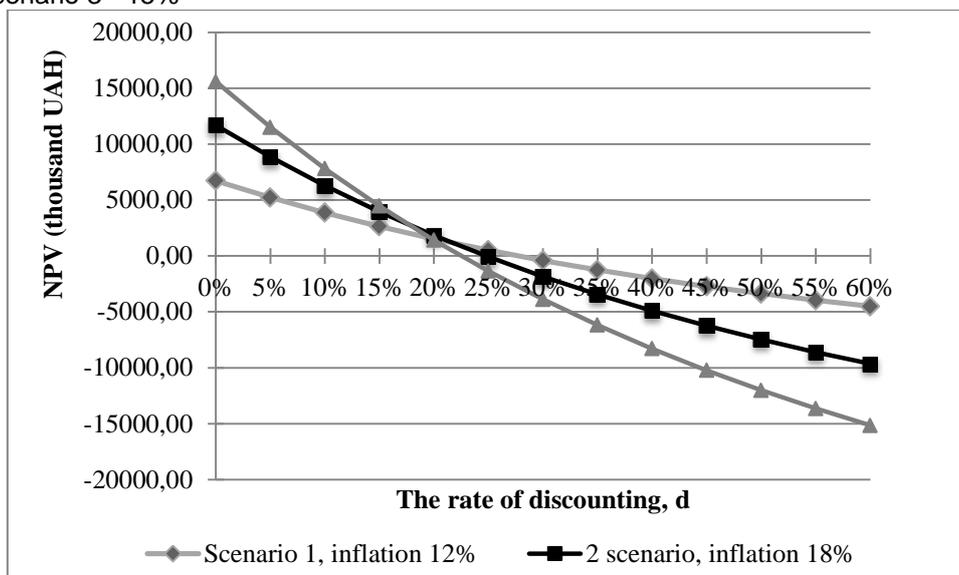
Source: Calculations of authors'

As illustrated by Figures 5 and 6, the presence of one-time and monthly fees significantly increases the yield of the loan product. Thus, the introduction of a one-time commission in obtaining credit and

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monthly fees for the service at a rate of 0.1% shifts breakeven loan product from 40% to 50% for annuity scheme repayment and 55% for the classical scheme of repayment.

Negatively on the net income reduced credit product affects inflation, as evidenced by the results of the scenario analysis presented in pictures 7 and 8. In particular, for annuity scheme repayment scenario 1 (12% rate of inflation) loan product break-even point has moved from 40% 25% scenario 2 - 20% and scenario 3 - 15%



**Fig. 7. The net income reduced loan product based on inflation for annuity scheme repayment**  
 Source: Calculations of authors'

The use of differentiated repayment scheme allows diminish the negative impact of inflation scenario 1 break-even point is not shifted - remained at 40% discount rules, scenario 2 - decreased to 35%, scenario 3 - 30%. Negative forecasts of inflation have caused increased risk loan product for annuity scheme repayment CV = 5,51 and somewhat lower risk for differentiated schemes CV = 1,14.

After bank's management work of the decision to issue loan product on the market and choice of channels. In this connection, a network of channels that sell retail credit products must meet market diversity and constantly expand. It is essential that banks provide an integrated experience across all channels, from branches to online, mobile and even social networks. Customers should be able to get on any of the existing channels of assistance or advice on specific banking product or service.

The most popular remote channels today are: Internet banking, SMS services, remote phone sales. In this case, the bank does not need to spend money on building a marketing infrastructure extensive sales network already deployed by companies providers, and equipment for use access channels (mobile phones, software systems) acquires the client. The use of remote banking technologies can provide anytime access to banking products, regardless of the location of the customer, improves the speed and quality of service while reducing the cost of operations, the implementation of the communication function, forms the image of the bank as high-tech customer-oriented financial institution.

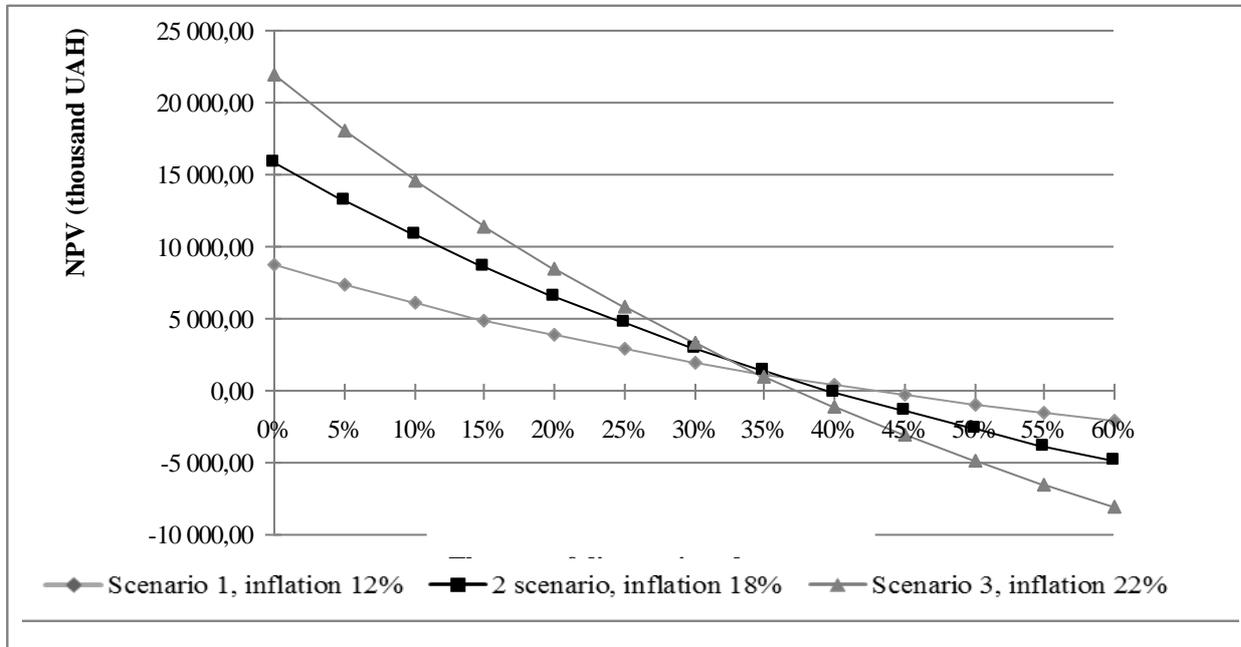
The Bank can build its sales network by connecting to the network of financial services, the possibility of getting a lower cost to expand its presence in the market.

As additional channels should consider the possibility of bank retail loans sales points in shopping malls and large shopping halls. This is the most mobile point of care, which can be placed in both food and non-food shopping malls and car dealers in the territory.

Given that most there is intense competition in the consumer interest free express-loans that banks carried out in trade organizations, some large stores in an effort to attract customers, self-pay banks interest on loans. Loss of profits trading network compensates for the increase in sales, which increases, in turn, the volume of retail lending banks. Working with retail chains lending promotes effec-

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tive promotion of banking products and networks involved in subsidizing interest rates making credit products more accessible and attractive to customers.



**Fig. 8. The net income reduced loan product based on inflation for differentiated repayment scheme**  
 Source: Calculations of authors'

Many banks in cooperation with various enterprises in trade and services Cobranding offer a variety of programs that allow the cardholder bank get a discount, paying by credit card. Cobranding programs in this case may be an agreement with airlines banks, mobile operators, car dealers, shopping centers and more. Also, banks are actively offer cards as a bonus to other banking products such as deposits discovered within the framework of salary projects.

The transmission of features to attract individuals to bank credit services to corporate clients (implementation of the principle of network marketing). In general, the corporate customer base of the bank can be divided into two groups: customers, characterized by a developed system of internal consumer relations (for example, enterprises that have significant staffing level, but practically not generate external relationships with individuals) and customers characterized by a developed system of consumer external relations (commercial enterprises that have a minimum staffing level, but generate ample external relations of individuals).

The practice of leading foreign banks shows that the most effective way to attract customers, increase their loyalty and increase sales of retail credit products is the realization of the concept of channel mix, is the use of traditional and remote access channels in their indissoluble unity. This should be ensured friendliness, efficiency, safety, utility use these channels and the ability for a customer at his discretion to move between them in a single communications environment. Bank elected optimal ratio of personalized services involving office workers and remote services.

With the development of computer technology services remote access channels are becoming increasingly multi-channel - the customer chooses the most suitable for a particular time communication channel or service. Improve the management of multi-channel network of banking products is by including customer database information about which channel to bank messaging and shape relations with the bank prefers to keep client.

We consider it necessary to encourage consumers to purchase retail credit products and interest of the bank employees to maximize sales services to customers. Offers banks to use such methods to

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stimulate customers as providing the right customer for some time to use banking services free or at a discount, a combination of free and paid services, the provision of non-preferential products to maintain personal contacts with consumers of services, systems of public and advertise banking services.

**Conclusions.** Consequently, the Bank proposed scientific principles of designing retail credit products will help expand their product range and developing sales channels that will allow banks to expand the range of services provided to customers, due to the impact of technological change and increased financial literacy clients. The above will help improve the profitability of retail lending, reduce costs and maintain customer loyalty, facilitate credit risk management, stimulate the development of remote banking, which in turn decides the optimization of personnel policy banks.

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Received for publication 25.10.2016