

ECONOMIC SCIENCE

Banks and the banking system

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Optimizing advertising costs of banking services

One of the key elements of market infrastructure has a decisive influence on the economic development of any country, serving the banking system. Reforming the economic system of Ukraine is impossible without the existence and sustainable development of the financial sector, where a significant role of commercial banks. This is because it is the commercial banks in the market is one of the most important elements of the economic structure for the organization of cash and capital resources. With the consolidation trend of economic growth in our country, the question of effective implementation of banks entrusted to them in a market economy functions become more significant. Particular weight they gain in terms of sharpening the competitive relationship in the Ukrainian banking market. The limited sources of resource base and secure areas of capital investment requires banks to new approaches to financial intermediation to ensure compliance with the requirements of services market. One of these areas is ongoing promotional activities of banks with their coverage of the services.

When working in this area need to invest in advertising with the greatest efficiency, which requires the development of a system of feedback with the specialists of the bank, who have their own opinion on the effectiveness of different types of advertising. Then, because of expert opinion may be of the best areas to invest in advertising with the greatest efficiency.

It was a problem to the management of the commercial bank "Concord" city Dnieper, Ukraine. The management of the bank has been allocated 10,000 UAH for a

new advertising campaign. Employees of the bank and its customers asking questions with a request to name the most effective, in their view, form submission on

$$W = \frac{12 \sum_{i=1}^m \left(\sum_{j=1}^d \rho_{ij} - \frac{d(m+1)}{2} \right)^2}{d^2(m^3 - m)}, \quad (1)$$

where – ρ_{ij} rank expert answers, d – number of experts, m - number criteria.

Check the unanimity of responses was conducted of the (1) for parameters $d=5$, $m=28$. After calculation received value $W = 0,745095785$.

This result can be considered acceptable, because it is more than 0.55.

Eligibility questionnaire allows us to find the average score of the effectiveness of each type of advertising campaign results are presented in Table. 1.

Table 1

Results calculating the average score types of advertising campaign effectiveness

Advertising on radio	Advertising in TV	Advertising on the Internet	Outdoor advertising	Advertisement in public transport
2,3666667	3,2	3,8666667	2,7333333	2,2666667

As can be seen from the calculations, experts believe the most effective online advertising. In second place - on television.

To determine the need to invest in some of these species must also consider the price to advertise. Knowing the rating of each type of advertising, you need to plan, what is the proportion of the amount allocated to advertising should spend on each of its kind?

To create an optimization model we introduce the following notation:

X_i – share amounts S , allocated to each type of advertising ($1 \leq i \leq N$);

N – number of types of advertising;

C_i – price of the units of each type of advertising.

Then just be following expressions

$$\sum_{i=1}^N X_i = 1, \quad (2)$$

$$S = \sum_{i=1}^N X_i C_i. \quad (3)$$

The mean score the performance of each type of advertising is denoted as E_i .

While the overall effectiveness of measures to promote banking services, can be found as

$$E = \sum_{i=1}^N X_i E_i. \quad (4)$$

Subject to (2) - (3) can make the task of maximizing the efficiency of promotional activities as

$$\left. \begin{aligned} E = \sum_{i=1}^N X_i E_i \rightarrow \max, \\ \sum_{i=1}^N X_i = 1, \quad S = \sum_{i=1}^N X_i C_i. \end{aligned} \right\} \quad (5)$$

Collecting data on the cost of advertising in the river gave the following results [2]: Radio 1 sec – 24,00 UAH radio (1440 UAH / minute); Television as 10 to 60 000 UAH for 1 minute; Advertisement in public transport – from 25 UAH to 1,500 UAH per month; Outdoor Advertising – 1500 UAH per month (large board); Advertising on the Internet (banner ads) - from 3000 UAH (4 hour per 4 sm) 16 cm².

These data should lead to units that would determine the conventional area, similar to the cost of radio. In addition, it was found that advertising on transport has two components: advertising in the middle of the cabin and advertising placed on the outside of the chassis of the vehicle.

Then, the present value of different types of advertising was (Table. 2)

$$\left. \begin{aligned} 2,3666667X_1 + 3,2X_2 + 3,8666667X_3 + 2,733333X_4 + 2,2666667X_5 + \\ + 2,2666667X_6 \rightarrow \max, \\ 24X_1 + 600X_2 + 187,5X_3 + 50X_4 + 13,889X_5 + 1,4563X_6 = 10\,000, \\ \sum_{i=1}^N X_i = 1. \end{aligned} \right\} \quad (6)$$

Table 2

Present value types of advertising for the city Dnieper

Options prices	Types of advertising					
	Advertising on radio	Advertising in TV	Advertising on the Internet	Outdoor advertising	Advertisement in public transport, in the middle of the cabin	Advertising on public transport, on the outside of the body
Unit price	24	600	187,5	50	13,889	1,4563
dimension prices	грн/с	грн/с	грн/см ²	грн/день	грн/м ² /день	грн/м ² /день

The solution to this problem of linear programming using the application "Search solution" Microsoft Excel spreadsheet simplex method gave an unexpected result, namely, $X_1 \dots X_5 = 0, X_6 = 1$.

This decision means that the most effective advertising on the outside of public transport. Therefore, you need the full amount of 10 000 UAH to spend on 15564.44467 UAH / m² / day.

That is, for the month of 30 days to advertise banking services at 518.8148224 m². But according to certificate management of urban electric transport, free were only 188 m² area in trams and trolleybuses.

So finally the bank's management made a decision to purchase all the available space and advertise for $15564.44467 / 188 = 82$ days.

As a result of the campaign for the fourth quarter of 2015, number of clients increased by 7, 8%, and profit - by 2.4%.

Literature

1. Voronov VA Churikanova AU, Non-parametric statistical methods in economics / – D. National Mining University, 2008. – 63 p.
2. <http://index.minfin.com.ua/index/infl/>