

# Impact of Bank Cards Transactions on Banking Fee Income Growth in Russia

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**Abstract:** The article covers the advent of new sources of income which banks should concentrate on in the light of digitalization and development of new technologies. In spite of dynamic bank cards market development, there are many unresolved issues and challenges in this sphere, which generally relate to the necessity to enhance legal framework regulation; development of effective anti-fraud methods; utilization of innovative technologies and others. The Russian economy and society are in need of highly efficient, safe and economically viable and independent payment system, including such method of payments as bank cards. The conducted analysis revealed that there is a correlation between individual indicators of the bank card market development and the level of a bank's income. The latter depends not only on the revenue flows generated by the growth of interest rates on loans or other conventional types of banking transactions, but on the level of bank cards transactions. It is important to identify correlation between the growth of banks' fee income from card transaction and the amount of funds raised by commercial banks, the numbers of ATM, the average income per card, the number of operating cards, and per capita income of the population.

**Keywords:** Bank card, bank fee income, regression analysis, transaction.

## 1. INTRODUCTION

Given the implementation of the National System of Payment Cards in Russia, there is a growing need to develop specific measures for the effective functioning of the payment card market. Such tasks were identified in the Federal Law "On the National Payment System" (2011) and "Development strategy for the national payment system" (2013). They consist of researching factors that can positively affect the growth of a commercial bank's income. The importance of implementation of the National Payment Card System is that the bank card market:

- stimulates development of retail consumption, accelerates industrial production;
- beneficially affects economic growth and creation of new jobs;
- contributes to the reduction of the grey economy share/scale;
- leads to upheaval in tax revenues;
- provides for significant reduction in the cost of cash transactions;
- expands consumer access to additional financial services;

- promotes the development of a competitive payment ecosystem, faster economic growth;
- stimulates the development of consumer demand and significantly increases the indicators of real consumer income of the population.

In addition, the development of the bank card market is not only related to the expansion of the scope of their use, but also contributes to the acquisition by retail customers of promising forms of payments for goods and services, tuition fees, medical services, transportation and others, without visiting a bank's office and without using cash.

Thus, it becomes necessary to replace more traditional instruments and technologies with more sophisticated or having them combined. Series of research studies stipulate close relationship between quantitative and qualitative indicators that characterize the level of bank cards usage in retail payments and settlements (Obayeva and Rudakova, 2016; 2010).

The purpose of this research is to identify the relationship between individual indicators of the bank card market development and the growth of fee income generated therein. The object of the research is the market of bank cards, the subject of the research is the relationship between the income from operations with bank cards and the factors of the payment card market development. Correlation-regression analysis is the primary method utilized in the research.

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## 2. REVIEW OF RELATED LITERATURE

In recent years, the role of e-business tools has significantly increased. Therefore a lots of works have been published concerning such electronic business tools as bank cards,. In particular, some economists (Puhov and Matskevich 2015) believe that payments in the economy are initiated by cardholders, therefore, transactions using the card must be attributed to credit transfers. Thus, the bank cards are used as payment instrument of non-cash payments in retail banking.

According to Mussel (2015), a bank card can be used in e-business only to identify the owner and his bank account. In this context, the card is viewed as an instrument of access to the owner's account, the ability to apply a digital signature, which diminishes its value. According to Pyarina (2011), the payment card acts as a kind of financial card, which is a personalized means of payment that is intended for cash receipt using ATMs, as well as for goods payment, services in retail networks, and electronic document management.

In our opinion, the actual substance behind bank cards usage is as means of electronic business in the implementation of calculations, can be considered to the statement of Voronin (2014). According to his opinion, the bank card is a means whereby client initiates the issuance of cash from the account of the credit organization-issuer or goods payments and the retail network services, and also uses for settlements and funds transfer. Thus, the bank card acts not only as a key to electronic access to the account, but also as a payment instrument, which gives it an independent economic and technological component.

Furthermore, under the influence of the advent of digital technologies, the landscape of electronic

document management has been changing, whereby payment cards act as means to achieve competitive advantages and choose business models for a bank's development, according to (Yermolenko 2015; Maluntseva 2017). Factors of economic development (such as the amount of attracted funds from commercial banks, the level of average per capita expenditures of the population, the number of ATMs, the average income per card) have direct impact on the amount of fee income of banks from operations with cards, which are the subject of research in this article.

## 3. METHODOLOGY

**Hypothesis of the research** is the analysis of the impact of the following factors on banking income: number of ATMs, the borrowed funds of clients of one of the leading banks of the country (PAO Sberbank), average income per one card, number of operating cards, average per capita income.

**Research Methodology.** Assessment of the level of dependence of bank income from operations with bank cards via application of the regression analysis method.

**Description of empirical data and research results.** the example is based on the PAO Sberbank data of bank cards with in period 2010-2017, that shows the dependence of the fee income growth driven by bank cards based on changes in the five indices: the number of ATMs (X1), the borrowed funds of PAO Sberbank clients (X2) average income per card (X3), the number of valid cards (X4), per capita income of the population (X5). The initial data for constructing the model is given in the Table 1.

As the next step we perform the respective calculations and compile the correlation in the Table 2.

**Table 1: Initial Data**

Year	Fee income by bank cards, bln.rub.	ATM numbers, thousand	Borrowed funds of PAO Sberbank clients, bln. rub.	Average income per card, rub.	Number of valid cards, bln. holders	Per capita income of the population, rub.
2010	48	28	6 581 478	941	51	18958
2011	51	35	7 781 107	750	68	20780
2012	70	45	9 382 163	843	83	23221
2013	95	54	11 127 840	1 022	93	25928
2014	126	66	14 024 157	1 235	102	27766
2015	156	86	17 721 501	1 322	118	30224
2016	158	92	17 000 000	1 373	131	32479
2017	179	103	19 000 000	1 575	143	34765

**Table 2: Correlation Table**

	Fee income by bank cards	ATM numbers	Borrowed funds	Average income per card	Number of valid cards	Per capita income of the population
Fee income by bank cards	1					
ATM numbers	0,992441801	1				
Borrowed funds of PAO Sberbank clients	0,996286908	0,991662928	1			
Average income per card	0,965002303	0,947935346	0,94465589	1		
Number of valid cards	0,975010653	0,989125059	0,974467254	0,909311379	1	
Per capita income of the population	0,98633492	0,992977272	0,980823959	0,937689491	0,996543433	1

The correlation analysis reveals that all partial correlation coefficients between each parameter and the response (Y) are greater than 0.8, which means that the selected parameters are closely correlated with the response, i.e. they can be used as foundation for the model development. This means that the amount of fee income from operations with bank cards and selected factors are closely correlated.

Let's calculate the regression equation, which showed the tightness dependence between X and Y (Table 3).

**Table 3: Regression Model**

Regression statistic	
Multiple R	0,99985004
R-square	0,999700102
Normalized R-squared	0,998950357
Standard Error	1,669411143
Observations	8
Coefficients	
Y-intersection	-111,9681018
Variable X 1	-0,114304587
Variable X 2	0,743812306
Variable X 3	0,015193634
Variable X 4	-0,89533324
Variable X 5	0,007670382

After the discovery of stochastic dependence, the next step is regression analysis, which is done by using the "Data Analysis" package in Excel. In the Predictor

Y column, values are close to the actual source data (Table 4).

**Table 4: Fee Income by Bank Cards, bln. rub**

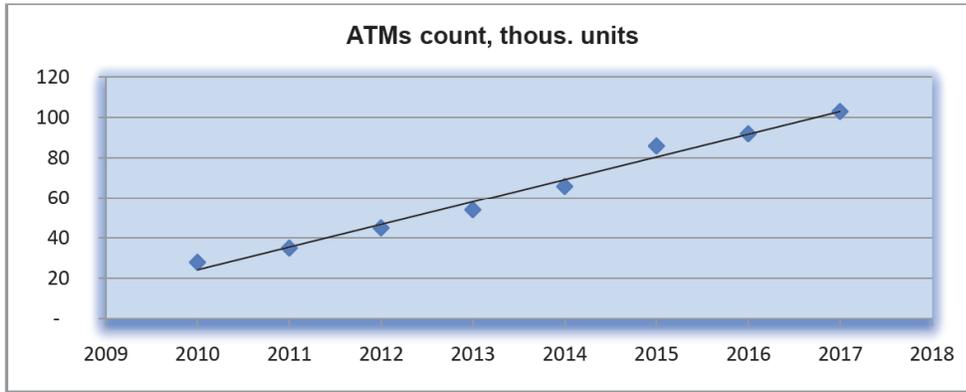
Year	Indicators (real)	Indicators (predicted (Y))
2010	48	48,81931769
2011	51	53,88913274
2012	70	67,19882599
2013	95	97,46779487
2014	126	121,0483796
2015	156	154,7299931
2016	158	156,9487602
2017	179	182,8977958

Obtaining of the linear regression equation:

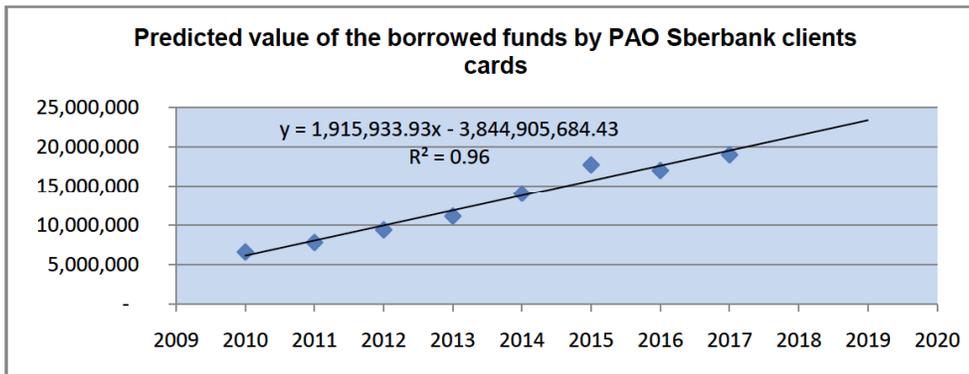
$$Y = -112,0226314 - 0,114259434 \cdot x_1 + 0,00743897 \cdot x_2 + 0,015162293 \cdot x_3 - 0,896646012 \cdot x_4 + 0,007678135 \cdot x_5 \quad (1)$$

Calculating the predicted value of the ATMs number for 2018-2020 by linear trend according to the formula:  $Y = 11,25x - 22588$ . Result  $Y_{2018} = 11,25 \cdot 2018 - 22588 = 115$ thous. units;  $Y_{2019} = 11,25 \cdot 2019 - 22588 = 126$ thous. units;  $Y_{2020} = 11,25 \cdot 2020 - 22588 = 137$ thousand units

By increasing the number of ATMs at present it can be predicted in the short term (by 2020 compared to 2017) by 33%. Constructing a linear trend of the index X2 to predict the volume of raised funds.



Picture 1: Predictive value of the ATMs number.

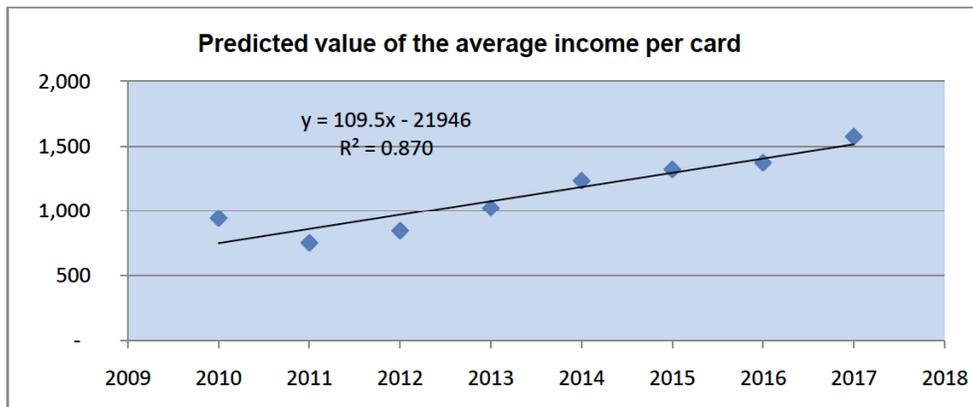


Picture 2: Predicted value of the borrowed funds volume by bank cards.

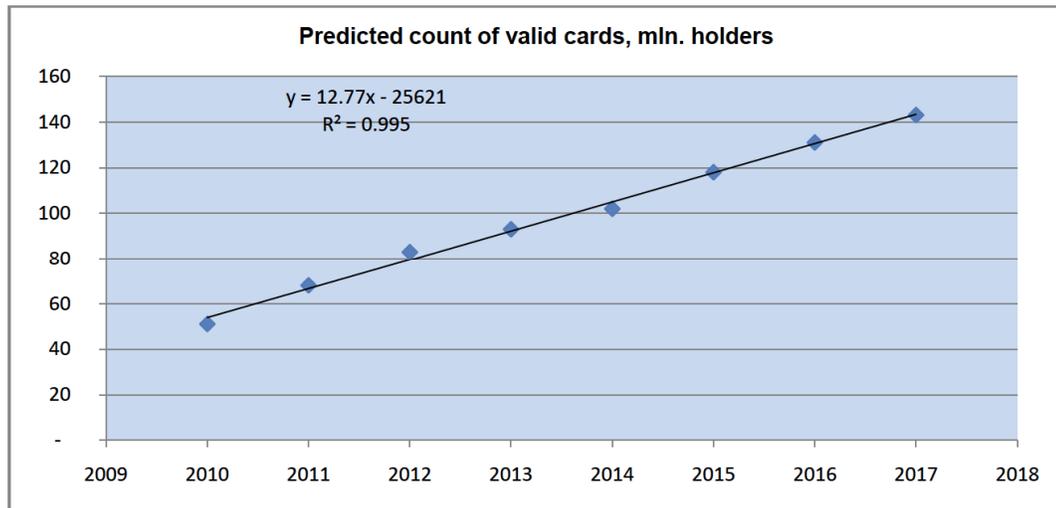
Calculating the predicted value of the borrowed funds volume by cards for 2018-2020 by linear trend according to the formula:  $Y = 1\,915\,933.93x - 3\,844\,905\,684.43$ . Result  $Y_{2018} = 1\,915\,933.93 \cdot 2018 - 3\,844\,905\,684.43 = 21\,4489\,986$  bln. rub. ;  $Y_{2019} = 1\,915\,933.93 \cdot 2019 - 3\,844\,905\,684.43 = 23\,364\,920$  bln. rub. ;  $Y_{2020} = 1\,915\,933.93 \cdot 2020 - 3\,844\,905\,684.43 = 25\,280\,854$  bln. rub. The volume of borrowed funds by 2020 compared with 2017 shows a predicted growth of 20%.

Calculating the predicted value of the average income per card for 2018-2020 by linear trend according to the formula:  $Y = 12,774x - 25621$ . Result  $Y_{2018} = 12,774 \cdot 2018 - 25621 = 1627$  rub.;  $Y_{2019} = 12,774 \cdot 2019 - 25621 = 1737$  rub.;  $Y_{2020} = 12,774 \cdot 2020 - 25621 = 1846$  rub.

Hence, the average income per card by 2020 will grow by 20% (an average of 2.7% per year) compared with 2017.



Picture 3: Predicted value of the average income per card, rub.



Picture 4: Predicted count of valid cards.

Calculating the predicted value of count of valid cards for 2018-2020 by linear trend according to the formula:  $Y = 12,774x - 25621$ . Result $Y_{2018} = 12,774 \cdot 2018 - 25621 = 157$  bln. units;  $Y_{2019} = 12,774 \cdot 2019 - 25621 = 170$  bln. units;  $Y_{2020} = 12,774 \cdot 2020 - 25621 = 182$  bln. units

The predicted count of valid cards may increase by 2020 by 27% compare to 2017.

Calculating the predicted value of per capita income of the population from the cards usage for 2018-2020 by linear trend according to the formula:  $Y = 2285,61x - 4575304,86$ . Result $Y_{2018} = 2285,61 \cdot 2018 - 4575304,86 = 37056$  (rub.);  $Y_{2019} = 2285,61 \cdot 2019 - 4575304,86 = 39342$  (rub.);  $Y_{2020} = 2285,61 \cdot 2020 - 4575304,86 = 41627$  (rub.)

Based on these calculations, it can be concluded that by 2020 per capita incomes of the population may increase by 20% compared to 2017 (on average, the annual increase will be 2.7% per year, there will be such a serious increase by 2020 due to the compound interest).

Thus, by determining the regression coefficients for all ("predicted") regression models and substituting them into the general linear regression equation, we get the predicted response Y values.

Let's substitute the received values in the regression equation, we will receive the prediction volume of bank net profit from cards usage:  $Y_{2018} = 202$  bln. rub.;  $Y_{2019} = 223$  bln. rub.;  $Y_{2020} = 244$  bln. rub. Adding all previously obtained data into Table 5:

Table 5: Summary Table of Calculation

Variables	Indicators/ years		
	2018	2019	2020
X1	115	126	137
X2	21489	23364	25280
X3	1627	1737	1846
X4	157	170	182
X5	37056	39342	41672
Y	202,8953	223,1314	244,5459

#### 4. CONCLUSION AND RECOMMENDATIONS

Thus, according to the constructed model, it can be concluded that under otherwise unchanged conditions, the amount of fee income from operations with bank cards may increase by 36% in a bank by 2020.

Consequently, all other things being equal, the growth of fee income from operations with bank cards will be achieved due to the influence of the considered variables. The results of the analysis confirmed that there is a positively significant relationship between these variables and the effect of income growth. Therefore operations with bank cards would allow the banks to achieve competitive advantages, ensure the development of a client-centered approach, encourage banks to build a personalized model of customer service and increase customer loyalty to the bank.

We can identify the following factors as recommendations for the development of the card business in Russia:

- (1) Commercial banks need to constantly work on creating new products based on national payment instruments and international payment cards. These include:
  - by influencing the price and non-price parameters of expanding the line of card products, it is necessary to ensure the growth of a bank's revenues;
  - based on increase in the number of cards for salary projects and the amounts of remunerated payroll of company employees, which are serviced by banks, it is important to expand the range of services for partner banks;
  - with the help of diversification of the client base, it is required to increase the number and servicing level of active clients by developing client services for the promotion of various types of cards;
  - according to the research results of customers loyalty level, it is necessary to increase the penetration rate of Internet and mobile bank into an active client base through: the introduction of new demanded services; analysis of customer satisfaction level with the quality of provided services; Increase the economic efficiency of card products by changing tariffs;
  - it is necessary to achieve the effectiveness of risk management in the provision of this type of services.
- (2) The product strategy of a commercial bank regarding card products should be based on providing the widest possible range of services that takes into account needs of customers. Under the conditions of economic instability, the key task for a commercial bank should be flexible management of price and non-price parameters of card products.
- (3) It is recommended that commercial banks optimize card products in order to achieve their balance by identifying strategically important points of their card business. The most preferred products are debit cards for individuals and salary projects, as well as based on NFC technology. The strategy for the card products development of a commercial bank should provide for an increase in the growth rates of volumes on debit cards, which will increase a bank's share of the card business in the total amount of a bank's revenues and maintain its current level of profitability.
- (4) Important strategic directions of a commercial bank should be speed and flexibility of its response to changing external business conditions through the quick modification of the existing parameters of products and services that will take advantage of the universal model of the bank's work and continue to develop other important strategic directions of its business. In particular, such format of relations as "a Bank for Banks", wherein a commercial bank will be able to provide new types of services for partner banks (including outsourcing of the following services: collection of cash, banknotes, services of digital and mobile banking and card business).
- (5) In order to counteract fraudulent activities using bank cards, it is necessary to continue work on: increasing the level of financial awareness of cardholders; provision to all participants of bank card transactions the information about unauthorized transactions; creation of data bases about fraudulent activities within the country; monitoring and information exchange between all calculation participants; development of necessary measures related to minimizing damage to the cardholder and the bank as its issuer.
- (6) For the development of the national card "MIR", it is advisable to implement a number of measures that will not only attract citizens of the country for active usage of this card, but also make the issue of this card profitable for the banks themselves. Such measures include: introduction of a more preferential tariff for the provision of various types of operational services and services in the range of payment clearing, collected from participating banks in favor of payment system operators; development and implementation of 3D-secure technology for payment of goods in online stores via online mode; usage of loyalty programs (including in cashback form with mandatory interest on the balance); setting a lower annual maintenance than the usual debit card; setting preferential tariffs for corporate clients of salary projects.
- (7) Banks' fee income growth depends on the level of development of the non-cash methods of

payments in retail. This growth, however, inevitably leads to the rise in the costs and subsequent increase in retail prices for goods and services, with small and medium enterprises being mostly affected. Acquiring fees that are charged by the banks and suppliers in Russia are unified for all payment systems and range between 2%-3% of a transaction amount. These tariffs should be lowered for the MIR payment system to boost its use in retail as alternative to conventional cash payments.

- (8) It is necessary to develop and introduce various kinds of smart cards into circulation, including payment for education and use of educational services on the basis of campus cards for students of higher and secondary educational institutions, schoolchildren; cards for wealthy customers; various kinds of applications within fuel and transport cards us age.

Thus, the introduction of modern IT technologies, electronic banking, contactless payments are required development of the card business on a new technological basis, including through the widespread distribution of the "MIR" payment card, which will increase the number of non-cash transactions throughout the country and make such payments more reliable.

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