



Benefits of the retail payments card market: Russian cardholders' evidence[☆]

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ABSTRACT

This article evaluates cardholders' benefits resulting from the participation in the retail payments market. Using surveys and data simulations to obtain a representative sample of 1500 Russian individuals, the article finds significant, robust evidence in favor of positive cardholders' benefits. This study also examines the effect of the level of variable cardholders' benefits on the frequency of card payments. Results show that such effect is non-linear and forms a u-shape. Findings imply that unbalanced intervention may be detrimental to the agents' welfare and propose a mechanism for ex-ante evaluation of the effect of shocks and interventions.

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1. Introduction

Payment cards have been in the center of global financial services and business innovation for the past few decades. During recent years market participants have experienced different shocks and interventions drawing from the argument that some groups of agents exploit benefits from the participation in the market at the expense of other agents. None of these interventions, however, has proven to be Pareto efficient yet (Schmiedel, Kostova, & Ruttenberg, 2012; Weiner & Wright, 2005). One of the main reasons for such results is the failure of both market participants and regulators to empirically evaluate current levels of benefits from the participation in the market, and the consequences of shocks and interventions for these benefits.

This article aims to contribute to two rising strands of literature. The first one concerns the formation of the retail payments market equilibrium (Bedre-Defolie & Calvano, 2013; Rochet & Tirole, 2002; Weiner & Wright, 2005). This literature so far has not provided any quantitative estimates of the benefits for stakeholders, claiming this value to be theoretical rather than empirical. This research aims to fill this gap by estimating the cardholders' benefits at the Russian retail payments market. After examining the literature, this is the first study to evaluate the benefits empirically rather than propose theoretical identification of them. Additionally, this study extends the

growing empirical literature on the emerging retail payments markets (Reinartz, Dellaert, Krafft, Kumar, & Varadarajan, 2011) by providing the insights into the current market situation and deepening stylized facts of the retail payments market in Russia.

The empirical analysis of the benefits uses a representative sample of 1500 individuals from all Russian regions and the data simulations drawing on this survey. The study finds significant robust evidence in favor of the presence of positive cardholders' benefits at the Russian retail payments market. In addition, the value of benefits does significantly influence the frequency of using payment cards at the point of sale (POS). The results in this article highlight the importance of empirical evaluation of the benefits for explaining the market equilibrium formation and the cardholders' behavior.

Following this introduction, Section 2 provides the theoretical framework. Section 3 explains the empirical set-up of the research and method of benefits evaluation. Section 4 presents major findings. Finally, Section 5 offers the discussion of the major results, identifies limitations and suggestions for future research, and concludes.

2. Cardholders' benefits

Cardholders' benefits form the basis for the identification of the market equilibrium (Baxter, 1983; Bedre-Defolie & Calvano, 2013; Rochet & Tirole, 2002). In particular, these benefits allow determining the level of interchange fees to attain the equilibrium redistribution of costs among the two sides of the retail payments market (Baxter, 1983). Following the theoretical model of Bedre-Defolie and Calvano (2013), this study differentiates between the fixed (e.g., being able to pay larger sums of money than present in the wallet) and variable benefits (e.g., easier personal finance management) for cardholders.

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2.1. Sources and determinants of benefits

One of the most important sources of the cardholders' benefits is the presence of the network externalities (Carbó-Valverde, Linares-Zegarra, & Rodríguez-Fernandez, 2012; Rysman, 2007). With these externalities cardholders receive additional benefits when the number of merchants accepting payment cards increases.

Additional sources of benefits of the payment cards relative to the cash instruments originate from the quality of services at the particular POS, the easiness of personal financial management, the ability to defer the payment, the declined risk of fraud, and the monetary protection of the holdings in case of fraud (Arango, Huynh, & Sabetti, 2011). Besides, benefits originate largely as a result of the increasing transaction volumes (Arango, Huynh, & Sabetti, 2011; Bounie & François, 2006; Cohen & Rysman, 2013; Hayashi & Klee, 2003). Individuals prefer to use cards more often whenever their overall spending level increases, although the relationship is non-linear.

Finally, the major source of the cardholders' benefits is the existence of loyalty programs (Arango, Huynh, & Sabetti, 2011; Bedre-Defolie & Calvano, 2013; Bolt & Chakravorti, 2008; Ching & Hayashi, 2010). Stimulating programs compensate the participants with bonuses and monetary payments (e.g. cashback), which decrease net costs of using the card. However, researchers must pay special attention to the habit of paying with cash present in the Russian market (Krivosheya, Korolev, & Plaksenkov, 2015; Plaksenkov, Korovkin, & Krivosheya, 2015). Since cash is a convenient payment instrument to some groups of individuals, the level of benefits may be lower for them.

Proposition 1. Both fixed and variable benefits are positive and significant for the cardholders.

In addition to the above determinants of benefits, the literature finds significant evidence in favor of additional benefits of increased competition (Guthrie & Wright, 2007; Rochet & Tirole, 2003). Higher competition among issuing banks results in lower value of costs for the cardholders.

Proposition 2. Increased competition leads to the higher value of net benefits.

2.2. Determinants of the card usage frequency

The frequency of using card at the POS depends on the transaction characteristics, merchant characteristics, social and economic characteristics of the individual, technology adoption, and participation in the loyalty programs, which links to the benefits (Arango, Huynh, & Sabetti, 2011; Bounie & François, 2006; Ching & Hayashi, 2010; Cohen & Rysman, 2013; Hayashi & Klee, 2003; Rochet & Tirole, 2003).

Proposition 3. In presence of positive variable cardholders' benefits, the probability to use card increases.

3. Empirical set-up

3.1. Data

Finance, payments, and e-commerce chair generously provide private data from the survey of Russian cardholders' profiles and their behavior in 2013–2014. Face-to-face survey of individuals includes all Russian regions to ensure sample representativeness for the Russian retail payments market. For the same purposes survey involves at least 18 years old individuals from the cities with at least 500,000 inhabitants. Three stage-probability sampling and quotas for age and gender ensure valid proportion of each distinct group of individuals (gender, income, age, and geographical area groups) corresponding to Russian demographics. The survey questionnaire focuses on the payment

behavior and payment instrument choice of the cardholders. Also, the questionnaire includes sections on individuals' sociodemographic characteristics (age, gender, geography, income, education levels, and work and household characteristics).

The resulting sample consists of 1500 individuals. 44.4% of the sample individuals are women. Only 26.7% of individuals are from Moscow and 11.3% from Saint-Petersburg. About 73.5% of the individuals hold at least one payment card, 75% of which pay by card for goods and services.

In addition, this study investigates bank costs and revenues from the payment cards business in 7 of top 20 banks in Russia in terms of assets. This issuing banks sample covers more than 80% of the Russian payment cards market.

The survey identifies some stylized facts about Russian retail payments market:

- An increase in the payment and cardholding activity in Russia during the latest years originates from the change in behavior of the holders of salary cards. The employers pay the fixed and variable fees for such cards.
- Salary cards comprise approximately 42% of all cards.
- The demand for cardholding and paying with card of the holders of salary cards is close to absolutely elastic.

The survey of individuals includes a number of questions on the level of fixed fees that individual pays. One concerns the actual level of fixed fees paid for the card usage (self-report). Another one values the cut-off level of fixed fees (the level of fees under which the individual will abstain from holding the card). Self-reported value of the cardholder's fees combined with the cut-off value allows evaluating implicitly the attitude of the individual toward the payment cards and willingness to pay for being able to hold card. Asymptotic dataset for the cardholders' benefits allows performing such an implicit evaluation.

Following Nicolay (2014), this study uses the sample of 1 million observations over 1000 simulations to calculate the average net fixed benefits for cardholders. Such sample allows convergence to the asymptotic values and leads to the consistent estimate, close to the population parameters results. Robustness checks use 10 million observations. Both simulations are representative for the whole population of 122.7 million observations (entire Russian population legally eligible to hold payment cards as at 2014). Visual support follows the sample of 10 million observations, whereas the results section discusses findings for 1 million observation samples. The study uses the survey sample to estimate the variable benefits.

3.2. Method

3.2.1. Fixed benefits evaluation method

Distribution of the fixed cardholders' fees for the Russian market has the following descriptive statistics: the mean is 482.8 RUR, the variance is 178,132, skewness is 2, and kurtosis is 15. These figures form the basis for the simulation of fixed gross benefits for the cardholders. Consistency with the requirements of the law of large numbers allows using skewed normal distribution for simulations. Such distribution accounts for the stylized facts identified above. Particularly, probability of getting nearly zero benefit is higher than getting the high value of benefit, which corresponds to the proportion of holders of salary cards.

Fig. 1 presents the results of data generation for 10 million observations. The gray line shows the closest symmetric normal distribution. Histogram of gross benefits reports heavier tails, especially in positive region, than symmetric normal distribution as well as more observations around zero. This result supports the limitations of using conventional symmetric normal distribution for gross cardholder fixed benefits because those methods do not account for the stylized facts.

The next step is to identify the level of net cardholders' benefits. Issuing banks impose actual fees for the cardholders. In case of perfect

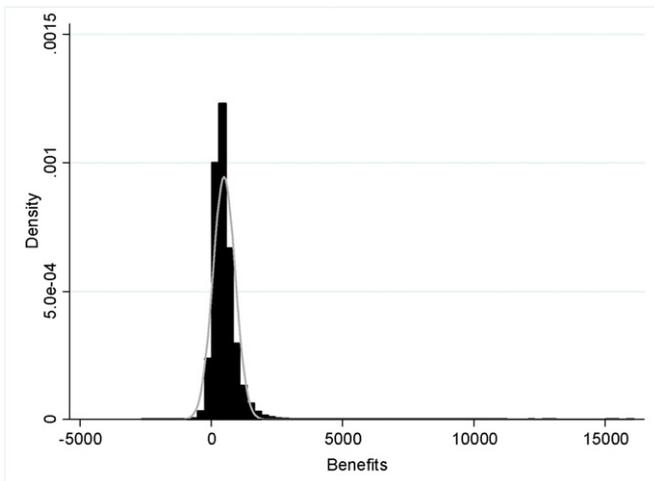


Fig. 1. Distribution of the gross fixed cardholders' benefits. 10 million observations.

price discrimination, banks would be able to set fixed fees exactly at the level of fixed individual benefits. In such case, average net fixed individual benefits would be zero. In reality, however, information asymmetry is present. Banks cannot observe the actual level of individual fixed fees. Nevertheless, current market setting allows for non-perfect discrimination. Banks offer the choice of five types of payment cards: salary, electronic, standard, gold, and platinum cards. In essence, the bank provides the same services across all types of cards. Additional bonuses and specificities of different card types allow banks to identify the level of individual fixed benefits and sell the individual the card of the corresponding type. Zero bounds the value of fixed fees from below, because the bank does not pay for the opening of any card type. The individual may choose to hold more than one payment card in which case he or she enters the sample twice.

Usually, individuals eligible to receive government support and willing to accept the employer-funded cards have lower than average income and are, on average, less likely to get the card themselves. That is why in a world of perfect planning, without information and market frictions, social planner would grant salary cards to the individuals with the lowest fixed gross benefits. Although general tendency does persist and the majority of holders of salary cards indeed have the lowest benefits, in absence of such planner and in a world with information asymmetry, individuals with any level of benefits may become the holders of salary cards. In case of salary cards, the decision to open the card is involuntary. Receiving social transfers electronically is legally binding for the individuals eligible to receive them. However, as at 2014 (the year of survey conduction), the legislation allows to request cash transfers.

According to official Russian statistics (Goskomstat), at least about 10% of Russian individuals who receive social payments do not belong to the lower income groups. Besides, these 10% include the proportion of recent graduates who are likely to receive a salary card with the first employment. This claim forms the ground for identification of the individuals receiving the salary card. At the first step, individuals from the lowest 42 percentile of gross fixed benefits receive a salary card with 90% probability. Then, any individual regardless of the level of his or her benefits has a 10% chance to receive a salary card. In case of double drawing, the individual receives only one salary card.

According to the Central Bank of Russia, about 90% of the issued cards are standard, 8% are electronic, 1.5% are gold cards, and 0.5% of the cards are platinum. The banks impose the level of fees to each of the products according to the average level of fees among the competitors and the market research of the bank products. According to the expert interviews (Plaksenkov, Korovkin, & Krivosheya, 2015), the importance of these two categories for tariffs-setting is approximately

30% and 70% respectively; mainly because of the moderate quality of Russian banks' marketing services and the development of the country's financial system. This study assumes that the banks set the level of fees using these proportions (30% and 70%).

Individuals observe the full set of products and base their choice on the level of benefits (observable to them only) as well as the targeting and marketing power of the bank (the better the marketing services of the bank are, the more precise product offering is). Ideally, the individuals enter the group according to their level of benefits in the percentiles resulting from the proportion of each card type. The presence of market frictions may force individuals to transfer to the neighboring groups. The probability of transferring to distant groups is lower than the probability of staying within the ideal group. Adding and subtracting random drawings from the Poisson distribution with $\lambda = 0.1$ allows to account for such transfers.

According to the survey of the 7 largest banks in Russia in terms of assets (more than 80% of the issuing market as at 2014), the average level of fees are (rubles per year):

- a) Electronic cards: 300
- b) Standard: 1000
- c) Gold: 3100
- d) Platinum: 7100.

The ideal fees are the mean level of fixed gross benefits for each category (this way, the value of net benefits is zero). Taking into account the fact that the level of actual fees is lower than the level of average fixed gross benefits in each group, the study supports the claim that price competition among issuing banks effectively decreases the level of cardholding fees (Arango, Huynh, & Sabetti, 2011; Rochet & Tirole, 2002).

Net fixed benefits are the difference between the level of gross fixed benefits and the fixed fees. Fig. 2 presents the results of net fixed benefits calculation for the sample of 10 million observations.

3.2.2. Variable benefits evaluation method

The survey of individuals includes questions on whether the individual uses the card for paying for goods and services, what proportion of total transactions volume do the card payments constitute, and how often the individual chooses the payment card against cash if the merchant accepts cards at the POS. These questions allow evaluating the value of payments by card for each individual as well as the willingness to use the card at the POS.

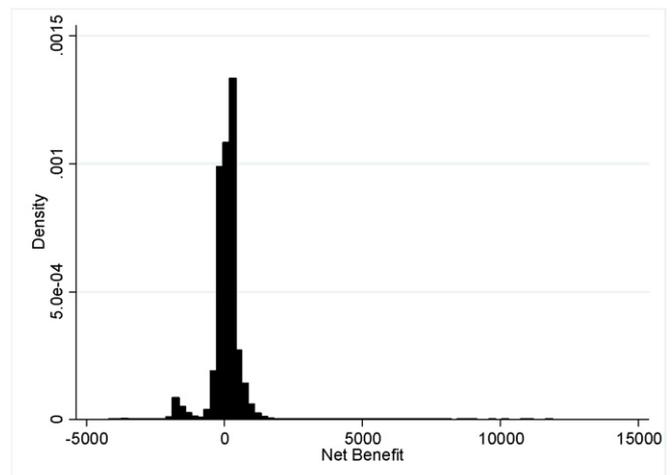


Fig. 2. Distribution of the net fixed cardholders' benefits. 10 million observations.

According to official Russian statistics (Rosstat) the transaction volume per capita in retail segment during a month in 2014 was about 7517.1 RUR. Following Nielsen (2014), this study assumes the level of average check at the retail stores of 550 RUR. Linear dependence of the number of store visits on the average check suggests 12.5 store visits a month. However, this does not correspond with the market research results (WCIOM, 2014; FOM, 2014). Instead, this study proposes that the number of store visits depends non-linearly on the average check. Specifically, $av.check = T^{\frac{1}{N}}$; where T is transaction volume, e is elasticity of average check to the transaction volume, N is the number of store visits.

This model allows incorporating individual preferences toward store visits through elasticity. A busier individual, ceteris paribus, might be less willing to visit the store even if the total spending is large. Besides, the estimates of the number of store visits help explain empirical patterns. Finally, marginal returns to the average check are diminishing with the total transaction value of the individual, which complements the existing literature (Bounie & François, 2006; Humphrey, 2010).

This formula allows calculating the average value of elasticity for Russian retail payments market out of the observed average check and transactions volume per capita, as well as the number of card payments per month available for each individual from the survey. The resulting average elasticity value is 0.40, which explains the empirical pattern of store visits much better than the result from linear dependence: 0.12.

Unlike simulations, the survey allows evaluating the value of net variable benefits first. Gross benefits are the sum of net benefits and (negative) loyalty program reward payments. The volume of electronic payments for each individual per month is the product of the proportion of card payments in total transaction volume and the volume of retail transactions per capita per month. The developed model prescribes the number of store visits for each individual. The product of the probability to pay with card at the POS and the number of store visits is the expected number of store visits ending with card payment. The number of visits is discrete; therefore, the study rounds expected number of visits to the nearest integer. Dividing the volume of electronic payments by the expected number of store visits resulting in card payment yields the average check of the electronic transaction for the individual. The division of this value by the total volume of transactions yields the value of variable benefits of the individual for a monthly consumption bundle. Dividing this value by the number of store visits gives the value of variable benefits per transaction. Fig. 3 presents the distribution of variable per transaction net benefits for the sample resulting from the survey.

According to the data by the Finance, Payments, and e-commerce chair, the costs of issuing banks in Russia divide them in two groups.

Group A aims at the mass segment, whereas group B aims at premium cardholders. Besides, credit and debit cards divide the payment cards in two categories. Costs of the bank per one card devoted to the loyalty programs show the monetary value of participating in the loyalty program for the individual. The costs per one debit card are 61 RUR and 335.7 RUR for groups A and B respectively. For credit cards, the corresponding figures are 70 RUR and 1215 RUR respectively.

Fig. 4 presents the distribution of gross variable benefits. Essentially, loyalty programs aim at the individuals with the lowest and negative variable benefits.

3.3. Statistic and econometric methods

The Student (1908) test of statistical significance allows testing the difference of the mean of resulting benefits from zero. Normality of the distributions the central limit theorem prescribes explains the validity of choice of the Student test. Following Schuh and Stavins (2010), this study uses the Heckman selection model to estimate the effect of benefits on the frequency of card payments at the POS.

4. Results

4.1. Fixed cardholders' benefits

The average value of net fixed benefits of cardholders resulting from 1000 times simulation of the calculation of net fixed cardholding benefits on a sample of 1 million observations equals 247.7 RUR per year. In other words, participating in the cashless retail payments market brings individual, on average, 247.7 RUR per year, which includes, for instance, foregone transaction costs of going to the ATM or attaining social status. Average value of corresponding Student t-statistics is 118.3. For both two-sided and one-sided (positive) alternative hypotheses the resulting mean is significant at any reasonable significance level.

The breakdown of the results by the type of the card is as follows (RUR per year):

- a) Electronic cards: 466.8
- b) Standard: 176.6
- c) Gold: 105
- d) Platinum: 793.7
- e) Salary: 286.4.

All of the means are significant at any reasonable significance level.

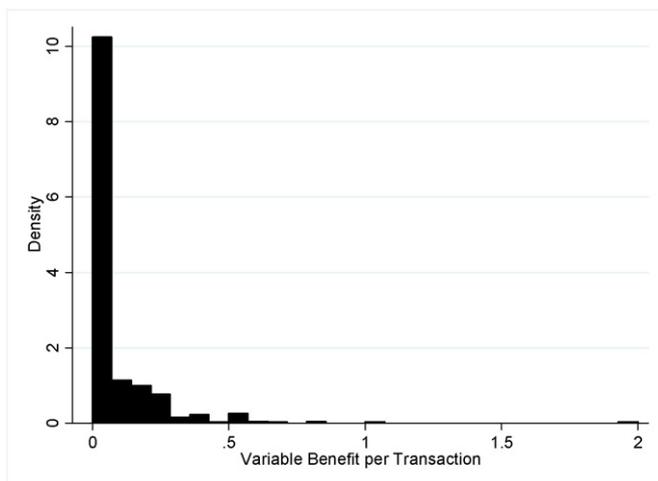


Fig. 3. Distribution of net variable cardholders' benefits: % of the transaction.

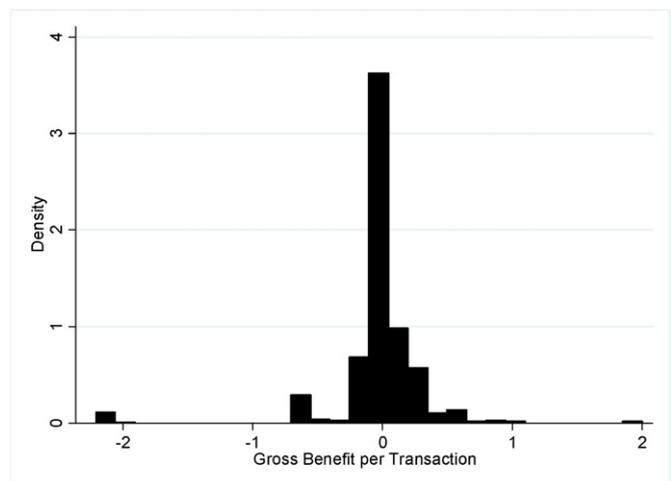


Fig. 4. Distribution of gross variable cardholders' benefits: % of the transaction.

4.2. Variable cardholders' benefits

The average value of variable benefits per transaction is 7.7%. Assuming the average check of 550 RUR, this figure translates to the average variable net cardholder's benefit of 42.5 RUR per transaction. The value of corresponding t-statistic is 13.49. Again, at any reasonable significance level, the mean is significantly different from zero.

The mean variable benefits per transaction becomes 4.3% or 10.7 RUR, when assuming constant elasticity of average check to the transaction volume per month if the volume of transactions in the retail stores for the individual is 1000 rubles. Under the transaction volume per month of 10,000 rubles, the mean variable benefit becomes about 18.8% or 131.2 RUR. Finally, the transaction volume of 100,000 rubles yields the mean variable cardholder's benefits of 15% or 782.6 RUR. Decreasing marginal returns to the average check allows for the existence of a socially optimal level of variable benefits (maximal per-transaction level of benefits in percentage terms).

The mean value of gross benefits is about –2% or –10.9 RUR. Loyalty and bonus programs effectively stimulate the payment activity by increasing the value of variable benefits. In case of the loyalty program termination, a considerable proportion (about 20% of the loyalty program participants) of the market will pay with card less often. The T-statistic value for the difference of means between the gross and net variable benefits is 8.7; meaning that the gross benefits are significantly lower than the net benefits. Overall, both [propositions 1](#) and [2](#) find significant support.

[Table 1](#) reports the results of estimating the two-step Heckman model for the analysis of the determinants card payment frequency. The effect of variable benefits are non-linear and highly significant. The level of benefits increases with the level of average check, while the number of store visits decreases. This result explains why higher benefits may result in a lower number of store visits and, hence, of card payments in a month. On the other hand, higher level of variable benefits motivates the individual to use the card more often. Notably, assuming linear effect of benefits, the effect becomes negative but stays highly significant. This result supports [proposition 3](#) and shows that benefits help explain consumers' behavior. Furthermore, incorporation of benefits improves the explanatory power of the model. Other characteristics that are significant include technology adoption, loyalty programs participation, and holding a salary card, thus confirming the results of previous studies outlined above ([Arango, Huynh, & Sabetti, 2011](#); [Bounie & François, 2006](#)). The results are robust in spite of the exclusion of the city dummies and personal characteristics (e.g., age). The study does not report robustness checks.

According to the presented method and theoretical framework, the value of benefits among other determinants depends on the:

- Loyalty program participation
- The level of financial literacy of an individual and overall information awareness
- Availability of new types of cards in banks
- Precision of the bank targeting
- Speed and quality of processing of the payment.

Changing the targeting quality of the banks to the ideal level results in almost zero benefits. If banks assign individuals to card types at random, the level of fixed benefits as well as variable benefits declines significantly. On the one hand, better allocation of the individuals to the groups results in fair products' distribution. This procedure increases the benefits of individuals who pay for a more expensive type of card in case of moderate targeting. On the other hand, the precision of market research results improves, leading to higher fees for the cardholders. Depending on the relative marketing power of banks and the level of financial literacy in the country or particular region, either of the effects prevails.

Table 1

Two-step Heckman selection model for frequency of card payments. Figures in parentheses denote standard errors.

Variables	Individual pays often (at least once a week) with card	Selection equation
Age		
18–25	–0.01 (0.04)	–0.03 (0.17)
25–35	–0.00 (0.04)	0.15 (0.16)
35–45	–0.02 (0.04)	0.02 (0.16)
55–65	–0.03 (0.04)	–0.06 (0.16)
65 and older	–0.09 (0.09)	–0.92*** (0.19)
Education		
Beginning professional	–0.01 (0.05)	0.42** (0.18)
Medium professional	0.02 (0.04)	0.49*** (0.12)
Higher professional	0.04 (0.04)	0.68*** (0.13)
Married	–0.00 (0.03)	0.13 (0.10)
Have children	–0.04 (0.03)	0.18* (0.10)
Advanced PC user	0.10* (0.05)	0.94*** (0.13)
Low Income	0.04 (0.06)	–0.40** (0.17)
High Income	0.02 (0.03)	0.24** (0.11)
Variable benefit (in percent)	–3.12*** (0.13)	
Variable benefit (in percent)^2	1.56*** (0.10)	
Credit Card	0.02 (0.04)	
No fees	–0.06** (0.02)	
Loyalty program participant	0.07*** (0.03)	
Often trips within Russia		0.39* (0.23)
Often trips within Neighboring countries		–0.28 (0.41)
Often trips around the world		0.05 (0.33)
Constant	0.71*** (0.15)	–1.25*** (0.36)
City dummies	YES	YES
Observations	1224	1224
Degrees of Freedom	53	53
Loglikelihood	–760.2	–760.2

* Denotes significance at 10% level.

** Denotes significance at 5% level.

*** Denotes significance at 1% level.

Monopolization of the issuing market leads to the increase in the negotiation power of the issuers, which yields higher level of fees for all cardholders. Increasing competition, on the contrary, introduces the variety of the payment products because of the imperfect competition market structure. Love of variety at the market leads to higher value of welfare and benefits from using the card ([Ardelean, 2006](#)). Stimulating and fostering competition allows achieving Pareto improvement in the market.

The vulnerability of significant proportion of the cardholders to changes undermines the importance of monetary ways to alter the level of tariffs and translates into the fragility of current market equilibrium on the retail payments market in Russia. Unbalanced interventions resulting in tariff changes may lead to loyalty programs' shutdowns, which would likely result in significant payment activity decline. Active

usage of electronic payments correlates, in turn, with the economic growth, transparency and sustainability (Handa & Khan, 2008; Plaksenkov, Korovkin, & Krivosheya, 2015).

5. Discussion and conclusion

This study evaluates the benefits of agents present at the retail payments market, specifically, those of the cardholders. A representative survey of 1500 Russian cardholders allows calculating both fixed and variable benefits of the individuals. The former, in addition, employs the simulation of the benefits distribution obtainable from the survey on the sample of 1 million observations with 1000 repetitions. The corresponding Student's *t*-statistics show significant evidence in favor of the presence of positive fixed and variable benefits for Russian cardholders. The study, then, shows significant evidence in favor of the u-shape effect of the benefits on the frequency of card payments. These findings underline the importance of the cardholders' benefits for the equilibrium formation at the retail payments market and can help deepen the understanding of cardholders' behavior.

This research contributes to the burgeoning literature on the analysis of agents' behavior and equilibrium determinants at the retail payments market (Bedre-Defolie & Calvano, 2013; Guthrie & Wright, 2007; Martikainen, Schmiedel, & Takalo, 2015; Rochet & Tirole, 2002). This literature, however, treats benefits as purely theoretical rather than empirical value. This study is the first attempt to design a method to calculate empirical benefits. The empirical value of benefits is a toolbox for academics and practitioners to effectively address the development of the retail payments market by analyzing the effect of various policies introduced to the market. In addition, this study extends the rising strand of literature concerning the evaluation of the current situation at the emerging retail payments markets (Chizhikova, 2013; Reinartz, Dellaert, Krafft, Kumar, & Varadarajan, 2011). Revisiting the current market situation description with a focus on benefits allows deepening the understanding of differences in terms of retail payments market development and, specifically, card usage in payments.

One of the main practical and social implications of this research concerns the fact that the benefits of the participation in the retail payments market exist for all the agents on the market and not just payment systems. Criticism of the payment systems often includes capturing benefits of other participants (Schmalensee & Evans, 2005). Besides, understanding the ways to evaluate the level of benefits allows approaching potential regulation initiatives ex-ante in order not to disturb fragile equilibrium. Empirical evaluation of the benefits is a step toward the introduction of fair pricing of the payment instruments, implementation of effective policies and identification of socially optimal market equilibrium in Russia as well as other countries.

This study has certain limitations that create opportunities for further research in this area. Firstly, the research focuses on cardholders' benefits. Expanding the method to all stakeholders of the retail payments market system can help explain the general equilibrium formation.

Secondly, future research may aim at explaining the factors affecting the value of benefits empirically. Finally, other countries' and cross-country benefits may be of interest in the context of the increasing economic integration.

References

- Arango, C. A., Huynh, K. P., & Sabetti, L. (2011). How do you pay? The role of incentives at the point-of-sale. *Working paper 2011-23*. Bank of Canada.
- Ardelean, A. (2006). *How strong is the love of variety?* Purdue CIBER Working Paper.
- Baxter, W. F. (1983). Bank interchange of transactional paper: Legal and economic perspectives. *The Journal of Law & Economics*, 26(3), 541–588.
- Bedre-Defolie, Ö., & Calvano, E. (2013). Pricing payment cards. *American Economic Journal: Microeconomics*, 5(3), 206–231.
- Bolt, W., & Chakravorti, S. (2008). Economics of payment cards: A status report. *Economic Perspectives*, 32(4).
- Bounie, D., & François, A. (2006). Cash, check or bank card? The effects of transaction characteristics on the use of payment instruments. *Telecom Paris economics and social sciences working paper no. ESS-06-05*.
- Carbó-Valverde, S., Linares-Zegarra, J. M., & Rodríguez-Fernández, F. (2012). Feedback loop effects in payment card markets: Empirical evidence. *Review of Network Economics*, 11(2).
- Ching, A. T., & Hayashi, F. (2010). Payment card rewards programs and consumer payment choice. *Journal of Banking & Finance*, 34(8), 1773–1787.
- Chizhikova, E. S. (2013). The current payment system of the Russian Federation. *Middle-East Journal of Scientific Research*, 14(2), 244–247.
- Cohen, M. A., & Rysman, M. (2013). Payment choice with consumer panel data. *SSRN scholarly paper no. ID 2308121*.
- Guthrie, G., & Wright, J. (2007). Competing payment schemes. *The Journal of Industrial Economics*, 55(1), 37–67.
- Handa, J., & Khan, S. R. (2008). Financial development and economic growth: A symbiotic relationship. *Applied Financial Economics*, 18(13), 1033–1049.
- Hayashi, F., & Klee, E. (2003). Technology adoption and consumer payments: Evidence from survey data. *Review of Network Economics*, 2(2).
- Humphrey, D. B. (2010). Retail payments: New contributions, empirical results, and unanswered questions. *Journal of Banking & Finance*, 34(8), 1729–1737.
- Krivosheya, E., Korolev, A., & Plaksenkov, E. (2015). Measures for stimulating cashless economy in Russia. *Moscow School of Management SKOLKOVO working paper*.
- Martikainen, E., Schmiedel, H., & Takalo, T. (2015). Convergence of European retail payments. *Journal of Banking & Finance*, 50, 81–91.
- Nicolay, D. (2014). *Asymptotic chaos expansions in finance*. London: Springer.
- Plaksenkov, E., Korovkin, V., & Krivosheya, E. (2015). *Cashless economy in Russia: Trends, perspectives, opportunities*. Moscow School of Management SKOLKOVO Working Paper.
- Reinartz, W., Dellaert, B., Krafft, M., Kumar, V., & Varadarajan, R. (2011). Retailing innovations in a globalizing retail market environment. *Journal of Retailing*, 87, S53–S66.
- Rochet, J. C., & Tirole, J. (2002). Cooperation among competitors: Some economics of payment card associations. *The Rand Journal of Economics*, 33(4), 549–570.
- Rochet, J. C., & Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1(4), 990–1029.
- Rysman, M. (2007). An empirical analysis of payment card usage. *The Journal of Industrial Economics*, 55(1), 1–36.
- Schmalensee, R., & Evans, D. S. (2005). The economics of interchange fees and their regulation: An overview. *SSRN scholarly paper no. ID 744705*.
- Schmiedel, H., Kostova, G. L., & Ruttenberg, W. (2012). The social and private costs of retail payment instruments: A European perspective. *ECB Occasional Paper*, 137.
- Schuh, S., & Stavins, J. (2010). Why are (some) consumers (finally) writing fewer checks? The role of payment characteristics. *Journal of Banking & Finance*, 34(8), 1745–1758.
- Student (1908). The probable error of a mean. *Biometrika*, 6(1), 1–25.
- Weiner, S. E., & Wright, J. (2005). Interchange fees in various countries: Developments and determinants. *Review of Network Economics*, 4(4), 1–34.