

Psychological Factors of Multiple Debt Repayment Strategies

Maria Gagarina*, Tatiana Goroshnikova**

* Ph.D. in psychology, Financial University, Moscow, Russia, MGagarina@fa.ru

** Ph.D. in technical sciences, Financial University, Moscow, Russia, TGoroshnikova@fa.ru

Abstract

The article presents a review of the literature and the results of an empirical study of strategies for repayment of multiple debts in a laboratory experiment and their connection with the personality traits of the respondents (N = 348). The main strategies of debt repayment are identified – Rational, Semi-rational, Aversive, Distributive, Chaotic and Ignoring of small numbers. The smallest group in the empirical study is the group of respondents with Rational strategy. Respondents of all the groups, except Rational, were compared among themselves on personal characteristics. Respondents with the Semi-rational strategy, in contrast to respondents with other strategies, demonstrate a greater propensity for risk. An Aversive strategy is characterised by a tendency to reduce the number of debts and is demonstrated by respondents when performing various tasks. Respondents with a Chaotic strategy made multiple mistakes in the simulation and, in comparison with all other respondents, are less open to new experience. Respondents with a strategy for paying off debts Ignoring small numbers turned out to be more benevolent than Chaotic respondents and respondents with the Close to rational strategy.

Keywords: debt behaviour; personality traits; willingness to take risks; debt recovery strategies

JEL Classification: C91, D14, D84, G02

The Relevance of the Study

A credit strategy suggests a high level of predictability and consistency of consumption. However, increasing loan availability leads to households plunging into debts, thus damaging their financial wellbeing. Despite its evident burden, the majority of people manage their debt ineffectively trying to play with various types of debts, different terms and interest rates. This debt diversification demands to make decisions on the best ways of allocating limited resources. The most effective method of clearing a debt is to pay more attention to long-term credits with high-interest rates. It is empirically proven that the most part of consumers manages their multiple debts in favour of the shorter ones – paying them first. It is supposed that the strategy – aversive strategy is not just a mistake; it has a systematic character (Amar et al., 2011; Tversky & Kahneman, 1981). The majority of consumers with multiple debts are motivated to reduce a total of a number of debts instead of reducing a total amount of the related expenses.

It is possible to eliminate the tension between rationality and intuition, which is sometimes irrational, by initial payments of the debt with the highest per cent or structuring the environment with a guarantee of optimal allocation. The difficult solution of refinancing or debt integration demands time and efforts and can lead to a failure and inability to make the decision for fear.

In terms of a debt, it means that people who make the decision of using credit cards do it without a full understanding of the total cost of a debt in the future and an opportunity to call the automatic processes of control demanding internal obligations. Standard models in behavioural economy ignore internal mechanisms of obligations (Benhabib & Bisin, 2005). When preferences are inconsistent, decisions are defined not only rationally: making a decision at each stage of their own future decisions is based on various preferences. Such expectations are defined in balance. Dynamic decisions as a consecutive game between various options are limited to Markov balance and balance according to Nash in which people

are implicitly modelled as lacking for any form of internal psychological ability to the obligation or self-checking. Theoretical and experimental literature in psychology studies a problem of the dynamic choice and defines various internal obligations and the strategy of self-control. The dynamic choice of people with inconsistent preferences cannot be well understood without an obvious analysis of the dynamic strategy, including self-control. Thus, it is necessary to simulate the operating process inducing to the implementation of a number of the purposes irrespective of the impulses or temptations connected with a choice problem. A various action of automatic and controlled processes defines what process is responsible for the choice. Neurobiological basis of a postulate of this analysis, in which the internal obligation and self-control in the dynamic choice operate a certain form of informative control, has never been checked.

The environment with great temptations is characterized by the higher probability that the self-control is carried out, and temptations are forbidden. On the other hand, in such an environment, the less ambitious goals of the economy are established. A person with lower abilities to control, or a person whose attention is concentrated on other important tasks, trains self-control less often, and besides, establishes less ambitious goals in an attempt to forbid temptations. Psychologists constantly note that 'complexity' of the purposes reduces efficiency in problems of self-control and self-checking. According to this representation, the task is simpler in implementation if the purposes are simpler.

A simple saving consumption purpose can be more preferable than a complex purpose. More than that, a simple purpose tends to be preferred if a rate of return is rather small, in this case, there is little profit from self-control, and it is the dominating choice for a debtor to consume the most part of his accumulation every period. A simpler purpose will be also preferred if temptations become big. It is caused by the fact that when temptations are quite big both the difficult and simple purposes optimally cause automatic prohibition.

Interest in decision-making models, with violation of the neoclassical behavioural axioms considered and (taking into account) "irrational" behaviour of the beginnings, a search of a "rational" explanation of this phenomenon, increases.

A complete model (Opaluch & Segerson, 1989) has to provide communication between three components of the choice: motivation, decision rules for making a choice and potentially observed behaviour.

One of the difficulties of the classical approach to behaviour modelling is that the resultant structure is incapable of describing a full range of the actual behaviour. Instead, the approach to modelling defines critical motivation for decision-making and traces logics of the resultant model. In cases of lack of information, a less effective approach based on the general observations of behaviour can be useful as emphasizes. Moreover, there is usually no convincing way of checking the validity of hypothetical motivation of observed behaviour as there is no unambiguous compliance between the cornerstone motives and rules of decision-making or observed behaviour. Nevertheless, partial validation can be carried out when certain types of behaviour, which will be coordinated with some main motivation, are identified. Thus, though the peculiar hypothetical motivation cannot be usually checked, it can be recognized invalid as incompatible with peculiar observed behaviour.

The second approach to behavioural modelling begins with the indication of a certain set of rules of decision-making, such as optimization of rules, implementation of rules, empirical rules or lexicographic rules. Further sets of observed behaviour which is meant by such a rule of decision-making are defined. Rules of decision-making are not either motive of behaviour, or behaviour itself, but rather a means of transforming motivations into behaviour. Rules of decision-making can be exact, formal implementers of these motives or just convenient "philosophy" for the choice. Besides, the rule of acceptance can be the actual rule used by an individual making the choice or can be the rule "as if" where potentially observed behaviour corresponding to fundamental motives is considered as "decision". It is useful to be based on behavioural modelling for decision-making forecasting of observed behaviour, but it can also result in difficulties for welfare measurement and the analysis of social policy.

The third approach consists of defined rules of observed behaviour. This approach is useful for behaviour forecasting as it is capable of integrating broad observations concerning the real choice

and will lead to estimates which will probably correspond and, perhaps, will be a good predictor of observed behaviour. Tracking observed behaviour may be a useful method for the initial specification of hypothetical motives.

Introducing psychological approach into the analysis of a consumer debt has shown the importance of psychological factors when modelling consumers' debt by matching a number of personal qualities, relations, beliefs and behaviour to a consumer debt. A consumer debt is considered to be a phenomenon with distinct aspects, which are influenced by several psychological factors, and involves social and economic consequences (Ladas et al., 2015).

The most research is carried out on the limited number of observations that complicates consideration of the received results as the representative ones. Use of the Data mining methods with careful preliminary data processing, the powerful models and reliable methods of assessment containing full and difficult tools for the analysis of difficult data of the real world can guarantee representative and substantial discovery of knowledge. Data mining models from different families of intellectual modelling, namely logistic regression, the casual woods and neural networks, for assessment of a contribution of psychological factors to the analysis of a debt burden in a large number of experiments are used. The research for the debt obligations analysis generally focuses on the answer to three fundamental questions: 1) What factors separate debtors from not debtors? 2) What factors influence the amount of debt? 3) What factors influence repayment of a debt?

The answer to these questions leads to the detection of a number of the factors connected with a consumer debt. Amongst them: personal characteristics such as debt attitudes (Harrison N., et al., 2015); self-control and impulsiveness (Achtziger et al., 2015), other psychological factors, such as personal traits (Brown & Taylor, 2014) and locus of control (level of internality) according to Mewse et al. (2010). Framing effect is also considered: risk-taking in decisions depends on how the situation is presented; e.g. as a loss or as a gain (Tversky & Kahneman, 1981). By analogy with loss aversion, debts (losses) are perceived as the most stressful when accumulated. Several debts are more painful than a single one equal in

the amount. The wide list of the factors presented in the literature is supplemented by well-studied socio-economic factors which are traditionally used in economic models for an explanation of a consumer debt, for example, of the status of work, pure wealth and the number of children in family, income, a floor, education, etc. Impulsiveness and self-control appeared to be significantly connected consumer debts, especially in case of credit cards and catalogues of post orders. The impulsiveness is recognized as a strong predictor of unsecured debts, compared with mortgages and car loans. The rationale for this that secured debt influences decisions that last a long time and are therefore related to the life-cycle theory, according to which the consumer enters into debts on rational grounds in order to maximize utility and, therefore, is not associated with impulsive behaviour that favours short-term benefits.

Method or Instruments

To study the strategies of debt repayment in the situation of the multiple debts and the factors influencing decisions the following situation has been simulated. Participants had to distribute a certain sum of money to pay off six credit card debts. The game lasts 25 rounds; each round is equal to one year. Every year the player receives a certain sum, which he has to use completely for debt repayment. During the game, additional bonuses, which also have to be used for payment of the credits, are provided to participants. The winner will be the player with the positive balance (or with the smallest debt) at the end of the game.

To assess the role of psychological factors in the choice of debt repayment strategy, we used the following psycho-diagnostic techniques.

The "Big Five" personality traits, the questionnaire by which the literature already presents the results that confirm the reliability of this tool and indicate the time invariance of personality traits (Caspi et al., 2005), as well as the role of personality traits diagnosed with the help of this tool in economic behaviour (Brown & Taylor, 2014). "Personal factors of decision-making of T. V. Kornilova" aimed at assessing risk-taking (risk readiness) as a readiness for self-control of actions in uncertainty and incompleteness of information, as well as a willingness to rely on its own potential.

The basic methods in our study were a game aimed at determining debt repayment strategies and a questionnaire of debt behaviour — they were performed by all 350 respondents. The remaining methods were connected at different stages: “Big Five” (N = 290 people), “Personal factors of decision-making, T.V. Kornilova” (N = 137 people). For all respondents, socio-demographic characteristics were collected: gender, age, education.

Hypotheses: We supposed that strategy of debt repayment is determined by psychological traits and attitudes to risk.

Procedure: The participants were informed about the research, about their rights and their responsibilities. The examination procedure was objectively explained.

Results

Analysis of Debt Repayment Strategies in the Simulation

Based on the actions taken by respondents for repayment of debts we identified following strategies: rational, semi-rational, aversive, distributive, chaotic and ignorance of small numbers. By “the strategy of debt repayment” we mean the system of actions for distribution of the resources which are available in the “Game” leading to the change of the total amount of debt.

Rational strategy is a repayment of debt taking into account the interest rates for the credit and directed to the reduction of total amount of debt. Only this strategy allows completing a game with a positive balance in our experiment.

Semi-rational strategy directed to reduction of total amount of debt — is aimed at reducing the total amount of debt, is characterized by the procedure for repaying debts from the larger with the highest interest rate to a smaller one, but with small deviations (for example, in one or two rounds, the respondent distributes money between two large accounts or repays a small debt in full). As a result, the respondent ends the game with a small, in comparison with other strategies, debt.

The aversive strategy is the strategy directed to the reduction of a number of debts, but not the total amount of debt. The respondent pays off small debts completely, proceeding from the sum available to placement and finishes a game with outstanding big debts.

Distributive strategy — the respondent deposits funds to pay off all or several debts (three

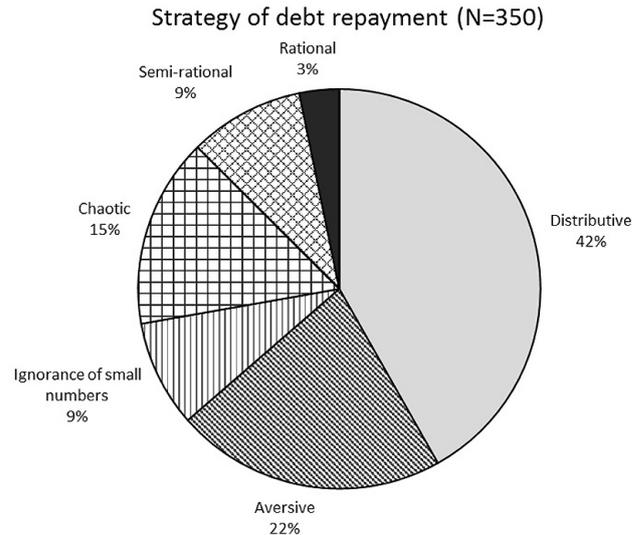


Fig. 1. Representativeness of strategies.

or more) simultaneously, without closing them completely.

The chaotic strategy is characterized by the existence of mathematical and logical mistakes — the respondent does not use all available funds for repayment of debt, places more means on account of repayment of debt than it is required or continues to pay a debt after his full repayment. Representativeness of strategies in our group you can see in Figure 1.

The most common strategy is “Distributive” (42%) — it means respondents consider repayment of debts as a task for asset allocation, which is similar to the results obtained by other authors. Next, on popularity is “Aversive” strategy (22%) — aimed at reducing the number of debts, while the amount of debt continues to grow.

A “Rational” strategy (3%) is the least common, probably because the situation of having six simultaneous debts is quite complex and atypical for our respondents, although before the beginning of the experiment they were asked whether they understand what the interest rate is credit, how the interest accumulates, etc., however, for most, such knowledge was insufficient to solve the task. Group “Chaotic” (15%): although the assignment was accompanied by verbal and written instructions, an explanation of the progress of work, nevertheless some respondents made mistakes indicating a complete lack of understanding of the task. We assume that this is due to the motivation to perform the task and personal characteristics. The strategy “Semi-rational” meets with the same frequency as “Ignorance of small numbers” (9%).

Table 1
Comparison of the mean value of scales of the Big Five among respondents with different debt repayment strategies

Big Five questionnaire							
Strategy/scale	Semi-rational (N=18)		Chaotic (N=31)		t	df	p
	M	SD	M	SD			
Openness to experience	11.44	1.98	9.45	2.69	-2.74	47	0.01
	Semi-rational (N=18)		Ignorance of small numbers (N=21)		t	df	p
	M	SD	M	SD			
Agreeableness	9.17	2.66	11.48	4.15	2.03	37	0.05
	Aversive (N=49)		Chaotic (N=31)		t	df	p
	M	SD	M	SD			
Openness to experience	11.14	2.28	9.45	2.69	3.01	78	0.00
Agreeableness	10.65	2.88	9.32	3.20	1.92	78	0.06
	Distributive (N=87)		Chaotic (N=31)		t	df	p
	M	SD	M	SD			
Openness to experience	10.63	2.43	9.45	2.69	2.26	116	0.03
	Ignorance of small numbers (N=21)		Chaotic (N=31)		t	df	p
	M	SD	M	SD			
Agreeableness	11.48	4.15	9.32	3.21	2.11	50	0.04

Source: authors' calculations.

Table 2
Comparison of mean values of the scales of the methodology "Personal factors of decision-making, T.V. Kornilova" among the respondents with different strategies for debt repayment

Personal factors of decision-making							
	Semi-rational (N=11)		Aversive (N=23)		t	df	p
	M	SD	M	SD			
Risk readiness	5.09	3.53	2.09	3.67	-2.26	32	0.03
	Semi-rational (N=11)		Chaotic (N=21)		t	df	p
	M	SD	M	SD			
Risk readiness	5.09	3.53	1.95	3.61	-2.35	30	0.03
	Semi-rational (N=11)		Ignorance of small numbers (N=11)		t	df	p
	M	SD	M	SD			
Risk readiness	5.09	3.53	2.00	3.13	-2.17	20	0.04

Source: authors' calculations.

After that, we compared in pairs the respondents with different debt-repayment strategies on their personal characteristics. The Tables only reflect the scales for which significant differences were found.

Respondents from "Chaotic" debt repayment strategy significantly differ from those with "Semi-rational", "Aversive" and "Distributive" strategies with lower values on the "Openness to experience" scale.

Table 3

Comparison of mean sums of money placed on the indebted accounts in the tasks “3,000 roubles task” and “30,000 roubles task” for respondents with different debt repayment strategies

“3,000 roubles task”							
Strategy/Indebted account	Aversive (N = 64)		Rational (N = 10)		t	df	p
	M	SD	M	SD			
3,000 roubles; 19% APR	2,146.4	1,264.99	850.0	1,375.38	2.98	72	0.004
30,000 roubles; 24% APR	853.6	1,264.99	2,150.0	1,375.38	-2.98	72	0.004
“30,000 roubles task”							
Strategy/Indebted account	Aversive (N = 64)		Semi-rational (N = 28)		t	df	p
	M	SD	M	SD			
3,000 roubles; 19% APR	2,146.4	1,264.99	1,321.4	1,492.04	2.72	90	0.008
30,000 roubles; 24% APR	853.6	1,264.99	1,678.6	1,492.04	-2.72	90	0.008
“30,000 roubles task”							
Strategy/Indebted account	Ignorance of small numbers (N = 26)		Semi-rational (N = 28)		t	df	p
	M	SD	M	SD			
3,000 roubles; 19% APR	1,335.0	1,598.71	428.6	1,069.04	2.47	52	0.017
“30,000 roubles task”							
Strategy/Indebted account	Aversive (N = 64)		Chaotic (N = 45)		t	df	p
	M	SD	M	SD			
30,000 roubles; 24% APR	2,9044.7	1,431.41	2,6851.2	8,102.23	2.12	107	0.036

Source: authors’ calculations.

Respondents with a strategy for paying off debts “Ignoring small numbers” differ significantly from respondents with strategies “Semi-rational” and “Chaotic”, and respondents with the “Aversive” strategy from respondents with the strategy “Chaotic” higher values on the scale of “Agreeableness”.

As a result, questionnaires “Personal factors of decision-making” respondents with the “Semi-rational” strategy are characterized by higher risk readiness than respondents with “Aversive”, “Chaotic” strategies and the strategy “Ignorance of small numbers”.

Based on the results of “3,000 roubles task”, we figured out that the respondents with “Aversive” were significantly different from the respondents with “Rational” and “Semi-rational” strategies. They allocated a significantly higher sum of money to repay debts of 3,000 roubles, 19% than repay debts of 30,000 roubles, 24%. It reflects the tendency to close the small account in full.

In result of “30,000 roubles task” we received reliable differences between respondents with the strategy “Semi-rational” from respondents with the strategy “Ignorance of small numbers”, who significantly more often closed the account of 3000 roubles. When comparing respondents with the strategy “Aversive” and “Chaotic” — the latter significantly fewer pay off debt account 30 000 roubles with 24%.

Discussion

The results obtained in the study show that when solving problems for repayment of multiple debts respondents use different strategies and those strategies differ from rational ones.

For respondents with the “Rational” strategy, only one difference was found — from respondents with the “Aversive” strategy for solving the “3,000 roubles task” and these results confirm the content of both strategies. “Rational” respondents behave “more rational” and “Aversive” behave “more aversive”.

The strategy “Semi-rational” is characterized by the desire of respondents to reduce the total amount of debt, the actions are considered as analytical, but some inaccuracies do not allow characterizing them as fully rational. These respondents, in contrast to respondents with other strategies (except “Rational”), demonstrate a greater propensity for risk. It is important to dwell on the content we mean under “risk readiness”: it is a readiness for self-control of actions with deliberate incompleteness or inaccessibility of necessary benchmarks, and also a willingness to rely on one’s own potential. This definition of readiness for risk is in good agreement with our understanding of the experiences that accompany the passage of the “Game”. Because if the respondent chooses a rational or semi-rational debt repayment strategy (starting with large debts that have a high-interest rate), then he does not see a positive result of his actions long enough. The earliest when he sees a full repayment of Debt 6 is the fifth round, and then he starts paying off Debt 5 and repays it not earlier than the fifteenth round. All this time he must overcome the doubts caused by the uncertainty of the result: money is spent, and the debt does not decrease and it is necessary to have self-confidence and self-control in order to realize this strategy to the end.

As for personality traits, respondents with the “Semi-rational” strategy, they demonstrate higher curiosity, flexibility and readiness for change, compared with “Chaotic” respondents and tend to perceive others as competitors, in comparison

with respondents with the strategy “Ignorance of small numbers”.

The “Aversive” strategy is aimed at reducing the total number of arrears, more typical for women than for men. Respondents with this strategy make similar mistakes in a similar task with two debts: reducing the amount of arrears based on the number of funds available for placement.

Respondents with a “Chaotic” strategy allow multiple errors in the fulfilment of the task of paying off multiple debts. They miss payments, place more money on their accounts to repay the debt than they have, continue to put money into the account when the debt is already paid off, etc. In comparison with other respondents (Strategies: “Close to rational”, “Distribution” and “Aversive”), they are less open to new experience, not curious and flexible. In our opinion, they are not very interested in obtaining new knowledge and are not ready to make efforts to solve the set tasks.

Respondents with a strategy for paying off debts “Ignorance of small numbers” turned out to be more benevolent than “Chaotic” respondents and respondents with the “Close to rational” strategy.

In conclusion, we would like to say that our hypotheses that strategy of debt repayment is determined by psychological traits and attitudes to risk were proved. There are significant differences in personality traits and readiness to risk between respondents with different debt repayment strategies.

References

- Achtziger, A., Hubert, M., Kenning, P., Raab, G., & Reisch, L. (2015). Debt out of control: The links between self-control, compulsive buying, and real debts. *Journal of Economic Psychology*, 49, 141–149. DOI: 10.1016/j.joep.2015.04.003.
- Amar M., Ariely D., Ayal Sh., Cryder C., & Rick S. (2011). Winning the Battle but Losing the War: The Psychology of Debt Management. *Journal of Marketing Research*, Vol. XLVIII (Special Issue 2011), 38–50.
- Benhabib, J., & Bisin, A. (2005). Modelling Internal Commitment Mechanisms and Self-Control: A Neuroeconomics Approach to Consumption-Saving Decisions. *Games and Economic Behavior*, 52, 460–492.
- Brown, S., & Taylor, K. (2014). Household finances and the “Big Five” personality traits. *Journal of Economic Psychology*, 45, 197–212.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005) Personality Development: Stability and Change. *Annual Review of Psychology*. 56, 453–84.
- Davies, E., Lea, S. E. G. (1995). Student Attitudes to Student Debt. *Journal of Economic Psychology*, 02/1995, 16(4–16), 663–79.
- Harrison, N., Agnew, S., & Serido, J. (2015). Attitudes to debt among indebted undergraduates: A cross-national exploratory factor analysis. *Journal of Economic Psychology*, 46, 62–73.

- Ladas, A., Ferguson, E., Aickelin, U., & Garibaldi J. (2015) A data mining framework to model consumer indebtedness with psychological factors. CoRR arXiv:1502.05911.
- Lea, S. E. G., Webley, P., & Levine, R. M. (1993). The economic psychology of consumer debt. *Journal of Economic Psychology*, 14, 85–119.
- Mewse, A. J., Lea, S. E. G., & Wrapson, W. (2010). First steps out of debt: Attitudes and social identity as predictors of contact by debtors with creditors. *Journal of Economic Psychology*, 31, 1021–1034.
- Opaluch, J. J., & Segerson, K. (1989). Rational roots of “irrational” behaviour: new theories of economic decision-making. *Northeastern Journal of Agricultural and Resources Economics*, 18, 81–95.
- Tversky, A., & Kahneman, D. (1981). The Framing of decisions and the psychology of choice. *Science*. 211(4481), 453–458.

Психологические факторы стратегий погашения множественных задолженностей

Мария Гагарина*, Татьяна Горошникова**

* Кандидат психологических наук, доцент, Финансовый университет, Москва, Россия
MGagarina@fa.ru

** Кандидат технических наук, Финансовый университет, Москва, Россия
TGoroshnikova@fa.ru

Аннотация. В статье представлены результаты эмпирического исследования стратегий погашения множественных задолженностей в условиях лабораторного эксперимента и их связь с личностными чертами респондентов ($N = 348$). Выделены основные стратегии погашения задолженностей – рациональная, близкая к рациональной, аверсивная, распределение, хаотичная и игнорирование малых чисел. Самая малочисленная группа – респонденты с рациональной стратегией. Все остальные группы сравнивались между собой по личностным характеристикам. Респонденты со стратегией «Близкая к рациональной», в отличие от респондентов с другими стратегиями, демонстрировали большую склонность к риску. Стратегия «Аверсивная» направлена на уменьшение общего количества задолженностей и свойственна этим респондентам при выполнении разных задач. Респонденты с «Хаотичной» стратегией допускают множественные ошибки при выполнении задачи на погашение множественных задолженностей и, по сравнению со всеми другими респондентами, в меньшей степени открыты новому опыту. Респонденты со стратегией погашения задолженностей «Игнорирование малых чисел» оказались более доброжелательны, чем «Хаотичные» респонденты и респонденты со стратегией «Близкая к рациональной».

Ключевые слова: долговое поведение; личностные черты; готовность к риску; стратегии погашения множественных задолженностей

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