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Overcoming cognitive imbalances as a factor in increasing savings in the market economy

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In the article were suggested possible ways to increase amount of savings in emerging markets to overcome attentional bias; examines the impact of cognitive imbalances on economic policy decision-making. Such an analysis could not be carried out within the framework of traditional economic theory and lay in the plane of behavioural economics. The important and pressing issue of increasing savings in emerging markets by overcoming cognitive imbalances was being considered.

Keywords: attentional bias, decision-making research, modest effect, external effects, implement policies, rent-oriented behavior, imperfect information.

В статье предложены возможные пути увеличения объема сбережений на развивающихся рынках и преодоления диспропорций; рассматривается влияние когнитивных диспропорций на принятие решений в области экономической политики. Подобный анализ не может быть произведен в рамках традиционной экономической теории и лежит в плоскости поведенческой экономики. Рассматривается важная и актуальная проблема увеличения объема сбережений на рынках развивающихся стран с помощью преодоления когнитивных диспропорций.

Ключевые слова: когнитивные диспропорции, бихевиористская теория, исследование принятия решений, рациональные ожидания, внешние эффекты, ренториентированное поведение, несовершенная информация.

Introduction. How much to save or how much to consume is an important decision for every consumer. The level of savings and consumption over life cycle and influence of time preferences and time horizon on these decisions are classical questions for economists.

Traditional theory suggests that individuals have full information and are able to process it, so they make rational decisions, and their preferences are well-defined and don't change over time. However, these assumptions are questioned by behavioral economists and decision-making researchers. They are interested in the process of decision making in the context of incomplete information, limited cognitive resources, and behavior. Many studies in the field of judgment and decision making and behavioral economics provide empirical evidences suggesting that individuals often act in ways that are economically suboptimal [1].

It is important to notice that saving is crucial for development of emerging economies while microcredit have modest effect. Despite this fact, savings levels in developing countries remain relatively low and reasons for this are still not fully understood. In many cases, low level of savings is not caused by fact that individuals in emerging markets have not enough money to save. They meet different constraints to saving. One of the sufficient constraints is behavioral bias that is more tangible among poor people. Thus, it is important to understand the nature of this phenomenon in general and its features in emerging markets in order to realize how to implement policies to increase formal savings and contribute to the development of economy.

Main part. The psychological aspects of attentional bias as well as methods of its measurement are analyzed in the first part of this work. The analysis of features of this phenomenon is done in the third part as well as evidences and examples from banking sector of emerging markets which prove sufficiency of attentional bias are provided. Moreover, the third part includes the analysis of experiments from banking sector and other sectors of economy which were done in order to overcome negative effect of attentional bias on saving decision. Part 4 includes the ideas which may possibly contribute to the improvement of saving behaviour and increase of amount of savings.

«Attentional bias means that a person selectively attends to a certain category or certain categories of stimuli in the environment while tending to overlook, ignore, or disregard other kinds of stimuli» [2, p. 78].

It is the way in which people don't take into consideration all available possibilities making a decision because attention is often focused only on limited factors. Emotional state often affects the focus of attention and there is a tendency to pay more on the factors that stimulate us on the emotional levels. The stronger the emotional arousal is whether it is in a positive or negative manner, the greater the shift in focus on it over any other aspect available to people will be.

Attention bias affects the brain at the moment, but it also manipulates memory. This allows a person to biasedly recall a moment from the past, to remember events as a set of emotions and feelings. Principally, people often retain the emotion felt over anything else. This cognitive bias sometimes leads people to wrong decisions or skewed memories.

Attentional bias was found during a series of experiments named the «Stroop test». This test consists of a list of words printed in different colours and giving to participants, who need to speak out loud what the colour is, regardless the word itself. It showed that the participants found it harder to focus on colour (it took more time and effort to name the right one) while the words evoked emotions. It was clearly seen, for instance, when a participant with spider phobia had problem to focus on colour of the card with the word «spider» on it because attention was already shifted to the emotional stimulus. Thus, attentional bias can be associated with phenomenon of hyperattention to threatening material.

Psychologists used four main paradigms to measure attentional bias. Every test has its own specific characteristics and it is used to capture different features of attentional bias. The first one is Stroop paradigm which was described above. However, the gold standard in attentional bias research is dot-probe paradigm [2]. Two stimuli, one of which is neutral and the one of which is threatening, are presented simultaneously for predetermined length of time. The probe then replaces one of the two stimuli to which participants must respond – by classifying the probe or responding to a location.

The Posner paradigm or Posner cueing task is similar to the dot-probe paradigm. This test measures the ability of individuals to switch and focus on different stimuli presented [2]–[3].

The visual search is a less used way of measuring attentional bias. It includes the measurement of the ability to detect and distinguish specific objects among other objects.

People behave in suboptimal way making savings decision. It is caused by many factors: one of them is imperfect information. Moreover, imperfect information is often distorted by processing by individuals in biased manner. As it was shown in the first chapter, the attention bias is the cause of cognitive distortion. This happens when a person does not think about all possible scenarios for making decision.

A simple example can illustrate such behaviour. For instance, you have decided to go on a trip to some island and bought your plane ticket 3 months before departure. However, you have no money left to cover accommodation and daily expenditures. You already expect consumption shock in 3 months. In a perfect situation, you need to smooth your consumption and save money from date of travel decisions to date before departure. However, inattentiveness can cause the situation when you forget about your plans and decide consume instead to save. Then, in a day of departure you will face the situation when you need either significantly reduce your consumption or finance your trip by borrowing money and reduce future consumption. The third option – not going on a trip will lead to a loss of tickets. It is just one example from many possible situations and it can't be significant. However, over the life time such situations can add up and lead to serious consequences.

Such sort of distortion was implemented in a model of savings and consumption in a work of D. Karlan et. al [4]. Individual's aggregate utility consists of utility of «routine» consumption ($u(c_t)$) and on exceptional expenditure (x_t) which gives additional extra utility (\bar{u}). Exceptional expenditure has a unit cost 1 (x_t is a binary dummy variable and can be either 1 or 0) and can vary across time (travel expenditure in one period, medical expenditure in next and so on). So, anticipated expenditure is equal to keeping in mind future consumption goals [4]–[6]:

$$\sum_{t=1}^T (u(c_t) + x_t \bar{u}), \quad (1)$$

$$w_{t+1} = w_t = y - c_t - x_t \forall t \quad (2)$$

subject to:

$$w_1 = 0 \text{ and } w_{t+1} = 0. \quad (3)$$

Initial and final wealth is equal to zero so individuals can either save or borrow money, but they need to repay it till the end of lifetime.

There are two different types of individuals «fully attentive» and «inattentive». Fully attentive individuals will have perfect plan and smooth their «routine» consumption. They will be indifferent in financing one unit of exceptional consumption or additional marginal unite of ordinary consumption.

In reality, individuals are not fully attentive regarding exceptional expenditures in future (but they attend in both type of consumption in current period) and will use opportunity to get extra utility from it with probability:

$$u(c_t) + x_t \bar{u} + \sum_{t=1}^T (\theta u(c_t) + x_t \bar{u} + (1-\theta)u(c_t)) \quad (4)$$

Inattentive individuals face problem each period either to increase ordinary consumption or to consume one unit of exceptional consumption only in current period in order to maximize total utility. So, they are unaware of their inattention and the underforecast the number of expenditure opportunities [1]. Inattentiveness is a reason for individuals to reoptimize their saving-consumption plan every period with new realization of total number of future exceptional expenditures opportunities in period t \tilde{k}_t . Individuals don't save fixed amount of money regularly.

They decide how much to save in period t with respect to wealth in this period and plan of future exceptional consumption. However, t \tilde{k}_t . is changing over time and in some periods, individuals attend in unanticipated consumption consequently they are changing their save-consumption plan. When unanticipated exceptional consumption is sufficiently high, individuals have to drastically cut consumption in this period, borrow money and smoothly cut consumption in future periods, or forgo some exceptional expenditure.

Savings of inattentive individuals is:

$$\tilde{S}_t = \frac{\tilde{k}_t + \tilde{x}_t}{T-t+1} - \tilde{x}_t \quad (5)$$

So, savings in period t depend on difference between «routine» consumption in period t and sum of current expenditure (\tilde{x}_t) and future expenditures (\tilde{k}_t) divided by number of future periods till the end of lifetime when individuals will face decision to attend in exceptional consumption. So, consumers can only plan to spend periodically less money than the future exceptional spending opportunities they predict. Difference between inattentive and fully attentive individuals here is that for inattentive individuals savings can turn negative and they will have to borrow or forego some consumption.

Or for example, evidence from developing countries help to conclude that even if future expenditures are predicted, individuals tend to undersave and overborrow even with high interest rate.

Student-loan provider Navient conducted a research (Navient.com 2018) of more than 3,000 adults, aged 22 to 35. It reports that only 30 % of respondents are saving for retirement, and that almost 40 % believe they can safely put it off. The study concludes that it happened because people prioritize short-term consumption like home ownership, vacation, paying down debt or building an emergency fund.

Reasons in the first and second examples are different because financial behavior and motivation to save money are not the same in developed and emerging markets countries. However, it is clear, that the farther consumption goal is the more difficult to concentrate attention on it. Since individuals in developing and emerging markets have less income and consequently their purchasing power is lower than in developed countries with high incomes, they need more time to reach their consumption goals which have long-term status. Thus, the problem of becomes apparent in developing countries.

Mobilization of savings plays an important role for individuals and societal welfare. At the individual level, savings is an instrument for smoothing consumption and finance investments in human or entrepreneurial capital. At the macroeconomic level, savings rates help predict future economic growth. In developing countries, saving is an important financial tool while access to credit for private consumers and small business is very limited.

However, there exist many barriers to savings, especially in emerging markets. Among them are transaction costs, lack of trust, regulatory barriers and problem of supply of savings products. As it was found in study of A. Demirgüç-Kunt and L. Klapper [7], only 22 percent of adults worldwide have savings at a formal financial institution in the past 12 months, and 77 percent of adults living on less than \$2 a day and don't have an account at a formal financial institution. It is obvious,

that the situation is even worse if we take into account only developing countries. Thus, 61 % of the population in emerging market countries has a bank account, but only 21 % save in it [8]. Many evidences suggest that there are various constraints from demand - side which depress saving even among those individuals who have no problem with access to saving products. For instance, social climate, lack of knowledge, and/or behavioral biases may lead to suboptimal saving decision. Attentional bias may have significantly negative affect on saving behavior. Such distortion in savings is more problematic in developing countries because reasons mentioned above are more tangible there.

Attention bias is one of the most studied distortions of savings in modern literature. There are plenty experiments which prove that inattentiveness reduces amount of savings of households in emerging markets. Messaging is the most used way to overcome attention bias; however it is possible to suggest other methods.

Mental accounting is well studied concept; however, there were done not many experiments based on it. For example, online banks or fintech start-ups as Revolut and N26 in EU or Tinkoff in Russia gain popularity and compete with traditional banks for customer savings. They provide with easy and good tools based on mental accounting concept to increase amount of savings. One of these tools was called «Spaces». It gives opportunity to divide your account into different «spaces» like account for current expenditures, account for monthly payments, and saving-goals account. These accounts are visualized. It gives people the opportunity to see amount of money on every account, statistics from previous periods and, for saving accounts, percentage of fullness to achieve goal. It helps rationalize consumption-saving behaviour. Moreover, good features are possibility to automatically distribute incomes between different spaces and distinguish savings account among others. Thus, when consumer withdrawal cash or pay in shop, then money is withdrawn from the «space» intended for these payments and saving «space» remain untouched. So, automatization of amount of savings can reduce inattentiveness and visualization can help to see full picture of assets and focus on future expenditure.

Advantages of «Spaces» are obvious; however this concept can be implemented only on markets with high level of development of IT technologies. There are some emerging markets where IT infrastructure corresponds to the required level but it cannot be implemented in less developed countries.

It is a commonly known, that individuals pay more attention to what they count as important. The importance of different things is perceived in different ways by people with different levels of knowledge and education. Thus, financial literacy will likely influence the attention bias. Financial literacy is now globally recognized as an important element of economic and financial stability and development, however not many research has been done to estimate effect of financial literacy on behavioural biases in general. One reason for that is complexity of measurement of financial literacy itself. It is highly possible that increase of financial literacy lead to increase of responsibility for financial decisions and consequently attention to future financial statement.

Different age and gender groups have their own features of attention bias and different saving behavior. Especially, this situation is interesting in traditional economies most of them are also emerging markets. There are studies that argue that young people are over-consuming and not saving enough, while the older generation is different. However, most of this research was done in the context of developed economies. Evidences from emerging markets can be different, especially in case of gender issues. For example, evidences from Turkey suggest, that male investors tend to overestimate their knowledge and be overconfident in their decisions, while female are less tend to behave like that. These features can be relevant for analysis of saving behavior in context of attention bias.

As it was mentioned in the first part of this paper, attention bias depends on past experiences. Thus, it is possible to combine it with rational expectation of agents. Attention of individuals can be affected by today's state of the world and can be changed by appropriate change in policy. For example, individuals, who experienced hyperinflation, will consider possible expenditures in future, even after overcoming crisis, differently from those who used to stable currency. So, it is possible to conclude that attention bias tomorrow can be affected by macroeconomic policy today.

Conclusion. Attention bias is one of the significant distortions of consumption-saving decisions of individuals in emerging markets. In this paper the psychological nature of attention bias was analyzed as well as the importance of this phenomenon in behaviour economics.

Moreover, in this paper the way to include attention bias in intertemporal consumption-saving model was considered and the nature of difference in influence of this kind of behavioural bias on individuals from developed and emerging markets in context of mental accounting and endowment effect was explained. It is possible to conclude, that attentional bias has more significant impact on emerging markets.

There were done a lot of researches in economic literature regarding attentional bias and various ways to overcome it were tested. Summing up outcomes from different experiments conducted in emerging markets and in developed countries, messaging is one of the best solutions to overcome attention bias in saving decisions. However, in spite of strong positive influence on saving behaviour, reminders and feedbacks don't lead to great increase in amount of savings in emerging markets.

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