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RISK MITIGATION: RATIONALITY ANALYSIS OF LIFE INSURANCE BEHAVIOR IN TURBULENT TIMES

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Abstract: Life insurance plays a pivotal role in long-term investments and the sustained growth of economies, complementing personal savings. This financial product supports individuals in critical life events such as marriage, birth, death, casualty, and retirement. In developed countries like Japan, the United Kingdom, and France, life insurance premiums constituted a substantial portion of total insurance premiums in recent years. Economic volatility, crises, and uncertain conditions significantly influence the demand for life insurance. However, the individual responses to these economic uncertainties in the context of life insurance remain a subject of ongoing theoretical and empirical debate.

Understanding and regulating individuals' behavior concerning life insurance, savings, personal investments, and protection are crucial for economic policy, insurance marketing, and potential policyholders. As global aging trends shift public social commitments to personal responsibility, funded insurance plans like pensions, healthcare, and unemployment gain importance.

Remarkably, Russia has shown remarkable growth in its life insurance market, outpacing many developed and developing countries. This growth occurs amid unpredictable economic shocks, including a drop in oil prices, sanctions, and a lack of structural reforms. Despite resurging oil prices, Russia's GDP growth remains modest, and real disposable income has steadily declined, contributing to increased poverty levels.

In this backdrop of economic and social uncertainty, this study explores how individuals in Russia respond to the evolving economic landscape in their life insurance behavior.

Keywords: Life insurance, economic uncertainty, Russia, financial behavior, social commitments.

1. Introduction

Life insurance along with personal savings is an important source of long-term investments for the economy and its stable growth. Life insurance as one of the key financial products, which support individuals (households) in the most important life-events: marriage, birth, death, casualty, retirement. Nowadays life insurance occupies a significant part of the insurance markets of developed countries: life insurance premiums accounted 76%, 67%, and 60% of total insurance premiums in 2016 in Japan, United Kingdom, and France respectively (OECD, 2018).

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Significant volatility, economic crises, uncertain economic situations influence the demand for life insurance. How individuals respond on this economic uncertain environment in their life insurance behavior? The point views on this issue are still under theoretical and empirical discussions. The understanding and policy regulation of the individuals' behavior in the context of life insurance, savings, personal investments, and protection crucially important for the economic policy, insurance marketing and potential insured. The following transferring of publically financed social commitments to the personal level due to the global aging tendency in addition increases the role of funded insurance plans: pension, health care, and unemployment (Nadash, Cuellar, 2017; Alexandersen et al., 2016; Freitas, Martins, 2013). At the present time Russia shows the quickest growth of life insurance market between other developing and developed countries: life insurance premiums risen by an average of 39% over the past seven years and amounted increase in 54% in 2017. While growth of the life insurance was 27% in China and 12% in Brazil in 2016. The global life insurance premiums grew up by about 2% with the maximum rise in 22% in France and in almost 22% in Spain at the same year (OECD, 2018). Such significant growth of life insurance in Russia occurs against the background of unpredictable by time and in size shock in the country's economy. Russia goes through the serious economic challenges, which begun from 2014 with the drop in the global price of oil country's chief export, and geopolitical surroundings – sanctions, and the absence of necessary structural reforms in the economy.

Despite on resurgent oil prices in 2017, Russia's GDP growth remains modest in 1,5% in comparison with global growth in almost 3%, and previous increase in 4–6% in a year. The national currency is significantly depreciated more than 50% in value against the dollar within considering period. The real disposable income of the population is steadily declining: it's decreased in 2017 by 1,7% compared to 2016. On the whole, real incomes of citizens are declining for the fourth year in a row and fallen on 11,4% from 2014. The drop in real disposable income influences the level of poverty, that peak 13,4% after several years of reducing it before (World Bank, 2018; Federal State Statistics Service of Russia, 2018). Hence, country's economy is under strong economic and social uncertainty.

The contradictory between fall in the most of macroeconomics indicators and rise in life insurance premiums present a research field for customers' behavior under economic uncertainty. The influences of different factors, among them are often considered GDP, interest rate, inflation, currency, social expenditures, disposable income, unemployment rate, and others are observed with positive, negative or neutral effects regarding life insurance demand (Lee, Chiu, 2012; Sliwinski et al., 2013; Mitra, 2016; Burič et al., 2017).

Life insurance decisions are taking under uncertain (investment) / risk (protection) events in the future and the external risky environment strengthens the ambiguity that in their turn increases the risk aversion degree and wealth saving behavior, which are among basic incentives for insurance demand. Risk aversion connects with income uncertainty of individuals (households), primarily since their expectation a fall in income, and led to rise in the precautionary savings through life insurance contracts. We made accent further on the comparison of life insurance contracts and savings as substitute (complement) services that are been discussed in some previous research studies (Menegatti, Rebessi, 2011; Grainich, Peter, 2016). The mentioned above assumptions are related to one of ways of customers' behavior: rational, irrational or mixed. What one of them fit to the life insurance behavior in considering context of fall in economy and growth in life insurance? The investigation of the rationality of life insurance behavior under economic uncertainty on the example of Russia is the goal of this study.

The article structured as follows. In the first part we observe the literature review regarding to the theme. Further in the second part of study we analyze key macroeconomic, social, and insurance indicators influence on customers' behavior in life insurance under economic uncertainty in Russia. The third part includes some conclusions and policy suggestions.

2. Related literature

The life insurance behavior as a part of economic behavior is explained by several economic theories and approaches, the key element of which is the decision to purchase or not on service, good, in our example, insurance

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protection. There are two mainstream theoretical views of risky decision-making. Rational approach is connected with utility function (expected utility hypotheses) with choices made between buying or not of insurance depends on price of insurance premiums and regarding to the expected claims (Neumann, Morgenstern, 1947). According to this approach, individuals are risk averse and buy insurance policy if insurance premiums are lower expected loss. Further assumptions concerning rational behavior were connected with choosing certainty in preference to uncertainty by evaluation of consumers' motivations in game and insurance simultaneously (Friedman, Savage, 1948). Thus, purchasing insurance, the consumer prefers more predictable results with small loss as insurance premiums. Wherein, information is the valuable source (Savage, 1954) and insurance is optimal with actuarially fair premiums (Mossin, 1968). Further neoclassical studies of rational, utility-maximizing decisions suggested that the consumer decides whether to purchase insurance that depends on financial resources, expectations, risk aversion, insurance prices and other additional factors (Pauly, 1990; Bommier, Villeneuve, 2012), rational analysis before deciding to purchase (Deaton, Muellbauer, 1980; Zinkhan, 1992) or concerning of self-interests (taking into account the highest ratio of additional benefits) (Schiffman, Kanuk, 2007). Rational explanation is realized in more complex view with the assumption that agents may have imperfect cognitive abilities to process the available information. Bounded rationality approach allows imperfect cognitive abilities of agents to use the available information in fixed period of time of the decision making (Simon, 1955, 1959). This approach shares some of rational fundamental ideas, but uses an epistemological frame and empirical methodology, which contributed in the introduction to psychological factors in the explanation of economic agents (Barros, 2010). The concept of bounded rationality is shared by behavioral economists (Mingus, 2007; Ariely, 2008; Muramatsu, Fonseca, 2012; Vlaev, 2018), and together with "substantive rationality" is still the basis, starting point for behavioral economics.

Summarizing of rational (bounded rational) view on the individuals' behavior, we can conclude following important assumptions: principles of efficient market; consumers have access to the information; maximizing of the benefits; acting within budget; rational and long-term decisions; the analog goods are substitute each other on the market; risk clearly perceived.

One branch of limited rationality in the decision making under risk / uncertainty connects with prospect theory and its hypothesis of decision making errors, its heuristic, impact social patterns, subjective probabilities, more weighted losses than gains and present time in preference to future (Kahneman and Tversky, 1972; Tversky and Shafir, 1992). The finding that investors are a very risk-averse for small losses and rather indifferent for a small chance of very large losses has been supported empirically through numerous investigations. With regard to decisions in insurance, this means consumers' faults in refusing to insure low-probability and at the same time high-consequence events like nature disasters (Kunreuther and Slovic, 1978; Tversky and Fox, 1995). The research are concentrated in such areas as risk perception with the gap between expert views of risk and public perceptions (Slovic, 1972); probabilistic insurance with different weight of probabilities (Wakker et al., 1997; Zimmer et al., 2008); behavioral life cycle with preference current gratification instead of future balanced long-term expenditures (Shefrin and Thaler, 1988); rank dependent utility theory with subjective overweighed unlikely extreme outcomes (Quggin, 1982); overconfidence, for instance, by overestimating own knowledge and ability to control events while underestimating risks (Johnson et al., 1993); impact of high costs of obtaining information regarding insurance costs and benefits on fail to purchase insurance (Kunreuther and Pauly, 2005), using feelings and intuition within insurance decision making process (Kunreuther and Pauly, 2014). Summing up main prospect theory and probabilistic insurance hypotheses we can define following: subjective perception of objective insurance probabilities; diverse weights of present and future events; taking into account unperfected information and presence of transaction costs; fail in purchase of insurance for low probability high-consequence events; impact subjective over- and underestimations, confidence, social patterns.

With the continuation of the research evolution, the rational application is added by more integrated view, and taking into account social, political and cognitive factors, the behavioral insurance is developed. The most

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important findings point out that insurance decision making are accompanied by as cognitive process, and emotional reactions as well.

One of the key issues is connected with insurance decision making process under risk or uncertainty. The function of the value is less perceptive than the function of utility since the insurance decisions are oriented on the evaluation of loss or damage. Individuals are more willing to perceive the risk in insurance as a protection field. If individuals can understand and estimate the larger risk for him / her life, activity, work, there will be an interest to purchase insurance contract. The distinction between decision making under risk and decision making under uncertainty is that, in the first case, unambiguous probabilities are available in the decision problem due to calculation of frequency estimation, depending on the nature of situation. In the second case of uncertainty there is no obvious list of equally likely alternatives or the possible outcomes are unique, they are not available (Rustichini et al., 2005; Binmore, 2009). In addition, if a person is maximizing the expected value under uncertainty then that person should not buy insurance, for instance, whenever the insurance premium is higher than the expected loss (Gilboa et al., 2010). People evaluate decision outcomes, based on whether those are gains or losses, rather than based on what changes they make in their final welfare (Rick and Loewenstein, 2008). The behavior of individuals in risky, uncertain and ambiguous situations has psychological components as well. Hence, the insurance decision making under uncertainty is a more variety and complex process.

After literature analysis, we can conclude that there is not, in our opinion, the clear and opposite arguments to use one of the “rational” and “irrational” views on the decision making in insurance, insurance behavior. The process of development and improvement of understanding of the insurance behavior is developing. There are considering new approaches as, for instance, local rationality, which have an attempt to unite these two global ways. In addition, there is also a lack of research into the life insurance demand under economic uncertainty as crisis, shock, and simultaneously in developing economies. Further we test our assumptions on the example of life insurance in Russia.

3. Data and empirical strategy

The data used in the study are taken from Federal State Statistic Service and Central bank of Russia. We use data of the Russian Longitudinal Monitoring Survey (RLMS) for the testing of individual attitudes to the life insurance regarding to the income (RLMS, 2018). The study covers 2010-2017 years.

The beginning of the period was chosen as the initial stage of life insurance in Russia, since before there were non-classical variants of life insurance due to insufficient prudential supervision. We use linear regression model for the evaluation of macroeconomic factors' impact the life insurance behavior under economic uncertainty:

$$y = a + bx,$$

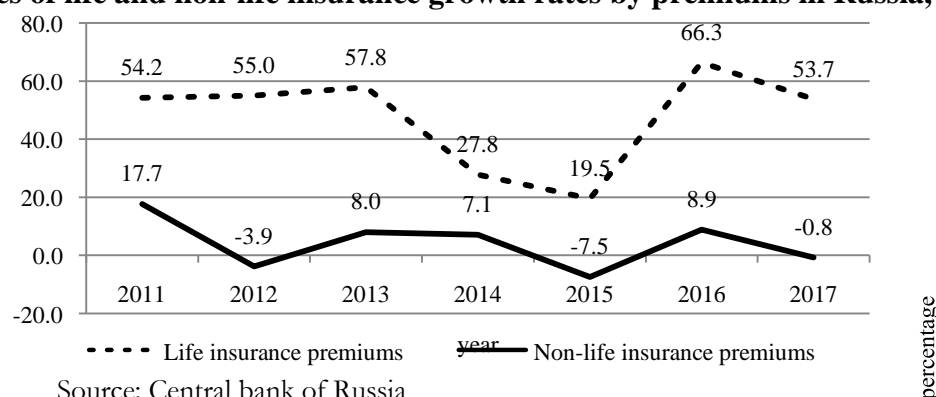
where y is the dependent variable, x is the independent variable (life insurance premiums), a is the y -intercept; b is the slope of the line. The dependent variables are GDP, real income, consumption, interest rate, inflation, rate of unemployment, social expenditures, and currency. In addition, we calculate the coefficient of variation of dependent variables for the estimating their variability under considering period. Further we use the cross-section questions to evaluate the relation between life insurance and income.

4. Empirical results of rationality life insurance behavior under uncertain economy environment

In the last seven years, life insurance in Russia has been characterized by significant growth: in average 39% per year and almost 54% in 2017 and 66% in 2016 (Fig. 1). Despite on the falling of the economy in 2014 and 2015, when the internal crisis began, the increase of life insurance was almost 28% and 20% in 2017 and 2016 respectively. This life insurance's growth is going on the background of dropping of non-life insurance. In 2012, 2015, and 2017 years the non-life insurance has showed the negative meanings: -3,9%, -7,5%, -0,8% accordingly. Taking into account the inflation, the real decrease of non-life insurance was deeper. These insurance contradictory trends occur against the backdrop of a recession in the country's economy.

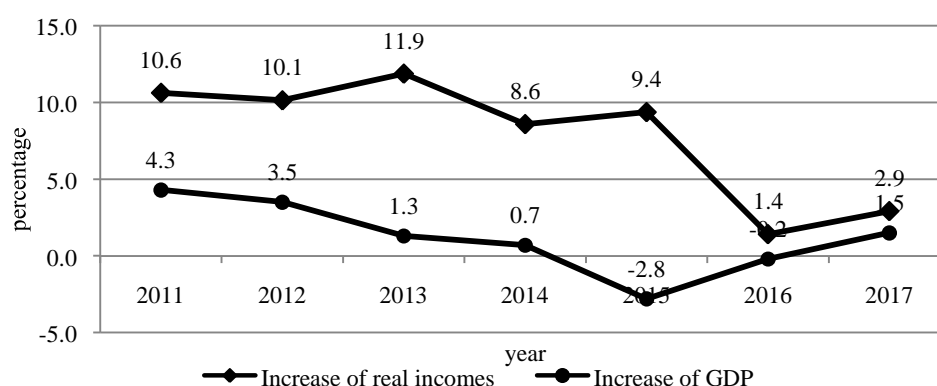
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Figure 1. Dynamics of life and non-life insurance growth rates by premiums in Russia, 2011-2017, %



Almost all macroeconomic factors are under negative pressure (Fig. 2). The beginning of the decline was caused by the fall in oil prices and the introduction of sanctions in 2014: GDP is falling sharply from 4,3% in 2011 to 1,5% in 2017. The decline in personal incomes continues and counts 86,6% in 2017 compared to 2010. The predictable situation in the economy is absent largely due to the high dependence on external factors: energy prices and the geopolitical environment, as well the need of internal economic reforms. Consequently, individuals are forced to make decisions in this uncertain economy and cannot predict any prospect stability.

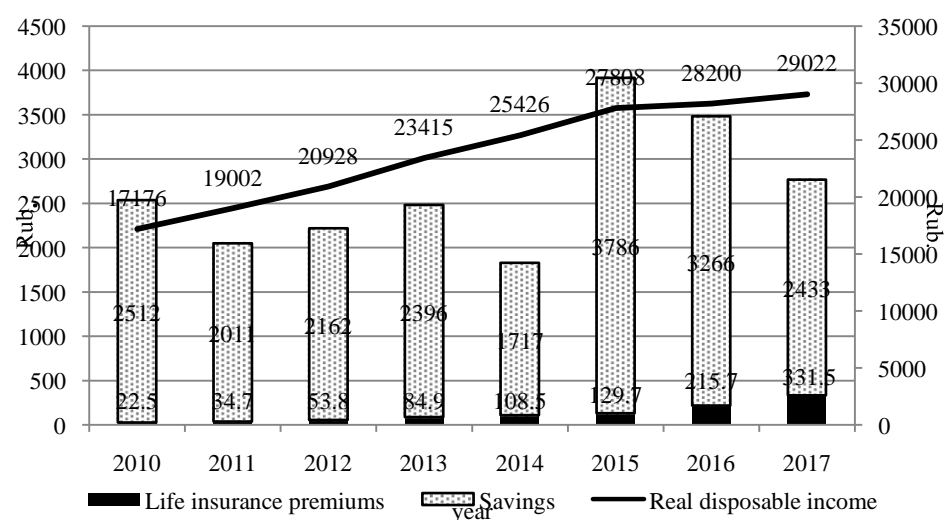
Figure 2. Dynamics of GDP and real income in Russia, 2010-2017, %



Despite of drops in the economy and non-life insurance, individuals purchase life insurance, that in current conditions of economic uncertainty, especially, fall in income, means the precautionary savings. The basic life insurance conditions include mid-term (from 5 to 7 years) investment and risk (death) guarantees for insured. Investment part, in its turn, might be divided on basic and additional parts, the first with low guaranty rate of return, and the second – in depends on chosen of insured person investment strategy. Moreover, high-risk or stable investment strategies are proposed without dividing into two standard parts. The rate of return varies from negative meaning to almost 30 percent in depend of investment instruments. At the same time, the official refinancing rate remains 7.25% and the rate on bank deposits is 6-7%. Hence, life insurance decisions are taken in conditions of income uncertainty with precautionary target and in the mid-term horizon in relation to quite complex financial product that fit into rational approach assumptions.

Figure 3. Dynamics of shares of the life insurance premiums (savings), real disposable income (to the previous year) in Russia, 2010-2017, Rub.

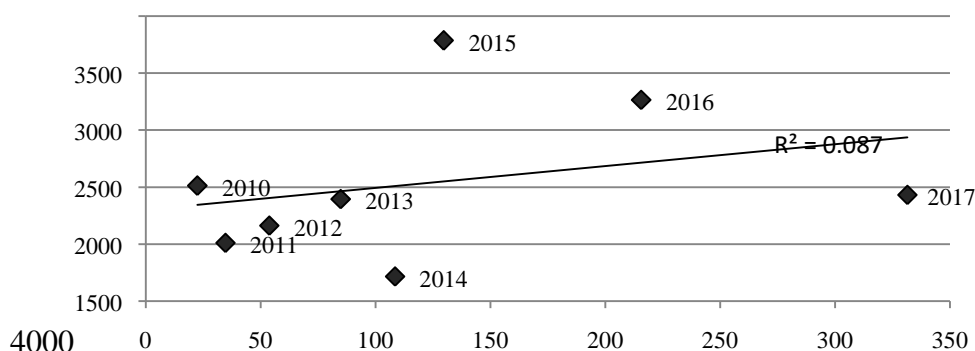
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Source: Central bank, Federal State Statistic Service

The similarity in personal investments allows compare the life insurance and saving behavior, its dependence on income and replaceability. We see that savings not increase in opposite the life insurance trend (Fig. 3). The savings showed a quick recovery almost in 2,2 times from 1717 Rub in 2014 to 3786 Rub. in 2015 after shock of 2014 as an precautionary respond. However, with the continuing fall in incomes, there is a reduction in savings. The simultaneous increase of life insurance does not substitute reducing part of savings. For instance, the decrease in both savings and life insurance as a whole was almost –13% in 2016 and almost –26% in 2017. Thereby, there is not empirical support for the substitute of savings and life insurance within one market (Fig. 4). The linear relation between these kinds of personal investments is positive and weak with about 0,09.

Figure 4. The relation between life insurance premiums and savings in Russia, 2010-2017



Source: Central bank, Federal State Statistic Service

We tested the macroeconomic factors' impact life insurance by regression model (Tab. 1). We found that the most influenced factors are consumption, income, GDP, and currency; less: oil prices and rate of unemployment, and weak: inflation, social expenditures, and interest rate. The same ranking of factors is confirmed by t statistic and Pvalues with 0,95 confidence. The absence of influence on life insurance as an investment product important monetary factors as inflation and interest rate cast doubt on the possibility of influencing the insurance sector through state financial policy. Nowadays, we are dealing rather with the pure life insurance market and the influence of two main valuables: income and consumption. Among the most significant influenced valuables,

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according to the coefficient of variation, only the currency remains with the variability in 37%. That is, a significant part of the variability and impact on life insurance is provided by the currency, its change. It is worth to note that the national currency rate has more than halved relative to 2014.

Table 1. Summary of regressions and variation of life insurance valuables

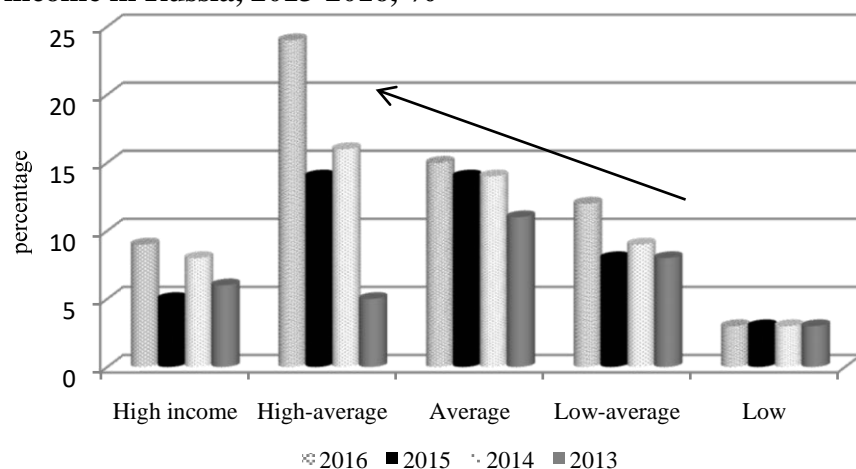
Valuables Estimate /	R Square	t statistic (2,36)	P-values	C_v, %
Interest Rate	7,5	0,69	0,5129	24
Real Personal Income	73,09	4,04	0,007	19
Currency	64,50	3,30	0,0163	37
Inflation	26,38	-1,47	0,1928	48
GDP	71,82	3,91	0,0079	20
Consumption	76,37	4,40	0,0046	20
Oil prices	51,63	-2,53	0,045	37
Unemployment rate	47,19	-2,32	0,06	14
Social expenditures	22,33	1,31	0,23	11

Source: Authors' calculations

For the further testing of the income impact the life insurance behavior we use cross-section questions of RLMS. The questions are: 1. What is the total amount of money that you personally received in the last 30 days. Please include everything: wages, retirement pensions, premiums, profits, material aid, incidental earnings, and other receipts, including foreign currency, but convert the currency into rubles? 2. Do you participate in the following voluntary insurance programs? Please do not indicate compulsory insurance programs. Life insurance and accident insurance? There is a quantity of deviation, since taking into account additional accident insurance. However, we do not consider this impact to be significant due to its stable change in the average growth rate of 8% per year under considered period, i.e. within the limits of inflation. The respondents were ranged into 5 quintile groups by income (Fig.5).

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Figure 5. Share of individuals holds life insurance and accident insurance policies per quintile groups by income in Russia, 2013-2016, %



Source: Russia Longitudinal Monitoring Survey

5. Conclusion

The results of the study largely confirm the assumptions of the normative approach to justify life insurance behavior. Along with this, not all assumptions are supported. Considering insurance behavior in conditions of economic uncertainty, we received in the most cases the confirmation of the positive behavior of individuals: risk averse with the precautionary motive for changes in incomes, long-term decisions for complex financial products, and dependence on financial resources (budget). The life insurance decision making are made in a market with not strong influence of state monetary regulation. Despite on this, there are several gaps, for instance, the lack of replaceability or substitute of insurance and savings that does allow confirming a rational approach as a whole. We can make conclusions that rationality of life insurance behavior under economic uncertainty presences in a limited status. We suppose that the most reflective in terms of understanding and analyzing insurance behavior is limited or bounded rationality, that allows taking into account the basis of normative theory and, if this will be applicable, with the subjective, psychological aspects.

It is important to take into account the existing link between the rationality / irrationality of savings behavior under conditions of income-based uncertainty. The rationality of long-term life insurance decisions that we have received for people with high and middle incomes may have the opposite meaning for less well-off groups of the population. We suppose that the providing individuals with the necessary information in the last case in accessible form and with some state financial support helps to increase rationality in decision-making and insurance behavior.

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