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Presentation date: December, 2019

Date of acceptance: January, 2020

Publication date: March, 2020

## THE SIGNIFICANCE

OF THE RISKS OF ECONOMIC SECURITY ACCORDING TO THE INSURANCE MARKET DATA IN THE RUSSIAN FEDERATION

**LA IMPORTANCIA DE LOS RIESGOS DE SEGURIDAD ECONÓMICA SEGÚN LOS DATOS DEL MERCADO DE SEGURO**

Valentina Karginova-Gubinova<sup>1</sup>

E-mail: [krcras@krc.karelia.ru](mailto:krcras@krc.karelia.ru)

ORCID: <https://orcid.org/0000-0002-8630-3621>

<sup>1</sup>Institute of Economics of the Karelian Research Centre of the Russian Academy of Sciences. Russian Federation.

Suggested citation (APA, seventh edition):

Karginova-Gubinova, V. (2020). The significance of the risks of economic security according to the insurance market data in the Russian Federation. *Universidad y Sociedad*, 12(2), 138-145.

### ABSTRACT

This work is aimed to determine the significance of economic security risks. The insurance risks of the Russian Federation were chosen as an object. The choice of the territory is caused by the lack of integrated research in relation to the Russian Federation and its regions, as well as the divergence of importance of factors for different countries and, accordingly, the impossibility of extrapolating the results of studies in other territories. The main data sources were the statistical databases of the Unified Interdepartmental Statistical Information System (UISIS) and the Central Bank of the Russian Federation; the data from the institute of the Swiss Reinsurance Company were used for international comparisons. The analysis was carried out using the methods of econometrics and applied statistics; a cluster analysis of the Russian regions was carried out. The importance of economic security risks is defined by both the objective factors (income level, property volume, life expectancy, etc.) and subjective (for example, gender).

**Keywords:** Acceptable risk, insurance risk, voluntary insurance, personal risks, property risks, economic security measures.

### RESUMEN

Este trabajo tiene como objetivo determinar la importancia de los riesgos de seguridad económica. Los riesgos de seguro de la Federación de Rusia fueron elegidos como un objeto. La elección del territorio se debe a la falta de investigación integrada en relación con la Federación de Rusia y sus regiones, así como a la divergencia de la importancia de los factores para diferentes países y, en consecuencia, la imposibilidad de extrapolar los resultados de los estudios en otros territorios. Las principales fuentes de datos fueron las bases de datos estadísticas del Sistema Unificado de Información Estadística Interdepartamental (UISIS) y el Banco Central de la Federación de Rusia; los datos del instituto de la Swiss Reinsurance Company Swiss Re se utilizaron para comparaciones internacionales. El análisis se realizó utilizando los métodos de econometría y estadística aplicada; se realizó un análisis de conglomerados de las regiones rusas. La importancia de los riesgos de seguridad económica se define tanto por los factores objetivos (nivel de ingresos, volumen de propiedad, esperanza de vida, etc.) como subjetivos (por ejemplo, género).

**Palabras clave:** Riesgo aceptable, riesgo de seguro, seguro voluntario, riesgos personales, riesgos de propiedad, medidas de seguridad económica.

## INTRODUCTION

For a long time the basic concept of providing the security of technical systems in Russian Federation was ALAPA (As Low As Practically Achievable) developed within the framework of “zero risk” concept. However, now this approach has been declared unsupportable: it does not comply with the internal laws of development of the technosphere and is economically unjustified.

ALAPA was replaced by ALARA (As Low As Reasonable Achievable), the concept of “acceptable risk” (Surova & Yuskevich, 2010). This concept was formulated in 1966 by the International Commission on Radiological Protection (1977), as the basic principle of radiation protection.

The approach of “acceptable risk” and providing of sufficient level of safety can be transmitted into the economic security (Karginova, 2018b). This will allow to adjust the traditional view of economic security, which implies a complete absence of threats. First of all, it is necessary to establish the importance of different types of risks for economic entities.

The purpose of this work is to determine the importance of economic security risks using the example of insurance risks.

The relevance of the study is caused by the need to adjust the traditional view of economic security as a state of the economy with zero risk due to its unattainability and financial inexpediency. The results will allow to determine the priority of the measures of providing the economic security.

An integrated study of risks began in the Renaissance. It was at that time that random events had come to be seen not only from the standpoint of religion, but also science, first of all mathematics (Bernstein, 1996).

In accordance with the formula of Sandman (1993), the perception of risk can be presented as the sum of two components: a measurable treat (consequences, their probability) and a perturbation reaction. Moreover, precisely the perturbation reaction has the determining influence on the risk perception, which is defined by many factors. Among them, it is worth to highlight both factors characterizing the immediate individual and the risk itself.

In particular, speaking about personal characteristics, the gender (women are less tolerant to risk) and age can be given as an example. It is considered that young people are more inclined to the risk than the representatives of elder age, but many modern researchers do not support this point of view. The difference in behavior of young and age groups is explained by their different ability to identify

the risk. Moreover, the evaluations of adolescent risk are more susceptible to the social influence.

The current situation parameters also have an influence. Lack of sleep, blocking feelings of satisfaction and regret, increases the risk tolerance. Euphoria has a similar effect. And depression, on the contrary, increases the risk non-acceptance.

A number of characteristics of individuals, for example, the level of education, have a weak connection with a risk perception. This was shown in the analysis of financial and credit risks, as well as medical.

In relation to the characteristics of risk, it is worthwhile to dwell on its consequences. Based on the pyramid of Abraham X. Maslow (1954); Rowe (1975), noted that the most important risks are those affecting the life and health, then family prosperity, career, etc.

It is necessary to divide the risks of obtaining the potential benefits and losses: as the experiments of Kahneman (2011), show, the subjective evaluation of losses is greater than of acquisitions. In addition, the risk sensitivity increases with the possibility to avoid the unfortunate consequences.

Of particular interest is the combination of individual and risk characteristics. The risk non-acceptance in the field of potential benefits decreases with increasing of age and income, and the risk non-acceptance in the field of potential losses with increasing of income. Moreover, on average, the anger reduces the non-acceptance of losses by half, the conclusion about the connection between risk non-acceptance in the field of potential losses and income is also confirmed Tanaka, Camerer & Nguyen (2010).

Taking into account the existing differences in the perception of certain types of risks, the impossibility of covering all kinds of risks within the framework of one work and the available statistical database in respect to the insurance risks, precisely they were the objects of this study.

In international comparisons, it should be understood that the tendency to risk insurance is influenced by macroeconomic (inflation rates, income per capita, etc.) and institutional (primacy of law, independence of justice, etc.) factors, as well as the differences in legislation: in different countries the same risks can be insured both forcibly and voluntarily.

Moreover, the differences in evaluations of insurance risks in populations of different countries are caused by the difference in cultures, first of all feelings of safety. In particular, this was shown on the example of language groups in Switzerland: the inhabitants of border municipalities who

speak French, Italian or Romance supported the expansion of social insurance more than the German-speaking population. The non-prevalence of life insurance in Latin America and the Caribbean region is explained by the high proportion of population professing Catholicism, which, in turn, leads to the predominance of fatalistic ideas. The negative influence of fatalism on the tendency to insurance was shown by John J. Burnett and Bruce & Palmer (1984). Also, the existing socio-political environment has an influence on the amount of perceived risk and the ways of its treatment.

It was shown that both personal and property insurance are more common in countries where the individual behavior predominates rather than collective, and with a low distances of power. Also, a positive influence on the expansion of personal insurance has an absence of aspiration for the results at any cost. The level of education is a significant factor only with respect to the property insurance.

In the course of studies previously carried out, the perception of insurance risks was analyzed in some countries and macro-regions. It was shown that factors that influence significantly on the perception of insurance risks in some territories could be insignificant for the population of others. The level of income could be an example: in property insurance the income matters in developing countries in Europe, but not in Asia. The integrated studies in relation to the Russian Federation and its regions are absent. Therefore, precisely on the example of this territory we will analyze the importance of risks.

#### METHODOLOGICAL APPROACH

Analysis of risk perception is mainly realized on the basis of carrying out of sociological surveys or experiments (Kahneman, 2011). A distinctive feature of this study was the focus on statistical data and mathematical methods.

The statistical data of the Unified Interdepartmental Statistical Information System (UISIS) and the Central Bank of the Russian Federation were used as the basic empirical base. The international comparisons were realized on the basis of data from the Institute of Swiss Reinsurance Company Swiss Re.

The approach was based on the methods of econometrics and applied statistics. A number of indicators were calculated that characterize the perception of insurance risks by Russians, the key of them were the shares of insurance contracts by type, the ratio of insurance payments to insurance premiums, and their average growth rate. The comparisons of indicators were realized to reveal the priority types of insurance, the degree of their effectiveness,

as well as influencing factors. The formalization of factors was carried out using the correlation analysis.

A cluster analysis was carried out to determine the special features of risk perception in certain regions of the Russian Federation. The clustering was carried out on the basis of two indicators, the share of voluntary personal insurance contracts in the total volume of voluntary insurance and the effectiveness of voluntary personal insurance.

In accordance with legislation of the Russian Federation, in a number of cases there is a responsibility for life, health, property or civil liability insurance. In particular, the Russian Federation has a compulsory medical insurance, social insurance for temporary disability and maternity insurance, life and health insurance of a number of officials (for example, military personnel), civil liability insurance of vehicle owners, court-appointed managers, cadastral engineers, appraisers, carriers and etc. These types of insurance are called obligatory; the others are voluntary.

The first indicator of clustering, the share of voluntary personal insurance contracts in the total volume of voluntary insurance, is aimed to determine the priority of personal insurance risks in comparison with the property ones. It was chosen precisely the voluntary insurance, because the conclusion of compulsory insurance contracts does not demonstrate the importance of these risks for insurant.

The effectiveness of voluntary personal insurance was calculated as the ratio of insurance payments to insurance premiums under insurance contracts in the insurance organizations in the Russian Federation. This indicator allows us to talk about the rationality of insurant: how economically feasible to insure the certain risks, do the citizens take this into account?

A hierarchical clustering was performed for the selected indicators. The advantage of hierarchical methods is that there is no need to set initially the number of clusters and their centers. The proximity of regions was established on the basis of the calculation of the distance matrix, which, in turn, was elaborated according to the average link method. Unlike the complete link method, it is suitable not only for analysis of compact and pronounced clusters. At the same time, the average link method does not lead to elongated clusters connected only by single elements (this is typical for the single link method).

In the course of each stage of clustering, according to the average link method, the elements were connected together, for which the average distance was minimal for all pairs of components. The calculation was carried out according to the Euclidean distance formula. It depends on the scales and measure units, however the both indicators

are expressed in the percentage that has allowed us not to produce the normalization of the data. The formal criterion to stop the uniting the elements was the similarity indicator: the clustering was carried out till the moment when this indicator sharply decreased.

Applied statistics methods were also used for comparison of risk perception by Russians with the perception of residents of other countries, to identify similarities and differences.

## RESULTS AND DISCUSSION

Let us examine the distribution of insurance contracts concluded by insurance organizations in the Russian Federation (Table 1).

Table 1. Insurance contracts concluded by insurance organizations in the Russian Federation.

Insurance Type	Share in 2018	The average growth rate for 2014-2018
Voluntary insurance	80,47	1,03
including: voluntary personal insurance	38,46	0,97
including: life insurance	2,54	0,89
accident and health insurance	29,89	0,98
voluntary health insurance	6,03	0,98
voluntary property insurance	42,01	1,12
including: voluntary property insurance of citizens	24,09	1,14
voluntary property insurance of legal persons	2,65	1,06
voluntary agricultural insurance	0,03	0,77
voluntary liability insurance	6,33	1,04
voluntary insurance of business and financial risks	8,91	1,27
Obligatory insurance	19,53	0,92
In total	100,00	1,00

To establish the special features of risk identification it is necessary, first of all, to focus on voluntary insurance. In 2018, the share of concluded contracts on voluntary types of insurance in the total number amounted to 80.5%, which indicates a fairly widespread prevalence of voluntary insurance. The more popular is property insurance, but not personal. At the same time, the number of voluntary property insurance contracts over the past five years

has been increasing on average by 12.3% annually, while voluntary personal insurance contributions only by 3.1%.

The demand for life insurance is partially explained by the interest in consumer credits: in 2018, the borrower's life insurance contracts amounted to 43.4% of the total number of life insurance contracts. In the same manner, the conclusion of accidents and health insurance contracts could be explained by desires to take a credit. Therefore, speaking of voluntary personal insurance, the most illustrative is the low number of contracts concluded in relation to health insurance, 6.0% of the total number of contracts.

Also the dynamics of property insurance contracts is not free from the influence of credit moods. So, banks, issuing a mortgage, require the property insurance. However, in 2018, the share of granted mortgage housing credits in the total volume of voluntary property insurance contracts for citizens amounted to only 3.0% (calculated on the basis of Unified Interdepartmental Statistical Information System, 2019), which only confirms the greater interest in property risks in comparison to personal ones.

It is interesting, that the greatest growth among the all types of insurance is shown by the insurance of business and financial risks, 26.6% per year over the past five years. Moreover, in this category the overwhelming share of contracts (99.9%) are the financial risks (calculated based on The Central Bank of the Russian Federation, 2019). A slightly smaller share and smaller growth is shown by liability insurance, the major part of contracts (79.2%) are related to the risks associated with causing damage to the third parties, 16.8% to the risks of carriers, moreover, more than the half of the latter (59.4%) are issued within the framework of the international insurance system "Green Card".

To evaluate the degrees of rationality of insurance, we compare the shares of contributions and payments under the contracts (Table 2). There is a weak and, importantly, inverse relationship between two indicators (the linear correlation coefficient was -0.18, excluding the obligatory types of insurance -0.23). For example, in comparison with other types of voluntary insurance, with a relatively low efficiency of life insurance, the share of costs for it is significant. At the same time, in comparison of expenses for accident and health insurance and voluntary medical insurance, the effectiveness of the first is approximately 7.5 times less.

Table 2. The relation of payments to insurance premiums under insurance contracts in insurance organizations in the Russian Federation.

Insurance Type	The relation of payments to insurance premiums in 2018	The average growth rate for 2014-2018
Voluntary insurance	30,23	0,93
including: voluntary personal insurance	25,15	0,92
including: life insurance	14,81	1,04
accident and health insurance	9,70	0,94
voluntary health insurance	73,06	0,99
voluntary property insurance	38,91	0,97
including: voluntary property insurance of citizens	37,29	0,90
voluntary property insurance of legal persons	47,73	1,08
voluntary agricultural insurance	41,75	1,02
voluntary liability insurance	21,23	1,01
voluntary insurance of business and financial risks	26,32	1,68
Obligatory insurance	58,99	1,02
In total	35,24	0,95

The exceeding of the effectiveness of property insurance of legal person in comparison with physical ones indicates the greater rationality with fulfilling the social and professional roles compared to the family and household ones (for other examples of differences within the framework of social and professional and family and household roles, see Karginova, 2018a).

In addition to the effectiveness of certain types of insurance, other factors that influence the risks perception by insurant were also considered. In general, the correlation coefficients calculated between the share of voluntary personal insurance contracts in the total volume of voluntary insurance and different characteristics of the regions show once again that the preference for personal insurance risks over the property is affected by both subjective factors (e.g. gender) and objective (income level, property volume, life expectancy, etc.) (Table 3). In general, low correlation coefficients indicate the complexity of

determining factors and the large role of subjective factors, which at this stage of the study were not formalized.

Table 3. The interrelation of shares of voluntary personal insurance contracts in the total volume of voluntary insurance for 2018 and individual characteristics of regions of the Russian Federation.

Characteristic	The value of the correlation coefficient	Link type
The share of population with money incomes lower than value of the subsistence minimum in 2018, percentage	0,17	Direct weak
The size of the total (usable) area per household member in 2017, square meter	-0,30	Reverse moderate
Life expectancy at birth in 2018, years	-0,18	Reverse weak
The share of number of women in number of men on January 1, 2019	-0,27	Reverse weak

The author also calculated the correlation coefficients of the share of voluntary personal insurance contracts in the total volume of voluntary insurance and the level of gross regional product per capita, morbidity and mortality, the volume of granted credits, including housing, the share of housing credits in the total volume of those given. However, none of the correlation coefficients exceeded the threshold value of 0,1.

A cluster analysis of these regions of the Russian Federation shows a rather big proximity in the perception of insurance risks: the total number of regions assigned to the second, third and fourth clusters comprises 74, and precisely these regions have the most similar indicators on the share of voluntary personal insurance contracts in the total volume of voluntary insurance and the effectiveness of voluntary personal insurance (Table 4).

Table 4. The results of cluster analysis of regions of the Russian Federation.

Regions	The share of voluntary personal insurance contracts in the total volume of voluntary insurance in 2018, %	The effectiveness of voluntary personal insurance in 2018, %
First cluster	20,56	10,29
Second cluster	37,73	15,71
Third cluster	47,09	25,61
Fourth cluster	57,94	15,88

Fifth cluster	71,63	68,34
Sixth cluster	74,08	20,23
City of federal importance Sevastopol	94,20	0,98
Khanty-Mansi autonomous area, Yugra	64,49	339,95

As the regions of the Russian Federation were considered separately the Nenets autonomous area and the Arkhangelsk region without the Nenets autonomous area, as well as the Khanty-Mansi autonomous area, Yugra, the Yamalo-Nenets autonomous area and the Tyumen region without these two areas.

The residents of regions that fell into the first cluster (Moscow and Smolensk regions, the Republic of Dagestan) can be characterized as enough wealthy: the share of population with incomes below the value of subsistence minimum is minimal for all clusters, 13.0% (2018), and the usable area per household member is maximal, 27.3 square meters (2017). Accordingly, it is permissible to assume that the inhabitants of these regions have a rather large property volume, value it and, first of all, insure it. The low efficiency of voluntary personal insurance is caused by low morbidity and mortality of population; the life expectancy at birth is the highest among the all clusters - 74.5 years (2018).

The nearly opposite situation is in the regions of the fifth cluster (Altai Republic, Chukotka autonomous area). The population is poor, the property volumes are insignificant, and precisely in this cluster the smallest usable area per household member is 21.5 square meters (2017). Accordingly, the personal insurance rather than the property is more common. At the same time, the high morbidity and mortality indicators, that reduce the life expectancy at birth to a minimum level in all clusters to 67.1 years (2018), lead to the high indicators of effectiveness of voluntary personal insurance. It is also interesting that precisely in the regions of the fifth cluster the smallest exceeding of number of women over men was 3.7% on January 1, 2019. As it was shown earlier, women prefer personal insurance more than property insurance.

The regions of the sixth cluster (Arkhangelsk region without the Nenets Autonomous area, Novosibirsk and Ryazan regions, Khabarovsk territory) combine the features of the first and fifth. So, they are also characterized by a low share of population with incomes below the subsistence minimum, 13.35% (2018) and a large usable area per household member, 24.0 meters (2017). Accordingly, it is logical to assume that the population of these territories

will have a rather high interest in property insurance. The actual dominance of personal types of insurance can be explained by the low life expectancy at birth, 71,8 years (2018). However, despite this, the effectiveness of personal insurance is considerable less than in the fifth cluster. It can be assumed that precisely in these regions the role of subjective risk perception factors is high.

Emissions on the effectiveness of voluntary personal insurance in the city of Sevastopol and the Khanty-Mansi autonomous area, Ugra need further refinement.

It is expediently to make some international comparisons. The most complete statistical information on foreign countries is presented in respect to personal and property insurance (Table 5).

Table 5. Macro-region insurance premiums in 2017.

Macro-region	Insurance premiums, in the percentages of Gross Domestic Product	The share of insurance premiums in total amount, in the percentages	
		personal insurance	property insurance
Europe	6,45	58,01	41,99
including: Russia	1,40	25,95	74,05
Asia	5,62	65,61	34,39
North America	7,11	39,98	60,02
Latin America and Caribbean	3,06	46,58	53,42
Africa	2,96	67,32	32,68
Oceania	5,62	37,60	62,40
In total	6,13	54,32	45,68

Actually, in the Russian Federation, the total insurance premiums comprise the significantly smaller share of GDP than both in the developed countries and also in many developing countries. For comparison, if in 2017 the insurance premiums in the Russian Federation reached 1.4% of GDP, then in South Africa the similar indicator was 13.8%, in the UK 9.6%, in Japan and the Commonwealth of the Bahamas 8.6%, in USA 7.1%. This indicates the general underdevelopment of the Russian insurance market and the low willingness of Russians to insure the existing risks.

In turn, the low willingness to insure risks is caused by both low incomes of citizens and the level of financial culture, as well as paternalistic moods. A survey conducted by the Levada Centre analytical center showed that in July 2018, 62% of population believed that "the state should take care of all its citizens, providing them with a decent standard of living." Since the beginning of 2001, this share

has decreased on 9 percentage points, but its value still remain significant.

Nevertheless, it is interesting to look at the popularity of certain types of insurance in the Russian Federation and other countries. In Asia and Africa, the sums of premiums with respect to life insurance are approximately two times higher than similar for non-life insurance. In Europe, this exceeding also exists, but it is not so pronounced. The opposite is observed in North America and Oceania: the non-life insurance premiums are on 50-70% greater than the life insurance premiums. The closest amounts for these types of insurance are in Latin America and the Caribbean region.

Obviously, these differences partially are caused by differences in legislation of countries. However, the differences exist within the framework of European Union, where there is a unification of laws and regulations (for example, in the UK the personal insurance premiums comprises 67.0% of the total sum, in Bulgaria only 17.2%).

The data on insurance premiums for the Russian Federation confirm the conclusion made earlier on the basis of the number of concluded contracts: in the Russian Federation, the property insurance is more popular than personal insurance. Moreover, the difference in comparison with other regions is very significant.

Analyzing the results obtained during the study, it is worth to remember that not all risks are insurance, that is, they can be transferred to the insurer through the payment of insurance premium by the insurant. The main signs of insurance risks can be:

The existence of many units in relation to which an adverse event may occur, that, because of the law of large numbers, will allow, forecasting the probability and consequences of risk, to distribute them among all the insurant; the probabilistic nature of the event and the insurant impossibility to influence its occurrence. It is obviously, the insurer will not take the obligation of payments on the reliable losses or those within the framework of which an opportunistic overstatement of amount of damage is possible.

The criterion of insurance risks is fixed by law. Interests, the insurance of which is not permitted are also established. In the Russian Federation, these are unlawful interests, losses in games, lotteries and betting, as well as expenses necessary for releasing of hostages.

In view of the foregoing, it can be said that the perception of risk forces by a particular individual and their insurance are not fully correlated. However, for determining the

priority of economic security measures, this factor can be considered insignificant.

## CONCLUSIONS

In most regions of the Russian Federation, the population is more willing to insure the property risks rather than the personal. And the same is true for the inhabitants of North America and Oceania, but the discrepancy observed there is not so significant. Moreover, we can talk about the general low willingness of Russians to insure risks: both in comparison with developed and developing countries. This is caused by the low incomes of citizens and the level of financial culture, as well as, which is important, paternalistic moods. On the basis of previously reviewed studies, the low expansion of insurance can be associated with low individualism and a high distance of power.

The greater popularity of property risks in comparison with personal can also be explained by paternalism, which is formed, among other things, by the existing system of compulsory medical insurance (the obligation to insure housing was discussed, but was not fixed. However, the high differentiation of incomes of the population also plays not the last role. Wealthy citizens who can afford an insurance have a large property volume. Accordingly, a larger number of concluded contracts with respect to property risks in comparison with personal can be associated with a multiple property objects. Moreover, more wealthy people have a better quality of life (food, etc.) that reduces morbidity and mortality, and increases life expectancy. And this category of citizens is capable to solve emerging health problems with the help of paid medicine. This can be seen in the example of the population of the Moscow and Smolensk regions, the Republic of Dagestan.

The higher preference for personal risks in comparison with property observed in some regions, in particular, in the Altai Republic and the Chukotka autonomous area, is caused by poverty of the population (small property volumes) and high morbidity and mortality rates that reduce life expectancy at birth. The prevalence of women plays not the last role: precisely the women who primarily insure personal risks rather than property.

In general, the behaviour of Russians in many aspects can be recognized as irrational. First of all, the population attempts to ensure to itself a sense of security, but not to reduce the possible financial losses: the connection between the share of contributions and the amount of payments is practically absent. The greater rationality is observed with fulfilling of social and professional roles in comparison with family and household ones and is manifested, in particular, in exceeding of the effectiveness of

property insurance of legal persons in comparison with physical ones.

Thus, the formation of economic security providing system requires taking into account both objective factors (income level, property volume, life expectancy, etc.) and subjective factors (for example, gender) that affect individuals' risk perceptions. A greater willingness to insure property rather than personal risks cause the necessity, on the one hand, to pay an attention to measures for providing the ontological safety in relation to property risks for an appearance a feeling of security in the individuals (achievement of fire safety of buildings, safety on the roads, support for the entrepreneurs in crisis situations, etc.), and, on the other hand, the priority of state and municipal measures in relation to the institutions for providing of actual personal safety (support for compulsory personal insurance systems, increasing the effectiveness of insurance payments, popularizing of corporate personal insurance, etc.).

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