Methodology for Calculating the Job Loss Insurance Rate

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ABSTRACT

The relevance of the research topic is confirmed by the fact that in the context of globalization, job search and job loss have become rather common. Therefore, the working-age population needs to be protected from job loss when looking for a new job. The purpose of the article is to develop a methodology for calculating the job loss insurance rate for citizens. The methodology is based on an actuarial approach that allows a comparison of the net rate and the gross rate paid by the insured. The scientific novelty of the study lies in the consideration of the net rate based on the reasons for employee termination, and the analysis of the possibilities of distributing the net rate between the employee and the employer. Main research methods include tabular and graphical methods, analysis and synthesis, comparison, induction, and deduction. As a result of the introduction of job loss insurance, the social protection of the population in the context of COVID-19 is being strengthened, and opportunities for temporary coverage of expenses during the job search period are being increased. The author concludes that this type of insurance is promising in a market economy and may become not only a new and interesting insurance product but also an effective tool for the social protection of the population in regions with high labor market turbulence.

Keywords: job loss insurance; actuarial calculations; employee; employer; insurance rate; insurer; methodology for calculating the insurance rate

INTRODUCTION

In the modern system of social protection of a person from the risks associated with the loss of livelihood (old age, illness, disability, unemployment, etc.), social assistance or social insurance may prevail. As a rule, social assistance is funded at the expense of budgetary funds of different levels.

In case of disability of members of society, the state guarantees their provision at the level of the subsistence minimum. The amount and payment of benefits are not related to the length of service and the previous size of wages. When assessing a person's need for benefits, the family composition, mandatory payments, size and income from property, etc. are taken into account.

Therefore, it is necessary to develop such a methodology for calculating the job loss insurance rate for citizens, which will protect the working-age population from job loss for the period of looking for a new job. To do this, it is advisable to use the method of actuarial calculations, adapted to the specifics of the problem being solved and the available initial data.

LITERATURE REVIEW

A sufficiently large number of domestic experts were involved in the analysis of foreign experience in insurance against job loss. In particular, I. N. Kuropatenkova and Yu. M. Zenovchik consider the experience of organizing unemployment insurance in the Republic of Belarus [1], and O.B. Pichkov analyzes the role of insurance in the implementation of US social policy [2]. In turn, V.P. Shram conducts a historiographic analysis of the pension insurance reform in Croatia [3], and the papers of A.V. Yakovleva and A.G. Kim are devoted to the Swedish system of job loss insurance [4]. We also want to distinguish the studies of J. Clasen and E. Viebrock [5].

The allocation of budgetary funds for the provision of social assistance directly depends on the economy and finances of the state. According to V.D. Roik, "this model initially assumes smaller state guarantees, and hence a lower level of sources for financing benefits" [6]. According to A. S. Tokmakov, "when using social insurance, the principle of residual budget financing of social expenditures is overcome and it becomes possible to increase social payments by investing free balances of insurance funds in highly profitable assets" [7].

Yu. P. Kalmykov in his paper notes that "insurance orients people, first of all, to rely on themselves, leaving, as a last resort, collective provision on a national scale from the authorities or the regional government" [8]. From the foregoing, it follows that compulsory social insurance of basic risks has significant advantages over the budgetary mechanism for providing social assistance [9]. The prospects for job loss insurance are reflected in the works of I.L. Soloshchenko [10] and Ya. A. Kovtun with M. A. Pisarevskaya [11], A.V. Logacheva and A.A. Smagin [12], as well as S.I. Maksimov and D.A. Rusinov [13].

Certain methods and mechanisms of insurance protection of employees as a result of negative events in the labor market were considered by A. V. Poletaev [14], general insurance principles of unemployment protection were studied by F.I. Mirzabalaeva, S. E. Pashkova, and G. V. Antonova [15], L. Yu. Laskina and A.V. Yakovleva [16], as well as A.A. Bykov [17]. It is important to note the issues of using risk management models in the system of job loss insurance. This issue was considered in detail by E. V. Matveeva, I. S. Ukraintsev, and D. A. Ukraintseva [18], as well as T. V. Mikhina [19]. It should also be noted a number of studies on the methodology of insurance calculations, which include the papers of M.D. Tinasilov and A.R. Urkumbaeva [20], as well as I. V. Sukhorukova and N.A. Chistyakova [21].

METHODOLOGY OVERVIEW

The characteristic of negative events of labor activity suggests the possibility of using various structural deductions and distributing the load between the employee and the

Insurance load in Germany in 2019

Type of insurance	Employer, %	Employee, %
Health insurance	7.3	7.3
Pension insurance	9.30	9.30
Occupational accident insurance	1.6	–
Nursing care insurance	1.525	1.525
Job loss insurance	1.25	1.25

Source: Statistics Germany (Statistisches Bundesamt). URL: https://www.destatis.de/DE/Themen/Querschnitt/Jahrbuch/statistisches-jahrbuch-2019-dl.pdf?__blob=publicationFile (accessed on 18.01.2022).
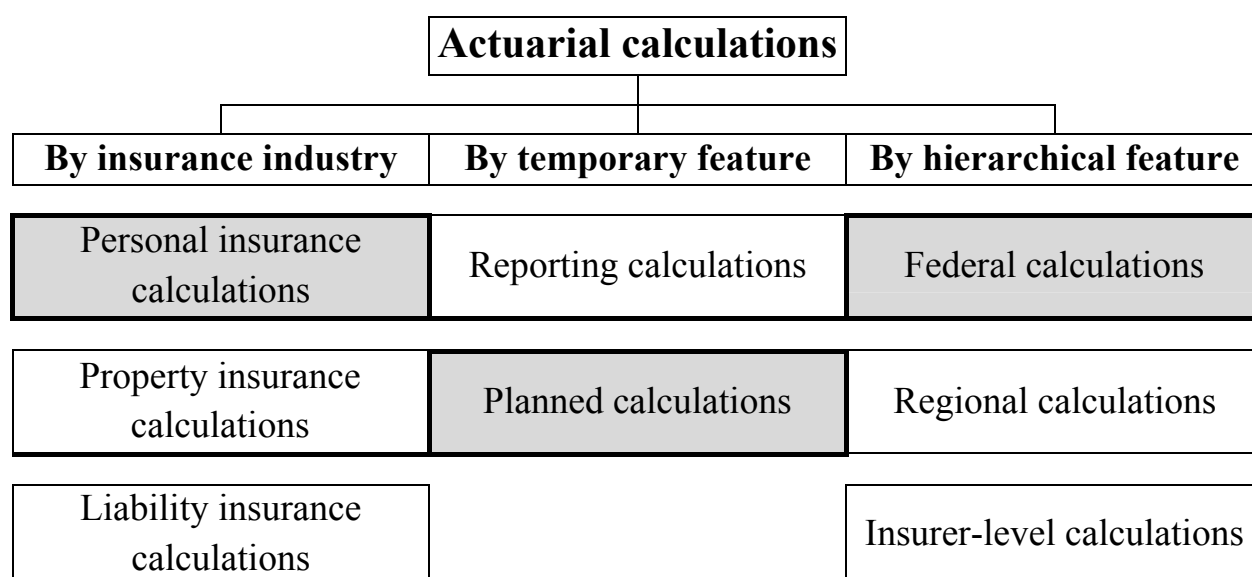

Fig. 1. **Classification of Types of Actuarial Calculations**
Source: Compiled by the author based on M.D. Tinasilov, A.R. Urkumbaeva [20].

employer. This is evidenced by information on the insurance load in Germany in 2019, presented in *Table 1*.

The experience of developed countries shows that job loss risk insurance, unlike other types of social insurance, is associated with the greatest difficulties [2]. To implement the insurance mechanism for the payment of unemployment benefits, it is necessary to justify the amount of payments, as well as the mechanism for the formation and size of the insurance fund [4].

For a preliminary assessment, it is advisable to use actuarial calculations, which can be classified according to various grounds (*Fig. 1*). Taking into account the task of calculating

Insurance rate (gross)			
Net rate	Load		
Directed to the insurance compensation payments	Management expenses	Preventive fund	Insurer's profit

Fig. 2. **The Structure of the Insurance Rate**

Source: Compiled by the author based on: Pricing Models for Insurance Products URL: https://studref.com/530041/strahovoe_delo/modeli_tsenoobrazovaniya_strahovye_produkty (accessed on 12.09.2021).

the size of the fund and the parameters of unemployment insurance *Fig. 1* highlights the elements related to the ongoing calculations.

By insurance industry, the issue under consideration relates to personal insurance, since the insured is a specific individual, an insured event, which is the subject of an insurance contract. On a temporary basis, the actuarial calculations carried out can be considered planned, since they are made when a new type of insurance is introduced, for which there are no clear risk indicators and it is required to assess the scale of insurance payments. On a hierarchical basis, the actuarial calculations can be federal, as they cover the labor market across the country.

The insured will be an employee who meets specific requirements for the length of service and the reasons for termination of the employment contract. For example, in order to receive insurance compensation for the loss of a job, an employee must work at the current workplace for a certain period of time (3 months, 6 months, 12 months, or more).

Also, as an insured event, in our opinion, the reason for termination of the employment contract should be taken into account. Currently, the general reasons for the termination of an employment contract are considered in Art. 77 of the Labor Code of the Russian Federation.[1] We believe that only those reasons that do not imply a voluntary decision of the employee should be an insured

event. Otherwise, abuse by unscrupulous citizens and losses of the insurer due to unreasonable payments are possible.

The insured in the conditions under consideration is an employee who indirectly, through the employer, pays insurance premiums to form an insurance fund. Thus, all parties to the contract have been established, which allows us to proceed to the analysis of the structure and size of the insurance fund, as well as to determine the parameters of the insurance rate. In accordance with the general rule, the universal structure of the insurance rate has the following form (*Fig. 2*).

MAIN RESEARCH RESULTS

It is important to understand that the insurer's profit is included in the rate only if this activity is delegated to insurance companies. If insurance payments are managed by the state fund, this part of the rate is equal to zero [8]. Accordingly, in the described model, actuarial calculations are required to establish the size of deductions and quantify the parameters of the rate. The size of the net rate, in our opinion, directly depends on the following parameters:

1) the basic payment to the insured person;
2) the number of payments;
3) the ratio of the number of employed to the number of unemployed (the probability of an insured event).

Then the formula for calculating the specific insurance compensation per insured takes the following form:

$$ic_j = \sum_{i=1}^{I} (s_i \cdot n_i), \qquad (1)$$

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[1] Labor Code of the Russian Federation No. 197-FZ dated December 30, 2001 (as amended on June 28, 2021) (as amended and supplemented, effective from September 1, 2021). Adopted by the State Duma on December 21, 2001. Approved by the Federation Council on December 26, 2001.

Basic Structure and Amount of Insurance Payments for the Insured

Amount \ Payment	First payment to an employee	Second payment to an employee	Third payment to an employee
Payment 1 amount	Minimum wage	Minimum wage	Minimum wage
Payment 2 amount	75% of wage	60% of wage	40% of wage
Payment 3 amount	Average wage at the place of work	Average wage at the place of work	Average wage at the place of work

Source: Developed by the author.

where ic_j — the amount of insurance compensation per *j*-th insured person;

s_i — the base amount of the *i*-th payment;

n_i — the number of *i*-th payment.

In particular, this formula describes the payment mechanism that existed before 2001 using the following parameters:

s_1 –75% of wage at the last place of work;

s_2 –60% of wage at the last place of work;

s_3 –40% of wage at the last place of work;

$n1 = n2 = n3 = 1$.

In our opinion, it is advisable to consider the following options for the amount of insurance compensation for an employee (*Table 2*). The table discusses the options for the amount of payments, which, firstly, should compensate the insured for losses as a result of involuntary termination of employment. Secondly, the amount and number of payments should be stimulating, i.e. encourage the insured to look for a new job or self-employment.

We believe that employees can choose the option with the amount and number of payments. At the same time, at their request, options for a one-time payment of any of the amounts are allowed. That is, an employee can receive a one-time payment in the amount of the average wage at the place of work three times the amount. These options do not change the total amount of the payment, therefore, do not affect the size of the insurance fund. Then the total amount of payments for insured events during the year will be:

$$IFN = \sum_{j=1}^{J} ic_j, \qquad (2)$$

where *IFN* — the total amount of the net insurance fund that is spent on payments to the insured as a result of the occurrence of an insured event;

J — the total number of payments (the total number of insured events during the year).).

The official data of state statistics provide information on the number of employed and unemployed, which makes it possible to assess the probability of an insured event (*Table 3*).

Moreover, as the data show, the job loss probability in men slightly exceeds that of women. That is, when calculating the size of the insurance rate, this feature can be taken into account [10]. However, we believe that this indicator does not give an objective idea of the size of the net insurance rate, since it does not take into account the various periods of formation of the general wage fund and the insurance fund. To assess it, we consider the necessary information according to Rosstat. The median monthly wage per employee in the Russian Federation in 2019–2020 is presented in *Table 4*.

Thus, based on the data on the number of employees and median wages, it is possible to calculate the total amount of funds allocated in the year under review for wages. For 2019, this amount is as follows:

Table 3

Estimation of the Probability of Occurrence of the Insured Event "Job Loss" Depending on the Gender of the Employee

Data	2015	2016	2017	2018	2019
Labor force, thousand people	72,324	76,636	76,285	76,190	75,398
Total:					
employed	72,324	72,393	72,316	72,532	71,933
unemployed	4,264	4,243	3,969	3,658	3,465
Job loss probability	5.90%	5.86%	5.49%	5.04%	4.82%
Men − total	39,433	39,470	39,291	39,175	38,758
employed	37,136	37,201	37,188	37,259	36,912
unemployed	2,296	2,269	2,102	1,916	1,846
Job loss probability	6.18%	6.10%	5.65%	5.14%	5.00%
Women − total	37,155	37,166	36,995	37,015	36,640
employed	35,187	35,192	35,128	35,272	35,021
unemployed	1,968	1,975	1,867	1,743	1,619
Job loss probability	5.59%	5.61%	5.31%	4.94%	4.62%

Source: Calculated by the author based on Rosstat. URL: https://rosstat.gov.ru/labour_force (accessed on 12.09.2021).

Table 4

Median Wage, Rubles

Research period	2019	2020
Russia	30,458	32,422

Source: Data for the indicator were compiled in accordance with Article 3 of the Federal Law No. 473-FZ dated December 29, 2020 "On Amending Certain Legislative Acts of the Russian Federation" based on the Methodology for Calculating the "Median Wage" Indicator approved by Rosstat Order dated 31 December 2020 No. 870.

Note: The indicator is calculated on average per year for 1 workplace for 1 paid month.

71,933 thousand people ·
· 30,458 rubles · 12 / 1,000,000 = 26,291.224 billion rubles per year

Rosstat provides statistics on the total number of laid-off workers for 2019 (*Table 5*).

In accordance with the assumption proposed above, from this number, it is necessary to subtract those who terminated voluntarily. However, to estimate the total volume of the insurance fund, this assumption can be neglected. If we assume that all those who lost their jobs during the analyzed year were insured, then the total amount of payments for all insured events will be equal to the values presented in *Table 6*.

Table 5

Total Number of People who Lost their Jobs in 2019, People

Type of economic activity	Q1 2019	Q2 2019	Q3 2019	Q4 2019
A	624	3,952	1,780	1,570
B	1,246	1,154	696	1,511
C	8,174	8,362	12,563	8,320
D	1,556	3,883	1,555	1,168
E	987	1,087	997	944
F	1,274	2,399	3,668	4,034
G	965	1,361	1,501	1,194
H	3,412	2,732	1,891	2,922
I	311	626	1,337	514
J	851	1,305	1,739	1,148
K	2,917	3,299	2,399	3,957
L	677	1,743	1,062	863
M	2,443	1,737	2,085	2,427
N	2,095	1,147	1,107	1,673
O	9,109	6,744	7,715	18,004
P	2,509	4,497	5,208	2,417
Q	2,936	3,464	3,140	2,829
R	447	1,124	918	714
S	72	85	147	219
T	0	0	0	0
U	0	0	0	0
Total	42,605	50,701	51,508	56,428
Total per year				201,242

Source: The number of retired employees on the payroll. URL: https://showdata.gks.ru/report/274190/ (accessed on 08.09.2021).
Note: Codes of types of economic activity are given according to «OK 034–2014 (KPES 2008). All-Russian classifier of products by type of economic activity (OKPD 2)» (approved by Order of Rosstandart dated 31.01.2014 № 14-st) (version from 04.02.2022).

Table 6

**The Total Amount of Payments for Insurance Compensation, Depending
on the Basic Structure and Size of Payments, Billion Rubles**

Amount of payments	Total for the first payment	Total for the second payment	Total for the third payment	Total payments
Payment 1 amount	2,270	2,270	2,270	6,810
Payment 2 amount	4,597	3,678	2,452	10,727
Payment 3 amount	6,129	6,129	6,129	18,388

Source: Calculated by the author.

Note: Data on the size of the minimum wage in 2019 are taken from the official website of the Ministry of Labor and Social Protection of the Russian Federation. URL: https://mintrud.gov.ru/labour/salary/113#:~:text=%D0%A1%201%20%D1%8F%D0%BD%D0%B2%D0%B0%D1%80%D1%8F%202019%20%D0%B3%D0%BE%D0%B4%D0%B0%20%D1%80%D0%B0%D0%B7%D0%BC%D0%B5%D1%80%20%D0%9C%D0%A0%D0%9E%D0%A2%20%D1%81%D0%BE%D1%81%D1%82%D0%B0%D0%B2%D0%B8%D1%82%2011%20280%20%D1%80%D1%83%D0%B1%D0%BB%D0%B5%D0%B9 (accessed on 08.09.2021).

Table 7

Unemployment Insurance Net Rate

Net rate	In % to wage	Per 100 rubles wage
Net rate option 1	0.026	0.026
Net rate option 2	0.041	0.041
Net rate option 3	0.070	0.070

Source: Calculated by the author.

Table 8

Selected Data on the Activities of Insurance Companies in 2020

No.	Company	Insurance premiums received in 2020, million rubles	Business expenses, million rubles	Ratio
1	Allianz	5,078.2	34.5	0.68%
2	Ingosstrakh	116,027.3	23,678.7	20.41%
3	RESO-Garantia	109,683.4	26,319.4	24.00%
4	SOGAZ-LIFE	76,069.9	12,069.0	15.87%
5	Sberbank Insurance	21,818.5	17,861.6	81.86%
6	Alliance Life	15,150.0	775	5.12%
7	Total	343,827.3	30,705.6	8.93%

Source: Compiled by the author.

Results of Calculating the Gross Unemployment Insurance Rate Depending on the Share of Expenses for Preventive Measures, %

Gross rate	10	11	12	13	14	15
Option 1	0.031	0.032	0.032	0.032	0.032	0.033
Option 2	0.049	0.050	0.050	0.051	0.051	0.052
Option 3	0.084	0.085	0.086	0.087	0.088	0.088

Source: Calculated by the author.

The Amount of the Monthly Payment, Depending on the Chosen Insurance Compensation Option and the Amount of Expenses for Preventive Measures, Rubles

Monthly payment	10%	11%	12%	13%	14%	15%
Option 1	9.53	9.62	9.70	9.79	9.88	9.96
Option 2	15.01	15.15	15.28	15.42	15.56	15.69
Option 3	25.73	25.96	26.20	26.43	26.67	26.90

Source: Calculated by the author.

Thus, as a result of a preliminary assessment of the total amount of payments, it becomes clear that the maximum proposed amount of payment is 1.7 times higher than in 2001, which allows the employee to secure a comfortable income while looking for a new job. Accordingly, on the basis of data on payments and the annual size of the wage fund in the Russian Federation, a basic net rate per 1 ruble of wages is formed (*Table 7*).

For example, the maximum additional payment of an insurance premium in the amount of the net rate for this type of insurance for the median wage will be:

$$30{,}458 \text{ rubles} \cdot 0.070\% =$$
$$= 21 \text{ rubles } 30 \text{ kop. per month}$$

As mentioned earlier, this calculation does not take into account the assumption that the labor relationship between the employee and the employer can be terminated for various reasons. To assess the part of the rate allocated for preventive measures, it is advisable to establish a net rate standard, for example, 10% of the net rate.

We propose to estimate the rate for management expenses based on establishing the relationship between the management expenses of the largest insurance companies and the total amount of assets under management. The rating of insurance companies in Russia and the data for analysis are presented in *Table 8*. The table shows that the weighted average ratio of the cost of doing business to the total amount of insurance premiums is 8.93%. This calculation makes it possible to estimate the part of the rate aimed at compensating the insurer's management expenses.

The size of the fund, taking into account the data received, is formed as follows:

$$IFT = IFN + k_p \cdot IFN + 8.93\% IFT,$$

where *IFT* — the total size of the insurance fund, taking into account the load;

k_p — the coefficient for calculating the volume of preventive measures (previously, the value of 10% was considered).

Let us carry out transformations in order to express IFT through IFN and completely compose the rate based on the net rate:

$$IFT - 8.93\% IFT = IFN + k_p \cdot IFN,$$

$$0.9107 \cdot IFT = \left(1 + k_p\right) \cdot IFN,$$

$$IFT = \frac{\left(1 + k_p\right)}{0.9107} \cdot IFN.$$

Then, taking into account the assumption about the size of the rate for preventive measures, for example, in the range from 10 to 15%, it is possible to calculate the final rate for the previously considered payment options in accordance with the size of the load (*Table 9*). The analysis shows that taking into account the load, the rate changes slightly — the maximum excess over the net rate is 1.26 times or 26% of the net rate.

We also estimated the amount of the employee's total monthly payment based on the median wage (Table 10). As the analysis shows, the monthly payment does not exceed 27 rubles, which is an acceptable price for compensating for the involuntary job loss risks.

CONCLUSION

Thus, based on the performed actuarial calculations, the following conclusions and recommendations can be drawn.

1. At present, it is advisable to create a job loss insurance protection mechanism. However, it is necessary to determine which reasons for termination of the employment contract are an insured event to be protected at the expense of the insurance fund. In our opinion, the most appropriate are those reasons, the source of which is not the employee.

2. When assessing the amount of payment, the length of service of the employee at the last place of work should be taken into account. Only those employees who worked at their last place of work for at least six months should be covered by insurance. Otherwise, the probability is high that the employee and the employer will collude to manipulate insurance payments. Another important issue is the term of insurance. As a rule, the term of insurance is limited to one year. However, in the type of insurance under consideration, this period can be extended for the duration of the employment relationship between the employee and the employer at the place of work.

3. When assessing the size of the insurance fund, one should take into account the number of people laid off during the period. Due to the fact that the labor market in different regions has certain characteristics in terms of the nature of work, wages, and the direction of migration, it is advisable to differentiate the rate and structure of the fund by region. For this, it is required to carry out regional actuarial calculations according to the methodology proposed in the research work in order to clarify the amount of financing for preventive measures and the remuneration of the insurer.

4. The question of choosing an insurer for this type of insurance remains open. On the one hand, a single specialized fund supported by the state, such as an employment fund, could consolidate the funds of the insurance fund throughout the country. On the other hand, centralization, as a rule, leads to an increase in the cost of insurance and an increase in the insurance rate. Commercial insurance companies, on the other hand, are focused on making a profit and stricter risk management. In the context of the digitalization of employment paperwork, it is advisable to conduct an experiment on choosing an insurance model and evaluate the results.

5. Sectoral differentiation of the insurance fund is possible only on the condition that preventive measures in certain areas of

economic activity can be significantly more expensive than in other types of activity. However, it is necessary to take into account the number of people employed in specific types of economic activity, therefore, after testing the basic insurance model, additional actuarial calculations can be carried out to make changes to the rate formation procedure.

6. The procedure and frequency of payment of insurance compensation may be established individually for each insured person. It is advisable to resolve this issue in the insurance contract when determining the conditions for each insured. It is very important to decide who will be insured and pay insurance premiums. In our opinion, the basic paradigm should be the transition to individual payment of premiums for all types of insurance, so the insured should be an employee who determines the procedure and frequency of payment.

7. A very important issue that goes beyond actuarial calculations is the question of the moment of commencement of the insurance contract and the procedure for its conclusion. There may be a contradiction between the desire of the state to create an unemployment insurance mechanism and consumer protection legislation. That is, the introduction of a new insurance product will require changes in labor legislation, as well as in insurance legislation.

In general, it can be argued that this type of insurance is promising in a market economy and can become not only an interesting new insurance product but also an effective tool for the social protection of the population in regions with high labor turbulence. The long-term development of this area of insurance will require efforts to clarify rates and improve the quality of insurance fund management.

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