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## PRICING OF INSURANCE SERVICES IN INSURANCE MARKET OF THE REPUBLIC OF UZBEKISTAN

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***Abstract.** Today, it is necessary to conduct analytical research to assess the risks associated with the implementation of the tasks set out in the country's development strategy by setting appropriate tariff rates and the formation of sufficient insurance reserves. One of the primary needs is to analyze the loss trends in the insurance business, to apply science-based experience in practice. To achieve these goals, this article analyzes the prices of insurance services in the Uzbek insurance market.*

***Key words.** Price, insurance, insurance market, underwriting cycle, loss, underwriting expenses, underwriting profit*

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### INTRODUCTION

Issues of risks tariff related to insurance coverage of socio-economic projects being implemented today in the Republic of Uzbekistan put in new requirements to insurers. It is required to improve the current insurance rates calculation methodology developed and approved by insurance supervision body back in 2007<sup>1</sup>. It is also required to conduct analytical studies to assess the risks related to implementation of the tasks outlined in the country's development strategies in order to set adequate tariff rates and form sufficient insurance reserves. The ability to quickly analyze and correctly use the experience gained on the basis of the loss trends analysis by insurance business lines comes to the fore. Applying more modern mathematical and economic (actuarial) apparatus with the use of appropriate software applications will help insurers to improve their risk assessment and pricing approach.

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<sup>1</sup> Guidelines for the insurance rates calculation in general and life insurance industry. Approved by the Ministry of Finance of the Republic of Uzbekistan at November 30<sup>th</sup> 2007 №CE16-02-32/415



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## LITERATURE REVIEW

An analysis of the literature shows that there are different approaches to the formation of insurance tariffs, insurance tariff threshold, tariff rate, cash rates. In particular,

The factors influencing the determination of the insurance rate include: the state, the market environment, consumers. The state determines the structure of the insurance tariff, fixed in licenses by type of insurance. The lower limit of the insurance rate is determined by actuarial calculations, which are a system of statistical and economic-mathematical methods for calculating tariff rates and determining the financial relationship between the insurer and the insured [1].

The calculation of the tariff rate (actuarial calculation) includes the determination of the net rate, the size of the costs of doing business, the risk premium in property and liability insurance, the discount on loan interest in life insurance and pensions [2].

For existing types of insurance, actuarial calculations are made according to the available reporting data (reporting actuarial calculations); when introducing a new type of insurance, the results of actuarial calculations for types of insurance of the same type or similar in content, which have already been carried out by the insurance company (scheduled actuarial calculations), are used [3].

The market environment largely determines the price of the new strategy of the insurance company. There are four types of markets in the economy, each of which determines the pricing policy. The market of monopolistic competition consists of many sellers and buyers, while sellers offer different options for goods. Goods differ in quality, properties and other characteristics. Buyers pay different prices for goods depending on quality and other characteristics. An oligopolistic market consists of a small number of sellers who are sensitive to each other's pricing policies and marketing strategies. In a pure monopoly, there is only one seller in the market. In this case, pricing is regulated by the state.

Obviously, the insurance company must determine the type of market in which it operates, and take into account the features and pricing opportunities in its conditions [4].

The possible price for insurance services lies between prices that are too low, at which it is impossible to make a profit, and too high, at which it is impossible to form solvent demand. When setting the upper limit of the price, it is necessary to analyze economic factors. For example, such as the level of income of the population and its differentiation depending on the selected market segment [5].



## RESULT AND DISCUSSION

Pricing methods in insurance are based on probabilistic and statistical estimates of the insurance operations costs, taking into account regulatory and legal restrictions, financial and economic conditions, on the one hand, and insurance theory scientific progress, pricing, marketing and actuarial science, on the other hand. According to the Boston Consulting Group, approximately 75% of insurers have cost-oriented pricing for insurance services, 15% of insurers use the so-called “competitive pricing”, and 10% of insurers use customer-oriented pricing<sup>2</sup>.

In cost-oriented pricing, risk taking by insurance company is accompanied by a priori analysis involving risks ensemble segmentation depending on the influencing factors so that each group consists of customers (policyholders) with similar risk profile and pays the same reasonable insurance premiums. At this stage of the analysis, the actuary eagers to determine the effect of observable factors or insured risk variables and data correlation existence. This step allows to determine the main elements of net insurance premium taken by multiplying the insurance claims frequency conditional expectation by their expected monetary value.

At the last stage of the pricing process, the individual data of the insured or insured object are accessed. Taking into account individual data, in other words, the a posteriori component of the pricing process, allows to achieve balance between the premium paid by policyholders and the risk assumed by the insurance company<sup>3</sup>.

According to the generally accepted model, the insurance premium calculation is based on the fundamental insurance equation<sup>4</sup>:

$$\text{Premium} = \text{loss} + \text{loss regulation expenses} + \text{underwriting expenses} + \text{underwriting profit}$$

The rating process is based on the assessment of this fundamental equation compotents. Based on this equation, the following formula is proposed for premium calculation<sup>5</sup>:

$$P = \frac{(L + E_L) + E_F}{(1 - V - Q)}, \quad (1)$$

where, P – premium; L – expected total losses;  $E_L$  – expected total loss regulation expenses;  $E_F$  – amount of fixed underwriting expenses in monetary units; V – variable underwriting expenses set as the percentage of the premium; Q - underwriting profit target set as the percentage of the premium.

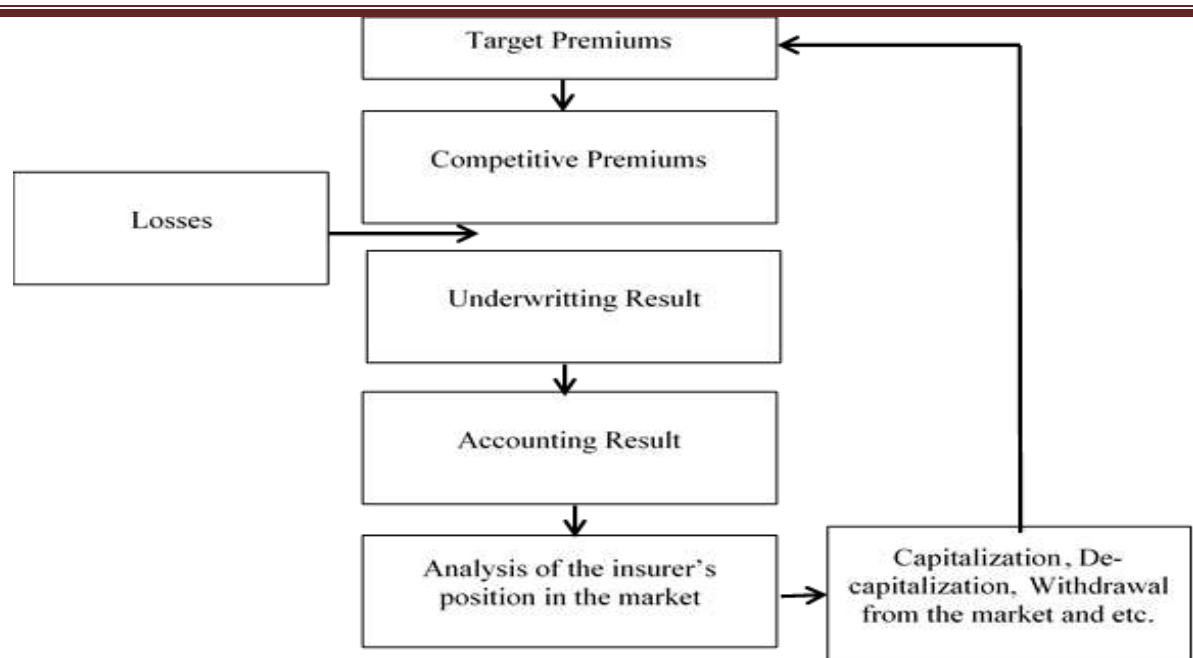
The pricing process in insurance should also take into account the existence of the underwriting cycle (Figure 1), as a result of which the insurance activities profitability is subject to cyclical changes.

<sup>2</sup> Gard, J.-C. and O. Eyal, 2012, The Six Steps to Pricing Power in Insurance, Technical Report, The Boston Consulting Group, Paris/London

<sup>3</sup> M. David. A review of theoretical concepts and empirical literature of non-life insurance pricing. J. Procedia Economics and Finance. **V.20**, 2015, P. 157-162/ <https://www.sciencedirect.com/~S221256711500060X>

<sup>4</sup> Werner G., Modlin C. Basic Ratemaking. Version 5, MAY 2016 Casualty Actuarial Society, P.64, [https://www.casact.org/sites/default/files/old/studynotes\\_werner\\_modlin\\_ratemaking.pdf](https://www.casact.org/sites/default/files/old/studynotes_werner_modlin_ratemaking.pdf)

<sup>5</sup> The same. p.139



**Figure 1. Underwriting cycle**

*Source: Author's analysis.*

Growth of underwriting profit attracts new players to the market. The growth rate in the insurance services supply from the insurance companies begins to overcome demand and leads to insurance premiums decrease. As a result, the insurance profitability falls, losses increase, and the financial stability of companies decreases. All this leads to decrease in the planned (target) business volumes and leave of some companies from the insurance market. Decline in supply generates increase in demand and, over time, its excess over supply. Premiums will grow and profitability will recover, signaling the start of a new cycle.

The possible price for insurance services is determined based on the cost price based on actuarial calculations, taking into account the prices of competitors, unique advantages, insurance conditions provided by the company. Based on the above conditions, pricing methods are selected, among which are:

- determination of the price using the “cost plus profit” method;
- pricing based on break-even analysis and ensuring target profit;
- pricing based on the perceived value of insurance services;
- pricing based on current market rates;
- pricing based on relationships with the clientele;
- pricing for market penetration;
- pricing based on a sliding demand curve.



The methodology for calculating tariff rates presented in the above guidelines, assumes availability of a number of statistical risk indicators - the damage frequency, the damage severity, the sum insured loss ratio - with the help of which the insurance event probability and possible loss amount in case of insurance event are estimated.

It must be noted that the proposed method for calculating tariff rates in general insurance is based on the law of large numbers and the Central Limit Theorem and, thus, limits its practical application. Indeed, the application of these probabilistic-statistical laws requires the fulfillment of the insured risks mass nature condition. Therefore, in the methodology for calculating tariff rates for risky insurance types approved by the Resolution of the Federal Service on Supervision of Insurance Activities of Russian Federation N 02-03-36 dated by August 07<sup>th</sup>, 1993 which was widely used in the development of the above-mentioned domestic methodology for calculating tariff rates, emphasis is placed on mass character<sup>6</sup>. It should be noted that under widely spread risky insurance types are understood insurance types that presumably cover significant number of insurance subjects and insurance risks characterized by the insurance objects homogeneity and insignificant spread in the sum insured amounts<sup>7</sup>.

The existing methodology is not suitable for calculating tariff rates in catastrophic risks insurance. Catastrophic risks are characterized by insurance events low frequency and large financial losses in case of insurance events. The number of objects for such insurance types is limited and the spread of the sum insureds is large. Such insurance types include insurance against natural disasters the possible damage from which is quite substantial due to the cumulation of minor damages caused by one insurance event.

When calculating tariff rates for the insurance of rare and large-scale events it is necessary to use not the average but the feasible risk cost and use methods based on expert assessments.

The current methodology is also not applicable for new insurance types, i.e., for new risks, since the new risk characteristics in the insurance portfolio significantly differ from the general (average) typical risk characteristics. Use of the insurance object's individual risk characteristics in calculating the insurance rate for new insurance types allows to reduce the underwriting risk. Since new risks characteristics are not sufficiently known for the insurance company it will not be able to adjust the insurance rate in a timely manner if it turned out to be insufficient. This problem will remain relevant for the insurance company in the future if it plans to expand such portfolio of insurance agreements. We consider the application of the proposed approach justified in case of new expanding portfolio of the insurance company since its main advantage is the reduction of risk uncertainty arising from the heterogeneity and constant insurance portfolio expansion. After stabilization of the insurance portfolio, it is possible to apply the current methodology.

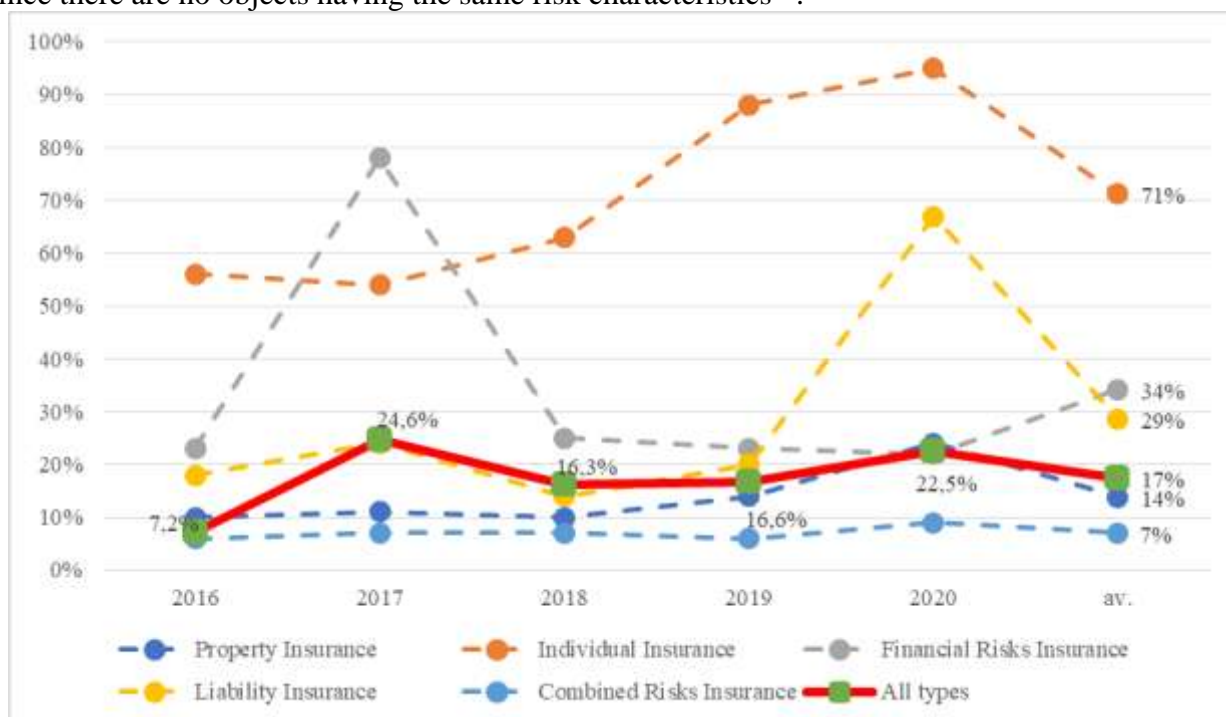
The current methodology for calculating tariff rate does not reflect the issues of considering the changes in assessed insurance risks characteristics since it operates with average values

<sup>6</sup> Methods for calculating tariff rates for risky types of insurance (approved by the Resolution of Rosstrakhnadzor on July 18<sup>th</sup>, 1993 N 02-03-36) <https://docs.cntd.ru/document/9007827>. Not being applied since January 6<sup>th</sup>, 2020 based on the order of the Bank of Russia dated by December 26<sup>th</sup>, 2019 N 5378-Y

<sup>7</sup> The same

from previous periods of the insurance company. Therefore, it is considered important to improve the methodology for calculating tariff rates based on advanced knowledge of insurance theory, actuarial science and software applications for statistical data analysis. This issue is very important in the context of changing nature and scale of socio-economic processes, expanding the reproduction of goods and services.

Another issue with this methodology is that it is based on the assumption that insurance portfolio for which the tariff rate is calculated is homogeneous and it narrows the boundaries of its application. As it is noted by T.P. Lomakina "... even when carrying out one type of insurance under unified conditions, the insurer cannot form homogeneous insurance aggregate since there are no objects having the same risk characteristics"<sup>8</sup>.



**Figure 2. Loss ratio by main business lines in general insurance industry**

Source: Author's analysis.

It is economically unfeasible and impossible to calculate and apply such a variety of tariffs due to the lack of necessary statistical data for each group. Therefore, each insurer when setting tariff for any insurance product, has to find a compromise between the degree of objects homogeneity in a group and the number of groups. Additional limitation is the own possibilities of insurance companies to collect and process the necessary data.

Loss ratio analysis in the context of the main insurance business lines in general insurance industry for the period 2016-2020 shows that although there is a growth trend, it is still at a fairly low level (see Figure 2): over this period, the loss ratio for general insurance industry varied from 7.2% to 24.6%. For comparison, we must note that in the EU countries the loss

<sup>8</sup> Lomakina T.P. Methodological and organizational bases for future harvest insurance: dis. ... doctor of economic sciences: 08.00.10 / T.P. Lomakina. – Volgograd, 2002.

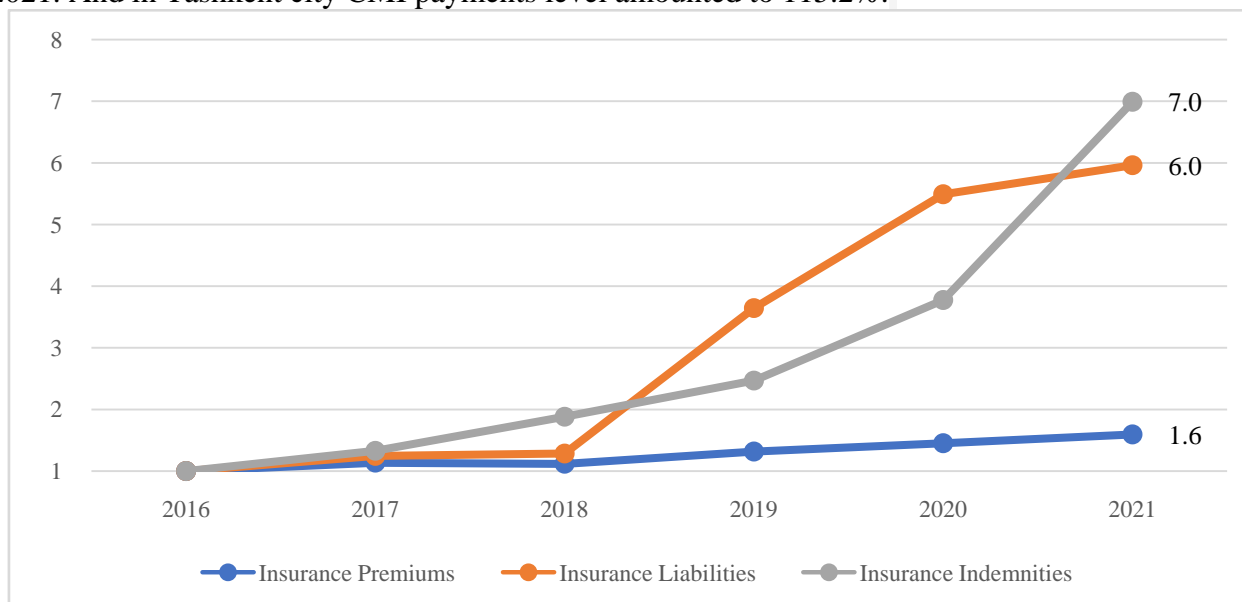


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ratio in 2020 ranged from 36.6% (Romania) to 76.0% (Iceland)<sup>9</sup>.

With loss ratio decrease, the net profit of the insurer will increase. But there is a dark side of it: artificial decrease of loss ratio due to the refusal to pay insurance indemnities under various reasons increase the population and business entities distrust to the insurance mechanism. It should not be forgotten that insurance is the element of social protection system.

Indicators analysis of compulsory motor insurance (CMI) for the period 2016-2020 shows the feasibility for revising tariff rates (see Figure 3). Indeed, if for the period 2016-2020 the insurers' total liabilities for this type of insurance increased 6 times, the premiums collection - only 1.6 times, excluding inflation affect. This, in turn, led to the insurance claims growth by 7 times over this period. As a result, CMI loss ratio increased from 15.4% in 2016 to 62.2% in 2021. And in Tashkent city CMI payments level amounted to 115.2%.



**Figure 3. Time series of premiums, sums insured and insurance indemnities by CMI relative to the 2016 indicator (Indicators for 2016 are taken as a unit)**

Source: Author's analysis.

We must specify that if the share of CMI in the insurance market in 2016 was equal to 17.2% then by the end of 2021 it was only 6.0%. That means that CMI is turning from a market growth driver into the problems source for the insurance companies. The reason behind this is that when setting the price for CMI policy inflation factor, the change in spare parts prices, vehicle repair services' prices increase, and etc. were not considered.

In a rapidly changing insurance business environment driven by the changes in the frequency and severity of business risks as a result of climate change, as well as the nature of business risks driven by the world economy globalization and the supply chains' complexity, the importance of pricing in insurance is ever growing. If, on the one hand, technical progress

<sup>9</sup> Claims ratio for non-life insurance in Europe in 2020, by country. <https://www.statista.com/statistics/1268896/non-life-insurance-claims-ratio-country-europe>



in the field of information technology, economy digitalization opens up huge prospects as an addition to people's judgments about insurance, then, on the other hand, the opportunity provided to policyholders for instant price comparison worsens the insurance company's client base since customers often choose goods (services) with the lowest price.

## CONCLUSION

To effectively interact with and resist the above trends, new innovative approaches to the pricing process are required. Insurers must successfully adapt to new technological, market and consumer realities if they are to maintain competitive edge in the insurance industry since:

- Price and cost transparency is increasing. Insurance business digitalization provides insurance consumers with possibility to compare hundreds of insurance products on price, value and benefits. These sites also educate consumers on how to more effectively match product choices to their unique needs and willingness to pay, as do insurance brokers.

- Consumers are more informed and sophisticated. As prices has become more transparent, consumers are increasingly open to new offers based on different variables such as security, mobility and different coverage types, and these offers require new, dynamic pricing structures.

- Control by the insurance supervisory authorities is strengthening. The recommendations of the International Association of Insurance Supervisors (IAIS), which the Republic of Uzbekistan is a member, insist that insurers are to maintain higher level of capital without overall profitability reduction, and for this, insurers must either reduce expenses or increase prices.

- New financial products (insurance ecosystems) and new technologies (insurtech) are introduced to the market. The insurance industry is diversifying: e-commerce, bank assurance, retailers and other non-traditional players offer new innovative business models and products.

- New revolutionary technologies open up new pricing models. Big data, machine learning, and applied data analytical tools give insurance companies advanced and powerful options to develop pricing models based on using other innovative models; extract data from new external sources and more accurately assess the risk or willingness of consumers to pay, buy or refuse services.

Insurers who do not recognize these factors and fail to develop and adopt new pricing models will end up in losses. These insurers will quickly lose their competitive advantages in the marketplace over competitors who have a better understanding of what drives their customers' needs and willingness to pay, and, thus, can develop better offers at lower prices.

In addition, those insurers continuing to rely solely on traditional pricing methods will end up with unbalanced portfolio with riskier and less profitable insurance agreements reducing the profitability of their insurance business and, as a result, their market share.





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