

The impact of industrialization on approaches to optimizing labor costs

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Abstract—The article presents the problems of labor evaluation and factors of salary increase in the Russian Federation in general and in the Chelyabinsk region in particular. In addition, a comparison is made between the size of remuneration for various branches of the economy in the Chelyabinsk region, as well as the system of remuneration for labor, which must take into account various factors. The article refers to the expansion of measures to support participants in regional investment projects, such as income tax relief. The solution of the problem in the form of the establishment of the project "The All- Russian Prize and Labor Productivity" is given. The results can be used in the processes of developing and implementing payroll policy in the territory of Russia and the Chelyabinsk region.

Keywords—*industrialization; wage; labor productivity, modernization; staff motivation; benefits; taxes*

I. INTRODUCTION

In the overall cost structure of any company, labor costs as well as social funds have a large proportion: the Pension Fund, the Social Insurance Fund, the Mandatory Medical Insurance Fund.

Recently, the share of labor costs in the cost of production and services tends to increase. This is due to the introduction of new technologies. New technologies impose higher requirements for the qualification of personnel. Changes in laws in the field of labor law also entail an increase in labor costs in the cost of production. In addition, the level of wages is affected by rising prices for consumer goods. The relevance of this article is the search for forms and methods of planning and regulation of wages, which would allow us to identify the reserves of cost optimization. The

increase in salary costs should increase staff motivation to achieve the best business performance. The purpose of the work is the competent planning of labor costs, increasing the competitive advantage in the formation of cost and pricing [3].

According to the Russian Federation Labour Code, salary is remuneration for work, depending on the quality and conditions of work performed.

In order to survive the competition, companies are looking for ways to reduce labor costs. Organisations have the right to establish the order of remuneration, its size [5].

The minimum wage (SMIC) for public sector employees and the extrabudgetary sector of the economy is defined by law. From January 1, 2017, the minimum wage in the public sector is 7650 rubles, and from July 1, 2017 it is 7850 rubles. In the extrabudgetary sector of the economy, the minimum wage is determined by the legislation of the region. In the Chelyabinsk region, the minimum wage in 2017 is set at 9,700 rubles, in 2016 the minimum wage was 9,200 rubles. In the Sverdlovsk region, the minimum wage in 2017 is set at 8,862 rubles, and in the Kurgan region 8,770 rubles. At the level of the minimum wage, about five million Russians receive wages. The minimum wage in Russia is below the subsistence minimum, which is currently 10678 rubles for an able-bodied citizen. Below the minimum wage establish the base salaries of junior staff in budget organizations [1].

The real salary in the regions exceeds the minimum wage, but the figures are underestimated due to the "gray" salary, the so-called salary in envelopes. Employers indicate in the labor contracts a regional minimum wage to reduce the size of the personal income tax and payments to social funds. [4].

It is enough to compare the average salaries in a particular industry and the average salary in an enterprise where employees officially receive salaries in the amount of the minimum wage or in amounts slightly exceeding the minimum wage to identify such facts [9].

II. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

The theoretical and methodological base of the study included the works of foreign and domestic specialists in the field of economics, management, and business administration of the staff motivation industry in Russia.

During the research, we used the work of Sytnik N. I, in which an interesting approach to Organizational learning as a component of knowledge management [12].

The problems of flexible benefits have been thoroughly examined in the works of Santos, Francisleine da Silva; Mother Caregnatto, Margareth Ines; Borelli, Verena Alice. They proposed a model and a mechanism for flexible benefits [9].

In our research we relied on the works of Struck, Clemens C. on the theory and practice of labor market. The author expresses the idea of the need to develop labor market frictions, investment and capital flows [11].

Understanding productivity dynamics considered in the works of Fonseca, Tiago; Lima, Francisco; Pereira, Sonia C. The authors proposed a task taxonomy approach [8]. According to survey by the Higher School of Economics, 41% of the Russian citizens cannot afford to buy all the clothes and food they need, and 10% almost cannot afford to buy any clothes or food. As per data by the International Labour Organisation, an average salary in Russia significantly differs from average salaries in the developed countries (Fig.1).

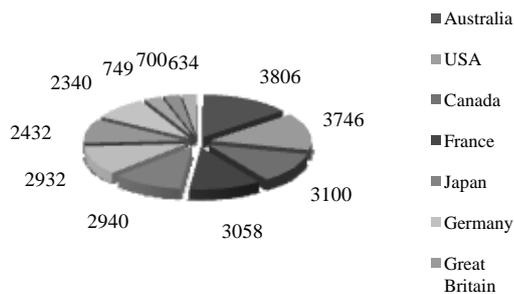


Fig. 1. Average monthly wage in the US dollars

Wage costs are an element of cost. The increase in labor remuneration increases the motivation of staff in achieving the best indicators of business development, resulting in workers' incomes. On the other hand, wage growth leads to an increase in the tax base for the tax on personal income and the unified social tax [7].

III. MATERIALS AND METHODS

The study uses the Russian Federal State Statistics Service in comparison with similar indicators of France, Germany, the United States and China. Methods of analyzing the payroll and labor productivity are used. The new provisions of the Tax Code of the Russian Federation,

influencing the development of the material and technical base of enterprises and increasing the productivity of labor and the average wage of workers are explored.

According to data for 2015, GDP in the Russian Federation was \$ 23.7 per hour of working time, in the USA this figure was \$ 67, in France and Germany - more than \$ 64. Thus, labor productivity in the Russian Federation reached only 36% of the United States and 37% of France and Germany [10].

Over the recent 20 years, labour productivity in Russia has grown by 26%, while in China it has increased six-fold over the same period of time. Raising nominal wages without any growth of labour productivity will lead only to inflation. There are several reasons of low labour productivity in Russia, and the main reason is the worn-out state of machinery assets (equipment, transport, production facilities). To increase productivity, technical re-equipment of enterprises is necessary. Additional expenditures are needed on upgrading equipment, training and retraining of personnel. The country's president set the task of creating and upgrading 25 million high-performance jobs by 2020.

In case of production modernisation business costs may decrease even despite the increase in labour costs – the reason for it are the improved efficiency of the new technologies and reduction of other production expenses. The Russian Federation appropriated 107.5 billion Russian roubles for modernization and technical upgrade of certain sectors of industry (automobile, agricultural engineering, road construction and utility engineering, consumer goods and food industries engineering).

A powerful instrument of supporting technical upgrade, and consequently of boosting labour productivity, are tax benefits defined by Article 25 of the Russian Federation Tax Code.

Starting from January 1, 2017 measures supporting the participants of regional investment projects have been expanded. Before 2017, profit tax relief supported the participants of regional investment projects on Gross Domestic Products fulfilling their projects at the Far East region and six regions of the Siberian Federal District. This year relief support has expanded to the manufacturers of goods fulfilling their regional investment projects in all entities of the Russian Federation. The participants of regional investment projects may count on the profit tax relief if they invest no less than 50 million Russian roubles into the region development within the course of three years. Regions are allowed to lower the rate of the profit tax entering regional budgets down to 10%, and the federal rate is set to nil. Income from the project fulfilment shall be not less than 90% of the income taken into account while calculating the taxation base for the profit tax [8].

Tax relief will allow the industrial enterprises to increase investments, perform production upgrade and improve competitive power of their products. Also, tax relief will allow to increase the growth rate of the Gross Domestic Product, will facilitate well-balanced development of economics, will provide new jobs for regions, and will allow

to increase the actual incomes of the working population.

In order to solve the problem of boosting labour productivity, a project “All-Russian Reward and Labour Productivity” was established by the Russian Federation President’s Council. The leaders of this field over the period of 2016 have already been marked. The main leaders are oil production and refining companies, energy companies and metallurgy. The average increase in labor productivity in enterprises in the TOP-100 list was 15 percent. The project involved more than 5,000 industrial enterprises in Russia. The total revenue of these enterprises amounted to more than 55% of GDP. The number of employees was more than 5.6 million people [6].

There are enterprises in Chelyabinsk Oblast which were listed among the 2016 industrial leaders of Russia (Tab.2).

TABLE 1. CHELYABINSK OBLAST INDUSTRIAL LEADERS

<i>Enterprise</i>	<i>Labour Productivity, mln RUR/person</i>	<i>Sector</i>
<i>PJSC MMK Group</i>	<i>8.05</i>	<i>Iron-and-steel</i>
<i>Chelyabinsk Zinc Plant</i>	<i>11.11</i>	<i>Iron-and-steel</i>
<i>Magnitogorsk Iron & Steel Works</i>	<i>15.63</i>	<i>Iron-and-steel</i>
<i>Chelyabinsk Pipe-Rolling Plant</i>	<i>16.93</i>	<i>Iron-and-steel</i>
<i>Fortum</i>	<i>19.51</i>	<i>Power generation</i>

One of the factors for increasing labor productivity and wages is the motivation of staff to work efficiently. The willingness and willingness of a person to do his job is a guarantee of quality performance of duties and is most effective in terms of achieving the goals of the organization.

The remuneration of labour system should be formed taking into account a number of factors:

- work specifics and complexity;
- labour efficiency;
- share of labour in the overall results of an enterprise’s activity.

The rate of labour payment depends on experience and qualifications of employees. The main instrument of regulating remuneration of labour is a tariff system, a complex of normatives used to calculate salary depending on the employee qualification, complexity of work and labour conditions.

Modernization of equipment requires new skills. The costs of staff development are the most effective type of investment, and not a burden for the enterprise. To improve production skills and technical knowledge in order to obtain a higher level at the enterprises, courses are organized with the subsequent passing of a theoretical and practical on-the-job examination. If you need to study new technology, target courses are organized [2].

Upgrade of qualifications is certified by a relevant document and as a rule leads to a raise in salary.

Professional training is also possible outside the enterprise: in employment centers, in advanced training institutes, training centers, etc. Training can be free when the

employer contributes money for study, or paid if the person who wants to acquire the status of a qualified employee makes the payment at his own expense. Around 2,000 jobs for qualified specialists have been created at Chelyabinsk Pipe-Rolling Plant over the past 2 years in the context of launching new productions: Vysota 239, Finishing Center, and Iron Ozone 32. Salaries at the Plant's new productions are 20% higher than the average ones in the same sector.

According to ChelPipe Press Center, over 10,500 employees of ChelPipe Group took various trainings in 2016. This program costs amounted to 27.5 mln Russian roubles. The majority of the employees obtained new, sideline or related professions.

For three years, the ChTPZ Group has been implementing the personnel reserve program “The Power of White Metallurgy”. In 2016, 380 executives became its participants. At the end of 2016, 71% of executive vacancies were closed at the expense of program participants.

In 2017 about 12,000 employees of the enterprise will undergo training.

Improving the skills of employees is an important factor in increasing productivity and reducing staff turnover. The personnel turnover coefficient at ChelPipe equalled 0.19%, while it is estimated as 20% in the industry in general.

According to the Agency for Strategic Initiatives, training costs for the dual model will not be subject to income tax from January 1, 2018 (Article 264 of the Tax Code of the Russian Federation). The tax authorities will not take these costs into account to determine the tax base for income tax. With the adoption of the law, employers will be interested in the training of highly skilled workers with their employment in the enterprise [4].

Highly qualified specialists are needed who not only understand the equipment specifics, but are also capable of programming it to operate new equipment. A unique dual education training centre has been created to prepare such personnel; it is analogous to a similar German education system where about 60% of time is given to practice. The creation of this centre cost approximately 700 mln Russian roubles, with 500 mln Russian roubles invested by ChelPipe and 200 mln Russian roubles appropriated from the regional budget.

IV. ECONOMIC AND MATHEMATICAL MODEL

The optimal level of labour costs should be determined taking into account the parameters of their efficiency. To substantiate these costs, one needs to preliminarily plan and analyze the formation and use of the payroll budget.

The payroll budget is analyzed as per categories of the personnel and office workers. The following formula is used for the analysis:

$$FOT = N_{av} \cdot S_i e, \quad (1)$$

where N_{av} is an average annual number of employees; $S_i e$ – average yearly salary of one employee.

The analysis of the payroll budget should reveal not

only deviations from the planned parameters, but also the reasons of the payroll budget overexpenditures: payments for overtime work and for idle hours through no fault of the employees, bonuses and other extra payments, including those from the net profit of an enterprise (Shmidt, Khudyakova, 2015).

According to data by the Russian Federal State Statistics Service, the 2016 average salary in Chelyabinsk Oblast amounted to 32,500 Russian roubles. As compared to 2015, it was raised by 9%. However, according to the official data, the inflation reduced its purchasing capacity by 4.5%, and thus, the actual salary equalled 31,000 Russian roubles [7].

It is worth noting that average salaries vary significantly depending of professions and personnel categories:

- Low-skilled personnel (cleaning staff, freight handlers, nurses and representatives of other professions not requiring additional training) earn 12,000 – 13,000 Russian roubles;
- Workers of the Housing and Utilities Sector and salesmen earn 15,500 – 16,500 Russian roubles;
- Semi-skilled personnel earns 25,000 – 26,000 Russian roubles;
- Operators of complex equipment are paid 28,000 – 29,000 Russian roubles;
- Qualified personnel of industrial enterprises receive salaries ranging from 29,000 to 30,000 Russian roubles;
- Highly trained professionals with higher education earn 30,000 to 31,000 Russian roubles; and
- Top managers receive an average salary of 48,000 – 49,000 Russian roubles (Ljungqvist, Sargent, 2017).

At present, two opposite processes are co-existing: declining of income level and fast growing cost of living caused not only by the inflation, but also by growth of social services. Social groups with low income are saving not only on food, but on medicines and chargeable healthcare services as well.

One of the most important indicators of good economic climate is labour productiveness, and it is one of the most pressing issues of the Russian economy.

Labour productiveness is calculated by the following formula:

$$LP = V_{c.o.} / N_{i.s.}, \quad (2)$$

where $V_{c.o.}$ is commodity output, Russian roubles; $N_{i.s.}$ – number of industrial staff, people.

Labour productiveness growth is calculated by:

$$\Delta LP = (LP_f / LP_{pl} - 1) \cdot 100\%, \quad (3)$$

where LP_f , LP_{pl} are the actual and planned labour productiveness.

The rate of labour productiveness growth should exceed the payroll budget increase rate.

The main criterion of labour costs efficiency is the ratio of the growth rate of net profit and labour costs as part of prime cost.

To assess the efficiency of various types of labour

activity, labour profitability index is used calculated by:

$$R_i = \frac{f_i - r_i}{r_i} \quad (4)$$

At the macrolevel, i.e. at the state economy level, it may be interpreted as follows:

- $i = 1, 2, \dots, I$ – type of labour activity (labour);
- R_i – profitability of i labour activity (labour);
- f_i – share of national income resulting from i labour activity (labour); and
- r_i – share of national income spent on consumption of labour power involved in i labour activity.

In the context of an enterprise, i.e. at the microlevel, the given formula may be interpreted as the share of labour costs in the accruing cost:

- f_i – added cost gained from the activity of the i group employees; and
- r_i – the i group employee expenses.

While the i group employee expenses should exceed their minimum required (permissible) value:

$$r_i > r_i^{\min}, \quad (5)$$

where r_i^{\min} is the minimum permissible value of the i group employee expenses [3].

V. CONCLUSIONS

The problems of increasing labor productivity and reducing staff turnover are being successfully solved at the enterprise of Conar OA, created on the basis of the Stankomash industrial park. At JSC Konar, equipment for the gas, oil and petrochemical industries is being developed, projected and manufactured. For the development of human resources and maintaining a low level of staff turnover, which in 2016 was 2%, the company cooperates with South Ural State University, Chelyabinsk Mechanics and Technology College, South Ural State Technical College. The students of these educational institutions, which study core specialties for the company, annually participate in Conar scholarship competitions. The company organizes production and pre-diploma practice, including paid. The prestige of working professions increase skill competitions held since 2016 [2].

Since 2015, the project “Career Management. Personnel reserve”, the purpose of which is to provide the enterprise with highly qualified management personnel. As a result of the implementation of the program “Personnel Policy for the period until 2020”. The salary of workers and specialists of JSC “Konar” is much higher than the average for Chelyabinsk.

Thus, the increase in real wages and labor productivity is a problem for each worker, organizations seeking to increase the competitiveness of qualified personnel and the state in order to develop the economy and improve the welfare of the population.

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References

- [1] Arkhipova E. (2015).ChelPipe Calls. *Direct Investment*, Vol.2., pp. 34-35.
- [2] Izotov A.V., Rostova O.V. (2017). The use of principal component analysis in the assessment of the investment climate regions. *Economic, financial and management problems of the manufacture*, (38), pp. 82–85.
- [3] Khudyakova T.A., Shmidt A.V. (2017).Improving the efficiency of the enterprise's activity based on the implementation of the controlling system, *Proceedings of the 12th International Conference on Strategic Management and its Support by Information Systems, SMSIS 2017*, pp. 46–52.
- [4] Khudyakova T.A., Shmidt A.V. (2018). Methodical approaches to managing the sustainability of enterprises in a variable economy, *Revista Espacios*, Vol 39.
- [5] Kocourek A., Nedomlelova I. (2018). Three levels of education and the economic growth, *Applied economics*, Vol. 50-19, pp. 2103-2116.
- [6] Lai Y., Saridakis G., Johnstone S. (2017). Human resource practices, employee attitudes and small firm performance, *International small business journal-researching entrepreneurship*, Vol. 35-4, pp. 470-494.
- [7] Ljungqvist L., Sargent T.J. (2017). The Fundamental Surplus, *American economic review*, Vol. 107-9, pp. 2630-2665.
- [8] Nica A-M., Stancu I., Stancu D. (2017). Innovation. An instrument for development of companies, *Amfiteatru economic*, Vol. 19-45, pp. 509-527.
- [9] Santos F.S., Mother C., Margaret I., Borelli V.A. (2017). Flexible benefits: a case study in an automotive industry, *Navus-revista de gestao e tecnologia*, Vol. 7-1, pp. 7-28.
- [10] Sarbu M. (2017). Does Social Media Increase Labour Productivity?, *Jahrbucher fur nationalokonomie und statistik*, Vol. 237-2, pp. 81- 88.
- [11] Struck C.C. (2018). Labor market frictions, investment and capital flows, *Economics letters*, Vol. 163, pp. 27-31.
- [12] Sytnik N.I. (2017). Organizational learning as a component of knowledge management, *Marketing and management of innovations*, Vol.3, pp. 345-353.