

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



**Bachelor Thesis**

**Unemployment and ways of its regulation in selected  
cities of Russia**

**Vadim Makiev**

**© 2018 CULS Prague**

## BACHELOR THESIS ASSIGNMENT

Vadim Makiev

Economics and Management

Thesis title

**Unemployment and ways of its regulation in selected cities of Russia**

---

### Objectives of thesis

The main aim of this Bachelor thesis is to evaluate unemployment, identify its general causes and ways of its regulation in the Russian Federation, chiefly in a big city. Also, main factors that contribute to unemployment in selected cities of Russia will be determined and analyzed. This helps to identify proper regulation to offset unemployment.

### Methodology

This thesis will be divided in two parts: theoretical and practical.

In the theoretical part there will be used scientific and economic methods of cognition: logical, inductive, deductive, abstraction and tabular methods of information interpretation. Practical part will include statistics, qualitative and quantitative analysis of data, obtained mainly from The Federal State Statistics Service.

## **The proposed extent of the thesis**

40 pages

## **Keywords**

Unemployment, Rate of Unemployment, Causes, Regulation, Labor Market, Big City, Moscow, Saint Petersburg.

---

## **Recommended information sources**

- Gimpelson, V.E., Kapelushnikov, R.I. 2006. Non-standard employment in the Russian economy. Higher school of Economics. – M.: Publishing House. House of HSE.
- Kartasheva A., Kubishin E. 2005. The Situation on the Labor Market: Directions of Development // Economist. No. 12.
- Marshall, A. 1993. Principles of economic science. Vol. 1, M.: "Progress", 310 p.
- Pigou, A. 1985. The Economic Theory of Welfare, Part 2. Publishing house "Progress", Moscow, 512 p.
- Say, J.-B., Bastiat, F. 2000. A Treatise on Political Economy / Jean-Baptiste Say; Economic sophisms. Economic harmony/ by F. Bastiat. M: Business, 232 p.
- Yakovleva, A.V. 2010. Features of Unemployment in a Large City: Trends in Regulation. The dissertation on competition of a scientific degree of Candidate of Economic Sciences. St Petersburg, 192 p.

---

## **Expected date of thesis defence**

2017/18 SS – FEM

## **The Bachelor Thesis Supervisor**

Ing. Petr Procházka, Ph.D., MSc

## **Supervising department**

Department of Economics

Electronic approval: 5. 3. 2018

**prof. Ing. Miroslav Svatoš, CSc.**

Head of department

Electronic approval: 6. 3. 2018

**Ing. Martin Pelikán, Ph.D.**

Dean

Prague on 12. 03. 2018

### **Declaration**

I declare that I have worked on my bachelor thesis titled "Unemployment and ways of its regulation in selected cities of Russia" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague, March 8, 2018

---

**Vadim Makiev**

### **Acknowledgement**

I would like to thank Ing. Petr Procházka, MSc, Ph. D. for his advice and support during my work on this thesis.

# **Unemployment and ways of its regulation in selected cities of Russia**

## **Abstract**

The aim of this Bachelor thesis is to evaluate unemployment, identify its general causes and ways of its regulation in the Russian Federation, chiefly in the federal cities. This research includes the development of separate theoretical positions that characterize the forms and manifestations of unemployment in the current economic environment, the development of methodological tools for the measurement of unemployment and its consequences.

The essence of unemployment, analysis of the relationship of the development of large cities and unemployment in the well-known economic theories is described in the theoretical part.

In the second, practical part, the author identified factors which influenced the unemployment rate in Russia, compared the situation on the labor market in Moscow and St. Petersburg, found common features and main differences, studied the basic priority directions of unemployment regulation in the federal cities and Russia as a whole.

**Keywords:** Unemployment, Rate of Unemployment, Regulation, Labor Market, Big City, Moscow, Saint Petersburg.

# Nezaměstnanost a způsoby její regulace ve vybraných městech Ruska

## Abstrakt

Cílem této bakalářské práce je zhodnotit nezaměstnanost, identifikovat její obecné příčiny a způsoby její regulace v Ruské federaci, především ve federálních městech. Tento výzkum zahrnuje vývoj samostatných teoretických pozic, které charakterizují formy a projevy nezaměstnanosti v současném ekonomickém prostředí, vývoj metodických nástrojů pro měření nezaměstnanosti a jejích důsledků.

V teoretické části je popsána podstata nezaměstnanosti a analýza vztahů rozvoje velkých měst a nezaměstnanosti pomocí známých ekonomických teorií.

V praktické části autor identifikoval faktory, které ovlivnily míru nezaměstnanosti v Ruské federaci, a porovnal je se situací na trhu práce v Moskvě a Petrohradě. Dále našel společné rysy a hlavní rozdíly, studoval základní prioritní směry regulace nezaměstnanosti ve federálních městech a v Rusku jako celku.

**Klíčová slova:** Nezaměstnanost, Míra nezaměstnanosti, Regulace, Trh práce, Velké město, Metropole, Moskva, Petrohrad.

# Contents

1. INTRODUCTION.....	12
1.1. Topical importance of the problem of unemployment.....	12
1.2. The essence of unemployment.....	13
1.3. Special role of major cities for the modern problem of unemployment .....	13
2. THE MAIN OBJECTIVE AND METHODOLOGY.....	14
2.1. The main objective and minor tasks .....	14
2.2. Methodology.....	15
2.2.1. The rationale for studying unemployment in a large city .....	15
2.2.2. Methods used in the thesis .....	17
3. LITERATURE REVIEW .....	18
3.1. General provisions on labor and unemployment .....	18
3.2. Elaboration of the unemployment topic in the world research.....	19
3.2.1. Classical views on economy and labor .....	19
3.2.2. Neoclassical direction of economic science.....	20
3.2.3. The theory of surplus value by Karl Marx .....	20
3.2.4. 20-th century views on the problem of unemployment.....	21
3.2.5. Achievements of world economic thought of the last decades .....	22
3.3. Problems of regulation unemployment in economic theory.....	23
4. PRACTICAL PART.....	29
4.1. Concentration of economic resources in the megacities of Russia.....	29
4.2. Analysis of distribution of types of property.....	30
4.3. Types of unemployment.....	33
4.3.1. Market and non-market unemployment.....	33
4.3.2. Standard and nonstandard unemployment .....	33



4.4. Current unemployment rate in Russia.....	37
4.4.1. Regression analysis.....	39
4.4.2. The results of analysis.....	42
4.5. Unemployment in Moscow and St. Petersburg .....	43
4.5.1. Analysis of data .....	43
4.5.2. Regression analysis.....	49
5. RESULTS AND DISCUSSION .....	54
5.1. The results of the comparison.....	54
5.2. The main directions of regulation of unemployment in Moscow and St.Petersburg	55
5.3. Advantages and disadvantages of big cities in fighting unemployment .....	57
6. CONCLUSION .....	58
7. REFERENCES.....	61

## List of Figures

Figure 1. The relationship between status groups in the labor market.....	36
Figure 2. The unemployment rate in Russia in 2000-2016 average per year .....	37
Figure 3. Average unemployment rate and economically active people in Moscow (2000-2015).....	47
Figure 4. Number of unemployed, officially registered unemployed and unemployed citizens receiving unemployment benefits in Moscow .....	47
Figure 5. Average unemployment rate and economically active people in St. Petersburg (2000-2015) .....	48
Figure 6. Number of unemployed, officially registered unemployed and unemployed citizens receiving unemployment benefits in St. Petersburg.....	48
Figure 7. The ratio of job seekers to job openings in Russia vs Moscow and St. Petersburg .....	49

## List of Tables

Table 1. Structure of average annual number of employment employees in enterprises of different ownership forms in 2015 .....	32
Table 2. Initial data. Russia .....	39
Table 3. Matrix of pair correlation coefficients. Russia .....	40
Table 4. Regression statistics. Russia.....	41
Table 5. The number of economically active, employed and unemployed population, officially registered unemployed population, unemployed citizens receiving unemployment benefits and unemployment rate in Moscow in 2000-2015 .....	44
Table 6. The ratio of job seekers to job openings in Russia vs Moscow and St. Petersburg .....	45
Table 7. The number of economically active, employed and unemployed population, officially registered unemployed population, unemployed citizens receiving unemployment benefits and unemployment rate in St. Petersburg in 2000-2015. ....	46
Table 8. Initial data. Moscow .....	50
Table 9. Initial data. St. Petersburg .....	51
Table 10. Matrix of pair correlation coefficients. Moscow .....	51
Table 11. Matrix of pair correlation coefficients. St. Petersburg.....	52
Table 12. Regression statistics. Moscow.....	52
Table 13. Regression statistics. St. Petersburg .....	53

## Abbreviations

HSE - Higher School of Economics

GDP - gross domestic product

RBC - RosBusinessConsulting

GNP - gross national product

GRP - gross regional product

Rosstat - Federal State Statistics Service of Russia

RAS - Russian Academy of Sciences

ILO - International Labor Organization

RF – the Russian Federation

i.e. – id est (Ger.): that is to say

UN – United Nations

# **1. INTRODUCTION**

## **1.1. Topical importance of the problem of unemployment**

One of the most important social and economic problems of society has traditionally been the problem of unemployment, which is characteristic of any stage of economic development. Unemployment is a reflection of the labor market situation that characterizes the equilibrium of supply and demand of jobs in the social sector. It is one of the main factors of realization of labor potential of the population in the economy to get stable income from employment. Therefore, the problem of unemployment is constantly in the focus of government regulation of the economy and the labor market entities, and the regulatory instruments of unemployment and its consequences evolve simultaneously with the development of social and economic relations.

Recently, the problem of unemployment has become most acute for the economy of different countries, because of the negative manifestation of the global economic crisis that caused a slowdown in the economic dynamics of production volumes and, consequently, reducing the number of jobs. This circumstance requires development of new scientific directions of unemployment regulation, resulting social and economic impacts of new approaches to the analytical study of unemployment and factors of its formation.

Despite the significant development of the issue of unemployment, it should be recognized that the emergence of factors contributing to its manifestation in new, previously nonexistent forms, requires deepening of the theoretical knowledge in the field of research of this important social and economic phenomenon of the labor market, organization of the forms and consequences of unemployment. The methodological tools for quantitative measurement of unemployment for the formation of objective information and analytical basis of its condition and dynamics with the purpose of choice of adequate directions regulation of unemployment and its consequences need to be improved.

The current crisis has actualized the question of the effectiveness of the known methods of state regulation of the labor market that do not give the desired result in reducing unemployment and prevention of its growth. For a more successful solution to the existing problem of unemployment, we need clarifying criteria to differentiate the reasons of problem

situations and choosing appropriate methods of state influence on the unemployment in the current circumstances.

## **1.2. The essence of unemployment**

In the field of employment and labor market the economies of various countries are faced with the phenomenon of unemployment, which is generally understood as a manifestation of macroeconomic instability expressed in the imbalance of the spheres of employment. In Investopedia unemployment is defined as “a phenomenon that occurs when a person who is actively searching for employment is unable to find work” (Investopedia, 2017).

The nub of this problem lies in violation of the proportion between economically active population and the number of jobs proposed for it. That is, unemployment reflects such state of the labor market when labor supply exceeds demand, and this mismatch can be both quantitative and qualitative.

The quantitative mismatch seems to be more serious. The matter is that qualitative imbalance can be aligned by changes in occupational demand for labor and by retraining. In difference to that, overcoming of the quantitative discrepancy implies an increase in the number of jobs, the expansion of the scale of production, stimulating demand for manufactured products, goods, works and services and, hence, considerable capital investments.

Unemployment is the flip side of employment: if a person of working age has no place of employment due to various reasons, therefore, he is unemployed from the point of view of participation in the reproduction process of GNP and GRP. In our study, we understand unemployment as a social and economic phenomenon arising from the factor of public participation in creating a socially useful product and reflecting the state of absence of employment for employable population due to objective or subjective reasons.

## **1.3. Special role of major cities for the modern problem of unemployment**

In the unemployment problem, we should make a particular emphasis on the special role of large cities at the present stage. This role is determined by the fact that in the post-industrial economy, all kinds of resources – material, human, and especially credit, financial or investment – are attracted there to a much more extent than during the stages of agrarian or

industrial development. A major city is becoming a mature dominant institutional structure of the economy in which the features of the national market are manifested clearly and distinctly. All other areas are under its influence. Hence, knowledge of features of modern unemployment in large cities allows to not only construct a clearer idea of the problems constraining the development of the national economy in general, and labor market in particular, but also to see possible solutions of emerging problems.

The need for proactive knowledge of threats and ways of their solution in the labor market is determined by growing labor shortage for reasons of the aging of population and low birth rate, which is typical of all developed countries and enhanced by the contemporary global crisis. The necessary correction of the traditional view of unemployment as a problem of limited social framework in the direction of its economic importance should be very helpful. Thus, the question of effective use of available workforce becomes especially topical.

The attempt to find criteria for the differentiation of methods of state regulation through the specific study of the economy of major Russian cities – Moscow and St. Petersburg – comes from the fact that they present the highest concentration of capital and human resources in the most developed form, presenting the potential of a market economy. Therefore, the study of the labor market and unemployment rates in these cities are especially important for developing most effective measures for labor market regulation in general.

All the foregoing in the whole describes the relevance of the chosen topic of the thesis and the objective necessity of this study.

## **2. THE MAIN OBJECTIVE AND METHODOLOGY**

### **2.1. The main objective and minor tasks**

The aim of the research includes the development of separate theoretical positions that characterize the forms and manifestations of unemployment in the current economic environment, the development of methodological tools for the measurement of unemployment and its consequences, the rationale for new areas of its regulation. One of the important tasks is also the justification of the prior directions of state regulation of the labor market, taking into account the features of unemployment and tendencies of its development in major cities of modern Russia.

The achievement of this objective determined the formulation and solution of the following tasks:

- specification of the nature and causes of unemployment;
- classification of unemployment types and factors shaping it in terms of the Russian economy;
- systematization of the social and economic impact of unemployment;
- development of recommendations on improvement of regulatory instruments of unemployment and its consequences;
- analysis of the relationship of the development of large cities and unemployment in the well-known economic theories;
- study of the basic priority directions of unemployment regulation in the labor market of large cities (on the example of Moscow and St. Petersburg).

## **2.2. Methodology**

### **2.2.1. The rationale for studying unemployment in a large city**

At the present stage of economic development "a big city" is considered as one of the defining features of development of the economy and state. There are sustainable changes in the assessment of urban growth that occurred in the context of scientific discourse. The fundamental question of whether a major city is a natural factor in the development and whether it is necessary to invest efforts and resources to counter this trend is solved positively.

The logic of social and economic evolution is that the bulk of the population will dwell in large cities. Modern civilization is arranged in such a way that the elements of the benefits of a large city are decisive in shaping the lifestyle of the majority of the population. The thesis that the concentration of the population should be regarded as a natural phenomenon that occurs as a natural consequence of the development of civilization, and therefore of human evolution, should be considered scientifically productive.

The growth of cities and their enlargement, an increase in the number of megacities is a natural evolutionary process, as well as the development of industry, communications, the emergence of transnational companies and suchlike processes. This is a consequence of those laws which govern our lives and emerge as a result of its evolution or self-organization.

In this case the arguments of the concept of sustainable development within the logic of co-evolution between man and nature are very appropriate, because the conflict between man and nature occurred in a large city and the search of forms and means of resolution is conducted here.

A large part of the world's population lives in urbanized countries. In Russia, about 73.9 % of the resident population lives in cities (according to 01.2015), this shows the critical role of cities for economic development. In Moscow and St. Petersburg there are more than 10% of population.

Modern civilization owes urbanism most of its distinctive qualities, both positive and negative. The concentration of population in large cities has made necessary the implementation of new features and programs that were unknown to the government on predominantly agricultural, agrarian territories. These include organization of public transport, roads, water systems, public health, education, national security, public works and more.

A modern big city is a kind of "magnet", attracting all kinds of economic resources (capital and labor). The growth in the number and size of large cities is associated with the emergence of the post-industrial economy, the emergence of the growing unevenness of development within national borders, besides, the more the territory of a state, the more uneven development.

Uneven development of market relations caused by development of large cities and rapid population growth in them allows to consider the economy as a space with a relatively homogeneous market potential. It is justified by the degree of concentration of capital within the country. For example, the highest concentration of capital is observed in the Russian economy in the two cities Moscow and St. Petersburg, respectively. The development of the market and its national traits or characteristics is seen here most clearly.

The significance and magnitude of the concentration of resources increases systemic risks in the "failure" mechanisms of development in big cities. The concentration of great human resources requires special attention to the mechanisms of influence on unemployment, as an inevitable consequence of the functioning of the market, as its being beyond the control of the state growth may entail significant economic and social losses and conflicts tangible to the society as a whole.



Concentration of resources of economic development in a modern megacity can be considered as a source of innovative practices for the development of institutional structures, processes and products within the boundaries of the national economy in a positive and negative sense. All other districts and territories are influenced by large cities, they learn from their experience, try on the already created institutional structures and relationships.

That is why it is important to insert in the problem field of analysis such factors as "a megacities", using them as analytical tools of making differentiation of the specific characteristics of the national economy, and the state to respond more appropriately to changes in the structure and magnitude of unemployment. It is important to differentiate the problems more clearly, to see the development trends and influence factors hindering the development of the national economy, the labor market and unemployment in particular.

### **2.2.2. Methods used in the thesis**

In theoretical and methodological basis of the undertaken research the author relied on the works by the classics of world Economics, modern economic scientists on the problems of employment and labor market. Interdisciplinary concept of sustainable development in the context of globalization and focus on the crucial role of large cities in ensuring this type of development were considered as significant provisions. We also used scientific development of the Institute of Economics (RAS) on the formation of strategic goals in social, economic and spatial development, as well as the materials of Research Institute of Labour and Social Insurance of Ministry of Health and Social Development of the Russian Federation.

The materials of the thesis also contain strategic approaches to managing the long-term development of Russia mentioned in the Messages of the President of the Russian Federation to the Federal Assembly, as well as in the concept of long-term social and economic development of the Russian Federation, Strategy of development of Moscow and Saint Petersburg.

The research was carried out with steadfast attention to the system method, methods of formal logic: deduction, induction, comparison and analogy. It was also important to apply dialectical methods: the unity of historical and logical, the ascent from the abstract to the concrete. The economic and mathematical methods were also of great use: correlation and regression analysis, methods of mathematical modeling, statistical method.

The developed methodical approach to the quantitative measurement of forms of unemployment were not covered by the Federal Statistical observation of Russia, which expands the methodological tools of analytical studies of unemployment and provides the objectivity of their results.

Model of integral estimation of unemployment on the basis of lowering and raising factors was used as a methodological tool and can also be applied for assessing the dynamics and make informed management decisions in the field of unemployment choice of governing instruments.

### **3. LITERATURE REVIEW**

Before proceeding to study the unemployment situation in the big cities of Russia, mention should be made of important scientific developments, which served as a basis for our study. Global practice study of the problems of unemployment in the world science can be divided into general theoretical analysis and comparative or regional analysis of countries or smaller units.

#### **3.1. General provisions on labor and unemployment**

Issues of employment and unemployment have been the subject of scientific research of many prominent representatives of the world economic thought. In the framework of the theoretical analysis of unemployment we should specially highlight the classical studies, carried out by Karl Marx, T.R. Malthus, A. Pigou, G.M. Keynes, R.M. Solow, S.T. Marston, M. Feldstein, K. Clark.

General problems of present time employment, formation and functioning of the labor market were studied by A. Smith, D. Ricardo, K. Menger, E. Bay-Baverk, F. Wieser, E. De Soto, M.I. Tugan-Baranovsky, V.P. Vorontsov, etc.

The questions of sources and causes of unemployment, the instruments of employment regulation were addressed by representatives of various economic schools: John M. Keynes, R. Harrod, M. Spence, G. Becker, T.W. Schultz, A. Toffler, A. Phillips, M. Friedman, D. Hamermesh, R.M. Solow and other prominent scientists.

A great role in the development of the theory of unemployment and the search for measures to weaken it played works by Russian researches: A. Apokin, G.P. Zhuravlyova,

O.A. Katsuk, A.I. Kravchenko, I.I. Lagunova, A.V. Kostyrya, A.V. Yakovleva and many others.

In modern economic literature territorial problems of unemployment can be examined in different contexts. Thus, they were analyzed in the context of studies of marketing places by F. Kotler, K. Asplund, I. Rein, D. Haider; in the context of regional competition – by M. Porter, N. Makarova, A.V. Kostyrya and others; in the context of responses of the governments to the regional problems of unemployment – by M. López-Santana, Jan Kunz and some others.

The problem of unemployment in large cities is thoroughly considered in the works by S.A. Kartashova, A.V. Yakovleva, etc. It should be mentioned that significantly greater interest to the problem of unemployment in big cities is manifested by demographers, economic geographers, experts in urban planning and municipal management and sociology than that of theoretical economists.

### **3.2. Elaboration of the unemployment topic in the world research**

Issues of labor and unemployment have been the subject of scientific research of many prominent economists of the world. It is necessary to disclose their findings to form the foolproof basis of our thesis.

#### **3.2.1. Classical views on economy and labor**

The founder of classical political economy Adam Smith (1723-1790) represented the economy as a system in which there are objective laws that ensure the balance of supply and demand. In relation to employment, this means that the demand and supply on the labor market are balanced and full employment is automatically provided ("invisible hand of the market"). It concludes on the harmful effects of state intervention in the sphere of free competition.

David Ricardo (1772 – 1823) continued to develop the basic provisions made by A. Smith, overcoming some of the shortcomings of his teachings. He firmly stood on the position of the labor theory of value, believing the law of labor value to be the general governing principle of market economy, arguing that the exchange value of commodities is proportional to labor expended on its production. Attaching great importance to the rate of profit, Ricardo explained the tendency of the rate of profit to fall and the resulting “lack of

saving”, affecting the development of production and employment. D. Ricardo was a true supporter of limited government intervention in the economy.

Jean-Baptiste Say (1767-1832) did not share the theory of value and became one of the pioneers of utility theory. At the core of his theory there are three factors - labor, capital and land, which correspond to three sources of income - wages, profit and rent. He formulated the so-called law of the market on which the exchange of product for product will automatically lead to equilibrium between buying and selling. Considering that the recipient of the income is always completely consumed, J.B. Say also believed that the economy can have neither overproduction, nor deficit, nor unemployment, nor lack of labor.

Classical economists largely based their studies on implicit assumption about the perfection of market mechanisms of self-regulation and further justified their conclusion that full employment is the norm for a market economy, the elasticity of relative prices and wages.

### **3.2.2. Neoclassical direction of economic science**

In the late 19th century a neoclassical direction of economic science was formed. Its founder A. Marshall (1842 – 1924) believed that employment is important to the regulation of supply and demand. However, he believed that the ultimate regulator of all demand is consumer demand and that this regulation is carried out automatically by the market. A. Marshall, as well as other representatives of the neoclassical theory believed that high wages inevitably reduces employment and increases unemployment.

The theory of A. Marshall was developed in the work by A. Pigou (1877 – 1959), called "Theory of Unemployment" (1933). The decrease in production costs, in his opinion, leads to a general decline in commodity prices and increase the purchasing power of the populations not living on wages, which creates additional demand, stimulating the expansion of production and employment. Another factor that determines the volume of employment, is a function of real demand for labor. In the end, in the presence of absolutely free competition among employees and high mobility of labor will naturally act trend to establish such a relation between wage rates and demand that all were busy.

### **3.2.3. The theory of surplus value by Karl Marx**

The theory of surplus value by Karl Marx is based on the analysis of the nature and characteristics of labor. He first pointed out the objective possibility of unemployment in the

conditions of capitalist production, relying on his theory of surplus value. Worker sells his workforce (ability to work) to the employer. In the production process, he creates new value, which is greater than the cost of labor on the amount of surplus value. The growth of the organic composition of capital (ratio of costs into constant and variable capital) causes a relative decrease in the demand for labor. As a result, the working population, producing the accumulation of capital, thereby increase the size of production, which results in a relatively redundant population, that is, unemployed (Marx, 1969).

### **3.2.4. 20-th century views on the problem of unemployment**

In the modern world science and practice there are two actively developing directions of solving the problem of unemployment, which are antithetical in character. The founders of these two theories were of John. M. Keynes (the theory of regulated capitalism and employment) and M. Friedman (monetarist theory).

Developed by John M. Keynes methods were successfully used until the 70-ies of the 20th century. According to them, enterprises are considered as actors shaping the demand in the labor market. The deployment of scientific and technical progress and strengthening of social security in the society led to the need to consider qualitative aspects of the use of human capital (the liberal direction, who grew up on the monetary theory of market regulation). In this case, the enterprise act as agents offering jobs, the satisfaction of which depends on the availability of labor resources of appropriate quality.

John M. Keynes strongly criticized the idea of neutrality of money in the first part of his famous work "General theory of employment, interest and money". Keynes believed that to find out "what determines output and employment as a whole, we need a complete theory of a Monetary Economy". According to him, "the importance of money essentially flows from its being a link between the present and the future" (Keynes, 2014). Therefore, the ultimate abstraction for Keynes, the playback attribute the properties of a real economic system is not a barter economy like most of his predecessors, and the monetary economy.

Hence, two main opposing positions to the solution of problems of employment and unemployment. Keynesians and supporting his ideas scientists (John Akerlof, D. Stiglitz, P. Wells, M. Wachter and others) assign economic policy of the state the leading role in coordinating and encouraging all types of professional activity. Liberal scholars (M. Friedman, R. Lucas, T. Sargent, M. Weitzman, B. Nordhaus, etc.) prefer individual initiative

in economic behavior. With the development of scientific and technical progress, contradictions between Keynesians and liberals are aggravated.

### **3.2.5. Achievements of world economic thought of the last decades**

Economic thought of the last decades made a significant contribution to the solution of the problem of unemployment, forming the conclusion about the necessity of organic compounds of market and state regulation. The most prominent representatives of world economic science – P. Samuelson, K. McConnell and S. Brue – united as a school the neoclassical synthesis.

Multivariate real human societies led to the ambiguity of the manifestations of the laws of development of the employment relationship, in which unemployment is manifested. It is necessary now to examine their specifics to solve problems caused by unemployment in a particular society and at a particular time.

As our study is devoted to disclosing reasons of unemployment and ways of finding solutions to this problem in big cities of Russia, it is important to name researchers who made a significant contribution to active analysis of economic theories of labor market and defining the ways of using them for the Russian economy: A.K. Akimov, V.S. Bulanov, L.A. Kostin, V.V. Kulikov, A.V. Kostyrya, A.V. Yakovleva and others.

Their study was based on statistical data, including those provided by the state employment service, and data of specially organized surveys. Most often, opinion polls and surveys were conducted by state employment service. For initial data analysis they involved methods of logical and comparative analysis, statistical and balance sheet methods, including those based on linear programming. Economic and mathematical methods were used in the work by M.M. Kabalova, V.P. Kryukov, F.T. Prokopov and other researchers.

Despite a comprehensive and thorough attitude of modern economic thought to the labor market and employment, there is a number of serious questions in the sphere of unemployment. Thus, there is still discussion about the nature of unemployment as an integral element of the market mechanism, formed in the depths of the socio-economic structure of society and organization of production. The possibility of minimizing unemployment by the management of impacts on different social and economic processes and phenomena is not solved to the fullest extent. There is no system of indicators, reflecting

the sensitivity of unemployment to the reproductive process. There are no special studies devoted to the problem of unemployment in a megalopolis.

### **3.3. Problems of regulation unemployment in economic theory**

Mention about measures of the state impact on unemployment in a market economy is presented in the writings of the most liberal economist of the classical school - J. B. Say. He notes, in particular, that if there is a short effect of factors that caused the fall of demand for labor (bad harvest, for example), then a suitable measure is the issuance of benefits. If a factor causing the fall of demand for labor is of more prolonged nature (war or a law, negatively affecting the production), it is possible to implement "procurement unnecessarily" just to keep workers or transportation workers in the other places where they are needed, either to adapt them to some other industry. "It is necessary to change the medication according to the cause of the disease, and to recognize this reason, before choosing a cure." (Say, 2000, p. 63).

In this way, J.B. Say practically enumerated all the modern means of fighting unemployment at the disposal of the state: grants, subsidies to producers and retraining of the unemployed and their mobility, and formulated the principle of successful regulation of the problem.

Nevertheless, J.B. Say warns, that neither the purchase of "unnecessary" products, nor the distribution of benefits can last long. As soon as they cease, workers will be in exactly the same plight in which they had been before.

A more effective means for workers is forming their own savings through the workers' associations. It is important to maintain workers' associations, which will allow workers to lay the paltry saving to save some money on the case when an unexpected illness or inability to work may deprive them of the opportunity to work.

It does not happen easily: due to low wage (its increase is good for the workers); because of the laws, which allow "scams" and seduce workers to acquire millions by investing small amounts; because of the policy, which encourages workers to bring money to pubs and be terribly wasteful (Say, 2000, p. 65-66).

Jan Batist Say formulates the conclusion about state participation and reduction of unemployment in the subjunctive mood: the government should protect workers, because they are naturally less secure than their masters. But enlightened government understands

that it is not worth while interfering in the affairs of private individuals, "so that natural disasters don't have more disasters occurring from the administration." (Say, 2000, p. 68).

A. Marshall, as many later representatives of neo-classical theory, did not particularly emphasize the problem of overcoming unemployment, but expressed a certain sympathy for those, devoid of social and psychological qualities, allowing to have a job. A. Marshall believed that the main means to reduce the number of people falling under the "lower classes", "balance", "dregs of society" is to prepare, as much as possible the number of their children to work not to repeat the fate of their parents. (Marshall, 1993, p. 133-134).

A. Pigou saw the root of the evil of unemployment is high wages because higher wages increase production costs and lead to job cuts. To prevent this, he proposes the following:

1. to contribute to the reduction of wages;
2. to explain to trade unions that wage growth leads to rising unemployment;
3. to employ workers applying for low income, in particular, to encourage the development of the social sphere.

A. Pigou thoroughly and comprehensively argued the need for a general reduction of money wages, as a way to stimulate employment. However, the statistics did not confirm the position that the unemployed are always replenished at the expense of workers with relatively low wages.

Among A. Pigou's recommendations, widely used in practice in RF, is division of wage and working time among several employees. Using a partial working day reduces unemployment even with the adverse conditions (Pigou, 1985).

The conclusion made by Pigou is that the division of labor that the market gives, ruling over all the relevant circumstances, whether perfect or imperfect, is the best possible the distribution, as the "national dividend" obtained by special measures for employment will not exceed those costs incurred by the society, in implementing these special measures (Yakovleva, 2010, p. 81).

John. M. Keynes was one of the first to see the relationship between unemployment, inflation and public spending, and he put forward the concept of growth of public spending to overcome unemployment. Keynesian program to combat unemployment involve the use of two blocks of activities: tactical methods – organization of public works by the state;



strategic interventions - state orders to the private sector and reducing interest rates, creating the conditions for cheap loans.

The first block aims at easing unemployment in the short term, when the positive shifts in the economy have not been felt yet. Its contents become public works, arranged and paid for by the state at the expense of its budget. It is recommended that these works focus on the formation of industrial and social infrastructure (roads, hospitals, etc.). The main thing is to involve the population into creating social stability and maintain at least a minimum of consumer demand on the part of employees.

The second block includes a system of strategic actions, able to revive the market, to create investment and, as a consequence, consumer demand, which should lead to an increase in the mass of commodities and employment. This unit includes two levers: the state order to major firms and the decrease in the discount rate due to the increase in government spending (perhaps with the growth of deficit spending). State order to large firms with a large network of business relations of suppliers and subcontractors greatly enhance the field of investment activity. The state order, given not to one firm, but to the whole network, certainly increases the demand for labor and, accordingly, resolves unemployment (Keynes, 2014).

The Keynesian program was successfully used after the Second World War in many countries. However, there came a period when there were natural objective difficulties for their implementation. Sources of funding for these programs has always been the state budget, and more specifically, government debt. The latter cannot grow indefinitely, since its increase requires additional emission of money without a corresponding increase in the mass of commodities contributes to inflation. In the context of high inflation, investment demand naturally reduces.

In addition, the process of reproduction brought new problems, which the government could not solve by the replenishment of demand. Resources rose in price sharply, which led to the economic downturn. Other pathways leading to the growth of supply were necessary, and this reflected further in the Keynesianism and the neoclassical synthesis.

In 1937 Sir John Richard Hicks sharply criticized Keynes and by 1950-1960-ies this criticism grew into a school of Neoclassical synthesis, currently holding the dominant position in the economic mainstream. One of the analytical discoveries of Neoclassical

synthesis is Phillips curve – graphic display of the expected inverse relationship between inflation and unemployment.

In the processing of P. Samuelson and R. Solow, Phillips curve described the choice between inflation and unemployment, showing that a decrease in one can only be at the expense of increasing the other. The reason for such a dependence lies in the fact that with high unemployment wages are kept at a low level, thereby slowing the rise in prices. According to Phillips curve, it was established, for example, that unemployment in England at the rate of 2.5 - 3% led to a sharp slowdown in the growth of prices and wages.

The essence of the theory is that in the long term, an acceptable level of inflation is possible only if the natural rate of unemployment. "The natural rate of unemployment" is the unemployment rate that corresponds to the appropriate level of full employment in the economy. Frictional and structural unemployment is a "natural" unemployment and its level is about 3 %. It is called natural because its origin is not influenced by monetary factors, such as wage levels, inflation and so on (Friedman, 1999, p. 136).

Fans of the Phillips curve suggest a variation of the new Keynesian Phillips curve (NKPC) (Amato, 2000), the basic idea of which is that current inflation depends on expectations of future inflation and the deviation of average marginal cost from an equilibrium state. Currently, it is being tested by researchers on different data (particular, in RF), but has very limited use in practice of economic policy of states and central banks (Yakovleva, 2010, p. 84).

Modern monetarism represents one of the three branches of economic theory (London school of neoliberalism and the ordoliberalism), which was formed on the basis of critical perception of John. M. Keynes's theory. According to experts of the history of economic thought, in the old-fashioned college textbooks Fisher's identity  $MV=PT$  is an equation, where M is the size of the money supply, V is the velocity of money, P is the price level, T is the natural volume of all transactions in the economy; PT is the value of all transactions in the economy (New English-Russian explanatory dictionary of financial markets, 2005).

The monetarist function of money supply, determining prices, income and employment  $M_s = f(p, y, e)$  is interpreted as a tool that allows you to adjust the economy at high employment/low unemployment, stable prices and rapid growth.

Although such interpretations provide great opportunities for students to exercise at the board, they have little in common with the theory and especially hurt real monetary policy. As the leader of modern monetarism M. Friedman noted, the "Fine adjustment" is an easily memorable formula, which has too little resemblance to what it corresponds to in practice, moreover, it is more like the real evil (Friedman, 1999, p. 129).

The conclusion formulated by Friedman concerning the capacity of monetary policy to influence the reduction of unemployment is that the monetary authorities can directly control their own commitments in nominal values, such as the value of the exchange rate, the nominal level of national income, the value of monetary aggregates, or set the rate to nominal changes; but they are not able (!) to control real variables, such as real interest rate, the real unemployment rate, the level of real national income, the real amount of money as well as the rate of growth of real income and the real quantity of money. Therefore, monetary policy does not formulate unambiguous, strict measures on unemployment regulation.

Thus, economic theory cannot boast of unanimity in the estimates of the theoretical developments in this area. The mechanisms that have been developed using modern fiscal and especially monetary instruments, are assessed as ambiguous in theory and in practice.

Even when an acceptable result is found, firstly, it is usually not durable in time and changing conditions change the impact of taken measures, and secondly, it cannot be transferred to other national soils. The modern theory is clearly aware of this phenomenon and explains it in a simplified or incorrect view of the possibility of borrowing measures or institutions. Adopting a particular theoretical principle for developing public policies to impact unemployment, it is impossible to apply the enforcement, i.e. the institutional practice of adaptation of this mechanism to real conditions. If you try to reproduce it on the model and likeness, it is the path to failure.

Thus, the search for an acceptable balance of interests of participants of the labor market is a rapidly changing issue that requires both theoretical (shared) basis of preparation of the algorithm when the current balance of power, and secrets of understanding the unique practices of enforcement.

Theoretically, the only true solution exists only in each concrete moment of time (or *ceteris paribus*), but bounded rationality and opportunistic behavior does not allow to take this decision as accurately as possible.

The existence of unemployment as an integral part of a market economy is recognized in all theoretical directions and schools. Nevertheless, in the light of changing circumstances related to the growing deficit of labor resources, a smaller proportion of researchers are inclined to consider the existence of unemployment as a positive factor stimulating effective work of employees. Uncontested is the recognition of unemployment as one of the sources of social tension in society. Increased social tension is also connected with the large scale of so-called “voluntary unemployment”, which is not considered part of the economic analysis of modern macroeconomics.

The question is how to distinguish those who are really looking for a job from those who do not want to find it. It is characteristic of modern cities to accumulate unemployed people. It creates certain moral social problems for society in general and threatens the security of the urban environment. Therefore, the search for measures against unemployment is a pressing economic and social problem.

The search for effective measures is of particular relevance in Russia, because, as noted in the UN report (24.04.2009) "Russia facing demographic challenges". In the coming years, demographic problems, especially the aging of the population, can seriously affect the economy, social sphere and security of Russia. The reduction in the number of working-age population may become an urgent problem. As stated in the report for 2008 - 2025, the number of working-age Russians will shrink by 14 million, while the number of pensioners will rise by 5 million (Report on human development in the Russian Federation, 2013).

Measures to increase the birth rate is not enough in such a situation, since children born today will not soon appear in the labor market, and in the meantime, the birth of second and third children may result in the outflow of women from the employment market. Besides, even if birth rates will seriously increase, children still do not have time to reach working age before the problem of population ageing will be felt.

Therefore, any economic justification of unemployment in modern Russia is a luxury. Modern tools tackling unemployment should be viewed not within the framework of social, but economic importance. Labor resources are considered now in full economic sense, as they are limited and demand rational management. Ways of overcoming this limitation are seen outside the national economy (attracting immigrants). However, if the labor market is

not organized in a civilized manner, formal involvement of migrants may not give the desired results.

Theoretical study of the problem of overcoming unemployment, thus, focuses on a comprehensive study of known and potential offer of new tools in the new environment, dramatically increasing scarcity of labor resources.

## **4. PRACTICAL PART**

### **4.1. Concentration of economic resources in the megacities of Russia**

If we consider national economies in the spatial aspect, the money is distributed quite unevenly. Where there is more capital, *ceteris paribus*, there is more economic entities. More economic entities provide concentration of the capital, and, consequently, greater economic development potential. A large city is such an institutional entity that concentrates the population and the capital. Statistics in Moscow clearly show that in all periods of formation and functioning of a market economy the greatest part of the financial resources were concentrated in Moscow, the second after Moscow city is St. Petersburg.

According to data of Ministry of Finance in 2014 income in the consolidated budget of the Russian Federation amounted to 26766.1 billion, and in 2015 it increased by 0.5%, and reached 26922 billion rubles, of them income in Moscow was 1610.2 billion rubles compared to 2014, this amount was increased by 5.3%. In St. Petersburg in 2014, revenues amounted to 409.1 billion rubles, and in 2015 it increased almost 3.9% and made 424.9 billion rubles (The Ministry of Finance of Russia, 2016).

If we consider the unemployment statistics and the amount of money in the region, it is not difficult to discover a strict correlation between these parameters.

It is common knowledge that in the practice of modern market economies employment agencies do not include in their statistics persons residing in depressed areas with no vacancies: where there is no money, there are no market relations. People attempting to find work in these regions fail, they are called "frustrated workers", they do not count as economically active population (Yakovleva, 2010, p. 39).

An additional argument to the propriety of the problem of interconnections between a large city and capital is ideas of M. Porter, who researched modern competition in space and

identified three cluster models: clusters of excellence, fore-clusters and early stages of development with no hint at any development of a cluster (Porter, 1998).

Clusters of excellence form competing or complementary companies that increase productivity through competition and joint ownership of assets. Only the promotion of competition forces companies to innovate to keep at the forefront, and attract human talent. A major city possesses the characteristics of a cluster of excellence. Therefore, it plays an important role in the national economy that form the internal mechanism of self-development, it is a kind of complete integrity in the space of the national economy.

The highest concentration of capital achieved in large cities, must therefore exercise the highest potential of the market economy and the most distinct institutions for adaptation of national economy to the market. As for the Russian economy, the two largest cities of Moscow and Saint Petersburg contain the highest concentration of capital.

#### **4.2. Analysis of distribution of types of property**

Capital is one of the types of private property. The processes of privatization and formation of businesses in various private forms of ownership significantly affected its concentration. Therefore, among the factors that have a significant impact on the level and structure of employment in Russian cities, the important place is occupied by the institutional changes associated with the transformation of forms of ownership.

The changes in the structure of property could not help affecting the state of employment in general and the transformation of relative labor demand in particular.

Let us refer to the statistics:

The percentage distribution of enterprises and organizations of Russia in Moscow and St. Petersburg vary greatly: Moscow accounts for 23.11 per cent, and in Saint Petersburg of 8.73%. In total, the share of Moscow and St. Petersburg account for almost 33% of enterprises and organizations of the country (10% of the population accounts for 32.84% of enterprises and organizations).

Analysis of the distribution of economic entities by types of ownership showed that only 6.8% (332.7 thousand) of the total number of considered economic entities (4886 thousand) accounted for state and municipal property. The vast majority of business entities (86.2 %)

were in private property (4212.2 thousand). Among the industries the share of private legal entities in the wholesale and retail trade and real estate transactions, rent and provision of services was above the average (Russian Statistical Yearbook, 2015).

In Moscow on 1 January 2015, on the wholesale and retail trade accounts for 53.06%, in St. Petersburg – 49.56% and operations with real estate, rent and granting of services in Moscow — 17.55%, St. Petersburg — of 16.12%.

The indicators characterizing the dynamics of institutional development alternative to the state sector of the economy of cities, gives grounds to assert that the relationship between capital intensity and real market reforms is obvious. The related increase in production volumes in some sectors of the economy in these cities has led to increase in demand for labor, decrease in the intensity of the release of labor.

Thus, the changes in the structure of property affected the state of employment and transformation of labor demand.

Statistics make it clear that the main emphasis of labor demand has shifted in favor of the private sector. At the end of 2015 in Moscow the need for workers declared by the organization in the public employment service amounted to 18.11% of the declared in Russia as a whole and in St. Petersburg - of 6.72%. The analysis showed that since 2005 the stated need for workers has increased in Moscow by 2.7% and amounted to 169412, and in St. Petersburg by 3.8% and amounted to - 62840.

Comparing the structure of average number of the employed in Moscow and St. Petersburg at the enterprises of different ownership forms, we can see that there are no fundamental differences (See Table 1):

**Table 1. Structure of average annual number of employment employees in enterprises of different ownership forms in 2015**

Enterprise category	Average annual number of employment at the enterprises of different ownership forms (in %)	
	Moscow	St. Petersburg
In total	100	100
State	26,5	31,4
Municipal	0,0	0,2
Private	51,3	55,8
Property of public and religious organizations	0,6	1,0
Combined	11,5	5,0
Foreign, shared foreign and Russian	10,1	6,5

*Source: Russian Statistical Yearbook, 2015.*

Analysis of the average annual number of employed in the economy by kinds of economic activities on the considered cities showed that in these cities there is the prevalence of 4 industries over others, in which the share of employment exceeds the 10% threshold:

1. manufacturing;
2. construction;
3. wholesale and retail trade, repair of motor vehicles, motorcycles, household goods and personal items;
4. operations with real estate, rent and granting of services.

Thus, a large city as an economic institution, concentrating financial resources, is a cluster of excellence, where the most developed market competition, can be included in the scope of economic analysis as a tool to highlight the differentiating specifics of the national economy in all its economic manifestations, including the labor market and unemployment.



The central research problem is not the economy of a big city as such, but the role of large cities in national economic development. A large city is seen as a "key Institute", allowing to understand the features of development of the market and the development prospects of less developed economic actors and economic space of the country's economy as a whole.

### **4.3. Types of unemployment**

#### **4.3.1. Market and non-market unemployment**

With the reference to the factors of the uneven development of the economic potential of the territory within the boundaries of one state, which is manifested in the concentration of capital and the degree of development of the competition, you can separate the forced unemployment to the "market type" unemployment and "non-market type" unemployment.

According to the criterion of concentration of cash resources, the involuntarily unemployed and living on a "money site" refer to the "market type unemployed" population. The remaining part of the population not having work and living on "hopeless" area is a "non-market type unemployed". The peculiarities of manifestation of regularities of development of the labor market, and the characteristics of the market unemployment in the country are reflected in the city perfectly. Peculiarities of the national unemployment in the economy shape the characteristics of the functioning of the unemployment of market and non-market type.

Thus, further analysis of unemployment as an element of supply in the labor market is maximally specified. According to the criterion of uneven concentration of financial resources, unemployment in scale of a national economy is divided into "market" and "non-market", and since the concentration of money in the most blatant form occurs in large cities, there are market features that appear most distinctly. Accordingly, the logic of the research analysis features of the unemployment market-type leads to its study in a large city.

#### **4.3.2. Standard and nonstandard unemployment**

Market-type unemployment is a component of the overall supply in the labor market, or rather its excess over demand volume. The value of employment varies inversely proportionally to the value of unemployment. The sum of employed and unemployed is the numerical workforce. The size of the labor force determines the potential or maximum possible employment in the event of the absence of unemployment (taking into account its

natural level). The labor force minus the unemployed make a real employment in the economy.

Industrial development required a concentration of population in cities. The population growth in cities has led to changes in the structure of the economy due to the demand for services from the state to solve problems of health, education, law, security, etc., and from the private sector in small business services associated with the diversity of individual needs, tastes, preferences and financial possibilities of the population.

Services of the state and business became the main potential niche for the development of employment. An increasing number of people displaced from the actual production of the primary and secondary sectors and moved into the tertiary service sector, so the main increase in employment occurred in the service sector, not industrial mass production.

The variety of activities is high and displays on the first place the goal of comfort, not a level of earnings, thereby transforming the labor element of comfort and pushing the boundaries of economically active age.

Peter Drucker, known for his analytical articles in Management, Economics and Politics, noted that for modern society (taking into account the increase of life expectancy), the issue of the second career that can take place in three of career options in the present circumstances:

1. to start a new career in a completely different region. managers and middle managers aged 45 and 48 years, when children have grown up, and the pension is guaranteed, go out of business and continue to work in non-profit organizations doing roughly the same thing, but in calmer conditions and part time.
2. when in retirement, to change jobs fundamentally, not for a living and for fun.
3. to start a parallel career (Drucker, 2007, p. 252-254).

Modern post-industrial society, giving diverse opportunities of economic activities, and, accordingly, forms of employment, resulted in a variety of forms of unemployment that do not fit into the old, traditional idea that non-standard forms can be a positive, not a negative practice of functioning of the market, as it was understood in the conditions of industrial society.

Theory and practice of industrial period operated with concepts of underemployment and partial (or part-time) employment as forms of unemployment. Underemployment is an ambiguous phenomenon and concept. Its extension may indicate a wide variety of forms of employment and flexibility of labor market or under-use of labor resources (in addition to standard unemployment), meaning a serious loss in efficiency.

Part-time employment exists when the hours of work of an employed person are insufficient in comparison with an alternative employment situation in which a person is willing and able to work. From the above definition we can understand that this form of non-standard employment is in all cases involuntary (Gimpelson, Kapelushnikov, 2006, p. 65).

Another form of nonstandard under-employment is temporary employment. World statistics offer a following list of kinds of temporary employment:

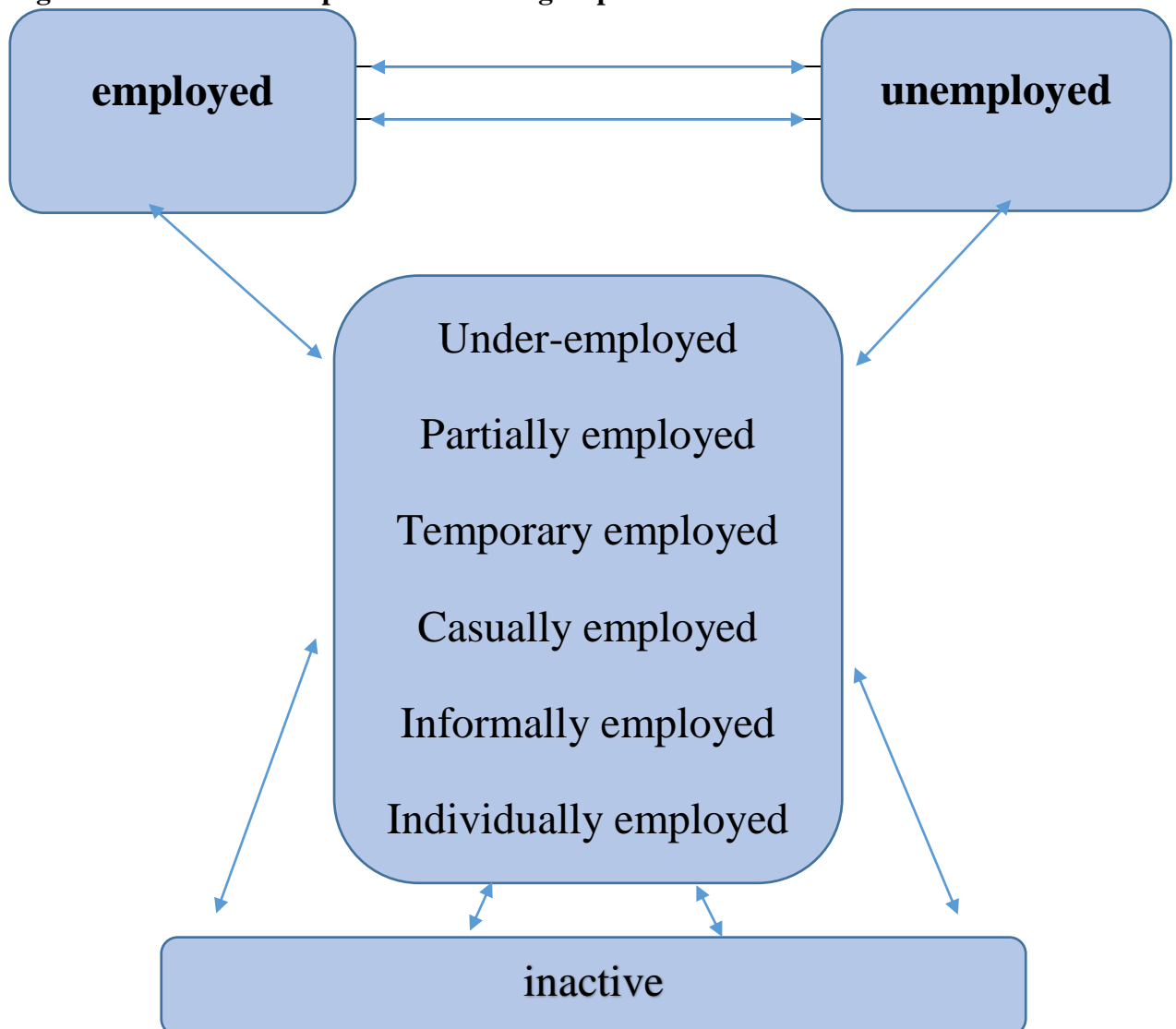
- employment on the basis of fixed-term employment contracts;
- employment in agencies providing labor to third parties;
- employment on the basis of agreement to perform certain types of work;
- replacement of temporarily absent employees (for example, family circumstances);
- seasonal work;
- work that is performed if necessary (e.g., cleaning apartments for the export)
- one-time employment (hired on a single day);
- apprenticeship (employment training program, but without a guarantee of subsequent employment);
- employment programme to create jobs (Gimpelson, Kapelushnikov, 2006, p. 124).

The most unstable form of non-permanent employment is the so-called casual employment. The hallmarks of the casual employment relationship are extremely short-term nature and frequent lack of any official registration. A set of activities is thus very wide: a random taxi driver on the car, one-time repair services, irregular services of cleaning apartments, services of nannies and caregivers, translations from foreign languages, and much more. Thus, occasionally employed people, not having a permanent job, can be involved in the implementation of different kinds of one-off jobs on an irregular basis. This group is actually in the border region between employed, unemployed and inactive ones (Gimpelson, Kapelushnikov, 2006, p. 183).

Informal employment is another non-standard form of employment. Its main distinguishing feature is the lack of an employment contract. The informal sector is usually understood as a set of small economic units, as well as economic activities carried out on the basis of household or individually. One of the most important components of precarious employment is the employment in the production of goods and services (primarily agricultural products) at home.

The types of non-standard employment can be considered as parallel non-standard forms of unemployment: the matter is that there is a movement of workers between the three alternative conditions on the labor market (or categories of employment): employment, unemployment and economic inactivity. This phenomenon is clearly seen in the Figure 1:

**Figure 1. The relationship between status groups in the labor market**



*Source: Author's own figure.*

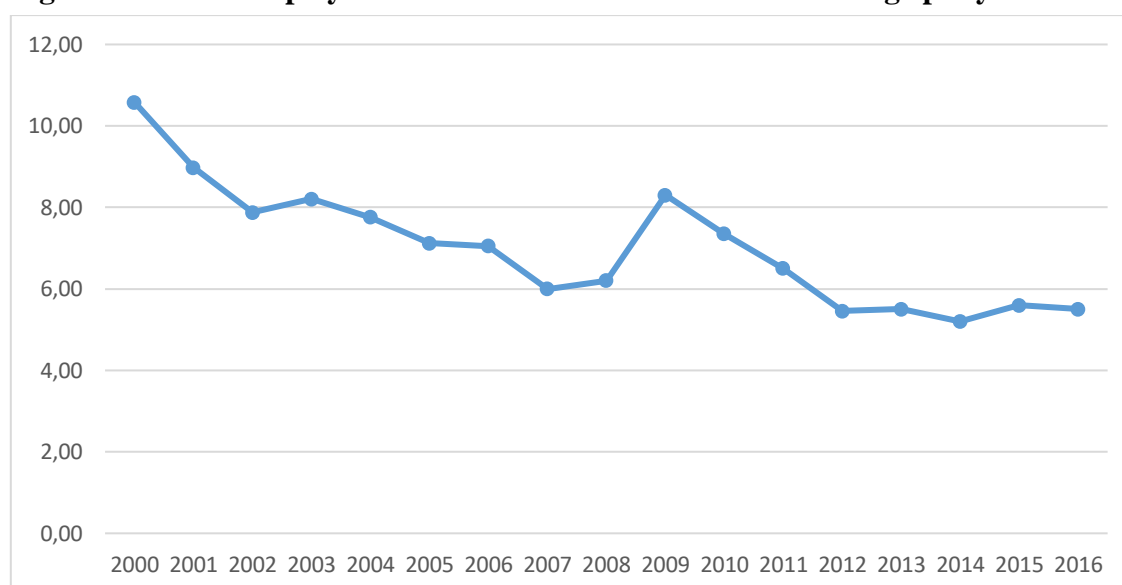
Non-standard types of unemployment (non-permanent, part time, casual, seasonal, etc.) are generated by the complementary non-standard types of employment (non-permanent, part time, casual, seasonal, etc.). Their difference from each other for the worker is the subjective assessment of the current "non-standard" status for the employee. If an employee is satisfied with his status, he counts himself in the group of non-standard workers, and if not, he counts himself unemployed. For companies non-standard employment is a real potential replenishment of cyclical unemployment in the event of partial or total decline of the economy.

Unemployment in the labor market is structurally divided into standard and non-standard, similar to how employment is divided into standard and non-standard type. The most important feature that reflects the structure of cyclical unemployment in the postindustrial economy is relative to the previous "standard" or "homogeneous" stage of the industrial or pre-industrial economic development.

#### 4.4. Current unemployment rate in Russia

As it follows from the latest data of Rosstat, the unemployment rate in Russia from 2000 to 2016 has a tendency to decrease, as seen the Figure 2:

**Figure 2. The Unemployment Rate in Russia in 2000-2016 average per year**



*Source: Rosstat, 2016.*

The unemployment rate in Russia calculated on methodology of the International Labor Organization (ILO) in July 2016 amounted to 5.3% (of 4.125 million unemployed). This is the lowest figure since October 2015. The number of people without work declined for the fourth month in a row, despite the fact that the economy remains in recession (RosBusinessConsulting, 2016).

The last time the unemployment rate in Russia was lower than the current rate in September 2015 (5.2%). Since then it steadily increased and reached a peak in March 2016 and amounted to nearly 6% (the highest value since January 2013), and then went into decline. Falls and the level of officially registered unemployment: as reported by the Ministry of Labor, on August 1, it was 1.2% is the lowest rate since November 2015.

Unemployment in Russia reduces in conditions of ongoing recession. The experts of the Institute "Development Center" Higher School of Economics (HSE) claim that in the overwhelming number of regions only one basic sector of the economy is growing out of five sectors. According to Rosstat, GDP declined in the second quarter of 2016, 0.6% in comparison with the same period of the previous year, and this was the sixth consecutive quarter of recession.

Economists of the British consulting firm "Capital Economics" draw attention to the phenomenon of discrepancy of the economic situation and unemployment in Russia. Information Agency Bloomberg noted that Russian companies instead of having to lay off employees, cut their salaries, send them on unpaid leave or transfer to part-time employment.

The Russian labor market has different mechanisms of adaptation to adjust to the crisis, it does this not so much due to the quantitative adjustment, but rather due to price and time. Deputy Director of the Centre for labor market studies HSE Rostislav Kapelyushnikov confirms this decision in the comments of RBC. A person can work full time, but get 8 thousand rubles, adds the head of the Center for Social Policy of the Institute of Economics, Eugene Gontmakher. The Russian workers have to agree on the deterioration of their own working conditions (RosBusinessConsulting, 2016).

At Capital Economics they also emphasize that people who are employed in the informal economy also lose their jobs, and many of them simply leave no trace in official statistics. In particular, we are talking about foreigners, not formalized. Rosstat does not take into account employment in the grey area, so, it is not possible to treat the unemployment rate

"seriously" according to ILO methodology. On the other hand, a survey of Rosstat employment exists in both the formal and the informal sector.

#### 4.4.1. Regression analysis

In order to find out what factors influence the level of registered unemployment, we will conduct a correlation and regression analysis, evaluate the close relationship between the features with the time period for the analysis from 2001 to 2016. This will allow us to identify the factors that have the greatest impact on productive criteria.

We will take the level of registered unemployment in the Russian Federation for 2001-2016, % as an effective sign (Y).

Factor features are as follows:

X1 - movement of employees of organizations (departure of employees), in % of the average number;

X2 - the number of economically active population in the Russian Federation, on average for the year, thousands of people;

X3 - the share of unprofitable organizations in the total number of organizations by all forms of ownership, %;

X4 – the average wage, growth rate;

X5 – the number of arrivals from outside Russia (total migration), thousands of people.

X6 – inflation, growth rate;

X7 – GDP per capita, growth rate;

X8 – FDI, growth rate;

X9 – Population, thousands of people.

**Table 2. Initial data. Russia**

<i>Year</i>	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>	<i>X8</i>	<i>X9</i>
2001	9,00	30,0	71547	37,9	0,46	193,45	-0,06	0,08	0,30	146303,61
2002	7,90	30,5	72357	43,4	0,35	184,61	-0,20	0,07	0,38	145166,73
2003	8,20	31,3	72273	43,0	0,26	129,14	-0,20	0,10	0,50	144963,65
2004	7,80	31,2	72985	38,1	0,23	119,16	-0,02	0,11	0,36	144168,21
2005	7,10	31,3	73581	36,4	0,27	177,23	-0,07	0,10	0,33	143474,22

<i>Year</i>	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>	<i>X8</i>	<i>X9</i>
2006	7,10	30,9	74419	32,5	0,24	186,38	-0,18	0,12	0,03	142753,55
2007	6,00	31,3	75289	25,5	0,28	286,96	0,32	0,12	1,19	142220,97
2008	6,20	32,6	75700	28,3	0,27	281,61	0,12	0,07	-0,14	142008,84
2009	8,30	30,5	75694	32,0	0,08	279,91	-0,34	-0,07	-0,21	141903,98
2010	7,30	28,2	75478	29,9	0,12	191,66	0,00	0,06	0,40	142856,54
2011	6,50	29,0	75779	30,0	0,12	356,54	-0,31	0,06	0,66	142865,43
2012	5,50	28,7	75676	29,1	0,15	417,68	0,08	0,05	-0,19	143056,38
2013	5,50	29,5	75529	31,0	0,11	482,24	-0,02	0,03	0,10	143347,06
2014	5,20	29,3	75428	33,0	0,09	590,82	0,76	0,02	-0,14	143666,93
2015	5,57	29,1	76588	32,6	0,04	598,62	0,14	-0,02	-0,08	146267,29
2016	5,54	28,4	76636	31,5	0,08	575,16	-0,58	0,01	0,03	146544,71

*Source: Russia in Figures, 2016.*

**Table 3. Matrix of pair correlation coefficients. Russia**

	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9
Y	1									
X1	0,36	1								
X2	-0,78	-0,44	1							
X3	0,64	0,23	-0,82	1						
X4	0,61	0,58	-0,83	0,46	1					
X5	-0,82	-0,58	0,74	-0,45	-0,70	1				
X6	-0,40	0,08	0,10	-0,24	-0,02	0,26	1			
X7	0,21	0,47	-0,56	0,20	0,69	-0,62	0,12	1		
X8	0,22	0,19	-0,32	0,04	0,40	-0,43	-0,02	0,59	1	
X9	0,11	-0,31	-0,30	0,55	0,13	0,23	-0,23	-0,10	-0,06	1

*Source: Author's own table.*

The analysis of the correlation matrix made it possible to choose explanatory factors, which have high values of the correlation coefficients. However, the factors which values of the correlation coefficients are greater than 0.8 indicate to us about the presence of multicollinearity.

To build the regression equation, we cannot take all factors simultaneously, as they are multicollinearity between X2 X3 X4, i.e. there is a high mutual correlativity of explanatory



variables. Therefore, to avoid multicollinearity, it is necessary to include factor where  $r_{yX}$  is the maximum. In our case, this factor is X2, the value of the coefficient of communication is  $r_{yX2} = -0.78$ .

Removing multicollinearity, we can make a regression analysis. Here we will use the method of backward stepwise regression to find the most significant variables, that make the greatest contribution to the variation of the dependent variable.

The results of the stepwise regression analysis will be presented in Table 4.

**Table 4. Regression statistics. Russia**

Dependent variable: Y

	coefficient	std. error	t-ratio	p-value	
const	37.6285	6.16060	6.108	5.27e-05	***
X2	-0.000378138	8.42165e-05	-4.490	0.0007	***
X5	-0.00584387	0.000863103	-6.771	1.98e-05	***
X7	-13.1511	2.24940	-5.846	7.88e-05	***
Mean dependent var	6.794375	S.D. dependent var	1.206095		
Sum squared resid	1.457444	S.E. of regression	0.348502		
R-squared	0.933206	Adjusted R-squared	0.916508		
F(3, 12)	55.88566	P-value(F)	2.53e-07		
Log-likelihood	-3.535779	Akaike criterion	15.07156		
Schwarz criterion	18.16191	Hannan-Quinn	15.22981		
rho	-0.115255	Durbin-Watson	1.852253		

Test for normality of residual -

Null hypothesis: error is normally distributed  
 Test statistic: Chi-square(2) = 0.851487  
 with p-value = 0.653284

LM test for autocorrelation up to order 4 -

Null hypothesis: no autocorrelation  
 Test statistic: LMF = 1.83783  
 with p-value =  $P(F(4, 8) > 1.83783) = 0.215026$

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present  
 Test statistic: LM = 12.2398  
 with p-value =  $P(\text{Chi-square}(9) > 12.2398) = 0.200127$

*Source: Author's own table.*

Multiple R = 0.97, which indicates a direct close relationship of the characteristic in the equation. The coefficient of determination  $R^2 = 0.93$ . It shows that 93% of the variation in the level of registered unemployment in Russia for 2001-2016 is due to the variation of the

factors included in the model, i.e. the number of arrivals from outside Russia, the number of economically active population in the Russian Federation, GDP per capita and the remaining unaccounted factors account for 7%.

The value of Fisher's F-test is 55.89. F-criterion is equal to 3.49 table. Hence,  $F_{\text{fact.}} > F_{\text{table.}}$ , the null hypothesis is rejected, and the regression equation is statistically significant. Also, the significance of the F-test shows the probability that the multiple R will be zero. It is extremely small (significance F less than 0.05), therefore, the regression equation is statistically significant with a probability of 95 %. Moreover, it is established that the model meets the general requirements for the normality of residuals, homoscedasticity and lack of autocorrelation.

The regression equation is:

$$Y = 37.63 - 0.00038X_2 - 0.0058X_5 - 13.15X_7$$

#### 4.4.2. The results of analysis

The analysis of the regression equation parameters gave the following results: with the increase in the number of arrivals from outside Russia to the territory of the Russian Federation by 1 million and the invariance of factor  $X_2$  and  $X_7$  (the number of economically active population in the Russian Federation, GDP per capita), the level of registered unemployment in Russia will decrease by an average of 5.8 %. In the case of the increase in the number of economically active population by 1 million and the invariance of the factor  $X_5$  and  $X_7$ , the level of registered unemployment in Russia will decrease by 0.38 % on average. And in the case of the increase in the growth rate of GDP per capita by 10 % and the invariance of the factor  $X_2$  and  $X_5$ , the level of registered unemployment in Russia will decrease by 1.32 %.

The undertaken analysis shows that the level of registered unemployment depends (the dependence is inverse, by the way) on the total number of migrants arriving on the territory of the Russian Federation, the number of economically active population in the Russian Federation and GDP per capita.

In Russia, the shortage of qualified personnel (primarily engineering workers) with an excess of employees in a number of other areas, as well as a too low GDP per capita rate are the main factors limiting the quality of economic development.

The influx of qualified personnel from abroad allows to "move" the economy and scientific and technological progress without the cost of education. In order for labor migration to become a factor of acceleration, rather than limiting Russia's economic growth, migration policy should be aimed primarily at the selection of foreign workers involved in the professions, specialties and qualifications necessary for the sustainable development of the host region, and the creation of conditions for their legal use by employers.

Another possibility for the development of the economy while maintaining social stability is the timely retraining of personnel, which makes it possible to effectively combat unemployment in some areas of the economy and the shortage of labor resources in other areas. It is obvious that the corresponding correction in the state task for training of future specialists in secondary special and higher educational institutions is also required.

## **4.5. Unemployment in Moscow and St. Petersburg**

### **4.5.1. Analysis of data**

Having described general provisions of the types of unemployment and taking into consideration current information about characteristic features of unemployment during recess in economics, let us draw our attention to data and consider the characteristics of the labor market and unemployment in the two largest cities of Russia (according to the standard parameters of official statistics) – Moscow and St. Petersburg.

The calculation of the number of unemployed persons is conducted according to the methodology of ILO, and the number of officially registered unemployed in the state employment service. It seems that the first indicator reflects the real level of unemployment, while in the second case there may be all sorts of manipulation.

Let us start analysis of unemployment in Moscow and St. Petersburg with the number of unemployed and unemployment rate. The data, including unemployment rate since 2000, is reflected in Table 5:

**Table 5. The number of economically active, employed and unemployed population, officially registered unemployed population, unemployed citizens receiving unemployment benefits and unemployment rate in Moscow in 2000-2015**

<i>Year</i>	<i>Economically active (pers.)</i>	<i>Employed (pers.)</i>	<i>Unemployed (pers.)</i>	<i>Officially Registered Unemployed (pers.)</i>	<i>Unemployment Benefit (pers.)</i>	<i>Rate of Unemployment</i>
2000	5 277 000	5 072 000	205 000	36100	31900	3,89
2001	5 517 000	5 400 000	116 000	34700	30400	2,11
2002	5 699 000	5 617 000	81 000	35900	31400	1,43
2003	5 738 000	5 663 000	74 000	33600	28300	1,29
2004	5 864 000	5 768 000	96 000	35100	28900	1,64
2005	5 968 000	5 918 000	50 000	34400	27700	0,83
2006	6 061 000	5 962 000	99 000	34000	26100	1,64
2007	6 276 000	6 224 000	52 000	22700	14800	0,83
2008	6 369 000	6 310 000	59 000	22900	14900	0,93
2009	6 374 000	6 198 000	176 000	59900	49100	2,77
2010	6 436 000	6 321 000	115 000	46300	37300	1,78
2011	6 644 000	6 548 000	95 000	40600	34000	1,44
2012	6 800 000	6 745 000	55 000	27600	22200	0,81
2013	6 879 300	6 762 200	117 100	24500	20600	1,70
2014	7 087 300	6 982 900	104 400	28600	22300	1,50
2015	7 067 500	6 942 300	125 200	44000	35500	1,80

*Source: The Federal State Statistics Services, 2016.*

From the table it follows that the percentage of unemployed has been steadily declining since 2000, before the global financial crisis began in 2008. In 2000 there was a local peak of unemployment (3.9% of economically active, or almost 205000 people, did not have a job).

In Moscow in 2012, the number of unemployed was only 55 thousand people and the unemployment rate was less than 1%, which is lower than average in the country by nearly 5%. This can be explained by the prestige of living and working in the capital.

However, due to the entry into force of western sanctions at the end of 2013 and a huge outflow of capital from RF, the rate of unemployment has risen sharply. The main reason was migration from poorest region to the Federal cities of Russia for a “better life”, therefore number of economically active population increased, but the amount of jobs position vice versa decreased. It is confirmed by the following table (Table 6):

**Table 6. The ratio of job seekers to job openings in Russia vs Moscow and St. Petersburg**

<i>Year</i>	<i>Russia</i>	<i>Moscow</i>	<i>St. Petersburg</i>
2008	3,5	0,3	0,7
2009	6,2	0,8	2,6
2010	4,9	0,7	1,3
2011	3,6	0,6	0,8
2012	2,7	0,4	0,5
2013	2,4	0,7	0,6
2014	2,1	0,6	0,5
2015	3,3	1,1	1
2016	3,3	1,1	1

*Source: Unified interdepartmental information and statistical system, 2016.*

As for the data on St. Petersburg, it is reflected in the Table 7, containing the figures concerning labor market:

**Table 7. The number of economically active, employed and unemployed population, officially registered unemployed population, unemployed citizens receiving unemployment benefits and unemployment rate in St. Petersburg in 2000-2015**

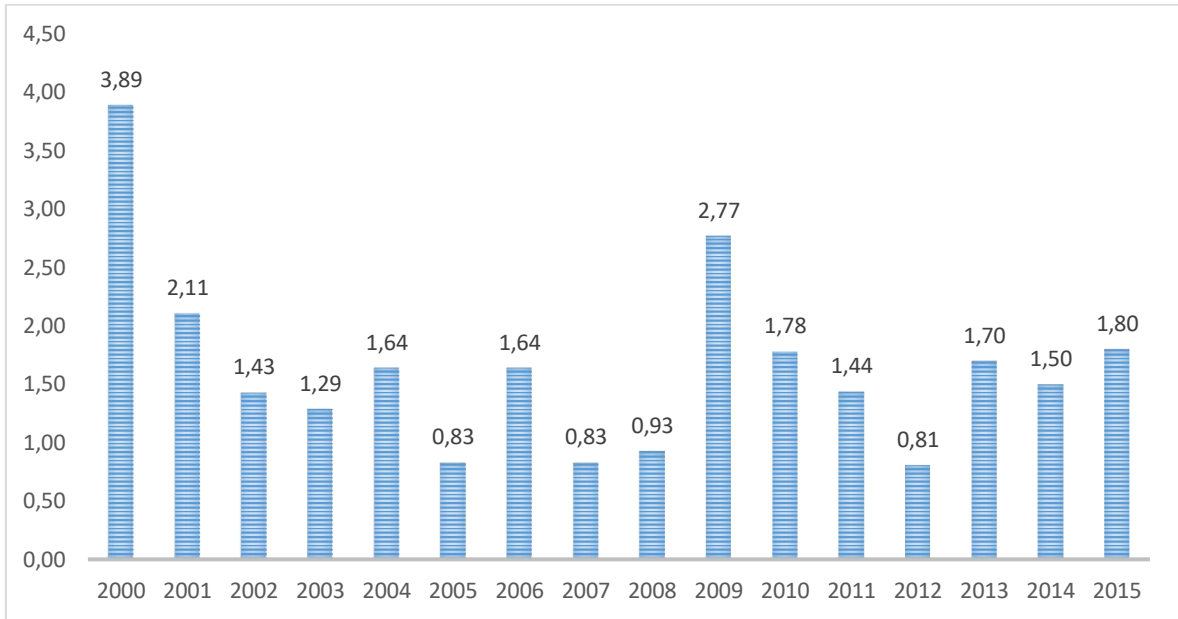
<i>Year</i>	<i>Economic ally active (pers.)</i>	<i>Employed (pers.)</i>	<i>Unemployed (pers.)</i>	<i>Officially Registered Unemployed (pers.)</i>	<i>Unemploy ment Benefit (pers.)</i>	<i>Rate of Unemplo yment</i>
2000	2 452 000	2 299 000	153 000	17200	15700	6,24
2001	2 466 000	2 368 000	98 000	17700	15900	3,99
2002	2 543 000	2 457 000	86 000	22100	19500	3,39
2003	2 512 000	2 407 000	105 000	19300	15600	4,18
2004	2 564 000	2 494 000	70 000	19900	16600	2,73
2005	2 620 000	2 562 000	57 000	19400	15900	2,19
2006	2 725 000	2 661 000	64 000	16100	13600	2,36
2007	2 812 000	2 754 000	58 000	13500	9900	2,05
2008	2 809 000	2 751 000	57 000	14400	11300	2,05
2009	2 847 000	2 731 000	117 000	28600	24400	4,09
2010	2 807 000	2 733 000	74 000	16800	12900	2,65
2011	2 858 000	2 802 000	56 000	13400	10600	1,95
2012	2 896 000	2 863 000	33 000	10700	8500	1,14
2013	2 849 000	2 805 000	42 735	9400	7300	1,50
2014	2 885 100	2 846 100	40 391	10300	8000	1,40
2015	2 967 200	2 905 300	62 311	13500	10900	2,10

*Source: The Federal State Statistics Services, 2016.*

In 2012 the number of unemployed there was 33 thousand people. The registered unemployment rate for the period was 1.14%. As we can see, the sanctions, though not as much as in Moscow, but finally had negative impact on the rate of unemployment in 2013. However, the registered unemployment rate higher than in Moscow, but still lower than average in the whole country.

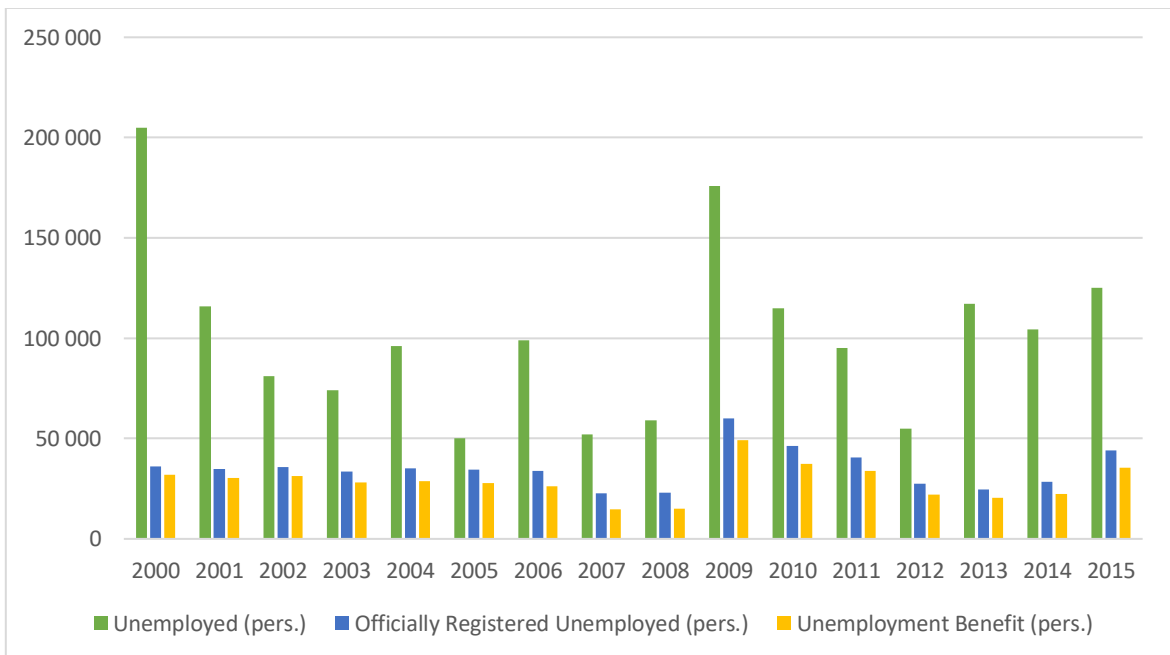
For a more visual perception of the presented data, we can provide a graphical illustration of the situation with employment and unemployment on both megacities of RF:

**Figure 3. Average unemployment rate and economically active people in Moscow (2000-2015)**



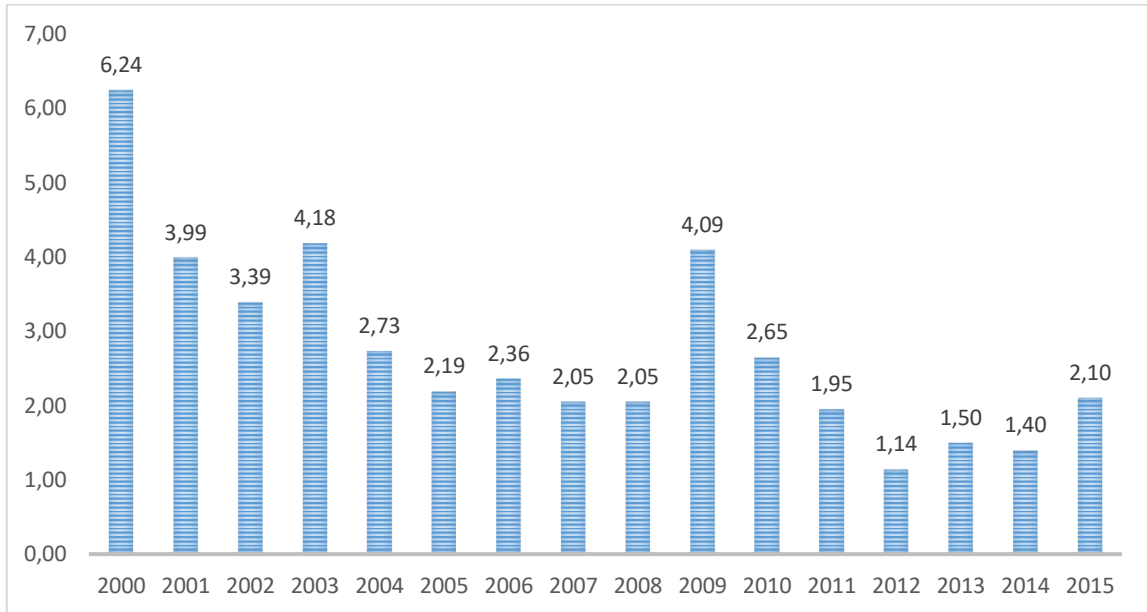
*Source: Author's own figure.*

**Figure 4. Number of unemployed, officially registered unemployed and unemployed citizens receiving unemployment benefits in Moscow**



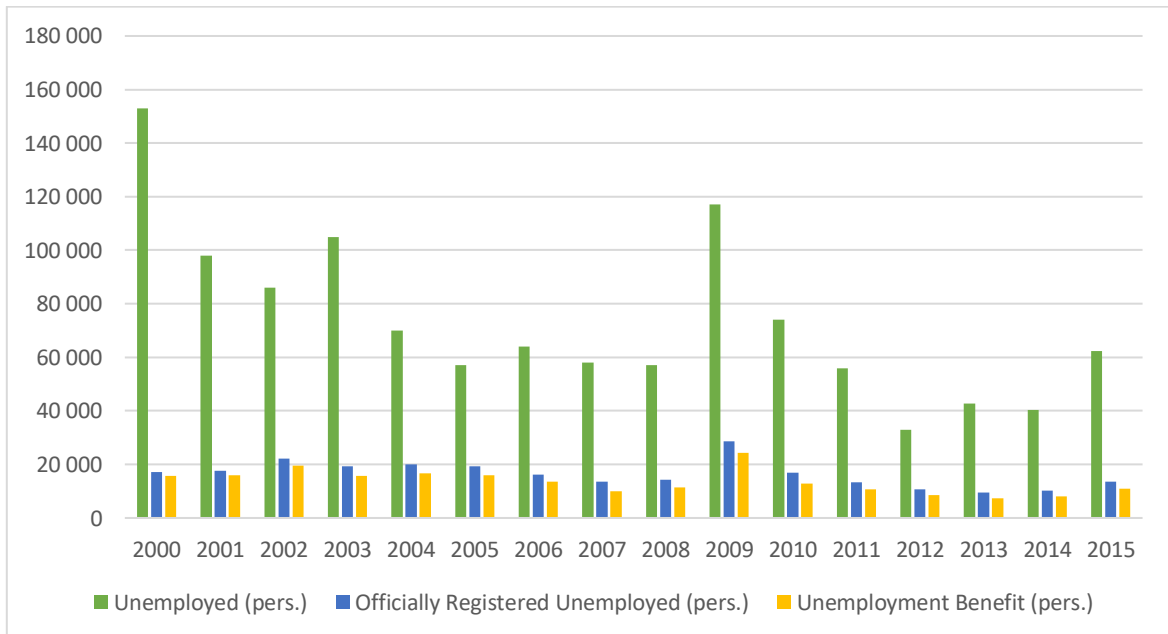
*Source: Author's own figure.*

**Figure 5. Average unemployment rate and economically active people in St. Petersburg (2000-2015)**



*Source: Author's own figure.*

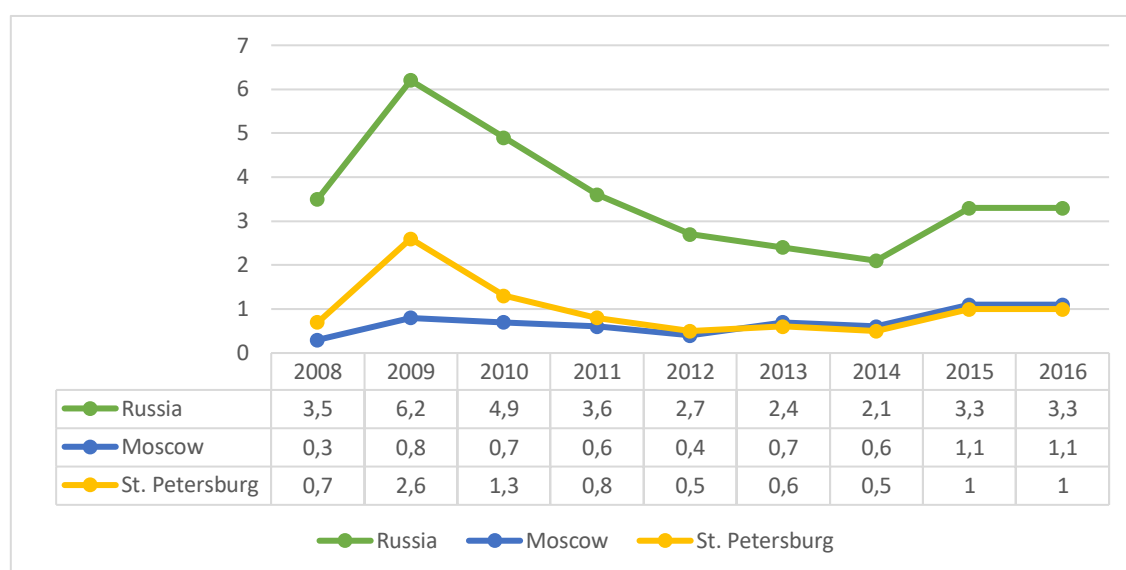
**Figure 6. Number of unemployed, officially registered unemployed and unemployed citizens receiving unemployment benefits in St. Petersburg**



*Source: Author's own figure.*



**Figure 7. The ratio of job seekers to job openings in Russia vs Moscow and St. Petersburg**



*Source: Author's own figure.*

Such a low level of unemployment in both cities is explained not so much by the real situation, but by other aspects:

1. peculiarities of the Russian system of support of unemployed, which does not provide sufficient incentives to register and oriented to "clipping" long-term unemployed;
2. the lack of confidence of citizens that it is possible to find a decent job by registering at the labor exchange;
3. a very low level of material support.

It is also important to keep in mind low attractiveness of vacancies offered by employment services. The reason for this is that the vast majority of jobs designed for skilled workers, is filled without the assistance of the relevant public services and, as a rule, on recommendations. Therefore, the vast majority of vacancies are officially published by the employment service, is not of significant interest either for Muscovites nor for Petersburgers, engaged in the search for a suitable job.

#### **4.5.2. Regression analysis**

To conduct regression analysis with the time period from 2001 to 2015 for Moscow and St. Petersburg we will use the following factors:

Dependent:

Y – Unemployment rate in % for 2001-2015

Independent:

X1 – GRP per capita, growth rate, %;

X2 – Fixed investment, growth rate, %;

X3 – Total population growth, growth rate, %;

X4 – Population, growth rate, %;

X5 – Economically active population, growth rate, %;

X6 – Migration, growth rate, %;

X7 – Foreign direct investment, growth rate, %.

**Table 8. Initial data. Moscow**

<i>Year</i>	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>
2001	2,1	16,26	11,28	-14,11	1,68	4,55	-22,02	56,26
2002	1,4	27,29	26,78	-24,85	1,34	3,30	-7,32	29,25
2003	1,3	22,23	22,32	27,16	1,29	0,68	5,29	23,13
2004	1,6	28,31	32,99	28,21	1,62	2,20	1,85	15,87
2005	0,8	42,33	27,19	3,45	1,83	1,77	6,33	157,57
2006	1,6	25,10	29,41	-15,03	1,69	1,56	-7,91	7,87
2007	0,8	25,80	31,44	-43,09	1,20	3,55	-40,26	46,17
2008	0,9	22,14	24,08	-0,67	0,85	1,48	82,18	-57,79
2009	2,8	-14,34	-22,86	6,07	0,87	0,08	5,45	61,02
2010	1,8	16,19	-1,30	58,10	1,14	0,97	49,38	-22,95
2011	1,4	17,60	16,88	-54,80	3,10	3,23	-31,83	109,12
2012	0,8	4,15	42,46	410,27	0,86	2,35	78,89	-46,22
2013	1,7	9,61	15,82	-64,88	1,06	1,17	2,91	52,28
2014	1,5	7,19	9,11	-30,60	0,91	3,02	-36,03	-4,47
2015	1,8	4,93	0,11	48,35	0,91	-0,28	61,64	34,30

Source: *The Federal State Statistics Services, 2016.*

**Table 9. Initial data. St. Petersburg**

<i>Year</i>	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>
2001	4	34,45	48,14	-2,40	-0,57	0,57	-5,87	35,49
2002	3,4	34,63	43,03	20,85	-0,62	3,12	-25,53	16,49
2003	4,2	22,01	46,86	-117,42	-0,28	-1,22	-45,34	74,29
2004	2,7	31,97	5,45	339,49	0,32	2,07	104,36	-1,29
2005	2,2	22,21	33,20	7,81	0,54	2,18	62,46	19,07
2006	2,4	23,02	23,48	31,61	0,65	4,01	40,33	42,39
2007	2,1	34,96	56,67	-50,10	0,55	3,19	33,57	48,86
2008	2	27,20	22,80	95,50	0,54	-0,11	21,40	26,15
2009	4,1	2,34	-10,35	0,58	0,71	1,35	-5,50	-16,78
2010	2,6	13,97	20,19	95,57	1,04	-1,40	17,77	-5,29
2011	2	21,59	-10,25	-19,09	1,24	1,82	59,34	71,52
2012	1,1	7,61	-2,29	38,80	1,31	1,33	26,37	-22,93
2013	1,5	7,33	34,94	39,00	1,79	-1,62	34,99	48,62
2014	1,4	5,12	10,14	-42,52	1,61	1,27	-47,21	-27,67
2015	2,1	12,61	-7,63	-43,09	0,91	2,85	-52,15	-4,97

Source: *The Federal State Statistics Services, 2016.*

Using Excel, we obtain a matrix of paired coefficients (Table 10; 11), on the basis of which we can conclude about the factors that can be included in the model of multiple regression.

**Table 10. Matrix of pair correlation coefficients. Moscow**

	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>	<i>X4</i>	<i>X5</i>	<i>X6</i>	<i>X7</i>
<i>Y</i>	1							
<i>X1</i>	-0,63	1						
<i>X2</i>	-0,82	0,66	1					
<i>X3</i>	-0,27	-0,26	0,31	1				
<i>X4</i>	-0,08	0,43	0,20	-0,32	1			
<i>X5</i>	-0,29	0,35	0,44	-0,11	0,41	1		
<i>X6</i>	-0,16	-0,20	0,01	0,63	-0,49	-0,55	1	
<i>X7</i>	0,10	0,26	-0,14	-0,45	0,61	0,12	-0,55	1

Source: *Author's own table.*

**Table 11. Matrix of pair correlation coefficients. St. Petersburg**

	Y	X1	X2	X3	X4	X5	X6	X7
Y	1							
X1	0,32	1						
X2	0,29	0,60	1					
X3	-0,12	0,21	-0,23	1				
X4	-0,79	-0,75	-0,53	0,01	1			
X5	-0,10	0,33	-0,14	0,01	-0,18	1		
X6	-0,28	0,28	-0,09	0,68	0,17	0,14	1	
X7	0,22	0,48	0,51	-0,31	-0,27	-0,12	0,17	1

Source: Author's own table.

The analysis of correlation matrix showed us the lack of multicollinearity (all coefficients are less than 0.8), therefore we can provide a regression analysis using the method of backward stepwise regression (Table 12, 13)

**Table 12. Regression statistics. Moscow**

Dependent variable: Y

	coefficient	std. error	t-ratio	p-value	
const	1.96799	0.123678	15.91	6.65e-010	***
X2	-0.0271709	0.00518041	-5.245	0.0002	***
Mean dependent var	1.486667	S.D. dependent var	0.546243		
Sum squared resid	1.340564	S.E. of regression	0.321124		
R-squared	0.679086	Adjusted R-squared	0.654401		
F(1, 13)	27.50932	P-value(F)	0.000158		
Log-likelihood	-3.171879	Akaike criterion	10.34376		
Schwarz criterion	11.75986	Hannan-Quinn	10.32867		
rho	-0.378818	Durbin-Watson	2.578494		

Test for normality of residual -

Null hypothesis: error is normally distributed  
 Test statistic: Chi-square(2) = 1.21816  
 with p-value = 0.543851

LM test for autocorrelation up to order 4 -

Null hypothesis: no autocorrelation  
 Test statistic: LMF = 0.899363  
 with p-value = P(F(4, 9) > 0.899363) = 0.503173

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present  
 Test statistic: LM = 1.32202  
 with p-value = P(Chi-square(2) > 1.32202) = 0.516329

Source: Author's own table.

**Table 13. Regression statistics. St. Petersburg**

Dependent variable: Y

	coefficient	std. error	t-ratio	p-value	
const	4.68692	0.516840	9.068	1.02e-06	***
X1	-0.0531233	0.0175789	-3.022	0.0106	**
X4	-1.69507	0.275498	-6.153	4.93e-05	***
Mean dependent var	2.520000	S.D. dependent var	0.987204		
Sum squared resid	2.952709	S.E. of regression	0.496043		
R-squared	0.783589	Adjusted R-squared	0.747521		
F(2, 12)	21.72505	P-value (F)	0.000103		
Log-likelihood	-9.094125	Akaike criterion	24.18825		
Schwarz criterion	26.31240	Hannan-Quinn	24.16562		
rho	-0.262254	Durbin-Watson	2.439370		

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 0.621312

with p-value = 0.732966

LM test for autocorrelation up to order 4 -

Null hypothesis: no autocorrelation

Test statistic: LMF = 0.277634

with p-value =  $P(F(4, 8) > 0.277634) = 0.884434$ 

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 4.48202

with p-value =  $P(\text{Chi-square}(5) > 4.48202) = 0.482293$ *Source: Author's own table.*

By constructing the regression equation, we saw that the multiple regression coefficient is 0.82 for Moscow and 0.89 for St. Petersburg, in other words the connection between factors are close and high. The coefficients of determination are 0.68 and 0.78, which mean that the unemployment rate in Moscow depends on 68 % by the Foreign investment; dependent variable (Unemployment rate) for St. Petersburg depends on GRP per capita and amount of population by 78%, and the remaining unaccounted factors in the models account for 32% and 22%.

The values of Fisher's F-test in both cases greater than F-criterion ( $F_{\text{table}}$  for Moscow is 4.6,  $F_{\text{table}}$  for St. Petersburg is 3.88). Hence,  $F_{\text{fact.}} > F_{\text{table}}$ , the null hypothesis is rejected in both cases, and the regression equations are statistically significant. Moreover, it is established that the models meet the general requirements for the normality of residuals, homoscedasticity and lack of autocorrelation.

Regression equation for Moscow:

$$Y = 1.97 - 0.03X2$$

It means, that with the increase in the growth rate of Fixed investment by 10 %, the unemployment rate will decrease by 0.3 %

Regression equation in St. Petersburg:

$$Y = 4.69 - 0.05X1 - 1.7X4$$

With the increase in the growth rate of GRP per capita by 1 % and the invariance of factor X4, the unemployment rate will decrease by 0.05%. In the case of the increase in the growth rate of amount of population by 1 % and the invariance of factor X1, the unemployment rate will decrease by 1.7 %

## **5. RESULTS AND DISCUSSION**

### **5.1. The results of the comparison**

For standard unemployment recorded according to the existing rules and regulations, the two largest cities of Russia have some common features:

- natural character, i.e. either frictional unemployment associated with the causes of personal property, or unemployment associated with the structural mismatch of occupational skills and job vacancies, resulting in low unemployment and a low value of coefficient of tension;
- increase the educational status;
- decrease in the average duration of job search;
- the level of unregistered unemployment is higher than that of registered one (which makes it close to non-standard unemployment);
- unemployment is «younger» than in Russia;
- some types of economic activities contribute to the reduction of unemployment among migrants: as a wholesale, retail trade and construction.

The distinctive characteristics arising from differences in the standard unemployment rate in these two cities include:

- different degree of attractiveness of labor migration from the point of view of migrants and cities (a great need in the labor force in St. Petersburg, but lesser attractiveness to migrants in comparison with Moscow);
- different "speed" of transformation of ownership, different impact of the fixed investment, and, accordingly, different "speed" effect on employment growth (higher in Moscow than in St. Petersburg). (Eremeeva, 2016)

Identifying these differences, we can conclude that the distinguishing features of St. Petersburg in comparison with Moscow largely reproduce the characteristics of the country as a whole. Moscow, due to the special status of the capital, has a number of differences: population growth caused by migration and natural growth is great, the investment in the fixed capital is bigger, greater "speed" of change of forms of ownership, which confirms the validity of the hypothesis of capital in major cities, the special structure of the postindustrial economy and their impact on unemployment.

## **5.2. The main directions of regulation of unemployment in Moscow and St. Petersburg**

State policy in the field of employment of the city population implements providing citizens with appropriate safeguards on the basis of existing centres for employment, retraining and professional orientation of the population, created by the City employment service. In this regard, the concept of employment demanded new definition. On the one hand, 'voluntary unemployment' is legal. On the other hand, unemployment of a person who is looking for a job is another matter. This category of the population should be under the control of the state, designed to provide every citizen his constitutional right to work. Accordingly, there is a need to keep score of the unwillingly unemployed population (Matskulyak, 2005, p. 24-27).

The law provides for the obligation of the unemployed citizen to report it. This is one of the new principles that define the rules of conduct of the citizen and the state in the labor market: an unemployed citizen appeals for help to the state, namely in the city employment service. Person is registered as a job seeker. Since that moment, the state is obliged within 10 calendar days to provide him with a suitable job. If after this period, there are no proposals for a suitable job there, he becomes unemployed and begins to receive state benefits.

The city employment service is a structure of special state bodies, designed to ensure coordination, the decision of questions of employment of the population, to regulate the supply and demand for labor, to assist citizens in employment, organization of their vocational training, the provision of social support to the unemployed. Services are provided by employment service free of charge.

In 2008-2010 in Moscow and St. Petersburg funds from the budget were allocated for the creation and modernization of jobs, including specialized, for people with disabilities. Measures were implemented to ensure access by persons with disabilities to jobs and objects of industrial infrastructure, their education and training.

In the modern context in the field of employment urban policy is focused on improving the efficiency of work, creation of conditions for improvement of the sectoral distribution of the workforce, linkages to ongoing activities with the interests of the parties in the labor market. The purpose of state regulation of employment in Moscow and in St. Petersburg at the present stage is to ensure a balanced labor market and minimize unemployment to the percentage needed for the normal functioning of market mechanisms. A form of implementation of the state employment policy at all levels of government is a city program.

State policy for effective employment in the cities of Moscow and St. Petersburg strategically solves different tasks, which indicate adaptation funds (employment programs) to achieve the same goals but in different conditions. In Moscow it is important to ensure the effective employment of the existing population (to prevent cyclical unemployment), in St. Petersburg effective employment requires a significant increase in the labor force, which is typical for the country as a whole.

For the modern Russian economy, from the point of view of selection of labor resources in the near future, there exist anti-opportunities and threats. Therefore, it is extremely rational to treat the existing economically active population including the unemployed correctly, otherwise diminishing capacity of human resources will become a brake of economic growth. This "inhibitory effect" already develops, so the problem lies in weakening this negative effect.



### **5.3. Advantages and disadvantages of big cities in fighting unemployment**

Only major city has the money or the market potential, the competitive advantages that can stably self-reproduce, and reproduce the conditions necessary for employment, in all other cases this is not happening. In other settlements people can't freely find or change jobs, since all other areas can be deprived of money to the extent in the amount they are present in a large city. There may not be competitive advantage that contribute to the rational distribution of all other inputs needed for productive work. The smaller the area, the more professionalism must be addressed to the task of creating jobs.

Therefore, the documents defining the strategies for labor market management should define creating and improving legal, economic and institutional conditions for increasing the efficiency of employment. It is clear that such measures will manifest themselves only in those places where there is market potential, jobs, employment and market unemployment. Territories, deprived of the market potential, can face degradation as a consequence of the lack of adequate action.

Megacities can come across hazards. As a place with developed competitive advantages, where it is easy to find a job and desirable quality of life, big city inevitably attracts new residents, visitors, firms and investment. The influx of people and resources entails an increase in prices for housing and real estate, increases the burden on existing infrastructure and social services budgets. To cope with these problems, the city will raise taxes on the population and firms or require more substantial funding from Central budget to pay for the necessary improvements in systems of transport, communications, energy and social sectors. Paradoxically, the well-being and attractiveness of a major city can awaken forces, which in the end will destroy its attractiveness, as they might operate the internal factors of the economic downturn (Kotler, Asplund, Rein and Haider, 2005, p. 33).

Unemployment in a large city with its complex structure due to interlocking types of industrial and post-industrial development, begins to develop on the cumulative principle. It is usually more protracted in time than in areas with less complex structure. During the current unemployment crisis in Moscow and St. Petersburg unemployment continued to grow, when the rest of the country felt release of unemployment tension. In a recession, non-standard employment turns into non- standard unemployment.

In the conditions of market relations formation appearance of non-standard employment was a factor, lightening the severity of transients in the current market, but the unwinding of non-standard unemployment only adds to the depth of the crisis. In this case, there is the imperfection of the legal, economic and institutional development.

It is therefore important for the state, to develop an employment strategy that seeks to make it attractive to live not only in the major cities (they are attractive), but also to develop other areas and places, in order to protect large cities from the start of the internal mechanisms of self-destruction.

Measures to overcome unemployment of a non-market type, as shown by the positive European experience, give sustainable results in 10-15 years. So they really should be built into the strategy, to respond to obstacles and setbacks on the road of developing the necessary competitive advantages that trigger the market mechanism in the labor market.

The positive role of large cities in the development of other settlements and territories is, as a kind of ground for farming institutional, product and process innovations, they represent a source of diverse experience, allow you to select the most appropriate areas for activities that may compete with their own fantasies of the local population and authorities.

## **6. CONCLUSION**

The undertaken study was aimed at theoretical substantiation of the need for additional factors reflecting features of contemporary unemployment for differentiated approach in developing measures for dealing with unemployment in a modern economy of the Russian Federation. The actually used state control measures are traditional, and their theoretical basis can be traced in the writings of the classical economists. This might be one of the reasons for the low efficiency of state regulation of the labor market. In conditions of economic crisis, the need for other embodiments of the concepts supporting the strategic regulatory measures to overcome unemployment is magnified.

The essence of the new approach, which was developed in the thesis, consists in the introduction of the analysis of such relevant institutional factor of the modern economy, as a major city. It allowed to bring the analysis beyond the known, very general characteristics of the macroeconomy, and to reflect the current state of the labor market and unemployment.

The possibility of introducing in the theoretical analysis of the factor "major city", argued that it is the most developed economic Institute, as it concentrates the economic resources such as capital and labor in greater volume than other territorial institutions. Their concentration in large cities makes the most obvious reflection of the peculiarities of national development, including the labor market and employment. The emphasis on the concentration of capital in a major city and its absence or scarcity in other areas of the national economy, gives foundation to divide unemployment into "market" and "nonmarket". Within the boundaries of the national economy, it is impossible to explain the existence of unemployment only by market factors. There are such areas in Russia, where the market potential is missing, and therefore the nature of unemployment is quite different, i.e. "non-market".

The theoretical conclusions of the concept study were confirmed by empirical analysis of data on unemployment in RF and its major cities (Moscow and Saint Petersburg), which, according to the hypothesis, represent the market potential of the economy in the most developed form. It was also important to analyze the political practices of overcoming unemployment in these cities. At the end of the thesis, we managed to word provisions that improve the development of strategy of state policy in the sphere of overcoming unemployment, showing the differentiated approach to the effects. These are direct and indirect measures, differentiated according to the nature of unemployment.

The analysis of employment policies in two megacities of Russia - Moscow and St. Petersburg - showed that the tactical employment policy objectives of these two cities are different. In Moscow, it is important to ensure the effective employment of the existing population, while St. Petersburg's effective employment requires a significant increase in the economically active population, which is typical for the country as a whole.

The characteristics of today's large cities focus attention at the postindustrial type of economy and, consequently, the nature of employment. The post-industrial economy corresponds to non-standard employment, which was confirmed in the study of the theoretical arguments with empirical facts. Nevertheless, modern post-industrial society provided the opportunity for diversity of economic activities, and, accordingly, forms of employment. As in specular reflection, various forms of employment resulted in a variety of forms of unemployment that do not fit in the old standard view, and defined in the thesis as nonstandard. "Non-standard employment" is understood in the study, through deviation from

the "standard", similar to how is the "imperfect competition" relative to "perfect competition".

At present, we observe in Russia the phenomenon of discrepancy of the economic situation and unemployment. Russian companies instead of laying off employees, cut their salaries, send them on unpaid leave or transfer to part-time employment. The Russian labor market has worked out different mechanisms of adaptation to adjust to the crisis. It does this not so much due to the quantitative adjustment, but rather due to price and time. In this case, employees suffer from having to work much time for a small salary, but there is no panic in the society because the average unemployment rate is bearable or even reasonable. Hopefully, it will soon give results, otherwise there might be serious discontentment of the population.

Considering the problem of state regulation in the sphere of unemployment, it should be specially emphasized that economic theory has no consensus in the estimation of the theoretical developments in this area, nor a universal positive experience. Anyhow, according to the logic of the conducted study, it was suggested to classify the methods for overcoming unemployment, from the point of view of the state in two directions.

The first direction (in the case of the market unemployment, which increasingly becomes a typical non-standard type): To regulate the unemployment rate, it is preferable to use indirect methods, through the creation of economic incentives and legal standards that support the establishment of new institutions of employment.

The second direction (in the case of unemployment of "non-market" type): to ensure inflow of capital, for example, the targeted development of investment projects. In this regard, to adequately assess the potential of small businesses which are not likely to develop in areas with lack or serious scarcity of capital.

## 7. REFERENCES

1. Amato, J.D., Gerlach, S. 2000. *Comparative Estimates of New Keynesian Phillips Curves*, Working paper № 265.
2. Apokin, A. 2008. *Analysis of Students' Employment in the Context of the Russian labor market* / A. Apokin, M. Yudkevich // *Questions of Economy*. - № 6. - С. 98-110.
3. Becker, G. 1981. *A Treatise on the Family* / G. Becker. - Cambridge: Harvard University Press. 424 p. ISBN 0-674-90699-3
4. Bulanov, C.B. 1996. *Modern Problems of Employment and Unemployment: Educational-methodical manual*. - M.: Publishing house RAGS.
5. Clark, K. 1982. *Unemployment Insurance and Labor Market Transitions* / K. Clark, L. Summers // *Workers, Jobs, and Inflation* / Edited by Martin Neil Bailey. - Washington, DC: Brookings Institution. Pp. 279-318.
6. De Soto, H. 1995. *The Other path: The Invisible Revolution in the Third World: a Study of Illegal economy in Peru*: / E. De Soto / ed. intr. M.V. Llosa. -Moscow: Catalaxy. 319 p.
7. Drucker, P.F. 2007. *Management challenges for the twenty-first century. Chapter V. The Second Half of Your Life*. M.: Publishing house "Williams". С. 252-254. ISBN 0750685093
8. Eremeeva, E.M. 2016. *Labor and employment of the population of Moscow*. Electronic source:  
[https://czn.mos.ru/cms\\_data/usercontent/regionaleditor/документы/труд%20и%20занятость/сборник%202016%20\(ок.%20вар.\).pdf](https://czn.mos.ru/cms_data/usercontent/regionaleditor/документы/труд%20и%20занятость/сборник%202016%20(ок.%20вар.).pdf)
9. Feldstein, M.S. 1974 *Unemployment Compensation: Adverse Incentives and Distributional Anomalies* / M. Feldstein // *National Tax Journal*. Vol.27. - № 2. - June. - Pp. 231-244.
10. Feldstein, M.S. 1978. *The Effect of Unemployment Insurance on Temporal Law of Unemployment* / M.S. Feldstein // *American Economic Review*, American Economic Association. Vol. 68 (5). - December. - Pp. 834-846.
11. Friedman, M. 1999. *If Money Could Speak*. M.: Case. 160 p.

12. Gimpelson, V.E., Kapelushnikov, R.I. 2006. *Non-standard employment in the Russian economy*. Higher school of Economics. - M.: Publishing House. House of HSE.
13. Hamermesh, D.S. 1977. *Jobless Pay and the Economy* / D.S. Hamermesh. - Baltimore: University Press. 114 p.
14. Harrod, R. 1939. *Essay in Dynamic Theory* / R. Harrod // *Economic Journal*. - Vol. 49. - P. 14-33.
15. Hibbs, D. 1977. *Political Parties and Macroeconomic Policy* / D. Hibbs // *American Political Science Review*. - Vol. 71. - Pp. 1467-1487.
16. Investopedia. 2017. *Unemployment*, Electronic resource: <http://www.investopedia.com>
17. Kartasheva, A., Kubishin E. 2005. *The Situation on the Labor Market: Directions of Development* // *Economist*. No. 12.
18. Katsuk, O.A. 2000. *Evolution of the Theory of Employment in a Transition Economy* / O.A. Kacuk. - Tambov: TSU Publishing house, - 20 C.
19. Keynes, John Maynard. 2014. *The General Theory of Employment, Interest and Money*. Electronic resource: [https://ebooks.adelaide.edu.au/k/keynes/john\\_maynard/k44g/index.html](https://ebooks.adelaide.edu.au/k/keynes/john_maynard/k44g/index.html)
20. Kostina, O.Y. 2006. *Regulation of the Labor Market of Small Towns of Russia*. M., 2006. Electronic resource: <http://www.hr.guu.ru/upload/kostina.doc>.
21. Kostyrya, A.V. 2010. *Unemployment and improvement of regulation*. The dissertation on competition of a scientific degree of Candidate of Economic Sciences. Belgorod. 267 p.
22. Kotler, F., Asplund K., Rein I. and Haider D. 2005. *Marketing places*. *Stockholm school of Economics in Saint-Petersburg*. - 416 p.
23. Kulikov, V.V. 2000. *Social Imperatives of Continued Economic Reform* // *REJ.*, No. 1.
24. Kulikov, V.V. 2005. *Of the National Economy: textbook* / ed. by P.V. Savchenko. - M.: Economist. // *REJ*. 2006. No. 4.
25. Kunz, J. 2004. *Unemployment and Employment policy at a Local Level: Academic Dissertation*. *Tampere*. Electronic resource: <http://tampub.uta.fi>
26. Lagunova, I.I. 2007. *The Infrastructure of the Labour Market and Ways of Its Development* / I.I. Lagunova. - Belgorod: "Cooperative education", - 26 p.

27. López-Santana, M. 2014. *Regional and Domestic Responses to the Unemployment Problem in Europe: Reconfiguring the Architectures of Welfare States*. Electronic resource: <http://web.isanet.org>
28. Malthus, T.R. 1993. *An essay on the Principle of Population*// The Anthology of Economic Classics. M. Vol.2. – 539 p.
29. Marshall, A. 1993. *Principles of economic science*. Vol. 1, M.: "Progress". 310 p.
30. Marston, S.T. 1973. *The Impact of Unemployment of Job Search* / S.T. Marston // Brookings Papers on Economic Activity. - Vol. 1. - Pp. 13-48.
31. Marx, K. 1969. *Capital. Critique of political economy*. Vol. 1. M.: Political literature. 514 p.
32. Matskulyak, I.D. 2005. *Employment Strategy: Prevention of Unemployment (political and economic aspect)* // Economy and life. No. 4. P. 24 - 27.
33. Menger, K. 1992. *Austrian School in Political Economy* / K. Menger, E. Böhm Bawerk, F. Wieser. - M.: Economics. 496 p.
34. New English-Russian explanatory dictionary of financial markets. 2005. Electronic resource: <http://Slovar-Vocab.com>
35. Phillips, A.W. 1958. *The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957* / A.W. Phillips // *Economica*. - Vol. 25. - № 100. - November. Pp. 283-299.
36. Pigou, A. 1985. *The Economic Theory of Welfare, Part 2*. Publishing house "Progress", Moscow. 512 p.
37. Porter, M.E. 1998. *Cluster and the New Economic of Competition* / Harvard Business review, Nov/Dec.
38. Portes, A. 1994. *Informal Economy and its Paradoxes* / A. Portes // *The Handbook of Economic Sociology*. - NY.: Princeton. Pp. 426-449.
39. Ricardo, D. 1955. *Collection of Works: Vol. 1.* / D. Ricciardo. M.: Politliterature. 360 p.
40. RosBusinessConsulting. 2016. Electronic resource: <http://www.rbc.ru/economics/23/08/2016/57bc614b9a794747a5086219>
41. Rosstat. *Russia in Figures*. 2016. Electronic resource: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/publications/catalog/doc\\_1135075100641](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1135075100641)

42. Russia facing demographic challenges: to change the reality and adapt to reality. 2013. *Report on human development in the Russian Federation*. Electronic resource: <http://unrussia.ru>
43. *Russian Statistical Yearbook* – 2015. 2015. Electronic resource: <http://uisrussia.msu.ru>
44. Say, J.-B., Bastiat, F. 2000. *A Treatise on Political Economy* / Jean-Baptiste Say; Economic sophisms. Economic harmony/ by F. Bastiat. M: Business. 232 p.
45. Schultz, T. 1961. *Investment in Human Capital: The Role of Education and of Research* /T. Schultz//American Economic Review. - March 1961.-Vol. 51.-Pp. 1-17.
46. Schultz, T. 1964. *The Economic Value of Education* / T. Schultz. - N.Y.: Columbia University Press. 92 p.
47. Smith, A. 1997. *An Inquiry into the Nature and Causes of the Wealth of Nations*. The first book "On the Causes of the Increase in Labor Productivity... " M.: 1997. – 570 p.
48. Solow, R.M. 1980. *On Theories of Unemployment* / R.M. Solow // American Economic Review, American Economic Association. - March 1980. - Vol.70.-№1.- P. 1-11.
49. Spence, M. 1973. *Job Market Signaling* / M. Spence // The Quarterly Journal of Economics. - 1973. - August. - (83) № 3. - Pp. 355-374.
50. The Federal State Statistics Services, 2016. Electronic sources: <http://cbsd.gks.ru>
51. The Ministry of FINANCE of Russia. 2016. *consolidated budget of the Russian Federation*. Electronic resource: <http://minfin.ru>
52. Toffler, O. 1991. *The Future of Work* / A. Toffler. - M.: Nauka. 389 p.
53. Tugan-Baranovsky, M. I. 1997. Favorites. *Periodic Industrial Crises. History of English Crises. General theory of crises* / M.I. Tugan-Baranowski, M.: Nauka, "Russian political encyclopedia". 574 p.
54. Unemployment rate in the Russian Federation, 2016. Electronic resource: <http://уровень-безработицы.рф>
55. Unified interdepartmental information and statistical system. 2016. *The ratio of job seekers to job openings*. Electronic resource: <https://www.fedstat.ru/indicator/43703>
56. Vorontsov, V. P. 2008. *The Fate of Capitalism in Russia* / V.P. Vorontsov // Economics and Capitalism. - M.: Astrel, 2008. - PP. 51-336.



57. Yakovleva, A.V. 2010. *Features of Unemployment in a Large City: Trends in Regulation*. The dissertation on competition of a scientific degree of Candidate of Economic Sciences. St Petersburg. 192 p.
58. Zhuravleva, G.P. 2008. *Economic Theory and Policy of a Market Economic System/ Free Economic Society of Russia, Tambov regional office / G.P. Zhuravleva, V.V. Smagin. - M.: Finances and Statistics. 604 p.*