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SIMULATION OF THE SELF-EMPLOYED LABOUR SUPPLY AND DEMAND

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Abstract

This article describes the modeling of the professional self-determination of the self-employed in conditions of socio-economic instability. For verification, the questionnaire "Professional self-determination during a pandemic and crisis" was used, which includes 42 statements aimed at identifying personal and professional attitudes, features of decision-making and planning, as well as the characteristics of respondents' experiences. The study sample consisted of 250 people. When developing the model, all subjects of labour activity were subdivided into: representatives of socionomic professions and representatives of technonomic professions. Statistical methods included frequency, comparative, and correlation analysis. The results showed that representatives of the socionomic professions have a higher adaptability, have a lower level of psychological tension, and also have a low level of criticism towards the official media. The conducted research confirmed the role of such internal psychological resources as the ability to quickly assess a new situation, the ability to make decisions in conditions of uncertainty, and confidence in achieving the set goals. The study confirmed the role of the optimistic orientations of the subject of labour activity in solving the problems of professional self-determination.

Keywords: Simulation modeling, professional self-determination, subjects of labour activity, unemployed, socio-economic crisis

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1. Introduction

The effects of the COVID-19 pandemic have been reflected in the global economic downturn, negatively affected the labour supply and demand of many countries, and affected the unemployment rate. According to the Ministry of Economic Development, more than 15 million people did not work in Russia during the quarantine period, some of them (according to official statistics, about 5%) were reduced and dismissed. The economic situation around the world, including in Russia, continues to be unstable. Many companies have resumed commercial activities, but according to surveys conducted by RBC (https://www.rbc.ru/), due to the consequences of the crisis, more than 20 percent of Russian companies will optimize their job responsibilities in order to reduce the number of employees. All this already has a negative impact on the quality of life and creates uncertainty in the future for a fifth of the subjects of labour activity. According to the conducted research, uncertainty in the future, a high degree of economic instability, cause anxiety, stress and lack of prospects. Information coming from the media and social networks increases the growth of anxiety and fears, provokes the development of mental maladaptation, aggression, interpersonal conflicts, inappropriate behaviour and actions. Prolonged exposure to uncertainty reduces activity, blocks the desire and ability to find and use even simple behaviour patterns to overcome difficult situations (Aldasheva et al., 2020; Garfin et al., 2020; Kubrak & Latynov, 2020; Nestik, 2020; Okruszek et al., 2020).

Studies of the psychological consequences of unemployment have shown that the loss of a job at the initial stage is experienced primarily as the inability to satisfy higher motivations, social status, interaction with the familiar environment. Having lost their jobs, people lose the ability to meet the needs associated with self-determination, self-actualization, self-preservation, as well as with dedication, affiliation, the need for unity and love (Nuttin, 2004).

As a result of the conducted research on ways to adapt and cope with the situation of job loss, people who lost their jobs tend to get a job in their specialty – to find a job where their existing professional experience and skills can be in demand. However, if it is not possible to find a job for a short time, personal feelings about their own lack of demand increase, there are signs of general psychosomatic distress and depression (Drobysheva et al., 2019). In the future, the unemployed have deep personal changes that affect the entire value system. In other words, with the increase in the "duration of unemployed status ", there is a transformation of value-semantic orientations takes place. As a result, there is a reassessment of their personal and professional prospects, increased change in social status, there is an identity change occurs, mismatch between individual needs and external environmental factors (Aldasheva et al., 2020; Emmons, 2003; Giddens, 1991).

The process of professional self-determination is realized through the choice of a new profession, new socialization and personal development. In the works of Zhuravlev (2004), the result of a decision determines both a separate action and behaviour as a whole. During the crisis, decision-making of the subject of labour, largely determines the effectiveness of professional and self-determination. According to the concept of Klimov (2012) professional self-determination is the result of search activity and has a two-level structure, including the gnostic and practical levels. professional self-determination as a psychological structure appears through a feature of professional self-awareness and identity to a particular profession,

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assessment of one's qualifications and compliance with the professional standard, vision and awareness of their position in the professional group, assessment of one's capabilities, abilities and prospects in the chosen field of work (Klimov, 2012). In the works of Zeer (2003), professional self-determination is considered in the context of a specific professional choice and in connection with the level of social maturity of the individual. Professional self-determination occurs throughout a person's life a person is constantly faced with problems of professional goals, career issues, attitudes towards the choice of a field of work, etc. According to Pryazhnikov (2008), self-determination has a multicomponent structure, in which such components as the ability to navigate in the socio-economic situation and to predict the prospects of the chosen work. Initiative, readiness and ability to master a new profession, the ability to quickly navigate in conditions of uncertainty, are predictors of successful professional reorientation. Initiative, readiness and ability to master a new profession, the ability to quickly navigate in conditions of uncertainty, are predictors of successful professional reorientation. The development of a predictive imitation model of the labour market, professional reorientation and self-determination becomes a priority in the context of the socio-economic crisis.

2. Problem Statement

The socio-economic crisis is caused by the COVID-19 pandemic, there has been a decline in the economic well-being of labour actors. In the labour supply, the demand for a wide range of professions has decreased. Subjects of labour activity in a number of professions were forced to master new skills and look for a new field of activity. In this regard, studies related to modeling and forecasting both the entire labour supply and demand and, in particular, the labour supply and demand of the self-employed have become highly relevant.

3. Research Questions

Simulation modeling is a well-established and fairly reliable way to study any dynamic process or phenomenon. Here is a brief description of the model used in this study. The subject of labour can be a representative of either socionomic or technonomic profession. Within the framework of the used simulation model, we will assume that the subject of labour (regardless of whether he is a representative of the socionomic or technonomic profession) has the following alternatives: to continue working in his specialty, as an employee or self-employed, to undergo training - professional retraining or advanced training. After training, work as an employee or self-employed. Let us formalize all of the above by introducing into consideration the transition matrix (or the adjacency matrix), which determines the possibilities of transitions between the nodes of the model Wt = | wij | and Wc = | wij |, for representatives of socionomic (Wc) and technonomic (Wt) professions, respectively. Within the framework of the model, we will assume that the number of vacancies for representatives of socionomic and technonomic professions is non-negative finite numbers. Let us introduce into the model the phenomenon of socio-economic crisis in a simplified way such as 1) reduction of vacancies for all subjects of labour activity, and 2) an increase in the number of subjects of labour activity in the process of professional self-determination and professional reorientation.

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Let us define the dynamic and probabilistic characteristics of the model for two states: the situation on the labour market is stable and the labour market is in a state of crisis. Thus, different speeds and probabilities of transition between the nodes of the model are possible in the model. The study is devoted to the analysis of the relationship between the psychological resources of the subject of labour activity (ability to quickly assess a new situation, to make decisions in conditions of uncertainty, confidence in achieving the set goals, etc.) with the strategy of professional self-determination in the supply and demand for labour in a socially economic crisis and in the post-crisis period.

4. Purpose of the Study

The aim of the study is to develop and verify modeling tools for predicting and analysing possible situations in the labour supply and demand. One of the objectives of this study was to compare the quantitative characteristics of the simulation model with the psychological resources of the subject of labour in labour activity.

5. Research Methods

The model was verified by a questionnaire method. For verification, a specially developed questionnaire "Professional self-determination during a pandemic and crisis" was used, which included 42 statements aimed at identifying personal and professional attitudes, features of decision-making and planning, as well as the characteristics of respondents' experiences (Aldasheva et al., 2020).

The questionnaire used a 4-point scale with the following gradation: “true”, “perhaps true”, “perhaps not true”, “incorrect”. Internal consistency and reliability checks showed that Cronbach's alpha is $\alpha = 0.7$, which corresponds to the average level of reliability.

Research participants. The research involved 250 people, specialists of various professions living in different regions and cities in Russia.

The verification task was the experimental confirmation of the quantitative characteristics of the model. At the stage of processing and analysing the results of the questionnaire survey, the research participants were divided into the following groups.

1) group of “employees” (n = 145) - respondents who have an employer and receive income from professional activities;

2) “self-employed” (n = 57) - respondents who receive income from their personal labour activities, who do not have an employer and it is not employees himself;

3) group "unemployed" (n = 48) - respondents who do not have a job at the time of the survey. Table 1 presents the socio-demographic characteristics of the respondents.

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Table 1. Socio-demographic characteristics of respondents

Indicators	Self-employed	Unemployed	Employed
Women	64.91%	66.66%	57.6%
Men	36.09%	33.34%	42.4%
Age	35.42±13.25	31.45±11.53	38.73±10.15
Are married	63.79%	44.9%	60.1%
Have dependents	58.2%	45.1%	67.1%
Work experience	19.37±11.15	16.67 ±12.38	17.08±10.07
Work experience in the specialty	13.02±10.24	8.06±10.61	12.78±10.01
Higher education	66.66%	62%	87.04
Representatives of socionomic professions	80.7%;	32%	62%
Representatives of techno-economic professions	19.3%	68%	38%

Statistical processing of the survey data included the method of frequency analysis, correlation analysis (r-Spearman coefficient), comparative analysis (Mann-Whitney U-test). The SPSS software package was used.

6. Findings

To determine the quantitative characteristics of the model, a comparative analysis of the data obtained was carried out. Each of the groups of respondents participating in the study "employed", "self-employed" and "unemployed" was compared and contrasted with each other. The results comparison of the groups of respondents are presented in Tables. 2 and 3.

Comparison of the groups of “self-employed” and “employed” made it possible to identify statistically significant differences in variety of socio-demographic characteristics. As follows from Table 2, the average age of the “self-employed” is higher than that of the “employed”. Among the "self-employed" there is a greater number of employed in professions related to socionomic types of labour.

Table 2. Comparison of the groups "employed" - "self-employed" (fragment of the matrix)

Variables	U - Mann-Whitney	W Wilcoxon	Z
Age	4350.500	22305.500	-2.201*
Type of profession	4394.500	22349.500	-2.158*
Work in the specialty	3635.500	15570.500	-2.008*
Unemployment rate	4417.500	22372.500	-2.998**
Questionnaire			
I plan to find a new job that will suit me	3564.500	5217.500	-2.593**
When I successfully complete a task, I am always happy with myself	4744.500	22699.500	-1.841*
I don't like to plan anything in advance	4039.000	5692.000	-3.018**
At all costs, I want to maintain my usual way of life	3777.000	16338.000	-1.916*
In a difficult situation, I never think long	4249.500	5902.500	-2.537*
In my life, I follow the saying "Who does not take risks, does not win»	4525.500	6178.500	-1.935*

** - p<0,05; ** - p<0,01*

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As for the comparison of the answers to the questionnaire, it was found that in the group of “self-employed” there are statistically fewer respondents who “make decisions quickly in difficult situations”, fewer of those who “do not like to plan something in advance” and fewer people who live according to the principle “who does not risk, he does not win". It was also found that "self-employed" are more focused on "maintaining their usual way of life at any cost". In addition, this group of respondents is more unsatisfied with their inclusion in the world of professions and who want to “find a job to their liking”.

Table 3 presents the results of comparing the group of “unemployed” and “employed. According to Table 3, the “unemployed” have less work experience in their specialty, there are more people who do not have a family and do not have dependents (children and disabled people) in their care. In the group of “unemployed” there are significantly more specialists employed in socio-technical professions that involve interaction in the “man-technology, sign” system.

Table 3. Comparison of the groups "employed" - "unemployed" (fragment of the matrix)

Variables	U - Mann-Whitney	W Wilcoxon	Z
Having a family	3831,000	5007,000	-2,448*
The presence of children and disabled people in the family	3612,000	4788,000	-3,051**
Work experience in the specialty	2850,500	4026,500	-4,202***
Work in the specialty	1716,500	13651,500	-6,543***
Profession type	3221,000	15782,000	-1,918*
Self-employment	3783,000	23484,000	-2,998**
Questionnaire:			
I am planning to find a new job that will suit my liking	2489,500	3665,500	-5,569***
I fear that my plans will not come true	3895,500	5071,500	-2,011*
My work contributes to the well-being of people close to me	3033,000	22734,000	-4,181***
I strive to develop my plans for the future in the smallest detail	3851,000	5027,000	-2,143*
My professional experience is not in demand in my current job	3693,500	4869,500	-2,548*
To maintain economic well-being, there is no need to impose restrictions due to the pandemic	3691,500	4867,500	-2,495*
I am a highly qualified specialist	3436,000	23137,000	-3,182**
I often follow the change in information related to the pandemic	3950,000	23651,000	-1,877*
From time to time I want to "work for myself"	3298,500	4474,500	-3,659***

** - p<0.05; ** - p<0.01;*** - p<0.001*

According to Table 3, the “unemployed” have less work experience in their specialty, there are more people who do not have a family and do not have dependents (children and disabled people) in their care. In the group of “unemployed” there are significantly more specialists employed in socio-technical professions that involve interaction in the “man-technology, sign” system.

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7. Conclusion

The results of the comparative analysis presented in Table 3 also showed that the “unemployed” assess their qualification status more highly (more often they consider themselves highly qualified specialists), while they more often note that their professional experience is not in demand. An analysis of the results of a questionnaire survey of “self-employed” and “unemployed” who, according to experts, are in the zone of high risk of loss of quality of life, revealed an increased level of subjective dissatisfaction and uncertainty of the respondents regarding the success of positive professional implementation during the socio-economic crisis. Compared to the group of respondents "employed", "self-employed" and "unemployed" negatively assess the economic constraints caused by the crisis. It is important to note that if the “self-employed” are ready to maintain the achieved economic well-being “at any cost”, continue to plan their lives and do not even exclude the possibility of finding “work to their liking,” then the psychological state of the “unemployed” is less favourable. The respondents in this group are characterized by the lack of confidence in their ability to find a “good job”; they have a weaker desire to “work for themselves”. Specialists, the "unemployed" are not sure that they will be able to self-realization in the professional field, and do not consider it necessary to plan their actions in detail, since they have don't believe in the possibility of implementation.

A comparative analysis of the value-semantic orientations and assessments of respondents, made it possible to obtain a generalized image of the respondent, whose attitudes towards uncertainty and self-determination during the period of a socio-economic crisis can be regarded as positive, aimed at a successful result. The simulation model describes the quantitative characteristics of the professional self-determination of respondents.

We can conclude that the “unemployed” and “self-employed”, as compared to the respondents from the “employed” group, psychological tension to a greater extent and experience dissatisfaction during the period of the socio-economic crisis.

For the group of “self-employed” it is characterized by a focus on a high level of living. During a socio-economic crisis, they continue to plan their future, believing that, as in any difficult situation, they should act on the basis of well-thought-out plans, and not be exposed to risks. Most of the respondents in this group (87.1%) specialize in socionomic types of work, and have a high degree of confidence in their professional success when performing difficult work (77.2%), highly assess the results of their professional activities (70.2%). At the same time, more than a third of the respondents (38.6%) would like to find another job, without changing the sphere of employment, that is, continuing to work with people. The majority of “self-employed” rely on themselves in a difficult situation (79%) and believe that their life “will turn out the way they want” (71.6%). In general, the respondents who have self-determined in the position of “self-employed” are characterized by social and psychological maturity, satisfaction with the choice of profession, and are able to resolve issues of professional self-determination in crisis and post-crisis period.

The results of the survey made it possible to speak about the respondents from the group of the unemployed as feeling their insecurity, lack of confidence in their abilities and opportunities to find a suitable job. The respondents from the group of “unemployed” do not believe that they will be able to successfully fulfil themselves as qualified specialists (74.5%), despite the high assessments of their

professional competencies (66.5%). They do not plan their actions in detail, as they do not believe in the possibility of their implementation (70.9%). There are the youngest, among them the highest percentage of those who do not have higher education (38%), the lowest percentage of people who are married (44.95%) and have children and disabled people in care (41.7%). Among the unemployed, the largest percent of professionals in socio-technical professions (68%), respondents in this group (81.3%) answered that they would like to prefer a job to socionomic sphere. It is also important to note that 50% of the “unemployed” are ready to “do everything possible to make their plans come true”; 66.7% are confident that they will “cope with a difficult job” and the same number (66.7%) “is optimistic about the future”; 77.1% believe that their life will turn out the way they want. In the group of "unemployed" who voluntarily took part in the study during the period of self-isolation, there is a fairly high percentage of optimists about their future.

Based on the analysis of the empirical data obtained in the study, the characteristics of the simulation model were quantified.

According to forecasts of leading Russian analysts, many sectors of the economy are unlikely to recover quickly in the near future. The director of the Institute for Strategic Analysis of the FBK, Professor of the Higher School of Economics I. Nikolaev, in Russia it is possible to expect a further deepening of the economic crisis and the deterioration of the current situation, right up to a repeat of the 1998 situation. In this regard, the task of developing modeling tools for forecasting and analysing possible situations in the labour supply and demand is becoming a highly urgent and priority task. The results obtained in the course of this study make it possible to compare the quantitative characteristics of the simulation model with the psychological resources of the subject of labour. The data obtained can be used in the development of similar models aimed at analysing and forecasting the consequences of the crisis on the labour supply and demand.

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References

Aldasheva, A. A., Bakanov, A. S., Zelenova, M. E., & Runets, O. V. (2020). Samoopredelenie i professional'nyj mentalitet sub#ekta truda v period pandemii i krizisa [Self-definition and professional mentality of the actor of labour under condition the pandemic and crisis]. *Institut Psikhologii Rossiyskoy Akademii Nauk. Organizatsionnaya Psikhologiya i Psikhologiya Truda [Institute of Psychology of the Russian Academy of Sciences. Organizational Psychology and Psychology of Labour], 5*(2), 166-195. https://doi.org/10.38098/ipran.opwp.2020.15.2.009

Drobysheva, T. V., Tikhonova, E. V., & Kablova, L. V. (2019). Social representations of the unemployed about coping with job loss situation before and after the pension reform adoption. *Bulletin of Moscow State Regional University. Series: Psychological Sciences, 2*, 6-24. https://doi.org/10.18384 / 2310-7235-2019-2-6-24

Emmons, R. A. (2003). *The Psychology of Ultimate Concerns: Motivation and Spirituality in Personality*. The Guilford Press.

Garfin, D. R., Silver, R. C., & Holman, E. A. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. *Health Psychology, 39*(5), 355–357. https://doi.org/10.1037/hea0000875

Giddens, A. (1991). Fate, Risk and Security. In: A. Giddens. *Modernity and Self-Identity: Self and Society in the Late Modern Age*. (pp. 109 –143). Polity Press.

Klimov, E. A. (2012). *Psychology of professional self-determination.* (5th Ed). Publ. Academy.

Kubrak, T. A., & Latynov, V. V. (2020). Opportunities and limitations of information-psychological influence in the situation of the coronavirus pandemic. *Institute of Psychology of the Russian Academy of Sciences. Social and Economic Psychology, 5,* 2(18), 84-114. https://doi.org/10.38098/ipran.sep.2020.18.2.003

Nestik, T. A. (2020). Impact of the COVID-19 pandemic on society: socio-psychological analysis. *Institute of Psychology of the Russian Academy of Sciences. Social and economic psychology, 5,* 2 (18), 47-83. https://doi.org/10.38098 / ipran.sep.2020.18.2.002

Nuttin, J. (2004). *Motivation, action and time perspective.* Smysl.

Okruszek, Ł., Aniszewska-Stańczuk, A., Piejka, A., Wiśniewska, M., & Żurek, K. (2020, April 10). Safe but lonely? Loneliness, mental health symptoms and COVID-19. https://doi.org/10.31234/osf.io/9njps

Pryazhnikov, N. S. (2008). *Professional self-determination: theory and practice*. Academy.

Zeer, E. F. (2003). *Psychology of professions*. Academic Project; Business Book.

Zhuravlev, A. L. (2004). *Psychology of managerial interaction: (theoretical and applied problems*. Publ. Institute of Psychology RAS.