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**EMPLOYMENT OF PEOPLE WITH DISABILITIES: ROLE OF THE
DISABILITY STATUS**

PhD Dissertation Summary

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Motivation

The problem of disability is very acute in many countries. According to the World Report on Disability, about 15% of the world's population is disabled [WHO 2011]. The number of people with disabilities increases, both due to population ageing and also as a result of prevalence of chronic diseases. Despite the development of anti-discrimination legislation and the expansion of measures aimed at the inclusion of the disabled in societal life, people with disabilities remain vulnerable with a relatively low standard of living. Low inclusion of people with disabilities in the labour market is one of the key problems. According to the UN, the employment rate of people with disabilities, on average, constitutes 36% versus 60% among people without disabilities [UN, 2018].

There is an even more difficult situation with employment of people with disabilities in Russia. In 2017, the employment rate of people with disabilities in Russia was only 12%, compared to 66% for the population as a whole¹. In recent years, various measures were adopted aimed at the integration of this group into Russian society. Particular emphasis was made on the inclusion of people with disabilities in the labour market. According to the governmental plan, the employment rate of people with disabilities, of working age, should reach 50% in 2020². In the light of this goal, it is especially crucial to analyse the reasons of their low employment rates.

In this research, terms “people with disabilities” or “disabled people” cover all the persons with persistent disabilities who experience activity limitations or restrictions on participation in various areas of life, regardless of whether they receive state disability support. The term “people with disability status” is used to identify individuals who receive state support for disability. In general, disability status is assigned as a result of a special examination procedure. In Russia, disability status is appointed according to the results of examination in the Medical and social expertise bureau. In Russia people with disability status are entitled to disability benefits, non-cash benefits and special employment support measures.

There is no single reason for the weak position of disabled people in the labour market. Factors determine their position both from the side of labour demand and the labour supply. From the point of view of employers, people with disabilities are, on average, less competitive in the labour market, due to their socio-demographic and occupational characteristics. The special employment guarantees for people with disabilities are associated with additional costs for employers which makes this group of workers less attractive. Information asymmetry on the

¹ http://www.gks.ru/free_doc/new_site/population/invalid/tab4-7.htm

² <http://www.garant.ru/products/ipo/prime/doc/71572298/>

labour productivity of people with disabilities and prejudices against this group may cause discrimination on the basis of disability in the labour market. From the point of view of labour supply, the disabled are, on average, older and less educated than non-disabled people. Sustainable health problems limit their life activities, the scope of professional activities available, and may adversely affect their productivity. Furthermore, the onset of disability may lead to changes in time preferences of individuals. Changes in time preferences stem from requiring extra time for treatment. Furthermore, disability benefits are a source of non-labour income, which may have an independent negative effect on the employment. The enumerated factors lead to a reduction in the labour supply or withdrawal of the disabled from the labour market.

Disability influences individual's labour market behaviour in two ways, which only partly overlap: the first is an influence of poor health on the individual's labour productivity, the second is a result of disability status. People without disability status may have health problems which limit their ability to work, and vice versa. This makes it interesting to separate these two effects.

Many foreign studies concluded that the employment rates of people with disabilities depend on the costs and benefits associated with disability status attainment. The size of the costs and benefits is determined by the institutions of national social protection systems (see, for example, [Bound, Burkhauser, 1999; Fevang et al, 2013]). Therefore, it is especially interesting to analyse the impact of disability status on the labour market outcomes. In this case disability status is analysed as an institute not as an indicator of a poor health.

In the Phd thesis the employment of the disabled people is analysed from the perspective of disability status (and associated benefits and costs). The quantitative estimates of the disability status on the employment outcomes of the individuals are given on the basis of econometric methodology and discussed in the paper.

Objectives of the Research

The aim of the research is to analyse the impact of the disability status on the employment of people with disabilities in the Russian labour market.

The study includes the following steps:

- 1) Systematisation of the main theoretical and empirical approaches to analysis of disabled people in the labour market, discussion of the institutions that determined the position of the disabled people in the Russian labour market and their changes;

2) Analysis of the sources of statistical data on the number of people with disabilities and their employment in Russia, and a description of employment of the disabled people using the official statistics;

3) Identification and assessment of the disability status effect on the labour supply of disabled people in Russia, particularly on the employment probability and working hours, using micro-data analysis;

4) Estimation of the unexplained part of the gap in employment rates between the disabled and the non-disabled using micro-data analysis.

Employment of people with the disability status in Russia is analysed. Only people who are 18–65 years old are included in the analysis, with exception of those who have received the disability status under 18 years.

Brief literature review

In the economic literature, the position of persons with disabilities in the labour market is explained by the mechanisms that act on the demand side and the supply side. They are described in neoclassical theories: the human capital model [Schultz, 1961, 1962; Becker, 1964], the labour supply theory [Killingsworth, 1983], labour demand theory and discrimination theories [Becker, 1957; Arrow, 1971, 1973; Phelps, 1972].

In accordance with G. Becker, health is a form of human capital. Sustainably poor health negatively affects labour productivity and may limit development of other forms of human capital. Relatively low human capital reduces the demand for labour of the disabled people and their wages, which in turn reduces the incentives of individuals to work. According to the theory of the labour supply, poor health may lead to the growth of utility of leisure and thus increase individual's reservation wage, which represents the lowest level of wages for which an individual is ready to work. At the same time, growth of non-labour income (as a result of receipt of disability benefits in cash or in kind) may also lead to an increase of reservation wages. The increase of reservation wages hinders labour supply of the disabled people. Discrimination is a feature of the disabled people position in the labour market. According to G. Becker, prejudice of employers, colleagues and consumers may lead to discrimination of a minority group in the labour market. K. Arrow and E. Phelps explain discrimination in the labour market by the information asymmetry about the real labour productivity of an individual. In this case the employer makes a decision to hire an employee or not on the basis on the information available to him about differences in the average productivity of individuals in groups of "majority" and "minority". This may help an employer to reduce costs, but may lead to discrimination of individuals in the "minority" group.

The negative influence of the health problems on the position of individuals in the labour market has been confirmed in a large number of economic research (see review, [Currie, Madrian, 1999]). It was revealed that the effect of poor health on the employment varies depending on the type, severity and number of health conditions [Premeaux 2001; Wilkins, 2004; Jones et al, 2006], as well as the sex and age of deterioration in health [Pelkowski, Berger, 2004].

A number of papers tested the propositions of the labour supply theory, especially about the growth of utility of leisure and reservation wages as a result of disability [Brown et al., 2010; Pagan, 2013]. Empirical research confirmed the growth of the leisure utility, while it failed to discover any confirmation of the reservation wages increase.

Studies of discrimination, on the basis of disability, analyse the position of the disabled from the labour demand side. Experimental research, based on the CV distribution analyse discrimination on the basis of disability in hiring [Ameri et al, 2015; Bellemare et al., 2018]. The works, based on econometric methodology, considered discrimination in employment in general [Kidd et al, 2000; Madden, 2004; Jones, 2006]. If the former confirm the existence of discrimination, the results of the latter largely depend on the control of unobservable differences in productivity between the disabled and non-disabled.

Measures of the state support for disability have an independent effect on the employment of people with disabilities. Disability status gives a right to receive passive and active support measures. Passive measures include pensions and disability benefits. They influence labour supply. An increase in the size of disability benefits and their availability reduces the employment probability of the disabled people [Parsons, 1980, 1982; Marie, Castello, 2012]. However, the effect can vary depending on the level of individuals education: an increase in the disability benefits may lead to the withdrawal from the labour market of individuals with a low level of education, without changes among more educated individuals [Autor, Duggan, 2003; Banks et al, 2015].

Active measures are aimed to support the employment of persons with disabilities and they are widely used in many countries. Active measures include anti-discrimination legislation, quotas, subsidized employment, promotion of self-employment, vocational rehabilitation, supported employment, and protected employment. Experience of the developed countries in this sphere is discussed in detail in OECD reviews [OECD 2003, 2010]. It is worth noting, that active measures, which are aimed at the people with disabilities, are a special case of active measures. A meta-analysis of microeconomic research in the field of active labour market policies by D. Card and others suggests that programs have different effects depending on the type and duration of support provided, the characteristics of participants and the research methodology [Card et al.,

2009]. The analysis of studies devoted to evaluation of active policy measures for people with disabilities revealed that the use of a particular type of active measures does not guarantee an increase in the employment rate of persons with disabilities. The effectiveness of active measures depends on their design, in particular on the following parameters: the size of the program (for example, the size of subsidies [Gupta et al., 2015]), whether the measure is obligatory for employers or not [Mori, Sakamoto, 2018], the size of penalties for non-compliance with the requirements [Wuellrich, 2010; Lalive et al., 2013].

The Russian literature also discussed the issue of disability. Most of the research devoted to the analysis of the position of people with disabilities in society and the labour market are studies in the sphere of sociology, law and social policy. In these studies, the “weak” position of people with disabilities in the labour market is associated with a lower level of education [Yarskaya-Smirnova, Naberushkina, 2004], physical environmental barriers [Romanov, Yarskaya-Smirnova, 2006; Martz, 2008], employers’ prejudices [Novozhilova, 2001], as well as the inefficiency of public measures aimed to support the employment of people with disabilities, in particular, through quotas [Topilin, 2011]. The sociological surveys of employers and workers with disabilities confirmed the existence of discrimination, on the basis of disability, in the labour market in Russia [Marz, 2008, Yarskaya-Smirnova, Naberushkina, 2009].

In addition, econometric studies revealed a significant negative impact of health on employment in Russia [Kuzmich, Roshchin, 2008; Lyashok, Roshchin, 2015]. In the article by O. Kuzmich and S. Roshchin, the disability status is used as an indicator of poor health. The econometric estimates of disability status, as an institution that has an independent effect on employment, have not been carried out. In the Phd dissertation, the effect of disability status is considered separately from the influence of poor health.

Methodology

The chosen econometric methods are aimed to solve the following methodological problems associated with the measurement of disability status effect.

1) The problem of incomparability of disabled and non-disabled by their productivity characteristics

There are significant differences between disabled and non-disabled people by socio-demographic characteristics, primarily by health. Therefore, in both groups, there are individuals with such combinations of characteristics, which cannot be found in the other group. At the same time the disabled people make up a relatively small part of the sample. In such a situation, in OLS-regressions and binary choice models, the coefficients of the observed variables and the form of the functional dependence, are assessed mainly on the sample of non-disabled people. Application of matching methods may solve the problem of lack of common support. Under this

paradigm, a control group includes only those non-disabled who are close, in all the observed characteristics, to the individuals from the treatment group. The treatment is participation in state disability support program.

2) Self-selection in the group of people with disability status

On the one hand, disability status gives the right to receive cash and non-cash disability benefits, and, on the other hand, it requires a special examination (annual or by-annual), and it can be a reason for discrimination in the labour market. In such a situation, self-selection in people with disability status may take place. Individuals with health disorders decide to enter the disability program, or not, on the basis of their analysis of the costs and benefits of disability status. The self-selection problem is not solved in the research, but the use of non-parametric methods weakens its effect, if the unobservable characteristics correlate with the observables taken into account.

3) The problem of separation of the effect of disability status from the effect of the reduced labour productivity

Lower employment rates of the people with disabilities are largely the result of reduced labour productivity associated with poor health. To separate these two effects, the variables of the disability status and health characteristics are included. The treatment group and the control group are formed on the basis of information about disability status. To control for health, thoroughly, two types of the health indicators and their interaction with the gender are included in the model. Health self-assessment and a health index are used. The health index is constructed on the basis of information about 15 objective health characteristics³ using factor analysis method. The inclusion of the health index is aimed at solving the problem of the endogenous nature of self-assessments. To control for unobservable differences in the labour productivity between people with and without disabilities in estimation of the unexplained difference in employment rates, data from the RLMS HSE data for 2005 is used.

4) The problem of availability of data about factors that determine position of the disabled people in the labour market

For the means of the econometric analysis the database should include not only information on socio-demographic characteristics but also information about disability status, health characteristics, employment characteristics and the size of non-labour income, including disability benefits. The analysis of Rosstat population surveys and surveys conducted by independent research organizations revealed that only the Russian Longitudinal Monitoring Survey - HSE (RLMS HSE) contains information about all necessary characteristics and

³ Information on acute conditions suffered (7 variables) was taken into account; the presence of various chronic diseases (7 variables); undergone surgery for the last year.

provides an opportunity to analyse an extended period of time (2004-2016). The sample of the research includes 27,839 individuals, among them 1,467 respondents who has disability status in at least one of the survey rounds. In addition, official statistics are used to describe the position of people with disabilities in the Russian labour market.

In the Phd thesis, the effect of disability status on the labour supply of disabled people is assessed on the basis of propensity score matching (PSM). The PSM includes the following stages. Firstly, a propensity score for all the individuals is calculated on the basis of the probit model. The propensity score is the probability that an individual will participate in a treatment. Treatment is possession of disability status. Variables⁴ that affect the probability of having the disability status and the probability of employment, are included in the estimation of the propensity score. Secondly, a control group is formed. The non-disabled people are included in the control group if their propensity score values are close to the disabled. Thus, the non-disabled people, whose characteristics are not close to the characteristics of the disabled, are not included in the control group. Thirdly, a counterfactual outcome for each disabled person is estimated. Counterfactual outcome is an estimate of employment probability/ number of working hours, each person from the treatment group could have, if he (she) did not have disability status, but retained all other characteristics in the current state. Counterfactual outcomes are estimated using two methods: nearest neighbour matching, with replacement, and stratification matching. The average treatment effect for the treated is estimated. It is the difference between the actual and the counterfactual values of the outcome. The estimates of the effect, based on regression analysis, are also provided. They are used as a baseline for analysis.

The evaluation of the unexplained part of the gap in the employment rates of people with and without disability status is carried out using the RLMS HSE data for 2005. The data include information on the limitations of daily activities, which allows us to take into account unobservable differences in the labour productivity. On the basis of this information, people with and without disability status are subdivided by the presence of limitations of daily activities. To estimate the unexplained part of the gap, the parametric [Oaxaca 1973, Blinder 1973; Even and McPherson, 1990] and the non-parametric [Nopo, 2008] decompositions are used. The decomposition methods divide the gap in the outcome between control and treatment group into explained and unexplained parts. The explained part is the result of differences between the disabled and non-disabled in their observable characteristics. The unexplained part is associated

⁴ Health self-assessment and its intersection with gender, health index and its intersection with gender, gender, age, being in retirement age, level of education, household size, individual's nonlabour income (excluding disability benefits paid in cash), living in capitals (Moscow, Moscow region and St. Petersburg), living in urban area.

with differences in the returns to the characteristics and, under certain assumptions, can be interpreted as the effect of discrimination.

The parametric methodology divides the gap into two parts. The decomposition is based on the probit-regression, which requires assumptions about the form of functional dependence and the comparability of individuals from the treatment group and the control group on the observed characteristics. As noted earlier, non-parametric methods make it possible to weaken these assumptions. At the first stage of non-parametric decomposition, disabled and non-disabled people are divided into comparable and incomparable on the basis of exact matching procedure. Further, the difference in employment rates of the disabled and non-disabled is decomposed into four parts:

$$\Delta = P_a - P_d = (\Delta_a + \Delta_x + \Delta_d) + \Delta_0, \quad (1)$$

где Δ_a – represents that part of the gap explained by the fact that there are some combinations of control group characteristics for which there are no comparable individuals from the treatment group; Δ_d – accounts for the same part of the gap as Δ_a , but for the treatment group; Δ_x – represents the part of the gap explained by the fact that individuals from the treatment and control groups tend to have individual characteristics that are distributed differently over their common support; Δ_0 – the part of the gap that can not be explained by these differences in observable characteristics of comparable and incomparable disabled and non-disabled.

Main findings

1) It was revealed, that the Russian official statistics had significant limitations in terms of analysing the situation of disabled people in the labour market during a long period of time. First, in the administrative statistics until 2017, data on the number of employed disabled people were compiled on the basis of information from pension documents, which in many cases was not reliable. Secondly, employment rates of disabled people estimated on the basis of the Pension Fund data and the Russian Labour Force Survey (LFS) data varied considerably. The variation can be explained by differences in the accounting period, in the coverage of different categories of employed people, in particular those employed in the informal sector of the economy, and by the underrepresentation of people with disabilities in the survey data.

At the same time, the analysis of the age and gender structure of people with disabilities did not reveal significant discrepancies between the LFS data and the Federal Register of Persons with Disabilities (FRD) statistics, which makes it possible to use the LFS data to analyse the structure of employment of the population with a disability. The available statistics show that people with disabilities are in a weak position in the Russian labour market, which is characterized by low employment rates at all ages, high unemployment rates, widespread employment in the informal sector, and a concentration of employment of people with

disabilities in low-skilled occupations. In addition, occupations of people with disabilities often do not match their education.

2) In 2004-2016 in Russia, the disability status primarily influenced the employment probability. Employment probability reflects the decision of a disabled person to enter the labour market and the likelihood of her being employed, saving her job. It was revealed that disability status has a significant negative impact on the employment probability of people with disabilities. The effect has been very substantial and stable over time - it was revealed that having the disability status reduced the probability of permanent employment by 30 percentage points, the probability of 'total employment', which also includes casual employment, by 32 percentage points. Disability status had a rather weak effect on the length of the working hours a week. This effect is small in size (3.6-3.8 hours), unstable in time, but for most years it is statistically significant. This effect includes the influence of federal legislation, according to which working week for the I and II disability groups should not exceed 35 hours (with preservation of wages), as well as differences in the professional structures of disabled and non-disabled people.

3) A significant part of the gap in the employment rates of people with and without disability status cannot be explained by the differences in the observed characteristics and unobservable differences in the labour productivity, taken into account. The unexplained part of the gap is about 25 percentage points. The analysis takes into account the observed differences in the characteristics of people with and without disability status, as well as information on everyday life activities, information about which is not collected in most of the surveys. The unexplained part of the gap is usually attributed to the effect of discrimination as differences in labour productivity is controlled thoroughly. Thus, according to estimates on the basis of RLMS HSE data of 2005, disabled people in Russia are most likely to face significant discrimination in the sphere of employment. The real scale of the discrimination is lower than these estimates, since the analysis only partially takes into account unobservable differences. In particular, such factors as self-selection for disability, fear of losing the right to disability benefits or their reduction, physical barriers and wage discrimination were not accounted for.

4) The results of the study suggest that it is more correct to use the non-parametric methods, than the parametric, to assess the effect of disability. The non-parametric methods impose fewer assumptions to assess the effect of disability. Unlike the parametric methodologies, they do not require assumptions about the comparability of the individuals in control and treatment groups and about the form of the functional dependence. At the same time, the analysis of alternative specifications revealed that the non-parametric methods maximize their potential only if the model takes into account all the important determinants of the labour

supply. In this case, the non-parametric methods help to alleviate the problem of self-selection if the included covariates correlate with the unobservables, that determine the selection into people with disability status.

Contribution

The Phd dissertation contributes to the empirical literature analysing the position of people with disabilities in the Russian labour market. Despite the fact that the inclusion of people with disabilities in employment is widely discussed in Russia, the analysis of the institutional environment influence on the employment of people with disabilities, using modern econometric tools, has not been carried out. The research expands the existing literature on the employment of people with disabilities with estimates of the effect of disability status on the employment probability and working hours of the disabled people. The empirical analysis is preceded by a detailed description of the institutional environment that determined the position of people with disabilities in the Russian labour market and discussion of the sources of statistics on the employment of persons with disabilities.

Provided analysis of the institutions of public support for people with disabilities complements existing research in this area. As far as the author knows, earlier research covered shorter time periods; did not focus on analysis of the impact of public support for the disabled on the labour demand and labour supply of this group of population. The paper describes changes in criteria of disability status assignment, size and types of cash and non-cash disability benefits paid and evolution of the special employment support measures for the disabled. The period from 1991 till 2018 is considered. The author has proposed a new periodization of the development of a public support measures for the disabled people in Russia.

In the research, a detailed analysis of the official employment statistics of people with disabilities was conducted for the first time. Various sources of statistical data on the employment of people with disabilities were critically examined. The methodology of the employment indicators of people with disabilities formed on the basis of administrative data and the LFS was analyzed. The position of persons with disabilities in the Russian labour market was compared with the position of the non-disabled people, the LFS micro-data were used for these purposes.

The author assessed the effect of disability status on the employment probability and working hours of the disabled people in Russia. Disability status is considered as an institution that has an independent impact on the position of an individual in the Russian labour market. Previously, this approach was not used in the Russian literature. The estimates of the disability status effect on the labour supply were obtained on the basis of the propensity matching method, taking into account specifics of the available data and Russian institutions. This methodology

allows to solve the problem of incompatibility of some of the disabled and non-disabled people by their characteristics.

For the first time in the Russian literature, the econometric estimate of the unexplained part of the gap in the employment rates of people with and without disability status was made on the basis of decomposition methods. The information on the everyday life activities limitations of individuals in the RLMS HSE data for 2005 allowed us to apply the methodology close with methodology of T. DeLeire [DeLeire, 2001] using the Russian data. The methodology allows to control for observed and unobserved differences in the labour productivity of people with and without disability status more carefully, thus the estimates of the unexplained part of the gap can be interpreted as a result of discrimination on the disability status in the sphere of employment.

Publications

Journal publications:

1. Demianova A. Measures of State Supporting Employment of Persons with Disabilities in Russia/ Public Administration Issues. 2015. No. 4. pp. 160-185
2. Demianova A., Lukyanova A. The impact of disability status on labour supply in Russia/ Applied Econometrics. 2016. v.44. pp. 50-74
3. Demyanova A., Ryzhikova Z. How to improve National Statistical Observation of Disability Employment using International Practices/ Voprosy Statistiki. 2017. No.2. pp. 33-40
4. Demianova A., Lukyanova A. How Substantial Is Employment Discrimination Against the Disabled in Russia? / HSE Economic Journal. 2017. v.21, No3. pp.385-411.

Other publications:

5. Demianova A. Employment of disabled people in Russia in the context of digital economy / NRU HSE. Series "Science, technology, innovation". 2018. No. 91/STI.