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Wage discrimination against foreign workers in Russia ☆

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Abstract

We try to determine with the help of the Oaxaca–Blinder decomposition technique whether foreign workers are discriminated against in Russia. We use the Russian Ministry of Labor (Rostrud) data on migrants' applications and the Russian Longitudinal Monitoring Survey (RLMS, provided by the Higher School of Economics) for the period 2009–2013. We show that there is significant discrimination against foreign workers. The average salary of Russian workers with the same level of productivity as migrants exceeds migrants' average salary by 40%. The industries in which the workers are employed have made most substantial contribution to the discrimination gap. Moreover, there is evidence that the lower salaries of foreign workers do not reduce the salaries of Russians employed in similar positions.

JEL classification: J31, J61, R23.
Keywords: discrimination, Oaxaca–Blinder decomposition, international labor migration.

1. Introduction

A comparison of labor wages between foreign migrants and local workers satisfies scholarly interest and creates a basis for immigration policy recommendations. This empirical study attempts to compare the wages of temporary foreign migrants and Russian workers. Is there discrimination against foreign workers in the Russian labor market, and if so, how does it manifest itself in quantitative

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terms? "Discrimination" refers to a situation in which people with the same level of productivity are offered different wages.

Foreign migrants constitute a significant segment of Russia's labor market. In 2013, for example, documents were issued authorizing labor activity in the Russian Federation for almost three million foreign migrants, according to the Federal Migration Service. This number accounts for approximately 4% of the economically active population within the Russian Federation. Political discussions frequently arise concerning the need for such a large number of migrants. Many demography experts defend the viewpoint that given the predicted reduction in the able-bodied population over the long term (up to 2050), even if domestic labor resources are mobilized (increased retirement age, the involvement of disabled persons in labor activity, etc.), the country will experience a high workforce deficit (Zaionchkovskaya, 2013). In this case, migration would make up for the resulting deficit to a large extent. However, the benefit of the actual increase in the migration flow is not obvious. Foreign workers can both augment the labor market of the country to which they migrate and increase the unemployment level or reduce the wages of local workers employed in similar positions.

Both demographic experts and economists have studied the position of foreign workers in the Russian labor market (Denisenko et al., 2013; Iontsev and Ivakhnyuk, 2012; Lokshin and Chernina, 2013). The set of questions that can be included in a study is usually limited by the specific features of the data used. The official data provided by the Federal Migration Service are limited given their lack of information about wages paid to foreign workers. The data from surveys of migrants from Tajikistan (Lokshin and Chernina, 2013) have another flaw, as they contain information about migrant flow from a single country. This paper uses data from the Federal Service for Labor and Employment, gathered by the authors from company statements on workforce requirements (from 2009 to 2013). These data have not been used in previous studies. As another source, we used the database of the Russia Longitudinal Monitoring Survey–Higher School of Economics (RLMS-HSE)[1] for the same period.

2. Literature survey

A great deal of research has been done in the economics of migration. Borjas (1994) reviews and generalizes the main questions sparking the interest of economists studying this phenomenon: the size of migrant incomes in the receiving country, the demand of the receiving country for foreign workers, the influence of migrant labor on wages, the employment level of the local population, etc. The literature also considers economic policy issues related to temporary foreign workers (Abella, 2006). For example, it is said that employers will always need cheap foreign workforce. At the same time, immigration may lead to negative consequences in the form of reduced wages paid to local workers or increased unemployment. Some countries establish minimum wages for foreign workers to avoid such consequences. A number of authors also mention the need to improve the quality of monitoring for local labor markets in order to identify the need for migrants.

[1] https://www.hse.ru/en/rlms/

The literature compares the wages of local and foreign workers. More often than not, to evaluate the differences between wages, the Oaxaca–Blinder decomposition method is used. The fullest description of the application technique and the limitations of this method is provided in Fortin et al. (2011). This method for evaluating the differences between wages has been used in many countries. For example, many studies exist on Germany (Lehmer and Ludsteck, 2011). It was found that a significant portion of the wage gap in Germany is caused by the fact that foreign workers with the same characteristics are paid lower wages than locals by 6.7% for men and 15.6% for women (Aldashev et al., 2012). An assessment of the situation in Spain showed that discrimination against low-income migrants is considerably greater than against high-income foreign workers (Canal-Domínguez and Rodríguez-Gutiérrez, 2007). In the Netherlands, discrimination was identified with respect to certain nationalities of migrants, whereas no discrimination was found with respect to other groups (Kee, 1995). The presence and extent of discrimination are specific both to the receiving country and to the migrant flow. However, as seen in the papers cited, discrimination against foreign workers is an empirical fact for a number of countries (naturally, if the model's prerequisites are met).

In Russia, immigration issues are dealt with by specialists in various social sciences. This topic is of interest to experts in demography and sociology. For example, in a number of papers, researchers point to the imbalance between the qualifications of Russian workers and the needs of Russian employers (Iontsev and Ivakhnyuk, 2012). Temporary foreign labor migrants have also been studied (Denisenko et al., 2013). However, the scarcity of migration data for analysis often complicates the study of this issue and the development of specific recommendations. For migrant wages, selected surveys by the Center for Migration Research have revealed a difference in the monthly average wages paid to Russians and migrants in the amount of 10%–15%; before the crisis, the difference increased to 21% (Zaionchkovskaya and Tyuryukanova, 2010). According to the authors' calculations, the average hourly wage for migrants is 42% lower than for Russian workers on average. However, these data point only to the difference in average wages and not to the discrimination gap calculated in the economists' papers. A study by Grigorieva and Mukomel (2014), based on a sociological survey of migrant laborers and the Russian workers communicating with them in the workplace, shows that migrants are paid considerably less than Russians employed in similar positions. However, no estimate of the extent of discrimination in the event of equal characteristics is provided. The authors concluded that migrants and Russians are not competing in the Russian labor market, as they are employed in positions that differ in terms of quality.

The issue of foreign migration into Russia is also studied by economists. Andrienko and Guriev (2004) state that migration (both domestic and foreign) plays an important part in Russia's economic development. Commander and Denisova (2012), based on an analysis of the data provided by the Russian Federal Service for Labor and Employment in 2010, confirm that the use of foreign migrants partially covers the deficit of highly skilled human resources. Relying on Tajikistan migrant data, Lokshin and Chernina (2013) composed a portrait of the typical migrant and compared the wages of local workers and Tajik migrants.

This paper, to some extent, continues what was done by Lokshin and Chernina, (2013). We used the same method but applied it to other data and over a longer period. The data provided by the Federal Service for Labor and Employment include many more migration flows.

3. Methodology

To find out what portion of the gap in wages is attributable to the differences in characteristics between Russian workers and migrants and how much is attributable to discrimination against foreign workers and other factors, we used the Oaxaca–Blinder decomposition method. First, we considered the Mincer equation underlying the method.

A multitude of papers use the Mincer equation to evaluate the payback from different levels of education and work experience (e.g., in relation to Russian workers, see Denisova and Kartseva, 2007; Kuzmich and Roshchin, 2008; Lukyanova, 2010; Oshchepkov, 2010). Traditionally, an equation with the following form is estimated (Heckman et al., 2006):

$$\ln(wage_i) = \beta_0 + \beta_1 education_i + \beta_2 exp_i + \beta_3 exp_i^2 + \varepsilon_i, \quad (1)$$

where $\ln(wage)$ is the logarithm of a worker's wages; *education* is the duration of schooling; *exp* is the work experience expressed in years; β_0, β_1, β_2, and β_3 are parameters to be estimated; ε is a random component; and i is the worker's index.

The ε values are assumed to be independent and normally distributed, $\varepsilon_i \sim N(0, \sigma^2)$. The model is evaluated using the least squares method. The β_1, β_2 parameters are expected to be positive, and the β_3 parameter is expected to be negative, which indicates a hill-shaped curve describing the relation between wages and work experience.

It is known that the absence of explanatory variables in the model, affecting the dependent variable, leads to a bias in the estimations of the β parameters. This is why researchers often introduce a number of other variables instead of the aforementioned ones. There is no clear standard regarding which additional variables should be included. The ability to include particular variables in the model is limited by the data used in the study. This paper uses a base specification in the following form:

$$\ln(wage_i) = \alpha_0 + \sum_{b=1}^{B} \beta_b REGION_{b,i} + \sum_{c=1}^{C} \gamma_c OKVED_{c,i} + \sum_{d=1}^{D} \delta_d OKZ_{d,i} + \\ + \sum_{e=1}^{E} \theta_e EXP_{e,i} + \sum_{f=1}^{F} \mu_f EDU_{f,i} + \varepsilon_i, \quad (2)$$

where $\ln(wage)$ is the logarithm of a worker's monthly wages; *EXP* is (work experience), represented by a set of dummy variables: from 3 to 5 years and over 5 years (the base category is under 3 years' experience); *EDU* is the (education level), represented by a set of dummy variables: vocational education, higher education (the base category consists of high school and lower education). The observation unit is a particular worker. For the control variables: *REGION* is a set of dummy variables for federal districts, Moscow, and Saint Petersburg; *OKVED*

is a set of dummy variables representing the type of economic activity in which the individual is employed; and *OKZ* is a set of dummy variables for the worker's profession according to the Russian Classification of Occupations.[2]

The absence of a continuous work experience variable in the data provided by the Federal Service for Labor and Employment prevented us from taking into account the reduction of income with age in the model (since we cannot include the experience squared, which is strongly correlated with age). Nevertheless, we do not believe that age is highly relevant for our purposes; we know from other studies that the majority of foreign workers is represented by people aged 40 and less (approximately 70% of temporary migrants; Denisenko et al., 2013). There is a very low probability that differences in age among this group have an impact on wages. In our opinion, the work experience categories included in the model are sufficient for taking into account nonspecific experience; these are the intervals where wages change to the greatest extent. It is also known that the Mincer equation has a potential endogeneity problem (Heckman et al., 2006). The education variable may correlate with the random component because a person has higher levels of education and wages due to his or her high skill. However, we do not take the skills of workers into account in our model. In this case, the payback from the level of education would be overestimated. Unfortunately, due to limited data in this case, we cannot find an instrumental variable and therefore need to take into account the fact that the evaluation of payback from the level of education may shift upward. Estimations of return on work experience according to the RLMS data may also shift because the work experience variable is calculated using the education variable.[3] Appendix Tables A2 and A3 contain estimations of the Mincer equations.

Now we shall consider the Oaxaca–Blinder decomposition method. Two Mincer models were estimated with the same set of variables: one based on foreign worker data and the other based on local worker data (Fortin et al., 2011).

$$ln(wage)_l = X_l'\beta_l + \varepsilon_l, l \in (M, R), \tag{3}$$

where M is the index representing foreign workers; R is the index for Russian workers, and X_l is the same set of explanatory variables as in (2).

The difference between average wages paid to local and foreign workers is decomposed as follows:

$$\overline{ln(wage)}_R - \overline{ln(wage)}_M = \underbrace{(\bar{X}_R - \bar{X}_M)\hat{\beta}_M}_{1} + \underbrace{\bar{X}_M(\hat{\beta}_R - \hat{\beta}_M)}_{2} + \underbrace{(\bar{X}_R - \bar{X}_M)(\hat{\beta}_R - \hat{\beta}_M)}_{3}, \tag{4}$$

where $\bar{X}_R$ and $\bar{X}_M$ are the rows of average values of the independent variables for Russian workers and foreign migrants, respectively, and $\hat{\beta}_R$ and $\hat{\beta}_M$ are the vectors

[2] The breakdown is provided in Appendix Table A1. Aggregate categories are similar to the International Standard Classification of Occupations.

[3] To calculate work experience based on RLMS data, we used the following formula: *age* – (6 + *x*), where *x* = 11 for persons with high school education, *x* = 14 for persons with vocational education, and *x* = 16 for persons with higher education.

of coefficients estimates obtained from model 3 for Russian workers and for migrants, respectively.

Component No. 1: the difference between average wages paid to migrants with characteristics of Russian workers and average wages paid to migrants. It is usually interpreted as the wage gap due to the differences in characteristics. However, in our case, all of the variables considered are categorical and established by a set of dummy variables, and only a portion of them can be ranked (e.g., education and experience). The mean value of dummy variables assuming 0 or 1 is the percent of observations in the sample in which the characteristic is inherent, for example, the percentage of people with higher education, the maximum work experience, living in Moscow, working in the construction industry, etc. However, what is the meaning of one sample containing more of those working in Moscow than another? In quantitative terms, it means that in the case of greater return on work, this region would demonstrate a greater gap in wages between the two groups. Consequently, Component 1 shows differences in the composition of the samples. We cannot state that the differences are attributable to better or worse worker characteristics. They are simply different in the event of fixed return on them (i.e., in the case of the same coefficients in the model).

Component No. 2: the difference between the average wages paid to Russian workers with the same characteristics as migrants and the average wages paid to migrants. The literature often interprets this component as a gap in wages caused by discrimination against foreign workers. However, this kind of interpretation makes sense only if the model contains all the required variables. For example, the differences in wages between local and foreign workers may be affected by knowledge of the local language. If this variable is not included in the model, then the gap resulting from the evaluation would partially include the difference in wages caused by possessing a special skill, i.e., knowledge of the language. In this case, it would not be absolutely correct to interpret this component purely as discrimination.

Component No. 3: the joint impact of Components 1 and 2. More often than not, this component assumes large values (often negative), when, for example, within one sample, the payback from a certain factor is greater than from another, but the average values of it are lower, or vice versa. However, the situation may differ substantially with respect to different factors; therefore, this component is difficult to interpret, and many researchers do not focus their attention on it. We do not address this component in this paper either, since all our variables are categorical and sufficiently numerous.

To understand what contribution is made to discrimination by particular factors in the model, we calculated a detailed decomposition (Fortin et al., 2011). The essence of such detailing consists of breaking down each component of the decomposition (4) into augends separately for each group of factors (education, work experience, industry, profession, region). Since the variables under review are categorical, they are joined into groups. Note that the literature (Fortin et al., 2011) considers the problem of using categorical variables in detailed Oaxaca–Blinder decomposition. In this article, we use the findings available in this area by utilizing adjustments for the invariability of the choice of base values (Jann, 2008).

4. Data description

Temporary foreign migrants have several opportunities to find jobs in Russia. The most common way is to obtain a work permit within an annual quota based on employer applications (at least, this was the case until 2013). These data are available on the Federal Service for Labor and Employment website and were used in this research. Vakulenko and Leukhin (2015) described in detail the ways that existed for legally employing temporary migrants and the potential problems with using data provided by the Federal Service for Labor and Employment (hereafter, Rostrud). The employer specified the characteristics and number of required migrants in the application, as well as the amount of pay offered to them. The formal Rostrud data contain only the wages offered to migrants, not the wages actually paid to them. However, we assume that the worker cannot bargain with the employer (he or she can either accept or decline the employer's offer). If the migrant accepts a given offer, then there is no reason for the employer to pay more.

This paper addresses discrimination against foreign workers in terms of the wages they are paid rather than with the comparative costs of a Russian firm associated with both foreign and Russian workers. RLMS data specify the wages cleared of all taxes. As to the wages according to the Rostrud data, it is not clear whether they include the personal income tax. We assume that they do not. If the tax is indeed included, then the discrimination gap is actually even greater than in our calculations. We also assume that a foreign worker stays in Russia for more than half a year. In this case, according to the Tax code of the Russian Federation, he becomes a tax resident and pays income tax at the same rate as a Russian citizen.

To use the Oaxaca–Blinder method, we need to estimate two equations with the same set of variables. Thus, we unified the variables for the two samples. We kept only the regions where the surveys were conducted for the RLMS in the Rostrud data; out of the types of economic activity, we kept only those for which we could find a definite correlation in both databases. The categories of work experience (according to Rostrud) "less than 1 year" and "from 1 to 3 years" were joined into one; "first-level" and "second level" vocational education were also joined into one group.

We now compare the samples according to RLMS and Rostrud data.[4] Fig. 1 and Fig. 2 show a comparison of average shares from 2009 to 2013. As shown in Fig. 1, the Rostrud data contain significantly more workers with less than 3 years of work experience, i.e., 59% versus 6%. There are also more workers with 3 to 5 years of experience (25% and 8%, respectively). There are many more Russian workers with more than 5 years of work experience, i.e., 86% (16% of foreign workers).

The proportion of workers with a high school education is considerably lower in the RLMS data (14% compared with 46%). The number of workers with vocational education is roughly the same in both samples. The Rostrud data feature far fewer workers with a higher education (7% compared with 32% in RLMS). Thus, the samples of Russian workers contain a higher number of better-educated people.

[4] The samples are limited by workers with wages between RUB 5,000 and RUB 60,000 so that outliers do not affect the results.

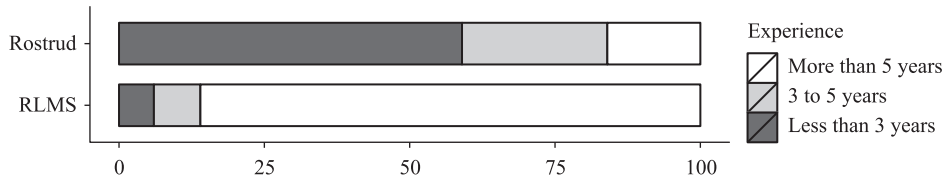

Fig. 1. Comparison of the Rostrud and RLMS samples based on work experience, 2009–2013 (%).

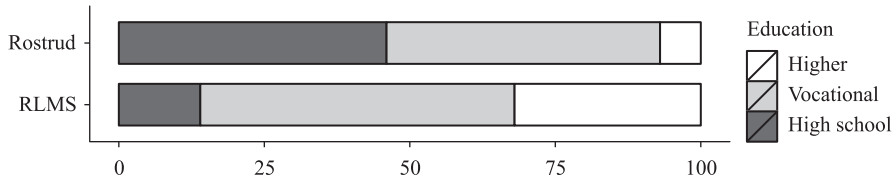

Fig. 2. Comparison of the Rostrud and RLMS samples based on education, 2009–2013 (%).

Workers' professions and the type of economic activity in which they were employed were also important indicators for this study. Foreign migrants are mostly employed in low-skilled positions; the percentage of Russian workers employed in those positions is considerably lower. The largest number of foreign workers is employed in construction. With respect to Russian workers, we cannot say whether they are concentrated in any one type of activity (see Appendix Table A1).

Fig. 3 shows a comparison of wage distribution densities based on the RLMS and Rostrud data. The distribution densities in these samples largely coincide with each other: both feature heavier left "tails," i.e., the samples contain more workers with low wages. The acute vertices of the wage distribution density based on the Rostrud data are due to the wages stated by the firms being usually round numbers and grouped around the same value. In 2013, average wages were RUB 15,165 according to Rostrud and RUB 19,214 according to RLMS (Table 1).

If we consider the samples cited as representative, it turns out that temporary foreign workers are less educated, have less experience, and occupy positions requiring lower qualifications in comparison with Russian workers.

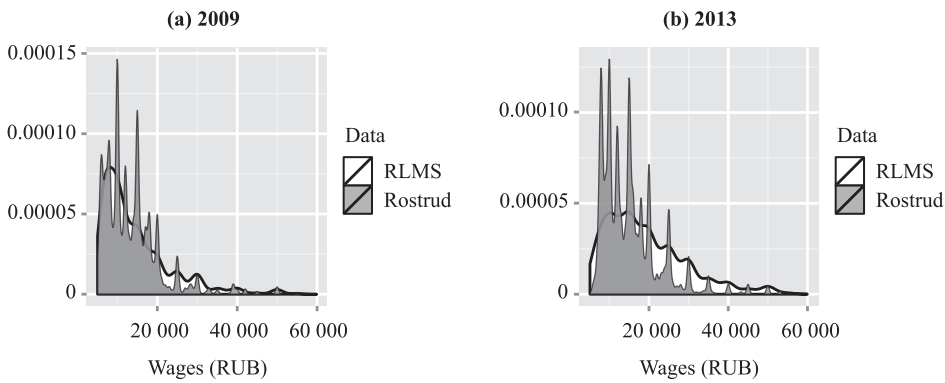

Fig. 3. Comparison of wage distribution densities based on RLMS and Rostrud data.

Note: See Appendix Fig. A5 for 2010–2012.

Table 1
Wages according to RLMS and Rostrud data, 2009–2013 (RUB, in current prices).

Year	Data source	Number of observations	Mean	Standard deviation	Minimum	Maximum
2009	RLMS	2 133	14 494	8 776	5 100	55 000
	Rostrud	658 360	13 447	7 076	5 040	59 800
2010	RLMS	3 942	15 410	9 071	5 020	58 000
	Rostrud	539 168	13 062	7 422	5 014	59 800
2011	RLMS	4 015	16 396	9 552	5 100	58 000
	Rostrud	607 319	13 223	7 065	5 005	59 800
2012	RLMS	4 009	18 125	10 120	5 083	58 000
	Rostrud	665 722	13 669	6 939	5 100	59 862
2013	RLMS	3 872	19 214	10 238	5 100	59 000
	Rostrud	749 913	15 165	7 389	5 250	59 952

5. Study findings

Appendices 2 and 3 represent the results of the Mincer model 2 estimation based on the RLMS and Rostrud data from 2009 to 2013. All of the obtained regressions are significant overall, with sufficiently high explanatory power; the R^2 is approximately 0.4. The return on work experience and education was subject to strong fluctuations in the time period under review. Nevertheless, it is quite reasonable to expect that more experienced workers are paid higher wages. Having higher education also results in significantly higher wages for both Russian and foreign workers. "First-level" vocational and "second-level" vocational education have almost the same impact for pay increases. Moreover, a temporary foreign worker with a vocational education receives only a slight increase in wages in comparison with a high school or lower-grade education.

6. Oaxaca–Blinder decomposition

Table 2 contains the results of the Oaxaca–Blinder decomposition (4). We are interested in four values: the difference in average wages, Components 1 and 2, and the degree of discrimination as a percentage. Component 3, while seemingly large, does not lend itself to a meaningful interpretation due to the reasons provided in section 3; however, it is cited here to provide a full picture.

The difference in the logarithms of average wages is quite substantial during the time period of interest (0.16 on average during the period). This gap can be attributed to the fact that foreign workers have a "poorer" set of characteristics than locals and that foreign workers are discriminated. Now we shall consider the components of this difference.

Component 1 over the period averaged 0.06 of the logarithm of wages, i.e., the differences between the characteristics of Russians and migrants at a fixed payback from the factors for migrants (estimates from the model for migrants).

Note that this value represents a small share of the total difference between the logarithms of wages. Recall that Component 1 represents the differences in the structure of the Russian and migrant samples. If we look at the detailed decomposition (Appendix Table A4), only the industry and the region — out of all the factor groups considered — have negative values for all periods. This indi-

Table 2
Oaxaca–Blinder decomposition for wage logarithms and the degree of discrimination, 2009–2013.

Components	2009	2010	2011	2012	2013
Difference between the wages of migrants and local workers	0.039	0.146	0.179	0.240	0.196
Difference in wages attributable to differences in the characteristics of local workers and foreigners (Component 1)	0.063	0.009	0.008	0.146	0.073
Degree of discrimination (Component 2)	0.299	0.360	0.320	0.328	0.350
Degree of discrimination (%)	35	43	38	39	42
Joint effect of Components 1 and 2 (Component 3)	−0.323	−0.223	−0.149	−0.234	−0.227

Note: All values, except for the degree of discrimination in percent, are provided in logarithms; the difference in average wages is $\overline{ln(wage)}_R - \overline{ln(wage)}_M$; Component 1 is $(\bar{X}_R - \bar{X}_M)\hat{\beta}_M$; Component 2 is $\bar{X}_M(\hat{\beta}_R - \hat{\beta}_M)$; the degree of discrimination in percent is $(e^{(Component\ 2)} - 1) \times 100$ — in other words, this value represents the difference between geometric average wages (RUB) paid to Russians with the characteristics of migrants and wages paid to migrants in relation to the average wages of migrants, i.e., discrimination in percent is calculated not for the logarithms of wages but for their RUB equivalents; Component 3 is $(\bar{X}_R - \bar{X}_M)(\hat{\beta}_R - \hat{\beta}_M)$.

cates that the share of migrants is higher in industries and regions with greater paybacks, meaning that migrants prefer to work in industries and regions where labor is better compensated. It should be noted that the greatest contribution to Component 1 in terms of the absolute value is the region. Education and experience make a positive contribution to this component, which means that within the evaluated samples, Russians are better educated and experienced. The profession also makes a positive contribution, i.e., the share of Russians is greater in professions with higher paybacks.

We now shall consider Component 2, which represents the discrimination gap. We define discrimination as the difference in wages under conditions of equal productivity. In this case, we evaluate the differences in wages paid to Russian and foreign workers based on the productivity of migrants.[5]

Table 2 contains data on the degree of discrimination. The difference in the productivity-based wages of migrants is 0.331 on average over the period in logarithms, or 40% (Fig. 4). This is significantly higher than Component 1. We can also see that this value remained roughly the same throughout the period under review. Thus, with the same level of productivity as the migrants, Russians would be paid significantly higher wages than foreign workers. Graphically, the differences in the logarithm of wages distribution density of Russian workers with the productivity of migrants and predicted logarithms of migrant wages are shown in Fig. 5.

If we look at the detailed decomposition for Component 2, i.e., the discrimination gap (see Appendix Table A4), the greatest contribution is made by the industry in which the workers are employed. It makes up half of the gap by absolute value. This means that the return on work in the same industries differs greatly between migrants and Russians, with the return being considerably greater for

[5] We also made our calculations based on a fixed productivity of Russian workers. In this case, the discrimination gap represents the differences in the logarithms of wages for Russians and migrants with the characteristics of Russians $\bar{X}_R(\hat{\beta}_R - \hat{\beta}_M)$. However, it is not a component of the Oaxaca–Blinder decomposition. This gap is considerably lower, 0.1 on average, over the period under review.

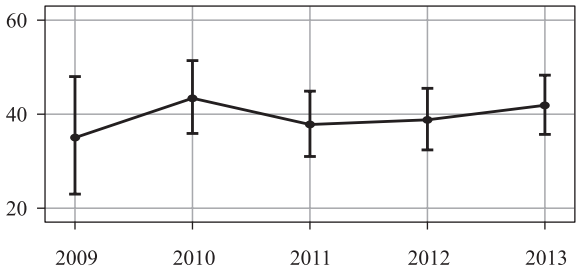

Fig. 4. Component 2* changes, 95 percent confidence interval, 2009–2013 (%).

* See note to Table 2

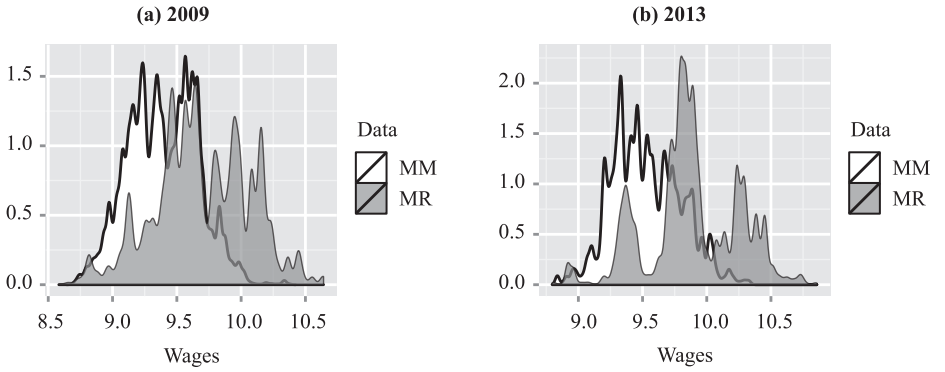

Fig. 5. Comparison of the predicted logarithm of wages density distribution for Russian workers with the productivity of migrants (MR) and predicted migrant wages (MM).

Note: See Appendix Fig. A6 for 2010–2012.

Russians. The contribution of the region becomes significant only starting in 2011, and it is negative, i.e., the return on work in particular regions is, on average, higher for migrants than for Russians.

The contribution of the profession to the discrimination gap is insignificant. Individual worker characteristics, such as education and experience, make different contributions to the discrimination gap in different years, insignificant in some years, positive or negative in other years. Absolute values are also rather low in comparison with the contribution from the industry.

We can assume that the main reason for the discrimination gap is that which can be considered "pure" discrimination. Foreign workers have a choice to either work in their own country or go to another country for temporary work. If the country of origin offers low wages, they are willing to work in another country, provided that their wages would be higher; however, the wages should not necessarily be at the same level as wages paid to local workers. Employers, in turn, find it to their advantage to pay foreigners less than a local worker for the same productivity. Thus, the equilibrium wage for migrants is lower than for locals if there is no legislation to protect the rights of foreign workers. However, this is not the only possible reason for the discrimination gap. Employers may simply lack the opportunity to determine the actual productivity of a foreign worker (Lokshin and Chernina, 2013), whereas they know far more about local workers (quality of educational institution, career history, etc.). The literature also mentions the exis-

tence of "migrant sectors" within the labor market (Lehmer and Ludsteck, 2011). Foreign workers with "good" characteristics, i.e., more productive ones, may be "attracted" to low-paid migrant sectors due to their social connections. Working there, they are paid less than they could earn for their individual set of characteristics. The same occurs if a misinformed foreign worker with good characteristics occupies a position that does not require a high level of skill.

If we assume that the main reason for the discrimination gap is pure discrimination, these conditions would be unfavorable for Russian workers employed in similar positions, as it might lead to lower wages for them or to unemployment. However, the preservation of stability in the wage gap may indicate that employing migrants does not lead to lower wages for Russians, since otherwise the level of wages paid to Russians would decrease to the level paid to migrants. Nevertheless, the results we obtained are insufficient alone to find a definite answer to this question since we do not know how this value has changed over a longer time period, and it is not clear how many local workers were forced to change their qualifications due to a lack of jobs.

Note that the obtained values of the discrimination gap probably do not correspond to the actual values due to imperfections in the model and other technical reasons. Foreign workers may be worse off than Russians in terms of unobserved characteristics (e.g., poor knowledge of the Russian language), causing an erroneous evaluation of predicted wages. The inaccuracy of the discrimination gap may also be caused by the fact that Russians and foreigners work with different intensity. Surveys show that migrants spend more time working than do Russians (Zaionchkovskaya and Tyuryukanova, 2010) and the available statistics cover only monthly wages. In addition, the set of characteristics for Russian workers may be dissimilar to the same set of characteristics for foreign workers. For example, higher education for a Russian worker and a foreigner is not necessarily of the same quality; however, it is assumed in the model that such characteristics are comparable. It is impossible to incorporate all such features in this paper.

Lokshin and Chernina (2013) found, based on Tajik migrant data, that the difference between the average wages paid to Russians and migrants is only 0.35 (Lokshin and Chernina, 2013, p. 66, Table 13), while the second component of the Oaxaca–Blinder decomposition is 0.61 (or 84% in our definition — see note to Table 2), which is twice as high as our calculation (40% on average over the period under review).

The differences between the results can be explained by several reasons. First, migrants from Tajikistan are likely to occupy less qualified positions than migrants in general. Accordingly, migrants from Tajikistan are paid lower wages, and the discrimination gap is greater for them. A second reason may be associated with the specifics of the data under review. In our source, wages are declared by the employer in the application for the quota and may be considered to be the wages offered to migrants. In the surveys of migrants from Tajikistan, wages are the amount that the migrant actually received. On one hand, discrimination may be greater because declared and actually paid wages may differ significantly. On the other hand, applications for quotas apply solely to legal migrants, and the surveys of migrants from Tajikistan were conducted among both legal and illegal migrants. According to Lokshin and Chernina (2013), 54% of migrants had

work permits in 2007, compared with 87% in 2009.[6] In this case, the differences may be attributed to unofficial forms of employment. As a rule, illegal migrants are paid lower wages, as their labor is not protected by the law. However, we should take into account that during a survey, not only may the amount of wages be understated (since respondents are reluctant to answer this question) but also the accuracy of responses about the legitimacy of employment may raise doubts. In any case, the discrimination gap that we obtained, even based on the wages offered to migrants, raises concerns about the nature of the gap and its implications.

7. Conclusion

The main result of this work was to establish the fact that foreign workers are strongly discriminated against in terms of wages: the average wages paid to Russian workers with the same productivity as migrants was, on average, 40% higher during 2009–2013. At the same time, the greatest contribution to explaining the discrimination gap is made by the industry (or types of economic activity) in which workers are employed.

The emergence of new empirical papers on the economics of migration is hindered mostly by the absence of statistical data of high quality. For example, in 2015, the rules for employing foreign migrants changed: the work permit quotas for CIS migrants were replaced with work patents for employment with legal entities while preserving the existing work patents for employment with individuals.[7] This, in turn, prevents further application of our methodology to identify discrimination based on the Rostrud data (on quota applications). No more data are available for the vast majority of migrants.

Many questions remain regarding the nature of the discrimination gap and its effect on the Russian labor market. For example, it is unclear how the low wages paid to migrants affect the wages paid to Russian workers employed in similar positions. This paper provides an argument that the low wages paid to migrants do not affect those paid to local workers, i.e., the discrimination gap remains constant over a long-term horizon. It is also unclear how the presence of foreign workers in the Russian labor market affects the employment of local workers with low skills. More high-quality data and new studies in the area of migration economics would produce a more complete picture and create a basis for correct political recommendations.

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[6] In the first case, authors reviewed a sample of migrants located abroad, and in the second, those who returned from their travels and were surveyed in Tajikistan.

[7] Federal Law No. 115-FZ, On the Legal Status of Foreign Citizens in the Russian Federation, dated June 25, 2002, as amended in 2015.

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Appendix A

Table A1
Composition of the Rostrud and RLMS samples, 2009–2013 (%).

Variable	Data	2009	2010	2011	2012	2013
Number of observations	RLMS	2 133	3 942	4 015	4 009	3 872
	Rostrud	658 360	539 168	607 319	665 722	749 913
Central Federal District	RLMS	19.5	22.3	20.9	19.8	19.5
	Rostrud	17.0	17.6	23.2	25.0	20.6
Southern Federal District	RLMS	9.1	10.7	10.7	9.9	10.9
	Rostrud	6.5	11.4	11.1	15.8	13.4
Northwestern Federal District	RLMS	9.0	7.9	7.5	7.5	7.3
	Rostrud	4.1	2.7	2.1	6.0	7.9
Far East Federal District	RLMS	4.5	4.1	4.1	4.2	4.3
	Rostrud	5.0	6.3	5.7	5.4	4.6
Northern Federal District	RLMS	11.9	12.4	13.2	13.2	14.3
	Rostrud	6.2	7.7	7.3	6.2	5.8
Urals Federal District	RLMS	6.5	6.9	7.7	7.1	8.0
	Rostrud	1.6	1.4	2.8	2.4	2.4
Volga Federal District	RLMS	21.6	21.8	22.0	22.5	22.6
	Rostrud	10.6	7.0	6.3	10.3	11.5
North Caucasus Federal District	RLMS	2.6	2.1	2.4	2.8	3.4
	Rostrud	0.3	0.3	0.5	0.6	0.8
Moscow	RLMS	10.6	8.0	7.7	9.4	6.7
	Rostrud	33.5	26.6	23.2	13.6	19.2
Saint Petersburg	RLMS	4.7	3.7	3.8	3.6	3.1
	Rostrud	15.2	18.9	17.7	14.6	13.7
OKZ[a] 1. Legislators, senior officials and managers	RLMS	4.5	4.5	4.1	4.4	5.4
	Rostrud	7.8	7.8	5.4	4.7	5.6
OKZ 2. Professionals	RLMS	21.2	22.3	20.1	19.7	19.0
	Rostrud	3.4	3.5	3.2	2.4	2.7
OKZ 3. Technicians and associate professionals	RLMS	18.4	19.3	20.4	21.2	20.1
	Rostrud	3.9	2.9	2.8	2.7	3.2
OKZ 4. Clerks	RLMS	5.9	5.9	6.5	7.0	6.4
	Rostrud	0.1	0.1	0.2	0.1	0.3
OKZ 5. Service workers and shop and market sales workers	RLMS	11.4	10.8	11.0	10.4	11.0
	Rostrud	1.7	2.5	2.6	1.6	2.3
OKZ 6. Skilled agricultural and fishery workers	RLMS	0.2	0.1	0.2	0.2	0.3
	Rostrud	2.8	4.5	5.7	6.5	5.4
OKZ 7. Craft and related trade workers	RLMS	14.6	14.6	13.5	13.5	12.8
	Rostrud	45.5	41.6	41.0	43.9	45.3
OKZ 8. Plant and machine operators and assemblers	RLMS	14.3	14.5	15.7	14.3	15.4
	Rostrud	11.7	11.0	12.0	11.6	11.9
OKZ 9. Elementary occupations	RLMS	9.3	8.1	8.4	9.3	9.6
	Rostrud	23.1	26.0	27.2	26.5	23.3
OKVED[b] 1. Agriculture, hunting, forestry	RLMS	3.7	4.0	5.1	4.8	5.0
	Rostrud	4.7	7.4	9.3	11.1	9.1
OKVED 4. Manufacturing enterprises	RLMS	24.8	23.9	22.9	23.5	22.5
	Rostrud	15.2	14.4	13.9	16.3	16.5
OKVED 6. Construction	RLMS	11.3	10.7	10.3	9.0	9.4
	Rostrud	56.8	54.8	44.0	52.3	51.2

(continued on next page)

Table A1 *(continued)*

Variable	Data	2009	2010	2011	2012	2013
OKVED 7. Wholesale and retail trade	RLMS	21.3	21.4	23.5	22.9	22.5
	Rostrud	17.2	16.9	28.6	15.4	16.9
OKVED 9. Transportation and communication	RLMS	11.3	12.2	11.4	11.4	11.2
	Rostrud	5.0	5.2	3.4	4.2	5.3
OKVED 10. Finance	RLMS	3.3	2.8	2.7	3.3	2.8
	Rostrud	0.5	0.5	0.3	0.2	0.3
OKVED 13. Education	RLMS	13.9	13.4	13.1	13.5	14.7
	Rostrud	0.3	0.5	0.3	0.2	0.2
OKVED 14. Health care	RLMS	10.3	11.7	11.0	11.4	12.0
	Rostrud	0.3	0.3	0.3	0.3	0.4
High school education	RLMS	13.7	13.2	14.8	12.7	15.3
	Rostrud	38.6	36.9	46.8	51.7	55.2
Vocational education	RLMS	54.5	53.4	52.9	54.6	52.9
	Rostrud	52.1	51.9	46.9	44.8	40.6
Higher education	RLMS	31.8	33.4	32.4	32.7	31.7
	Rostrud	9.3	11.2	6.3	3.6	4.2
Less than 3 years of experience	RLMS	1.7	4.1	5.2	7.5	9.3
	Rostrud	59.0	51.4	63.6	59.8	61.7
3 to 5 years of experience	RLMS	7.1	8.6	8.8	8.4	7.6
	Rostrud	23.8	28.1	21.4	26.4	24.9
More than 5 years of experience	RLMS	91.2	87.2	86.1	84.0	83.1
	Rostrud	17.2	20.5	15.1	13.8	13.4

[a] Russian classification of occupations.
[b] Type of economic activity.

Table A2
Estimation of model 2 based on Rostrud and RLMS data, 2009–2011.

Variable	2009		2010		2011	
	RLMS	Rostrud	RLMS	Rostrud	RLMS	Rostrud
Vocational education	0.013	0.084***	0.018	0.145***	–0.008	0.084***
	(0.028)	(0.001)	(0.021)	(0.001)	(0.020)	(0.001)
Higher education	0.208***	0.203***	0.207***	0.289***	0.205***	0.388***
	(0.033)	(0.002)	(0.025)	(0.002)	(0.024)	(0.003)
3 to 5 years of experience	–0.070	0.051***	0.030	0.064***	0.138***	0.014***
	(0.078)	(0.001)	(0.041)	(0.001)	(0.037)	(0.001)
More than 5 years of experience	0.015	0.097***	0.077**	0.077***	0.114***	0.043***
	(0.071)	(0.001)	(0.035)	(0.002)	(0.031)	(0.001)
Constant	9.832***	9.354***	9.927***	9.457***	9.903***	9.626***
	(0.088)	(0.001)	(0.054)	(0.002)	(0.052)	(0.002)
Observations	2 133	660 759	3 942	542 456	4 015	610 410
R^2	0.377	0.333	0.358	0.424	0.378	0.424
F statistic	45.402***	11 781.350***	77.833***	14 245.960***	86.586***	16 037.860***
	(*df* = 28; 2 104)	(*df* = 28; 660 730)	(*df* = 28; 3 913)	(*df* = 28; 542 427)	(*df* = 28; 3 986)	(*df* = 28; 610 381)

Note: The model also includes dummy variables for federal districts, Moscow, and Saint Petersburg; professions; and types of economic activity. The authors can provide these data upon request. *F* statistic shows the significance of the model on the whole.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table A3
Estimation of model 2 based on Rostrud and RLMS data, 2012–2013.

Variable	2012		2013	
	RLMS	Rostrud	RLMS	Rostrud
Vocational education	–0.016 (0.021)	0.031*** (0.001)	–0.013 (0.020)	0.064*** (0.001)
Higher education	0.171*** (0.025)	0.232*** (0.003)	0.210*** (0.024)	0.275*** (0.003)
3 to 5 years of experience	0.063* (0.034)	0.130*** (0.001)	0.071** (0.033)	0.128*** (0.001)
More than 5 years of experience	0.073*** (0.026)	0.167*** (0.001)	0.054** (0.024)	0.156*** (0.001)
Constant	9.980*** (0.048)	9.637*** (0.002)	9.956*** (0.048)	9.700*** (0.001)
Observations	4 008	666 415	3 872	749 913
R^2	0.388	0.403	0.379	0.388
F statistic	90.198*** (*df* = 28; 3979)	16 061.260*** (*df* = 28; 666 386)	83.890*** (*df* = 28; 3 843)	16 948.460*** (*df* = 28; 749 884)

Note: The model also includes dummy variables for federal districts, Moscow, and Saint Petersburg; professions; and types of economic activity. The authors can provide these data upon request. *F* statistic shows the relevance of the model on the whole.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

Table A4
Detailed decomposition for Components 1 and 2 of the Oaxaca–Blinder decomposition (4), 2009–2013.

Variable	2009	2010	2011	2012	2013
Component 1					
Education	0.047***	0.066***	0.106***	0.071***	0.084***
Experience	0.063***	0.038***	0.030***	0.094***	0.087***
Industry	–0.018***	–0.031***	–0.027***	–0.016***	–0.030***
OKZ[a)]	0.062***	0.049***	0.029***	0.077***	0.037***
Region	–0.091***	–0.113***	–0.130***	–0.081***	–0.104***
Total	0.063***	0.009*	0.008	0.145***	0.073***
Component 2					
Education	–0.015**	–0.005**	0.037***	–0.013**	–0.013**
Experience	0.025	0.002	–0.028***	0.023***	0.025***
Industry	0.188***	0.156***	0.115***	0.148***	0.125***
OKZ[a)]	0.049**	0.031	0.011	0.036***	–0.001
Region	0.015	0.014*	–0.036***	–0.046***	–0.023***
Constant	0.038	0.164***	0.223***	0.154***	0.211***
Total	0.299***	0.361***	0.321***	0.328***	0.350***

Note: The values in the table show the differences in the logarithms of wages based on the formula for Components 1 or 2.

[a)] Russian classification of occupations.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

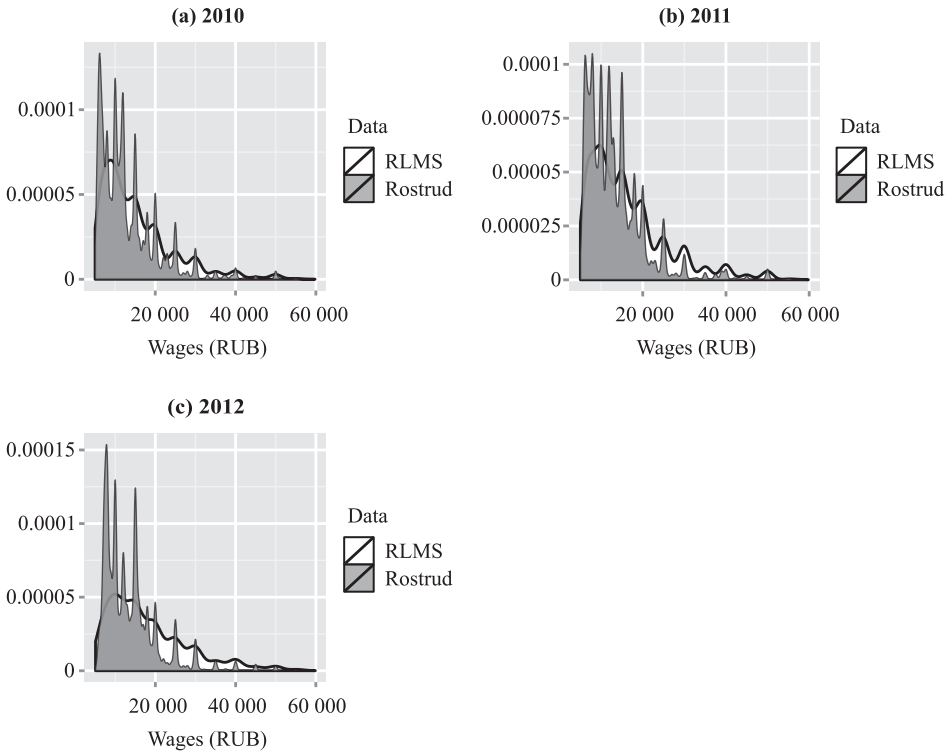

Fig. A5. Comparison of wages distribution density according to RLMS and Rostrud data, 2010–2012.

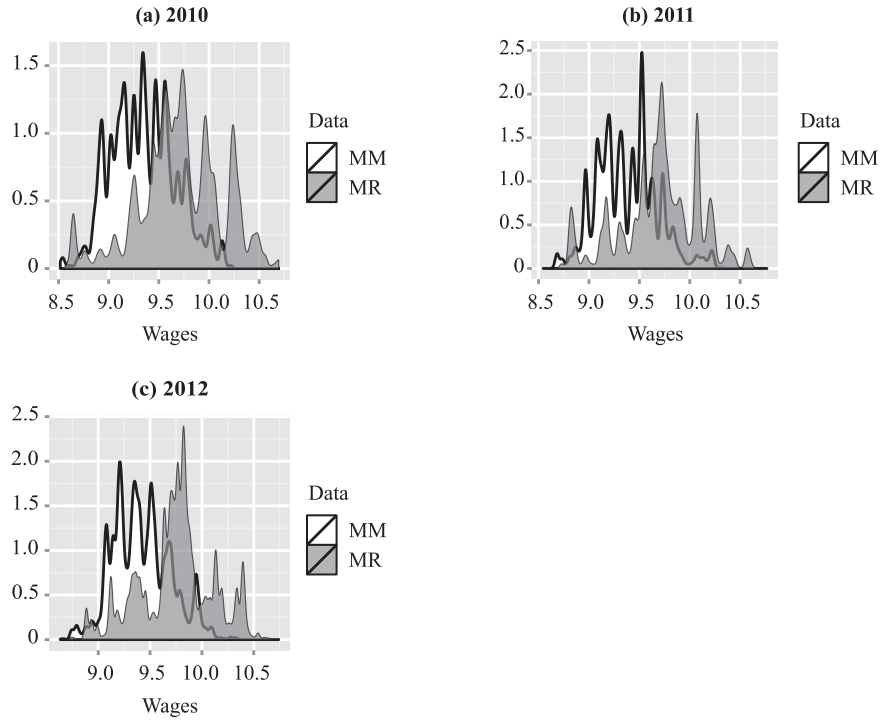

Fig. A6. Comparison of the predicted logarithm of wages distribution density for Russian workers with the productivity of migrants (MR) and predicted migrant wages (MM).