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ACTION AGAINST INCOME DISCRIMINATION. CASE STUDY: ROMA MINORITY IN ROMANIA

***Abstract.** The Roma identity significantly influences their welfare levels in Southeast Europe. This paper analyses income differences among the most three important ethnic groups in Romania, with a particular focus on the Roma minority in order to propose best policies in addressing income discrimination. In order to achieve its aim, the research considers several social and economic characteristics of a person gathered from two data sets: Population and Housing Census 2011 and the tax record data from 2013. Five different methods were used in order to assess wage discrimination. The variables included in our model explain 75% of the differences in the average income between the Roma and Romanians and Roma and Magyars, respectively. The effect of educational attainment on the wages of Roma is much lower than in the case of other minorities. Out of all three ethnic groups, Roma register the highest birth rate, lowest educational level and incomes.*

***Keywords:** income, discrimination, Roma, minority, decomposition.*

JEL Classification: J15, O15, D31

1. Introduction

“White workers \$24: Colored Workers \$20” said a job advertisement in 1927; these kind of ads were not uncommon (Ashenfelter, 1969). People may be treated unfairly in many situations but that may not be always against the law, whether the law is not comprehensive enough or the case is not an actual discrimination. For example, Kelley and Evans (2015) theory suggests that pay differences between outgroup and dominant group may come about because prejudiced members of the dominant group are paid too much, not because outgroup members are paid too little.

Roma people are one of the largest ethnic group in the European Union and among the most deprived, facing discrimination, social exclusion, unequal access to employment and education. It has been demonstrated that wage level is positively associated with integration and assimilation of ethnic groups (Drydakis, 2012). To achieve significant progress towards Roma integration, it is crucial to ensure that national, regional and local integration policies focus on Roma in a clear and specific way, and address the needs of Roma with explicit measures to prevent and compensate for disadvantages they face (European Commission 2011).

The aim of this paper is to assess discrimination from the perspective of income against Roma, as one of the most important minority group in Romania. This kind of discrimination is assessed through a statistical decomposition analysis, first introduced by Oaxaca (1973) and Blinder (1973). It has been broadly applied since then, in assessing income discrimination based on personal characteristics such as race, ethnicity, gender, age, education or work experience (see for example Pereira and Galego 2011). The technique has recently been used to assess wage discrimination of Roma but only using surveys at regional level (O'Higgins 2015). However, analyzing factors affecting wage differentials with a particular focus on Roma, is mandatory to be done within the specific context of a country, as people generally named Roma are very heterogeneous, as there are the places they are living in, a regional study on Roma being therefore limited (O'Higgins, 2015). Also, using data from the Population and Housing Census provides more accurate information about the Roma compared to surveys as it is difficult to identify Roma based upon distinctive characteristics such as appearance, language or family name (Revenga et.al. 2002), thus designing appropriate surveys being very difficult.

The paper is organized as follows: the first section describes the data and variables included in the analysis, the third section presents the results of the regression model assessing which factors affect wage differentials; next, the results of several income decomposition models are provided; last, best policies in addressing wage discrimination are stated along with main conclusions.

2. Data

Within the context, briefly described above, a strong analysis of the differences among average monthly income levels between ethnic groups in Romania with regard to educational attainment, work experience and gender is needed. This paper analyses these differences with a particular focus on the Roma minority. Also, several other variables were included: marital status, number of employment contracts for which a person gained income, a binary variable stating if the person uses the internet or not, number of children, number of persons within the household, area of residency and a binary variable stating if the person works in non-financial companies or not. All these variables form a puzzle in analyzing differences among average monthly income levels, either directly or indirectly.

In order to analyze the differences among average monthly income levels between ethnic groups, considering several social and economic characteristics of a

person, two data sets were used. First, the data obtained at the Population and Housing Census in 2011 were considered; second, data about monthly income, number of contracts and occupation were gathered from the tax record database for 2013. Questionnaires used for gathering census information are available on the <http://www.recensamantromania.ro/en/questionnaires/>. The two databases were aggregated using the Personal Identification Code, registered for each person for both the Census as well as the tax record database. In order to estimate regression parameters, records for Magyars, Romanians and Roma with a monthly average gross income between 800 and 8000 RON (181.0364 – 1810.364 EUR, at average exchange rate for 2013 of 1 EUR = 4.419 RON, according to <http://www.bnr.ro/Exchange-Rates--3727.aspx>) were used. Only people aged 15-65 were considered. One should note that the three ethnic groups represent 92.65% of the population of Romania; Magyars, Romanians and Roma represent 91.55% of the total number of persons obtaining a monthly average income between 800 and 8000 RON and 63.2% of the total number of persons that obtained income. Also, the share of persons that obtained an income between 800 and 8000 RON to the total number of persons that obtained an income is 75%. Furthermore in 2013, the minimum income level set by law was on average 800 RON. Additionally, Roma persons represent 0.07% among those who obtain an income greater than 8000 RON. Thus the interval 800-8000 RON was chosen as reference interval. For the purpose of the research it is important to analyze the biggest share of Roma population, not the ones affected by extremes, such as severe poverty or very high incomes.

Table 1 presents the population structure by ethnic group as registered in the 2011 Census as well as by 2013 level of income. Overall population characteristics as well as by ethnic group, are presented in table 2. The results reveal several important facts:

- The share of Ukrainians, Serbs, Jews and Bulgarians and other ethnic groups is similar at the 2011 Census and among persons who obtained an income between 800-8000 RON (181.0364 – 1810.364 EUR).
- The share of Roma people in the total population is considerably higher than the share of Roma people obtaining an income. Discrepancies are even higher for this ethnic group if one accounts for the 8000 RON income threshold: Roma people represent 3.09% of the total population of Romania; their share among those who obtain an income is 0.65%.

One should note that the persons who did not declare data at the 2011 Census represent 6.15% of the total population of Romania and 11.15% of the total persons that obtained an average monthly income higher than 8000. For these persons, statistical questionnaires for the Census were mostly completed using administrative data; yet, no information with regard to the ethnic group could be retrieved.

Table 1: Population structure by ethnic group (%)

Ethnic group	2011 Census (% of total persons)	Persons aged 15-65, that in January 2013 declared an income and were employed			
		Total	Income less than 800 RON	Income between 800 and 8000 RON	Income greater than 8000 RON
Romanian	83.46	84.58	81.82	85.75	85.70
Roma	3.09	0.65	0.86	0.47	0.07
Magyars	6.10	6.39	7.29	6.33	2.04
Turks	0.14	0.09	0.11	0.08	0.08
Germans	0.18	0.16	0.12	0.18	0.30
Ukrainians	0.25	0.12	0.15	0.10	0.04
Serbs	0.09	0.08	0.07	0.09	0.06
Jews	0.02	0.01	0.01	0.01	0.04
Bulgarians	0.04	0.03	0.02	0.04	0.03
Other	0.49	0.38	0.42	0.36	0.49
Not declared	6.15	7.51	9.11	6.61	11.15
	100.00	100.00	100.00	100.00	100.00

Table 2: Population aged 15-65 characteristics by income group

	All persons that obtained income	Income lower than 800 RON	Income between 800 and 8000 RON	Income higher than 8000 RON
Number of persons	4237771	939479	3208603	89689
Share of persons among the three income groups (%)	100.00	22.17	75.71	2.12
Number of persons among the three income groups	3861514	845301	2937454	78759
Share of the three analyzed ethnic groups in total population (%)	91.12	89.98	91.55	87.81
Average income	1981.91	550.57	2069.64	13836.41
Standard deviation	3143.74	219.26	1341.22	15487.18
Coefficient of variation	158.62	39.82	64.80	111.93

3. Regression model for the analysis of the monthly income

The analysis of the monthly income is performed using the following regression model:

$$\ln W = X\hat{\beta} \quad (1)$$

The dependent variable represents the logarithmic monthly income declared in 2013. The independent variables represent several characteristics of a person. All variables are described in table 3.

Table 3: Variable description

Variable	Explanation	Data source and observation
W	Income	Tax Record Data
Edu	Educational level: 7 – tertiary level, 6 – postsecondary and non-tertiary level, 5 – upper secondary level, 4 – professional level, 3 – lower secondary level, 2 – primary level, 1 – no education or other particular situations including illiterate	2011 Census, Question 26, Statistical questionnaire “P” (Persons)
Exp	Work experience	Defined based on question 4 with regard to the person’s age, questions 26 and 27 from Statistical questionnaire “P” (Persons) with regard to the level of education and several data transformations: age – (14+NS). NS is the number of school years over the age of 15, calculated as follows: tertiary level – 9 years, postsecondary and non-tertiary level – 5 years, secondary level – 4 years, professional level – 2 years, other levels – 0 years.
Sex	Gender: 1 – males, 0 – females	2011 Census, Question 3, Statistical questionnaire “P” (Persons)
Marital_status	Marital status: 1 – unmarried, widow or divorced, 0 – married, 9 – not declared	2011 Census, Question 5, Statistical questionnaire “P” (Persons)

N_contracts	Number of employment contracts for which a person gained income	D112 Declaration
Internet_user	1 – the person uses the internet, 0 – the person does not use the internet, 9 – not declared	2011 Census, Question 29, Statistical questionnaire “P” (Persons)
Children	Number of children	2011 Census, Statistical questionnaire “G” (Household)
H_persons	Number of persons within household	2011 Census, Statistical questionnaire “G” (Household)
Sect	Binary variable: 1 – person works in non-financial companies, 0 – otherwise (public administration, NGOs)	2011 Census, Question 36, Statistical questionnaire “P” (Persons)
Ethnic	Ethnic group	2011 Census, Question 23, Statistical questionnaire “P” (Persons)
Residency	Residency: 2-Urban area 1-Rural area	2011 Census, Question 15, Statistical questionnaire “P” (Persons)

The variable describing the ethnic group was used in order to split the population by ethnicity. The study considers three ethnic groups, the most important in Romania: Romanians, Roma, and Magyars. For several variables used in defining the model above, the average value at population level as well as by ethnic group was computed. The results, presented in table 4 reveal several important characteristics of each ethnic group:

- Roma people have lower income than other ethnic groups;
- Roma population is younger than the population in other ethnic groups: the average age for Roma, with regard to persons 15-65 years old is lower with 2.6 years compared to the Romanians and with 2.3 years lower compared to the Magyars;
- Males registered higher incomes than females at population level as well as by each ethnic group. For Roma, 58.8% of those who reported an income, are males;
- The overall educational level is lower for Roma than for other ethnic groups. Most people in this group successfully completed at most the lower secondary level of education; over 20% of the population in this group hasn't completed any level of education and 14% are illiterate. The data

considering the higher educational level for persons aged 10 and over was registered at the 2011 Census and are presented in table 5; one should consider that table 5 takes into account population above 10 years old, as this provides a more relevant picture on the educational attainment of ethnic groups especially for Roma, which usually register low educational attainment at all age levels.

- Roma ethnic group registered the highest number of children per family: 100 persons that obtain an income care for 87 children; with regard to the Romanians, 100 persons that obtain an income care for 57 children, while for Magyars, 100 persons that obtain an income care for 63 children; thus, the average number of persons in a household where at least one person provides an income is 4.9 for Roma and 3.4 for Romanian and Magyar;
- Lower income levels as well as lower educational attainment for Roma determine a lower access rate to the Internet: 64% of the persons in Romanian and Magyar ethnic groups compared to 23.7% of the persons in the Roma group that obtain an income use the internet.

Table 4: Average values for all variables in the model by ethnic group, data source: designed by the authors

Variable	Total	Romanian	Roma	Magyar
W	2033.8	2055.5	1317.9	1693.6
Edu	5.436148	5.465788	3.55872	5.175331
Exp	26.28390	26.53952	23.93136	26.24448
N_contracts	1.076767	1.077212	1.035502	1.065049
Sex	0.513443	0.512193	0.587675	0.512922
Marital_status	0.292288	0.27 6735	0.363863	0.306956
Internet_user	0.636969	0.634769	0.237109	0.646167
Children	0.571145	0.574741	0.87365	0.628887
Residency	1.517557	1.519103	1.919681	1.671552
H_persons	3.325191	3.387132	4.891604	3.400068
Sect	0.784785	0.778016	0.803591	0.809812

Table 5: Population characteristics by educational level, data sources: (1) 2011 Census, volume II, page 504, (2) designed by the authors

	Population over 10 years	tertiary level	postsecondary and non-tertiary level	secondary level	primary level	no education	illiterate
	Number of persons (1)						
Total	18022221	2591021	574043	11759627	2556286	541244	245387
Romanian	15222069	2254966	503958	9982366	2101700	379079	153221
Magyar	1119988	114470	37354	822101	122939	23124	9020
Roma	477715	3397	994	213582	163231	96511	67480
	Share of persons by educational level and ethnic group (%) (2)						
Total	100.00	14.38	3.19	65.25	14.18	3.00	1.36
Romanian	100.00	14.81	3.31	65.58	13.81	2.49	1.01
Magyar	100.00	10.22	3.34	73.40	10.98	2.06	0.81
Roma	100.00	0.71	0.21	44.71	34.17	20.20	14.13

	Share of persons belonging to a certain ethnic group within the total number of persons have a certain educational level (%) (2)						
Romanian	84.46	87.03	87.79	84.89	82.22	70.04	62.44
Magyar	6.21	4.42	6.51	6.99	4.81	4.27	3.68
Roma	2.65	0.13	0.17	1.82	6.39	17.83	27.50

The parameters for the regression model (1) were estimated for the entire population as well as for the three ethnic groups. Table 6 presents the results. As one can observe the coefficients of each variable have the same sign across all ethnic groups, yet, the level is very different. Comparing the three ethnic groups, one can observe the following:

- The educational level has approximately the same positive effect on the income level for the Magyar (14.6%) and Romanian (16%) ethnic groups; yet, due to the low educational level of the Roma population, the effect on the income is two times lower (7.8%);
- The number of employment contracts for which a person gained income has a positive effect on the income level; for the persons in Roma ethnic group the coefficient registered was 0.17, four times higher than for Romanians or Magyars;
- Male persons obtained a higher income than female persons among all three ethnic groups;
- As the parameter of the variable describing the number of children is negative, one can deduce that persons with a higher number of children generally obtain lower income;
- Across all three ethnic groups, married persons obtain higher revenues compared to unmarried persons;
- Persons that usually access the internet have 11.06% higher income than those who do not; the results are the same for all three ethnic groups as well as for the entire population.
- Area of residency negatively influences the income level, as people living in urban areas gain increased incomes compared to those living in rural areas.

Table 6: Regression model coefficients and characteristics by ethnic group; source: designed by the authors

Variable	Total	Romanian	Roma	Magyar
Edu	0.159393(656.36)	0.162501(632.11)	0.077740(27.55)	0.146173(157.88)
Exp	0.014781(105.27)	0.015718(102.20)	0.0100440(7.72)	0.0120290(24.58)
Exp^2	-0.000144(-56.64)	-0.000153(-55.26)	-0.000159(-6.16)	-0.000099(-10.93)
N_contracts	0.0494861(52.21)	0.0466640(48.31)	0.1705320(6.80)	0.0692560(10.82)
SEX	0.088018(113.06)	0.094075(111.31)	0.092444(11.61)	0.0900620(32.61)
Marital_status	-0.020405(-29.68)	-0.019187(-25.53)	-0.019009(-2.94)	-0.0218680(-9.31)
Internet_user	0.105266(162.20)	0.112634(160.79)	0.090934(10.13)	0.0924520(42.19)
Children	-0.034511(-85.61)	-0.033783(-76.48)	-0.024142(-11.49)	-0.022166(-15.64)
Residency	-0.032328 (-101.78)	-0.029855(-87.52)	-0.003659(-1.22)	-0.021272(-20.44)

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H_persons	-0.014217(-69.46)	-0.015080(-65.37)	-0.002360(-1.95)	-0.0080790(-9.64)
Sect	-0.008255(-12.59)	-0.0248800(33.33)	0.108123(14.74)	-0.066877(-26.81)
C	6.297581(2218.15)	6.259144(2113.69)	6.417303(192.77)	6.279077(567.56)
R ²	0.231	0.236	0.185	0.235
n	3208603	2722052	14816	200586

*t-values in brackets

Using the results of the regression model (1), as well as the average of each variable by ethnic group, the following relationship was defined:

$$\overline{\ln W_i} = \bar{X}_i \hat{\beta}_i, i = A, RO, ROM, MA \quad (2)$$

\bar{X}_i is the average of each variable used for defining the regression model for the overall population and by each ethnic group (A – overall population, RO – Romanian group, ROM – Roma group, MA – Magyar group).

After estimating parameters for each population, one must establish whether or not they significantly differ from one another. Specifically, the following relationship must be tested for each pair of ethnic groups $\hat{\beta}_i = \hat{\beta}_j, i, j = Ro, Rom, Hu$ and $i \neq j$. In order to compute a statistical test, the following elements of the first regression model were considered:

- SSR – sum of squared errors obtained after estimating regression model (1) using data for both ethnic groups;
- SSR_i – sum of squared errors obtained after estimating regression model (1) using data one ethnic group;
- $SSR_{ij} = SSR_i + SSR_j, i, j = Ro, Rom, Hu$ and $i \neq j$

$$F = \frac{(SSR - SSR_{ij})/p}{SSR_{ij}/(n_i + n_j - 2p)} \rightarrow F(p, n_i + n_j - 2p)$$

p – Number of regression parameters for model 1

n_i – Number of observations at each ethnic group

F is defined under the hypothesis of lack of structural change (H_0).

Table 7 presents the values for F and $Prob F(p, n_i + n_j - 2p)$ which are used in order to analyse parameters' stability among two ethnic groups. As one can observe, different profiles for the three ethnic groups can be defined. Thus, next, income decomposition among ethnic groups is performed emphasizing the influence of differences among ethnic groups and positive discrimination.

Table 7: Structural changes analysis among all three ethnic groups

		F Value (above main diagonal)		
		Romanian	Roma	Magyar
ProbF(p, n _i + n _j - 2p) (under main diagonal)	Romanian	-	140.47	1027.36
	Roma	0.00	-	172.16
	Magyar	0.00	0.00	-

4. Income difference decomposition among two ethnic groups

For each compared ethnic group, regression parameters are different depending on the values of different variables. For two ethnic groups, $\hat{\beta}_i$ and $\hat{\beta}_j$ are the regression model parameters. $\hat{\beta}_*$ is the regression model (1) parameter obtained if there is no positive or negative discrimination between ethnic groups considering income differences. This parameter is calculated using the two parameters estimated for the two ethnic groups based on the following relationship:

$$\hat{\beta}_* = \Omega_p(\hat{\beta}_i - \hat{\beta}_j) + \hat{\beta}_j \quad (3)$$

In the third relationship, Ω_p is a squared matrix of order p, which can have different forms:

- $\Omega_p = I_p$ where I_p is the unit matrix of order p. This decomposition method was proposed by Oaxaca (1973) and it assumes that there is positive discrimination only in favor of the second group (not the first one). In this case $\hat{\beta}_* = \hat{\beta}_i$. This decomposition technique has become a basic tool for studying racial and gender wage differentials and discrimination, and it has been allowed in court litigation on discrimination (Ashenfelter and Oaxaca 1987).
- $\Omega_p = O_p$ where O_p is the zero matrix of order p. This method, also proposed by Oaxaca (1973) was used in order to assess if there is positive discrimination only in favor of the first group (not the second one) within each comparison. In this case $\hat{\beta}_* = \hat{\beta}_j$;
- $\Omega_p = \frac{1}{2}I_p$ is the decomposition proposed by Reimers (1983). This method was chosen because it takes into account the possibility of selectivity bias in the observed wage sample. $\hat{\beta}_*$ is the average of the two parameters estimated for the two ethnic groups, $\hat{\beta}_* = \frac{1}{2}(\hat{\beta}_i + \hat{\beta}_j)$.
- $\Omega_p = \frac{n_i}{n_i+n_j}I_p$ is the decomposition proposed by Cotton (1988) which yields more nearly accurate estimates of the components of the wage differential than other methods. n_i is the number of persons in the first group and n_j is the number of persons in the second group. $\hat{\beta}_*$ is the

weighted average of the two parameters estimated for the two ethnic groups, $\hat{\beta}_* = \frac{n_i}{n_i+n_j}\hat{\beta}_i + \frac{n_j}{n_i+n_j}\hat{\beta}_j$;

- $\Omega_p = (XX')^{-1}(X_iX_i')$ was proposed by Oaxaca and Ranson (1994). X is the matrix containing all values for the characteristics of each ethnic group. This technique is similar to Neumark's (1988) and a generalization of the method proposed by Cotton (1988).

Using the linear regression model (3) and the $\hat{\beta}_*$ parameter, the differences between two ethnic groups considering the average income are decomposed using the following relationship:

$$\overline{\ln W_i} - \overline{\ln W_j} = \bar{X}_i(\hat{\beta}_i - \hat{\beta}_*) + \bar{X}_j(\hat{\beta}_* - \hat{\beta}_j) + (\bar{X}_i - \bar{X}_j)\hat{\beta}_* = D_i + D_j + H_{ij}, i,j=A,RO, ROM, HUi \neq j \quad (4)$$

D_i is the positive discrimination in favour of group i, D_j is the positive discrimination in favour of group j and H_{ij} measures the differences in the average income between the two ethnic groups due to the differences of the average values of the characteristics considered for comparing the two ethnic groups.

Considering that regression model (3) estimated for each ethnic group has a constant different from 0, then the fourth relationship becomes:

$$\overline{\ln W_i} - \overline{\ln W_j} = [D_{1i} + D_{2i}] + [D_{1j} + D_{2j}] + H_{ij}, i,j=A,RO, ROM, HUi \neq j \quad (5)$$

D_{1i} is the positive or negative discrimination that affects a person in the first ethnic group due to the factors that are not included in the model, D_{2i} is the positive or negative discrimination that affects a person in the first ethnic group due to the factors that are included in the model, D_{1j} is the positive or negative discrimination that affects a person in the second ethnic group due to the factors that are not included in the model, D_{2j} is the positive or negative discrimination that affects a person in the second ethnic group due to the factors that are included in the model. Given the decomposition formula for the difference in the average income between two ethnic groups presented in the fifth relationship, one can obtain the decomposition formula for the difference caused directly by the variables used to define the regression model 1:

$$[\overline{\ln W_i} - D_{1i}] - [\overline{\ln W_j} - D_{1j}] = D_{2i} + D_{2j} + H_{ij}, i,j=A,RO, ROM, HUi \neq j \quad (6)$$

As stated above, five different estimation methods were used for the $\hat{\beta}_*$ parameter (identified in the scientific literature). The results of each method are presented in table 8 and 9; for each pair of ethnic groups: $D_{2i}, D_{2j}, H_{ij}, D_{2i} + D_{2j}$ in absolute values (table 9), as well as relative values to the $D_{2i} + D_{2j} + H_{ij}$, which

represents the income exclusively determined by the variables included in the model (table 8).

Table 9 also presents the results obtained due to the analysis of the differences in the income level among ethnic groups based of the fourth relationship, thus evaluating the discrimination due to the variables included in the model as well as other factors. For each pair, values for all terms of relationship four are presented separately ($D_{2i}, D_{2j}, D_{2i} + D_{2j}$ and H_{ij}). As a consequence, differences in the average income of each ethnic group are revealed with regard to: D_{1i} , the discrimination that affects the first ethnic group due to the factors that are not included in the model, D_{2i} , the discrimination that affects the first ethnic group due to the factors that are included in the model, D_{1j} , the discrimination that affects the second ethnic group due to the factors that are not included in the model, D_{2j} is the discrimination that affects the second ethnic group due to the factors that are included in the model and H_{ij} the differences in the average income between the two ethnic groups due to the differences of the average values of the characteristics considered for comparing the two ethnic groups.

The results obtained through equation 5 emphasize the following:

- Relatively similar results were obtained for the Magyar and Romanian ethnic groups with regard to the share of income determined by the variables included in the first model. Less than 30% of the differences in the average income between Magyars and Romanians is explained through the dissimilarities between the two ethnic groups considering the independent variables in the regression model.
- All five models produced relatively close values for differences in the average income between the two ethnic groups due to the differences of the average values of the characteristics considered for comparing the two ethnic groups, expressed through H_{ij} in the fifth relationship;
- All five models revealed significant differences between the average income of the Romanian and Roma ethnic groups as well as of Magyar and Roma ethnic groups due to the variables included in the regression model (1). Overall, 75% of the differences in the average income between the compared ethnic groups are explained through the differences in the groups' socio-economic profile;
- Comparing the Romanian and Roma group, with regard to the differences due to the positive discrimination for one of the groups, one can observe a balanced situation: 18.9% of the differences in the income level for the two ethnic groups is explained through the positive discrimination for the Romanian group, while 15.3% of the differences in the income level for the two ethnic groups is explained through the positive discrimination for the Roma group;
- The results are different when analyzing the Romanian and Magyar groups: positive discrimination of the Magyars explained 50% of the

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income difference while positive discrimination of the Romanians, only 25%;

- Interesting results were obtained when the Roma and Magyar groups were examined: positive discrimination of the Magyars explained 25% of the income difference while positive discrimination of the Roma, only 1.6%;

Table 8: Evaluating relative differences among ethnic groups as result of model variables

Method	Compared groups	Discrimination in favor of the first group	Discrimination in favor of the second group	Differences due to different productivities	Total discrimination	Total differences
OAXAC A 1	Romanian VS Roma	0.00	21.96	78.04	21.96	100.00
	Romanian VS Magyar	0.00	72.96	27.04	72.96	100.00
	Magyar VS Roma	0.00	5.41	94.59	5.41	100.00
OAXAC A 2	Romanian VS Roma	62.34	0.00	37.66	62.34	100.00
	Romanian VS Magyar	75.05	0.00	24.95	75.05	100.00
	Magyar VS Roma	45.61	0.00	54.39	45.61	100.00
Reimers	Romanian VS Roma	31.17	10.98	57.85	42.15	100.00
	Romanian VS Magyar	37.53	36.48	25.99	74.01	100.00
	Magyar VS Roma	22.81	2.71	74.49	25.51	100.00
Cotton	Romanian VS Roma	0.34	21.84	77.82	22.18	100.00
	Romanian VS Magyar	5.15	67.95	26.90	73.10	100.00
	Magyar VS Roma	42.48	0.37	57.15	42.85	100.00
Neumark	Romanian VS Roma	0.88	21.52	77.60	22.40	100.00
	Romanian VS Magyar	3.78	68.93	27.28	72.72	100.00
	Magyar VS Roma	14.59	-0.66	86.07	13.93	100.00

Table 9: Evaluating differences among ethnic groups using regression model 2 and relationships 3 and 4

Method	Compared groups	Discrimination in favor of the first group		Discrimination in favor of the second group		Differences due to different productivities	Explained discrimination	Unexplained discrimination	Total discrimination	Differences due to the model variables	Total differences
		D_{1i}	D_{2i}	D_{1j}	D_{2j}	H_{ij}	$D_{2i} + D_{2j}$	$D_{1i} + D_{1j}$	(8)+(9)	(7)+(8)	(7)+(10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OAXACA 1	Romanian VS Roma	0.0000	0.0000	-0.1663	0.117174	0.41639	0.117174	-0.1663	-0.04913	0.53356	0.36726
	Romanian VS Magyar	0.0000	0.0000	-	0.150672	0.055847	0.150672	-0.02807	0.122602	0.20652	0.17845
	Magyar VS Roma	0.0000	0.0000	-	0.13823	0.017703	0.309342	-0.13823	-0.12053	0.32705	0.18882
OAXACA 2	Romanian VS Roma	-0.1663	0.332623	0.00000	0.00000	0.200941	0.332623	-0.1663	0.166323	0.53356	0.36726
	Romanian VS Magyar	-	0.154999	0.00000	0.00000	0.051521	0.154999	-0.02807	0.126929	0.20652	0.17851
	Magyar VS Roma	-	0.149173	0.00000	0.00000	0.177871	0.149173	-0.13823	0.010943	0.32704	0.18881
Reimers	Romanian VS Roma	-	0.166311	-	0.058587	0.308665	0.224898	-0.1663	0.058598	0.53356	0.36726
	Romanian VS Magyar	-	0.077499	-	0.075336	0.053684	0.152835	-0.02808	0.124755	0.20652	0.17844
	Magyar VS Roma	-	0.074587	-	0.008851	0.243607	0.083438	-0.13822	-0.05478	0.32705	0.18883
Cotton	Romanian VS Roma	-0.0009	0.001801	-0.1654	0.11654	0.415223	0.118341	-0.1663	-0.04796	0.53356	0.36726
	Romanian VS Magyar	-	0.010638	-	0.140331	0.05555	0.150969	-0.02807	0.122899	0.20652	0.17845
	Magyar VS Roma	-	0.138913	-	0.00951	0.186914	0.140131	-0.13823	0.001901	0.32705	0.18882

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Neumark	Romanian VS Roma	-0.0047	0.004677	0.16159	-	0.114833	0.414054	0.11951	-0.16629	-0.04678	0.53356	0.36727
	Romanian VS Magyar	0.00069	0.007816	0.02876	-	0.142356	0.056347	0.150172	-0.02807	0.122106	0.20652	0.17845
	Magyar VS Roma	-0.0523	0.047717	0.08593	-	-0.00217	0.281496	0.045547	-0.13823	-0.09268	0.32704	0.18881

5. Conclusions

This paper analyzed the differences in wages considering three major ethnic groups in Romania with focus on the Roma minority. The results are a strong basis for policies addressing wages discrimination with regard to ethnicity. Also, they provide strong incentives on the areas that should be treated with particular attention in order to increase wages.

First, out of all three ethnic groups, Roma register the highest number of children per family, lowest educational level and incomes. High birth rates result in a young population, yet, several alarming facts are to be emphasized considering health reproduction in Roma women: high infant mortality and perinatal death rates, premature births and low birth weight babies, abortion as an acceptable way of contraception (Ringold, 2000). With regard to contraception, Nikolic and Djikanovic (2015) emphasized that Roma women rely mostly on traditional ways of contraception. In addressing these issues, as well as all other health issues the Roma community is facing, public policies should focus on emphasizing the role of preventive health care (WHO Regional Office for Europe, 2013) which besides vaccination and adopting a healthy lifestyle, should also include promoting modern contraception. Considering increasing educational attainment, an inclusive approach on education is needed so that all children can have access to high quality education especially in those counties in Romania where educational attainment is very low (Dascălu et al, 2016). This is particularly necessary at tertiary level, as higher education is a solution to address unemployment in Romania increasing labor force participation, especially in the case of metropolitan Roma people (Andrei et al. 2016) and women (Andrei et al.2010).

Second, variables included in our model explains 75% of the differences in the average income between the Roma and Romanians and Roma and Magyars, respectively. Also, the effect of educational attainment on the wages of Roma is much lower than in the case of other minorities. Most of the public efforts considering Roma inclusion aimed at “*eliminating discrimination and closing the unacceptable gaps between Roma and the rest of society*” (Decade of Roma Inclusion Secretariat Foundation, 2015) considering employment, education, health and housing, gender inequality and poverty.

Third, considering wages with regard to gender, marital status, number of children, access to the internet and area of residency similar results were obtained for all ethnic groups. Thus, these issues must be addressed in a broad sense, but also taking into account ethnic group’s cultural particularities.

Male persons obtained a higher income than female persons. Thus, reducing gender pay gaps and improving access to financial resources is

mandatory, as these gap may have important negative consequences on women's life quality especially after retirement.

Married persons obtain higher revenues compared to unmarried persons. As, single mothers are one of the most vulnerable group within this category, policies addressing wage differentials should primarily focus on the.

Persons that usually access the internet have 11.06% higher income than those who do not; the results are the same for all three ethnic groups as well as for the entire population. Thus, strengthening efforts in order to increase internet usage especially in areas where using the internet is relatively easy will help reduce wage gaps.

Area of residency negatively influences the income level, as people living in urban areas gain increased incomes compared to those living in rural areas. This is of great relevance from the perspective of the objectives of social and inclusive growth of the Europe 2020 Strategy. Efficient ways in addressing low income levels in rural areas from Romania are needed.

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