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BALANCING BETWEEN MARKETS AND SOCIETY

Food consumption and diet quality choices of Roma in Romania: A counterfactual analysis

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Food consumption and diet quality choices of Roma in Romania: A counterfactual analysis*

Abstract

This paper analyses the diet quality aspect of food security of Roma in Romania. We employ a modified Blinder-Oaxaca decomposition technique using Household Budget Survey data for the period 2004-2011. The estimates suggest that Roma have inferior diet quality compared to the non-Roma. Around one-third of the diet quality gap is explained by the differences in observed socio-economic factors, whereas the remaining part of the gap is attributed to unobserved factors. We argue that the unexplained component of the diet quality gap is caused by the discrimination of the Roma on the labour market and by their specific informal institutions.

Key words: Roma, food security, diet quality, informal institutions, discrimination

1 Introduction

It is estimated there are around 11 million Roma people in Europe, mostly concentrated in the region of Central and Southeast Europe. Romania has one of the largest shares of Roma population in Europe. Around 16% of European and 30% of EU Roma live in Romania. The share of Roma in total Romanian population is above 10%, which is one of the highest shares in Europe (Council of Europe, 2012). Around 75% of Roma population in Romania lives below the poverty line, while 24% of Romanians and 25% of ethnic Hungarians lives below the poverty line (Amnesty International, 2010). In most European countries including Romania, Roma population faces, to various degrees, discrimination reflected in racism and exclusion from the formal labour market as well as more difficult access to healthcare and education than majority population (see, Tomovska, 2010; European Commission, 2012a; 2012b; 2014a; Bartoš et al., 2016; Ciaian and Kancs, 2016).

* We thank the Romanian National Institute of Statistics for granting access to the Household Budget Survey data. The authors are solely responsible for the content of the paper. The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission or of the National Bank of Slovakia.

In this paper we evaluate food consumption and the food security situation of the Roma population in Romania. We focus on the diet quality aspect of food security and reveal a possible cultural (institutional) and economic (marginalisation) forces determining Roma food diet choices. We proxy diet quality with three diet diversity indicators: the count of consumed food items, Simpson index, and Entropy index. Nutrition literature (e.g. Hatloy et al., 2000; Carletto et al., 2013) shows that consumption of diverse diet has positive impact on health and diet diversity is a good indicator of household food security and diet quality. We compare Roma diet choices to that of majority Romanian population and to other non-Roma minorities living in Romania. We study the quality of food diet of the Romanian Roma population using the counterfactual decomposition technique introduced by Blinder (1973) and Oaxaca (1973). Household Budget Survey (HBS) data from the Romanian National Institute of Statistics (NIS) covering the period 2004-2011 is used.

Food insecurity and specifically diet quality of ethnic minorities has been studied mainly in the United States (e.g. Coleman-Jensen et al., 2014). Papers analysing diet composition of the Roma ethnic group in Europe are rather limited. There are only general studies on Roma food security and poverty (UNDP, 2005; European Commission, 2004; 2012a; 2014). An exception is the UNDP (2013) study which collected a more detailed survey data on diet compositions of Roma households in Slovakia. However, this survey does not compare Roma's diet quality with that of the majority population.

Our main contribution to the literature is the evaluation of Roma dietary behaviour and its comparison to majority and non-Roma minority populations using a unique survey micro-data. To the best of our knowledge, there are no comparable studies on diet quality for the Roma ethnic group in Europe. Given a strong correlation between diet quality and food security this is a significant omission of the literature. Our second contribution to the literature is the application of the Blinder-Oaxaca decomposition technique to food and nutritional security of vulnerable households which has not been widely used in food demand studies.[1]

The paper is organized as follows. Section 2 explains the determinants of food consumption patterns of Roma that differ from non-Roma. Section 3 presents the methodology for measurement and estimation of diet diversity. Section 4 presents the data used in the estimation. In Section 5, empirical results are presented, while the last, Section 6, concludes.

[1] An exeption is a recent study by Hirvonen (2016) analysing differences in food diversity among children in urban-rural Ethiopia by means of the Blinder-Oaxaca method.

2 Roma specific determinants of food consumption patterns

In this section we first investigate the implications of Roma specific informal institutions on their food consumption patterns. Second, we analyse the role of economic marginalisation of Roma on their food consumption. Both these factors may importantly impact the Roma's food consumption level as well as its quality (diet diversity).

2.1 Impact of Roma informal institutions on food consumption

All aspects of Roma lives including consumption of food are heavily affected by the informal Roma institutions, *Romaniya*.[2] *Romaniya* rules are customary and oral and are enforced and administered by Roma informal enforcement system. The *Romaniya* legal system coexists with formal national legal order (Fraser, 1995; Weyrauch, 2001; Leeson, 2012). In line with Greif and Laitin (2004) theory of endogenous institutional change, *Romaniya* belongs to self-enforcing institutions (Leeson, 2012). In a self-enforcing institution, the belief-induced behaviour is self-enforcing leading individuals to act in a manner that reproduces the associated beliefs (Greif and Laitin, 2004; Leeson, 2012; Ciaian and Kancs, 2016).

Romaniya regulates both internal functioning of Roma society as well as its interaction with external (non-Roma) people in both social and economic affairs. *Romaniya* relies on ritual belief system with its core concept distinguishing between behaviour that is polluted (*marimé*) and pure (*vujo*).[3] What is *marimé* is perceived in Roma's belief system morally "dirty", not necessarily physically only but also spiritually (ritually). It has powerful significance for Roma as it determines which actions and behaviours are accepted and are in line with rules.

The main source of pollution (*marimé*) is human body. According to *Romaniya*, the human body consists of pure and impure (polluted) parts. The waist is dividing line. The lower body is polluted, while the upper part is fundamentally pure and clean. Further, non-Roma (*Gaje*) are by definition unclean as they do not adhere to the *Romaniya* rules. They are outside the accepted boundaries and they represent a constant danger of contamination.

The Roma belief system based on of *marimé* implies a whole series of social boundaries to Roma and has direct and indirect implication for food consumption habits. Food preparation and consumption needs to respect certain taboos.

[2] This should not be confused with Romania which refers to country name. The apparent similarity is just a coincidence.

[3] The belief system of the Roma varies from country to country and community to community, but many beliefs are common and vary only in the degree in which they are observed or applied (Patrin, 2015).

Marimé rules also restrict consumption of certain foods. For example, horse meat is forbidden to be prepared for food. Certain foods can only be eaten at certain events (e.g., peanuts only in funeral feast) (Weyrauch, 2001).

Important source of impurity and pollution are non-Roma places and objects because they do not observe the *Romaniya* rules. This is also valid for food. Food prepared by non-Roma is polluted and thus needs to be avoided.[4] To avoid *marimé*, Roma may reject consuming food procured outside the Roma community (e.g. in restaurants, hospitals, prisons). A strategy often used to reduce the pollution risks used when eating away from home is by using disposable dishes and cutlery,[5] eating pre-packed food and drinking from cartons or bottles (Weyrauch, 2001; Leeson, 2012). For example, to avoid pollution, Roma patients may refuse food prepared by non-Roma in the hospital cafeteria and prefer bringing home made food (Honer and Hoppie, 2004).

Other factor that may have affected eating habits of Roma - not necessarily linked to *Romaniya* - is their nomadic way of life practiced particularly in the past. Their diet was restricted to a large extent to what was readily available. For example, this included wild fruits, berries, leafy plants, and small mammals. As the Roma have gradually come into greater contact with non-Roma people and sedentary lifestyle, their eating habits have conformed closer to those of the non-Roma (Patrin, 2015). However, some of the habits may have been preserved till present days and affect dietary choices and way of food preparation and consumption.

The food consumption habits of Roma have implications for diet diversity. First, the key effect is restriction of consuming food prepared by non-Roma. It gives preference to Roma self-prepared food, which likely reduces the dietary diversity and increases cost of some foods which in turn indirectly reduces dietary diversity, or imposes specific requirements on preparation and handling if acquired away from home (e.g. wrapped take-away foods). Overall, these aspects of Roma informal rules reduce the set of consumption options as the access to food procured outside is restricted. Second, certain foods are restricted and not allowed by Roma rules. Third, low availability of food diversity due to the nomadic way of life in the past may affect the present dietary choices. All these elements are specific to Roma and are expected to lead to different dietary behavior of Roma as compared to the non-Roma population.

[4] An exception is the children; they may eat food prepared by non-Roma given that they are less subject to *marimé* rule.

[5] Roma may simply eat with their hands rather than use cutlery that may not have been properly washed.

2.2 Impact of economic marginalisation on Roma food consumption

The marginalisation and segregation experienced by Roma adversely impacts their income stream which ultimately reduces their possibility to purchase sufficient food particularly of better quality (Theil and Finke, 1983; Jackson, 1984; Dercon 2000, 2002). Roma marginalisation is largely due to the labour market discrimination. According to O'Higgins and Ivanov (2006) the unemployment rate of Romanian Roma was 45% compared to 29% of non-Roma in 2004. Further, the study revealed that most Roma suffered from long-term unemployment: 88% of Roma did not have a job since 1996 or earlier.

Roma workers usually have access only to temporary jobs such as seasonal works on farms, specialised crafts (e.g. music), trade on local markets, as well as semi-legal activities (begging). According to European Commission (2012a), only around 29% of Roma were reported to be in paid employment in Romania compared to 38% for similar non-Roma population (Troc, 2002; O'Higgins and Ivanov, 2006). According to European Commission (2014a), a considerable share (66%) of Roma in paid employment face precarious employment conditions: 60 % hold ad-hoc jobs, 4 % are self-employed and 1% are employed part-time, while only 34% have full time job.

The Roma labour market participation gaps are reflected in low and unstable income. According to the European Commission (2014a), the large majority of Roma households (78%) have an income below the national at risk-of-poverty level (i.e. lower than 60% of the national median disposable income) in Romania, compared to 35% of similar non-Roma households.

Dercon (2000, 2002) argues that the vulnerability of households with risky income stream is high and it is reflected in fluctuations in consumption which adversely impacts nutrition and health of household members. Although households operating in risky environment may develop risk-coping strategies (e.g. income diversification, self-insurance through savings, informal insurance and credit markets, informal risk-sharing) that mitigate decrease of consumption (including food) in periods when income is low, these strategies do not fully eliminate variability in consumption (Dercon 2000, 2002). Further, coping with recurrent income declines is more difficult than coping with a single income shock.

3 Methodology: Measuring diet quality and econometric approach

3.1 Measuring diet quality

In this paper we employ three measures of household diet quality: (i) the count of food items (CM), (ii) diversity measured by Simpson index (SI), and (iii) diversity measured by Entropy

index (EI). The count of food items consumed during specific time period has been used as an indicator of the varied diet (e.g. Moon et al. 2002; Hirvonen, 2016). Other measures used in the literature (e.g. Thiele and Weiss, 2003; Hertzfeld et al., 2014; Liu et al., 2014) are the Simpson index defined as $SI = 1 - \sum w_i^2$, and the Entropy (Berry) index defined as $EI = \sum w_i \log(1/w_i)$, where w_i is the budget share of the i^{th} (disaggregate) food item in the total food expenditure. Simpson and Entropy indices also take into account the distribution of food consumption. The formulation of SI and EI implies that diversity is higher when more food items are consumed in equal proportions.

3.2 Econometric approach: Decomposition analysis

To analyse the differences in the diet quality between Roma and non-Roma ethnic groups we apply a modified Blinder-Oaxaca (Blinder, 1973; Oaxaca, 1973) framework. The Blinder-Oaxaca decomposition has been widely used in labour economics literature to decompose racial and gender wage differentials (e.g. Drydakis, 2012; Croucher et al., 2016). It has also been applied in the health literature to study differences in obesity across racial groups (e.g. Sen, 2014) or in the nutrition literature to study gaps in dietary diversity of children in Ethiopia (e.g. Hirvonen, 2016).

In our case, the Blinder-Oaxaca decomposition divides the mean diet quality differential between Roma and non-Roma groups into two parts - one explained by group differences in observable characteristics such as income, food prices, education, etc., and another that cannot be accounted for by differences in observed characteristics. This unexplained part is interpreted as a measure of specific Roma institutions as well as impacts of discrimination against Roma. It also subsumes the effects of group differences in unobserved characteristics. Let us consider two ethnic groups, A (non-Roma) and B (Roma). To identify the contribution of group differences to the overall outcome difference, we can write:

$$R = \{E(X_A) - E(X_B)\}\beta_B + E(X_B)(\beta_A - \beta_B) + \{E(X_A) - E(X_B)\}(\beta_A - \beta_B) \quad (1)$$

Thus, we have a “threefold” decomposition where the outcome differential R is divided into three components, $R = E + C + I$. The first component, $E = \{E(X_A) - E(X_B)\}\beta_B$ amounts to the part of the differential that is due to differences between groups in observed characteristics (the “endowment effect”). The second component, $C = E(X_B)(\beta_A - \beta_B)$ measures the contribution of differences in the coefficients. Third one, $I = \{E(X_A) - E(X_B)\}(\beta_A - \beta_B)$ is an interaction between endowments and coefficients. Decomposition is formulated from the viewpoint of group *B*. The *E* component measures the expected change in group *B*’s mean outcome if group *B* had group *A*’s predictor levels (characteristics). Similarly, the *C* component

measures the expected change in group *B*'s mean outcome if group *B* had group *A*'s coefficients.

An alternative decomposition approach uses a non-discriminatory coefficient vector to determine the contribution of the differences in the observed characteristics (predictors). Let β^* be such a non-discriminatory coefficient vector that would exist if there were no differences between group *A* and group *B*. The outcome difference is then

$$R = \{E(X_A) - E(X_B)\}\beta^* + \{E(X_A)(\beta_A - \beta^*) + E(X_B)(\beta^* - \beta_B)\} \quad (2)$$

We now have a "twofold" decomposition, $R = Q + U$ where $Q = \{E(X_A) - E(X_B)\}\beta^*$ is the part of the outcome differential that is explained by group differences in the predictors (the quantity effect), and $U = E(X_A)(\beta_A - \beta^*) + E(X_B)(\beta^* - \beta_B)$ is the unexplained part. The latter is attributed to unobservable factors such as discrimination, specific Roma institutions and cultural factors.

The unexplained part of *U* can be expressed as $E(X_A)\delta_A - E(X_B)\delta_B$, where $U_A = E(X_A)\delta_A$ measures institutions and cultural traits in favour of group *A*'s diet quality and $U_B = -E(X_B)\delta_B$ quantifies institutions and cultural traits effects against group *B*'s diet quality. Thus, U_A and U_B have opposite interpretations.

Estimates of unknown non-discriminatory coefficients vector β^* are needed. Neumark (1988) advocates use of the coefficients from a pooled regression over both groups as an estimate for β^*. Oaxaca and Ransom (1994) and others propose weighting models taking into account the relative importance of groups. An issue with the approach used by Neumark (1988) and Oaxaca and Ransom (1994) is that it can inappropriately transfer some of the unexplained parts of the differential into the explained component. To avoid this, we include a group indicator in the pooled model as an additional covariate.

4 Data

We use the Household Budget Survey (HBS) of Romania covering the period from 2004 to 2011. It is organized as a quarterly survey on a sample of 9,360 dwellings. It contains information on household's income, sources of income, expenditures as well as quantities of foodstuffs and beverages consumed. HBS also contains information on household's location and characteristics, residence area characteristics, period of data collection, and information on household's ethnicity. The majority of surveyed households are Romanians. Other ethnic groups include Hungarians, Germans, Serbs, Bulgarians, as well as Roma.

Following previous studies (e.g. Jackson, 1984; Lee and Brown, 1989; Thiele and Weiss, 2003; Hertzfeld et al., 2014) we specify a standard demand for diet diversity. As

explanatory variables, we consider total household monthly income (*income*), and unit food price (*food_price*)[6]. We also include income squared variable (*income_2*) to account for potential non-linear relation between income level and diet quality. In an attempt to control for the type of income source and potentially for the income uncertainty and the importance of employment patterns, we consider a set of variables including the share of allowances (*share_allowances*) and share of salaries (*share_salaries*) in total household monthly income and a dummy variable capturing if the household head was working during the reference month (*d_working*). The share of food expenditure in the total household disposable income (*w_food*) accounts for the distribution of household consumption between food and non-food items. Given that households' composition and characteristics may importantly impact the household dietary choices, we include variables measuring household size (*hh_size*), dummy variable indicating whether household has at least one dependent child (*d_children*), gender of household's head (*d_male*), age and age squared of household's head (*age, age_2*), and a set of dummy variables indicating level of education of household head (*edu_primary*, *edu_secondary*, *edu_tertiary*). Further, an important driver of diet composition and quality could be the location of household, in rural or urban area. This variable may capture own-food production as households in rural areas are expected to produce own food. For this reason we consider a dummy variable taking a value one if a household resides in urban area and zero otherwise (*d_urban*). We also try to proxy regional differences by including a dummy variable for the Bucharest-Ilfov capital region (*d_bucharest*) taking value one if household resides in this region and zero otherwise. Given that the HBS is a quarterly survey, we consider dummies to account for the quarter within the year for which the survey data were collected (*q1*, *q3*), thus accounting for seasonality in consumption. Finally, to account for common change of food consumption pattern over time we also include a trend variable in the estimated equation (*trend*). Definition and descriptive statistics of variables used in regressions are presented in Table 1.

4.1 Ethnic groups

We distinguish between four ethnic groups in the paper: the majority Romanian households (*d_romanian*), Roma households (*d_gypsy*), Hungarian households (*d_hungarian*), and households belonging to other minorities (*d_other*). Alongside Roma, the Hungarian ethnic group is the largest minority in Romania. In total, the HBS includes 127,894 observations, out of which 115,978 (90.68% of total sample) are Romanians, 8,126 (6.35%) are Hungarians,

[6] Aggregated food price index is computed similarly to Cupák et al. (2015).

2,654 (2.07%) are Roma, and 1,137 (0.89%) are other minorities. The share of Roma in the total sample corresponds relatively closely to the 2011 Census according to which Roma account for 2.8% of total population in Romania. These official figures are significantly lower than those reported by Council of Europe (2012) which suggests that the upper estimates of Roma in total population may be as high as 12%.

As reference group *A* in the decomposition analysis we use three alternatives: the Romanian majority population, Hungarian ethnic group, and "Other" minority group. We estimate dietary differentials of Roma (group *B*) relative to each of these three non-Roma groups.

5 Empirical results

5.1 Descriptive statistics

Descriptive statistics of the HBS survey show a systematic difference in food consumption patterns between Roma, on the one hand, and majority Romanian population and non-Roma minorities, on the other hand. Figure 1 (panel a) depicts the development of the share of food expenditures in the total income by ethnic group in Romania. The share for Roma is significantly higher (by more than 15%) than for other ethnic groups. For all ethnic groups the ratio declined over time but the difference between Roma and non-Roma was largely maintained. Note that the share of food expenditures of Hungarian and other non-Roma minorities show similar patterns with the majority Romanian population in terms of magnitude and trend over time.

Roma's diet diversity as measured by the number of food items consumed, Simpson and Entropy indices are lower by between 15% to 18% than the diet diversity of Romanians or Hungarians (Figure 1, panels b, c, d). These results indicate a significant gap in food diet quality between Roma and non-Roma ethnic groups. However, some of these differences could be caused by different socio-economic characteristics of households.

There are also important differences in the diet composition between Roma and other ethnic groups. Roma's diet has on average higher share of cereals and lower shares of dairy products and fruits and vegetables relative to other ethnic groups, while differences in diet composition between non-Roma minorities and Romanians seem to be insignificant (Figure 2). These results suggest that Roma households obtain macronutrients and calories from cheaper food sources such as cereals and low quality condiments than Romanians or non-Roma minorities living in Romania.

Table 1 reports descriptive statistics of households from which it follows that Roma ethnic group has lower education, larger household size, and more children per household than other ethnic groups in Romania. Roma purchase cheaper food and have lower incomes than Romanians or non-Roma minorities. These differences between Roma and non-Roma indicate that household characteristics may also explain a part of the observed differences in the diet quality between the ethnic groups.

5.2 Decomposition results

The estimates from the Blinder-Oaxaca decomposition analysis are reported in Table 2 and Table 3. Overall, the results from the Blinder-Oaxaca decomposition show that the Roma's diet is quite different from the majority Romanian population diet and even more so when compared to non-Roma minorities. First, there are statistically significant differences between Roma's diet and the diet of non-Roma groups for all three diversity indicators. Second, the differences in diet diversity are due not only to differences in observed variables such as income, prices, and household characteristics but there is also substantial unexplained component which significantly exceeds in magnitude the explained component.

As reported in Table 2, the mean of the diet diversity measured by the count of food items consumed (CM) is 30.64 for the reference Romanian group and 25.80 for Roma, yielding a diet diversity gap of 4.837 between the two ethnic groups. The Blinder-Oaxaca technique splits the diet diversity gap into a part that is explained by differences in observed variables and a part that is caused by unobserved characteristics. The explained differential of 1.808 indicates that differences in explanatory variables account for around 37% of the diet diversity gap. The unexplained component constitutes 63% of the diet diversity gap of Roma relative to the reference Romanian group. Similar results are obtained for the other two indicators of diet quality.

The decomposition estimates obtained with respect to non-Roma minorities are also statistically significantly (Table 3). First, the estimated gaps of the mean values of all three diet quality indicators are positive, implying that non-Roma minorities attain better quality diet compared to Roma. Second, the estimated diet quality gap of Roma with respect to non-Roma minorities is greater by between 8% and 50% compared to the gap estimated with respect to Romanians. That is, Roma have lower diet quality than Romanians and even lower than non-Roma minorities (Table 2, Table 3). Non-Roma minorities tend to attain a better diet quality than the majority Romanian population.

The decomposition results for the explained differentials (gap) show that most explanatory variables causing the explained part of diet quality gap are statistically significant

(Table 2, Table 3). Note that a positive estimated coefficient suggests that its corresponding (differential) variable increases the explained diet differentials (i.e. it is associated with a large explained gap in the diet quality) of Roma relative to the reference non-Roma households. A negative coefficient suggests an opposite result. As expected, the explained part of the diet gap due to lower Roma income (larger income differential) is positive on aggregate. The linear income part (*income*) increases the gap, whereas the squared term (*income_2*) decreases the gap suggesting that households with higher income attain better diet quality as compared to low income households. These results are consistent across all three diversity indicators and reference groups. The employment related explanatory variables accounting for the importance of salary in total income (*share_salaries*) and labor market participation (*d_working*) are generally negative and thus reduce the explained part of the diet quality gap between Roma and non-Roma. These results indicate that salaried income and availability of jobs help Roma to improve their diet diversity (or reduce the gap) relative to non-Roma. The importance of allowances in total income (*share_allowances*) appears to be positive but less statistically significant than the above three income and employment variables. An exception are the estimates for Roma compared to Romanian group (Table 2) where the estimated coefficient corresponding to allowances is negative in Simpson and Entropy index specifications. These results provide some evidence that the higher Roma dependency on state allowances reduces their diet quality.

The impact on explained differentials of food expenditure in total disposable income (*w_food*) appears to be negative and statistically significant across most diversity indices and reference groups. Considering the fact that the food expenditure share of Roma is larger than the share of non-Roma, reducing the gap in food expenditure shares would lead to reduction in the diet quality gap. In contrast, the impact on the explained gap of food prices (*food_price*) is positive and statistically significant across all three diversity indices and reference groups. Higher food price differentials increase the diet gap between Roma and the reference non-Roma households (Table 2, Table 3).

Household characteristics have mixed impact on the explained part of diet quality. The dummy accounting for the presence of children in the household (*d_children*) is negative, the dummies accounting for household male head (*d_male*) and primary education (*edu_primary*) are generally positive, while other household characteristics (*hh_size*, *edu_secondary*, *edu_tertiary*, *age*, *age_2*) have mixed effects across diversity indices and reference groups (Table 2, Table 3). Overall, it appears that higher education (gap) is associated with widening the diet diversity gap.

The estimates for the trend variable (*trend*) suggest that the explained diet gap of Roma increased over time relative to the majority Romanian population (Table 2), whereas it tends to marginally improve relative to other non-Roma minorities (Table 3). The explained differentials due to urban residence (*d_urban*) is positive and statistically significant for all thee diversity indices and reference groups. Roma residing in urban areas consume relatively less diverse diet. Roma in rural areas could rely on own supply of food relative to urban households which usually procure food mostly from the market. Alternatively, the urban variable may capture fewer possibilities for employment of Roma which reduces their possibility to earn higher income to sustain better quality food diet (Table 2, Table 3). Interestingly, the impact of the dummy accounting for household residing in the capital region (*d_bucharest*) on the diet diversity differential is generally negative in the specification with the reference Romanian group (Table 2), while positive in non-Roma minority specifications (Table 3). These estimates suggest that the diet of Roma residing in the capital is relatively more similar to the diet of the Romanian majority, while compared to the non-Roma minorities Roma attain less diverse diet. The results taken together also suggest that the diet quality of non-Roma minorities is better than the diet quality of the Romanian population in Bucharest.

Turning to the decomposition results for the unexplained component of the diet quality gap, the estimates show that the subcomponent U_B by far accounts for the major share (more than 95%) of the total unexplained differential and is statistically significant for all three diversity indicators and reference group specifications. These results suggest that unobserved factors lead to lower diet diversity of Roma relative to non-Roma. The subcomponent U_A is small and statistically insignificant implying that unobserved factors do not affect non-Roma diet relative to Roma. Similar to the overall gap, the absolute value of the unexplained subcomponent U_B for Roma relative to the reference Romanian population is smaller than in the case of non-Roma minorities by between 15% and 80%. These estimates indicate that the unobserved factors impact Roma more than non-Roma minorities in their food diet choices. They suggest that Roma are much more different compared to the non-Roma minorities than they are compared to the majority Romanian population (Table 2, Table 3).

Following these decomposition results, we cannot reject the hypothesis that there is a non-trivial incidence of Roma specific factors causing a lower diet quality compared to other non-Roma ethnic groups, even when controlling for the income level, household characteristics and other structural (observed) characteristics. The unexplained gap estimated with the Blinder-Oaxaca decomposition technique is usually attributed to discrimination in the labour literature (e.g., Drydakis, 2012; Croucher et al., 2016). However, a direct association between

discrimination and the Roma diet quality is difficult to be identified. The causality could occur through indirect channels. As argued in previous sections, the discrimination affects adversely Roma access to labour market which reduces their job opportunities, income level and income and job security/stability. We have attempted to control for some of these effects by including among the explanatory variables household monthly income (*income*), the share of allowances in total household income (*share_allowances*), the share of salaries in total household income (*share_salaries*) and dummy variable capturing if the household head was working during the reference month (*d_working*). As the above results show these variables explain a share of the total observed diet gap between Roma and non-Roma. Although, these variables may capture some of the adverse labour market effects caused by discrimination, they may not fully account for the complex nature of Roma income insecurity and casual nature of jobs they usually have. As a result, following Dercon (2000, 2002), a part of the unexplained component of the diet quality gap of Roma relative to non-Roma could be caused by the risky income stream which is reflected in their inferior nutritional quality.

The unexplained component could be due to the specificities of the Roma informal institutions which are difficult to measure. Roma institutions and history have direct and indirect implications for their food consumption. Food preparation and consumption have to respect certain rules and taboos which may constrain Roma diet choices. First, restrictions are related to constrained use of food procured from non-Roma, some foods cannot be consumed or can be consumed only at particular events as well as the current eating habits of Roma could be strongly affected by their nomadic way of life practiced in the past when food storage was costly and own food production was limited potentially leading to a lower diet diversity. All these elements are specific to Roma and are likely the cause of the large unexplained component of diet differential.

Our results also show that unobserved factors affect non-Roma minorities to behave less differently relative to the majority Romanian population in term of their dietary choices than Roma do. Also non-Roma minorities tend to attain better diet quality than the majority Romanian population. This greater diet diversity of non-Roma minorities could be caused by the fact that minorities could combine own food dietary habits (cuisine) with that of majority Romanians and thus obtain a richer and more diverse diet. As our results show, this is not the case for Roma.

6 Conclusions

We decompose the diet differential between the Roma and non-Roma ethnic groups in Romania into a part explained by observable characteristics and a part that cannot be explained

by differences in observed characteristics but which can be attributed to other determinants of diet quality such as informal institutions or economic (marginalisation) forces. Our data come from the Romanian HBS covering the period 2004-2011.

The estimations suggest that the gap in diet quality between Roma and non-Roma populations is substantial. Roma show inferior dietary choices compared to the rest of the population. Around one-third of the gap is explained by the differences in the observed socio-economic characteristics such as income, prices, and household characteristics. The remaining part of the gap is attributed to unexplained Roma-specific factors. We argue that this unexplained component is caused by the discrimination induced inferior performance of Roma in the labour market and by Roma specific informal institutions. Unobserved factors cause Roma to be much more different from the majority Romanian population than the non-Roma minorities are which provides a stronger confirmation of the role of Roma-specific factors (e.g. informal institutions) explaining the diet quality gap of Roma with respect to non-Roma.

Our findings can help to better understand food diet quality of Roma and potential causes of its gap compared to the rest of the population. The estimated results suggest that the observed dietary gap of Roma cannot be explained solely by standard economic determinants but one needs to take into account also how the individual choices are impacted by informal institutions and norms, and histories. These results imply that a policy that will target only economic determinants may not be fully successful in improving Roma food diet if informal institutions and norms remain unaltered.

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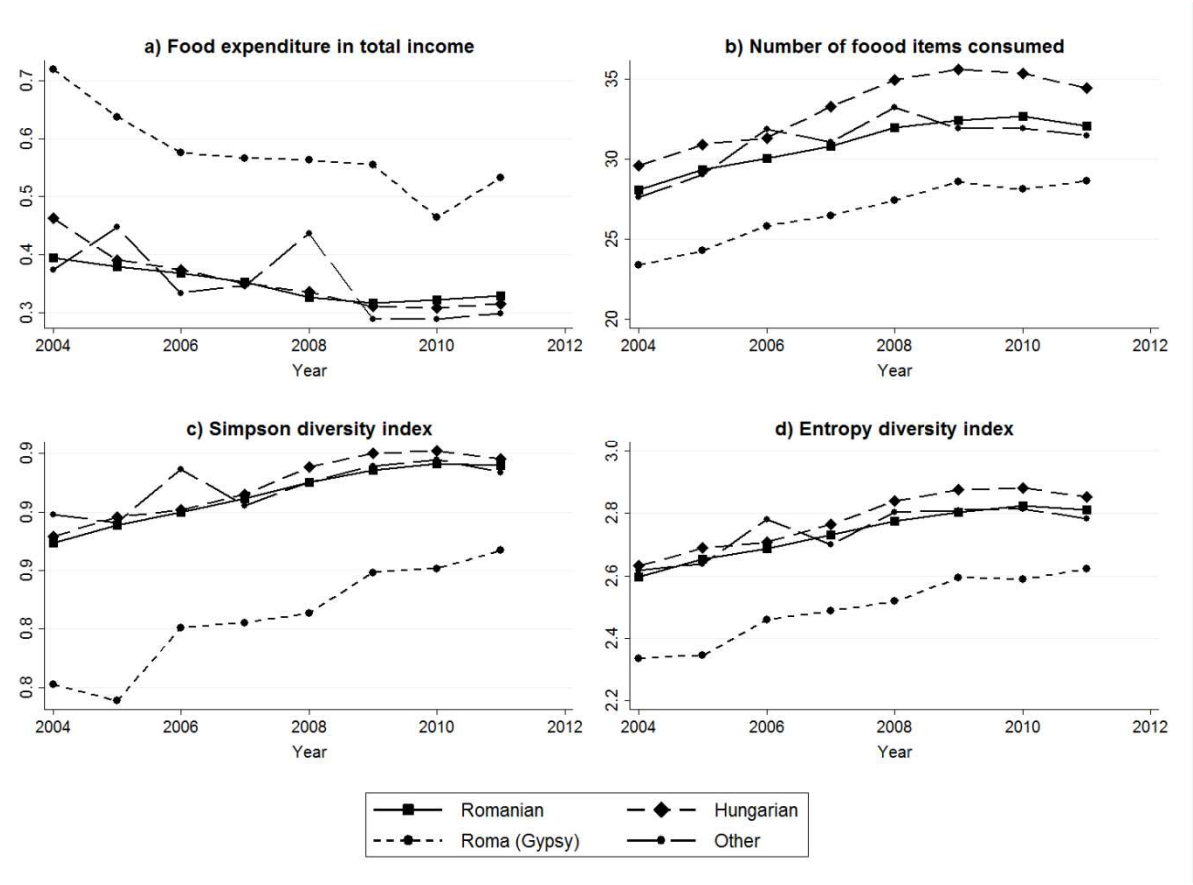
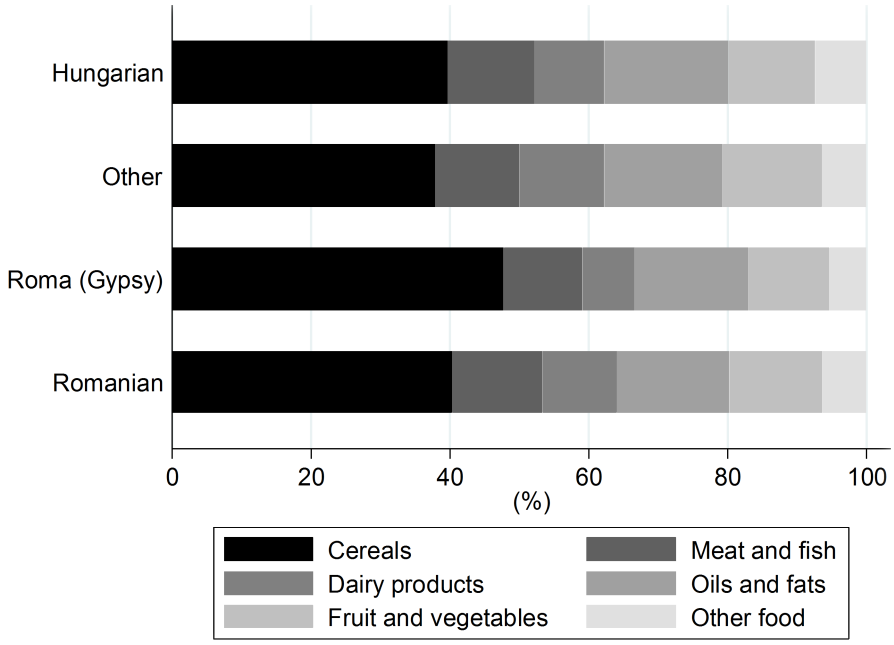
Figures

Figure 1. Evolution of food consumption and diet quality measures across ethnic groups and over time



Source: Household Budget Survey of Romania; own processing

Figure 2. Composition of diet across ethnic groups



Source: Household Budget Survey of Romania; own processing

Tables

Table 1. Summary statistics by ethnic groups, 2004-2011

		Ethnic group			
Variable	**Definition**	**Romanian**	**Hungarian**	**Roma**	**Other minorities**
CM	Count measure of food diversity	32.10	34.25	27.97	32.24
SI	Simpson index of food diversity	0.885	0.887	0.843	0.886
EI	Entropy index of food diversity	2.747	2.782	2.511	2.748
income	Household income (in Leu)	1446.1	1304.8	839.2	1335.6
income_2	Household income squared (in Leu)	3341860.2	2642340.7	1180143.7	2897606.1
share_allowances	Share of allowances in income	0.260	0.265	0.376	0.272
share_salaries	Share of salaries in income	0.405	0.399	0.162	0.312
w_food	Budget share of food in total income	0.328	0.336	0.534	0.328
food_price	Food price index	6.385	6.445	5.678	6.473
hh_size	Household size	2.893	2.826	4.321	2.811
d_children	Dummy: 1 if children in household	0.317	0.305	0.630	0.275
d_working	Dummy: 1 if HH is working	0.587	0.513	0.627	0.508
edu_primary	Dummy: 1 if primary education of HH	0.159	0.114	0.534	0.183
edu_secondary	Dummy: 1 if secondary education of HH	0.739	0.827	0.463	0.715
edu_tertiary	Dummy: 1 if tertiary education of HH	0.103	0.0591	0.00276	0.103
d_male	Dummy: 1 HH is male	0.745	0.730	0.792	0.719
age	Age of the HH	54.10	54.65	45.60	56.86
age_2	Age of the HH (squared)	3184.4	3243.4	2282.6	3493.8
q1	Dummy: 1 if 1st quarter of the year	0.499	0.492	0.487	0.508
q3	Dummy: 1 if 3rd quarter of the year	0.501	0.508	0.513	0.492
trend	Time trend	2007.5	2007.5	2007.8	2007.6
d_urban	Dummy: 1 if household lives in urban area	0.570	0.515	0.462	0.502
d_bucharest	Dummy: 1 if household lives in area of Bucharest	0.115	0.00162	0.0863	0.0524
N		110,557	9,160	2,146	1,158

Note: HH is household head.
Source: Household Budget Survey of Romania; authors' calculations

Table 2. Blinder-Oaxaca decomposition results: Roma minority compared to Romanian group, pooled sample (2004-2011)

	Number of food items	**Simpson index**	**Entropy index**
I. Differential			
Prediction (Romanian)	30.64***	0.883***	2.718***
Prediction (Roma)	25.80***	0.837***	2.450***
Difference	4.837***	0.0461***	0.269***
II. Decomposition			
Explained (Total)	1.808***	0.0192***	0.128***
Explained total (% of total difference)	37.38	41.65	47.58
income	3.857***	0.00865***	0.0954***
income_2	-1.644***	-0.00377***	-0.0418***
share_allowances	0.0212***	-0.0000538	-0.0000345
share_salaries	-0.0723***	-0.00165***	-0.00664***
w_food	-1.084***	-0.00103***	-0.0216***
food_price	0.619***	0.00516***	0.0381***
hh_size	-0.350***	0.00903***	0.0378***
d_children	-0.689***	-0.00202***	-0.0175***
d_working	-0.0149***	-0.000251***	-0.00103***
edu_primary	0.255***	0.00180***	0.0132***
edu_secondary	0.136***	-0.000135	0.00175***
edu_tertiary	0.0266***	0.0000985**	0.00123***
q3	0.00108	-0.0000496***	-0.000183***
d_male	0.0530***	0.000398***	0.00313***
age	0.872***	0.00323***	0.0325***
age_2	-0.407***	-0.00141**	-0.0169***
trend	0.0138***	0.0000563***	0.000421***
d_urban	0.219***	0.00126***	0.00991***
d_bucharest	-0.00623*	-0.0000768***	-0.000165
Unexplained total	3.029***	0.0269***	0.141***
Unexplained total (% of total difference)	62.62	58.35	52.42
Unexplained A (Romanian)	0.00502	0.0000240	0.000249
Unexplained B (Roma)	3.024***	0.0269***	0.141***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: Household Budget Survey of Romania; authors' calculations

Table 3. Blinder-Oaxaca decomposition results: Roma minority compared to Hungarian group and Other minority group, pooled sample (2004-2011)

	Hungarian group			Other minority group		
	Number of food items	**Simpson index**	**Entropy index**	**Number of food items**	**Simpson index**	**Entropy index**
I. Differential						
Prediction (Hungarian/Other minority)	32.96***	0.887***	2.766***	31.03***	0.889***	2.742***
Prediction (Roma)	25.80***	0.837***	2.450***	25.80***	0.837***	2.450***
Difference	7.164***	0.0496***	0.316***	5.229***	0.0515***	0.293***
II. Decomposition						
Explained (Total)	1.656***	0.0174***	0.115***	1.543***	0.0192***	0.125***
Explained total (% of total difference)	23.12	35.08	36.39	29.51	37.28	42.66
income	2.965***	0.00696***	0.0759***	2.726***	0.00594**	0.0726***
income_2	-1.128***	-0.00273***	-0.0299***	-1.388***	-0.00297**	-0.0372***
share_allowances	0.0837***	0.000126	0.00146*	0.034	0.000382	0.00207
share_salaries	-0.180***	-0.00224***	-0.0128***	-0.0482	-0.00131***	-0.00649***
w_food	-0.657***	-0.000389	-0.0134***	-0.404***	0.00118	-0.00198
food_price	0.804***	0.00473***	0.0380***	1.007***	0.00905***	0.0575***
hh_size	-0.542***	0.00862***	0.0334***	-0.291*	0.00914***	0.0366***
d_children	-0.710***	-0.00111*	-0.0122***	-1.111***	-0.00434***	-0.0323***
d_working	-0.0981***	-0.000933***	-0.00617***	-0.0403	-0.000899*	-0.00382*
edu_primary	0.275***	0.00209***	0.0158***	0.376***	0.00138	0.0164***
edu_secondary	0.165***	-0.000723*	-0.00236	-0.0214	0.0000127	-0.00206
edu_tertiary	-0.0071	-9.65E-06	-0.0000753	0.0552	-0.000492	0.000595
q3	-0.00157*	-0.000032***	-0.00020***	-0.0061	-0.00014**	-0.00065**
d_male	0.0612***	0.000538***	0.00414***	0.0486	0.000797**	0.00458***
age	0.028	0.0000423	0.00111	-0.0473	-0.00171	-0.00796
age_2	0.424	0.00127	0.0124	0.589	0.0027	0.0237
trend	0.00223	-0.0000388*	-0.000154	-0.0282**	-0.000065	-0.00088
d_urban	0.0432***	0.000670***	0.00475***	0.0446***	0.000294***	0.00215***
d_bucharest	0.127***	0.000574	0.00512**	0.0488***	0.00025*	0.00203***
Unexplained (Total)	5.507***	0.0322***	0.201***	3.685***	0.0323***	0.168***
Unexplained total (% of total difference)	76.88	64.92	63.61	70.49	62.72	57.34
Unexplained A (Hungarian)	0.0336	0.00046	0.00352*	0.187	0.000257	0.00448
Unexplained B (Roma)	5.474***	0.0318***	0.198***	3.498***	0.0320***	0.163***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Household Budget Survey of Romania; authors' calculations