Household consumer expenditure inequality in Slovakia

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Abstract

This paper aims to investigate the expenditure inequality in Slovakia. Total expenditure inequality is decomposed into the within-group and between-group components using Theil inequality decomposition technique. Decomposition is carried out according to the gender of the head of household, the urbanisation degree, the current activity of the head of household, the administrative region, the education level of the head of household, and the type of household. The analysis is based on individual data derived from the Household budget survey conducted by the Central Statistical Office in Slovakia in 2012.

Keywords: *inequality, Theil T index, Household Budget Surveys, expenditures, decomposition*
JEL Classification: I32, I33, D63

1. Introduction

Sen (1973) defines inequality as the difference in the capacity of individuals to follow lives of their choosing. The concept of inequality is quite broad. Inequality can be linked to inequality in opportunities, education, skills, happiness, health, life expectancy, welfare, assets and social mobility. Economists are especially interested in a monetarily measurable dimension of inequality related to individual household income and consumption.

Many researchers study macroeconomic effects and their relationship with inequality (Kuznets, 1955; Bourguignon, 2004; Milanovic, 2006; Sala-i-Martin, 2002; Forbes, 2000). The second framework for the analysis of inequality is the relationship between inequality and microeconomic factors. The aim of their studies is to assess the effect of household and individual characteristics on inequality (income and expenditure inequality).

In Slovakia, researchers focus mainly on income inequality among households or individuals. Existing studies on the inequality of distribution of income in Slovakia use data from the European Union Statistics on Income and Living Conditions (EU SILC) and Microcensus and Household budget survey (Filipová et al., 1998; Garner and Terrell, 1998, 2001; Gerbery, 2010; Labudová, 2013; Labudová and Vojtková, 2010; Ľapinová 2011; Michálek 2007, 2010; Milanovic, 1998; Pacáková et al., 2012; Sipková and Sipko, 2013; Večerník, 2001; Želinský, 2010).

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In this paper, we analyse inequality by using consumption. Whereas consumption is fundamentally difficult to measure, we use expenditure as a substitution for consumption.

2. Research method and data

There are many ways of measuring inequality. The most commonly used measuring methods in empirical studies include the following: the Gini coefficient, the decile ratio, the variance, the standard deviation of logarithms, the coefficient of variation, the Robin Hood index, The Generalized Entropy Indexes and the Atkinson index. In this paper we used The Generalized Entropy Indexes. Many empirical analyses of inequality rely on measures of inequality which are decomposable in the sense that, if the population is broken down into a certain number of subgroups, the inequality measure for the total population can be expressed as a sum of the weighted average of the inequality existing within subgroups of the population and of the inequality existing between them (Cowell and Jenkins, 1995). It is proven (Burguignon, 1979) that the only zero-homogeneous decomposable measures are the Generalized Entropy Indexes.

The Generalized Entropy Indexes are based on the concept of entropy (in thermodynamics, entropy is a measure of disorder) (Frenken, 2007). When applied to income or expenditure distributions, entropy has the meaning of deviations from perfect equality. The formula of a Generalised Entropy Indexes $GE(\alpha)$ is the following (Frenken, 2007):

$$GE(\alpha)=\frac{1}{\alpha^2-\alpha}\left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\bar{y}}\right)^{\alpha}-1\right] \tag{1}$$

where n is the number of individuals in the sample, y_i is the income of individual i (people, household,…), $i \in (1,2,...,n)$ and $\bar{y}$ is the mean income of the sample. α represents the weight given to distances between incomes at different parts of the income distribution.

The value of $GE(\alpha)$ ranges from 0 to ∞. Higher values represent higher levels of inequality and zero represents an equal distribution. The Generalized Entropy Indexes $GE(\alpha)$ take different forms depending on the value assigned to α. The most common values of α are 0 and 1. $GE(0)$ is Theil-L index, and $GE(1)$ is known as Theil-T index. Theil-T can be calculated using the formula:

$$Theil\,T=GE(1)=\lim_{\alpha\to 1}\frac{1}{\alpha^2-\alpha}\left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\bar{y}}\right)^{\alpha}-1\right]=\frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{\bar{y}}\log\frac{y_i}{\bar{y}}\,. \tag{2}$$

The Generalized Entropy Indexes are decomposable in the sense that, if the population is broken down into a certain number of subgroups, the inequality measure for the total population can be expressed as a sum of the weighted averages of the inequality existing within subgroups of the population and of the inequality existing between these subgroups (Cowell and Jenkins, 1995).

If we define that the overall inequality (T) can be completely and perfectly decomposed into a between-group component T_B and a within-group component T_W, then Theil T can be decomposed such that (Bourguignon 1979, Cowell 1980):

$$Theil\,T = \sum_{j=1}^{k}\left(\frac{y_j}{y}\right)T_j + \sum_{j=1}^{k}\left(\frac{y_j}{y}\right)\log\frac{y_j/y}{n_j/n} \tag{3}$$

where n_j represents the population in group (subgroups) j, y_j represents the total income in group (subgroups) j, j indexes a group and the Theil-T index for each group (T_j) corresponds to the inequality between those individuals that are members of group.

The first term (3) measures inequality within each of the j population subgroups, the second term describes inequality between these subgroups.

The Household budget survey micro data on family characteristics and expenditures (HBS) was used as a data source for this paper. The 2012 data were collected in 4 704 randomly selected households from the whole Slovak Republic. International classification of individual consumption by purpose (COICOP – HBS) was applied to the HBS and was published in "Household Budget Surveys in EU: Methodology and recommendations for harmonisation, 2003". The COICOP – HBS classification has 12 divisions: Foodstuffs and non-alcoholic beverages; Alcoholic beverages and tobacco; Garments and shoes; Housing, water, electricity, gas and other fuels; Furniture, dwelling equipment and current maintenance of house; Health; Transport; Communications; Recreation and culture; Education; Hotels, cafés and restaurants; Miscellaneous goods and services.

The aim of the analysis presented in this paper is to assess the socioeconomic factors in terms of their impact on inequality in the distribution of consumption expenditures among the households in Slovakia. We take into account the differences between regions of Slovakia and characteristics of the heads of households, which could have an impact on the behaviour of households in consumption.

3. Empirical results

Decomposition of the total consumption expenditure was performed according to population subgroups, which are based on the categories of variables that describe the characteristics of households: *Administrative region* (1 – Region of Bratislava, 2 – Region of Trnava, 3 – Region of Trenčín, 4 – Region of Nitra, 5 – Region of Žilina, 6 – Region of Banská Bystrica, 7 – Region of Prešov, 8 – Region of Košice), *Urbanisation degree* (1 – regional cities, 2 – other cities, 3 – other municipalities), *Type of household* (5 – single person, 6 – two adults, 8 – households without dependent children – others, 9 – single person with dependent children, 10 – two adults with one dependent child, 11 – two adults with two dependent children, 12 – two adults with three or more dependent children, 13 – households with dependent children – others) and variables that characterize the household heads: *Gender of the head of household* (1 – Male, 2 – Female), *Highest completed education of the head of household* (1 – primary education, 2 – first stage of basic education, 3 – second stage of basic education, 4 – vocational education without GCE (less than two years), 5 – vocational education without GCE (2 years and more**)**, 6 – secondary education without GCE (less than two years), 7 – secondary education without GCE (2 years and more**)**, 8 – vocational education with GCE, 9 – general secondary education, 10 – secondary vocational education, 11 – higher professional education (after graduation), 12 – higher professional education (non-university), 13 – universities – 1st degree (Bc), 14 – universities – 2nd degree (Mgr., Ing. RNDr., ...), 15 – universities – 3rd degree (Ph.D., ArtD.), *Current activity of the head of household* (1 – working (full and part-time), 2 – employed, but temporarily out of work, 3 – unemployed, 4 – not working pensioner, 5 – student, apprentice, 6 – economically inactive, housewife, 7 – unable to work, 8 – working pensioner, 9 – not applicable (dependent child not included in the code 5).

Results of decompositions of total consumption expenditure are shown in Table 1.

Decomposition of the Theil-T index shows that the most important determinant of overall inequality of consumption expenditure is a type of households (between-group inequality component represents 22.18 percent of total inequality) (Table 1). The greatest inequality in the distribution of consumption expenditure is in a group of single-person households (T-index=0.1016) and households with two adults and one dependent child (T-index=0.1016). By contrast, the smallest disparity was found in the group of households with two adults and two dependent children.

Variable	Theil *T* index		
	Component	Value (%)	Value
Gender	T_B	1.79 %	0.0020
	T_W	98.21 %	0.1103
Urbanisation degree	T_B	3.86 %	0.0043
	T_W	96.14 %	0.1079
Current activity of head of household	T_B	3.87 %	0.0044
	T_W	96.13 %	0.1079
Administrative region	T_B	4.85 %	0.0054
	T_W	95.15 %	0.1068
Education level of head of household	T_B	5.36 %	0.0060
	T_W	94.64 %	0.1063
Type of household	T_B	22.18 %	0.0249
	T_W	77.82 %	0.0874

Table 1. Decomposition of the Theil *T* index (net expenditures (EUR per person per month)) by household characteristics.

Source: ŠÚ SR: Household budget survey 2012.

Categorization of households is performed in two other ways. The first takes into account the number of dependent children (Household type II) and the second takes the number of adults (Household type III). Results of decompositions (Table 2, Table 3) suggest that the number of adults has greater impact on the differences in the distribution of consumption expenditure per household than the number of children.

Component	Type of household I	Type of household II	Type of household III
T_B	22.18%	13.68 %	20.30 %
T_W	77.82%	86.32 %	79.70 %

Table 2. Between-group inequality components by the type of household.

Source: ŠÚ SR: Household budget survey 2012.

Type of household I	*T* index	Type of household II	*T* index	Type of household III	*T* index
Single person	0.1016			Single person	0.1016
Two adults	0.0768			Two adults	0.0768
Households without dependent children-others	0.0900	Household without dependent children	0.1046	Households without dependent children-others	0.0900
Single person with dependent children	0.0798			Single person with dependent children	0.0798
Two adults with one dependent child	0.0962	Household with one dependent child	0.0868		
Two adults with two dependent children	0.0617	Household with two dependent children	0.0730	Two adults with dependent children	0.0911
Two adults with three or more dependent children	0.0663				
Households with dependent children-others	0.0796	Household with three dependent children	0.0750	Households with dependent children-others	0.0796

Table 3. Decomposition of the Theil *T* index (net expenditures (EUR per person per month)) by type of household.

Source: ŠÚ SR: Household budget survey 2012.

Conclusion

In this paper, we used the method of Generalized Entropy Indexes decomposition to measure the impact of characteristics of households and their members (the type of household, the urbanisation degree, the administrative region, the current activity of head of household, the education level of head of household and gender) on inequality of consumption expenditure.

Among our findings is that the most important determinant of overall inequality of consumption expenditure is the type of household (between-group inequality component represents 22.18 percent of total inequality).

In the next part, we analyzed how the between-group inequality component is influenced by the type of household and we find out that the number of adults has greater impact on the differences in the distribution of consumption expenditure per household than the number of dependent children.

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