ANALYSIS OF CHANGES IN THE CONSUMPTION STRUCTURE OF HOUSEHOLDS IN THE VISEGRAD COUNTRIES – FOOD EXPENDITURES

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Abstract

The article presents an analysis of changes in the share of food expenditures in the households final consumption expenditures of the Visegrad countries in the years 1995-2012. The enrichment process of societies in Czech Republic, Poland, Hungary and Slovakia (manifested as disposable income per capita increase) decreases a share of expenditures on food in the final households consumption expenditures. Nevertheless, it is impossible for food expenditures to be removed from households income expenditures plan. They will always appear in the societies of every economy. The aim of the investigation is to assign the optimal level of the expenditures on food consumption, allowing to meet the existential needs at a given disposable income level. Limit shares of the food expenditures was appointed with the first type of the Törnquist function – in version for subordinate goods. The saturation level of the food expenditures appointed in the terms of limitless income – considering tendency from several years – is a pattern to achieve for the Visegrad countries in the nearest future.

Key words: consumption structure, food expenditures, Törnquist function, Visegrad countries

JEL Code: C1, E2

Introduction

Food expenditures are the most important part of the spending plan in every household. Without food, the basic human existential needs would not be met. According to Engel's law, the level of food expenditures grows along with the increase in disposable income of households, however their share in final consumption expenditures (consumption structure) decreases (see: Horáková, 2015; Jankiewicz, 2018a; Verba & Kudinova, 2019). This is related to the progressing socio-economic development of countries, including the enrichment of society, which can afford to consume more and more non-food goods (see: Jankiewicz, 2018b, Simionescu *et al*., 2017, 2018; Łukasiewicz *et al*., 2018). Furthermore, with the increase in incomes, households can allocate more to savings (see: Trębska, 2018). Thus, changes in

consumption structure result from the improvement of the standards of living in the countries studied, as well as from positive institutional changes (see: Balcerzak & Pietrzak, 2016; Rogalska, *et al,*, 2017; Nowak, 2018).

Changes in the structure of consumption, manifested by a decrease in the share of food expenditures, are an improvement in the social status of households. Consumption is also one of the most important drivers of the economy. The increase in the level of consumption and changes in its structure towards a reduction in the share of food expenditures in final consumption expenditures is most often the result of an improvement in the macroeconomic situation of countries (see: Kisiała & Suszyńska, 2017; Kułyk et al., 2017). The ongoing globalization processes and following household behaviours in highly developed countries also significantly influenced the increase in the level and changes in consumption structure. The aim of the article is to analyse changes in the consumption structure in the Visegrad Group countries. Apart from the assessment of the level of food expenditures in individual countries, the minimum value of the share of consumption of this type of goods in final consumption expenditures for each of the analysed countries was also determined. The minimum values of the share of food expenditures was determined based on the Törnquist I type function.

1   Methodology

The analysis was based on household consumption data, which was obtained from the EUROSTAT database[1] (the data were obtained from the website). The data were obtained for the Czech Republic, Poland, Slovakia and Hungary for the time period 1995-2012. The explained variable Y is the share of household food expenditures in the total sum of expenditures in individual countries of the Visegrad Group. The explanatory variable X is the level of gross disposable income of households *per capita*. The values of the X and Y variables were obtained by means of own calculations.

The determined values of X and Y variables allowed to assess changes in the structure of consumption, while in order to determine the level of saturation of the shares of food expenditures in the V4 countries, the Törnquist function was applied. The level of saturation is understood as the share of expenditures in food goods that households can achieve, taking into account the current trend of changes. In order to determine the saturation level of the share of food products in consumption structure, the Törnquist type I model is used:

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[1] The data were obtained from the website https://ec.europa.eu/eurostat/data/database

$$Y_t = \frac{\alpha_0 \cdot X_t}{X_t + \alpha_1} + \varepsilon_t, \tag{1}$$

where Y_t is dependent variable, X_t is independent variable, α_0 is a parameter responsible for the saturation level, α_1 indicates the nature of a specific good, and ε_t is a random component.

To obtain α_0 and α_1 parameters, model (1) was subjected to the process of linearization, which allowed estimation of auxiliary model parameters using the KMNK method. The received evaluations of the auxiliary model parameters allowed to determine the assessment values for the parameters α_0, α_1.

2   Empirical results

In the first step of the study, the parameters of the Törnquist type I function specified by the equation (1) for each country were estimated separately. This allowed to determine the assessment of the parameters α_0 and α_1. The results obtained are presented in Table 1. Negative assessments of the α_1 parameter indicate that in all of the countries surveyed, food is a good of a lower order. However, the values of assessments of the parameter α_0 determine the level of saturation for the share of food expenditures in final consumption expenditures. The lowest level of saturation was recorded for the Czech Republic (13.1%). In the case of Hungary, the saturation level was 14.5%. A higher and comparable saturation level was obtained for Slovakia and Poland, 15.4% and 16% respectively. The high values of the coefficient of determination of the estimated models should be emphasized, which indicates a high degree of their adjustment to the empirical data and the reliability of the received parameter α_0 evaluations.

Tab. 1: Results of the estimation of the Törnquist function parameters

Czech Republic		Hungary	
Parameter	**Estimate**	**Parameter**	**Estimate**
α_0	13,1%	α_0	14,5%
α_1	-830.896	α_1	-794.335
$R^2 = 0.892$		$R^2 = 0.939$	
Poland		**Slovakia**	
Parameter	**Estimate**	**Parameter**	**Estimate**
α_0	16%	α_0	15,4%
α_1	-975.45	α_1	-824.643
$R^2 = 0.907$		$R^2 = 0.936$	

Source: authors own calculations.

Figure 1 shows the shares of food expenditures in final consumption expenditures for the time period 1995-2012 for each of the countries analysed. Figure 2 presents the level of disposable income *per capita*. In the case of food expenditures, there can be noted a downward trend in the share of expenditures on this type of goods in consumption structure. It is necessary to underline the different nature of the downward trend in each country. Only in the case of Poland, the downward trend is indicative of further declines in the future. In the last two years (2011, 2012) in the Czech Republic there was an unexpected increase in the share of food expenditures. However, in the case of Hungary and Slovakia, one can observe that the downward trend slowed down and since 2005 the share of food expenditures remained stable.

Fig. 1: Shares of the food expenditures in final consumption expenditures of the Visegrad Group countries in the years 1995-2012
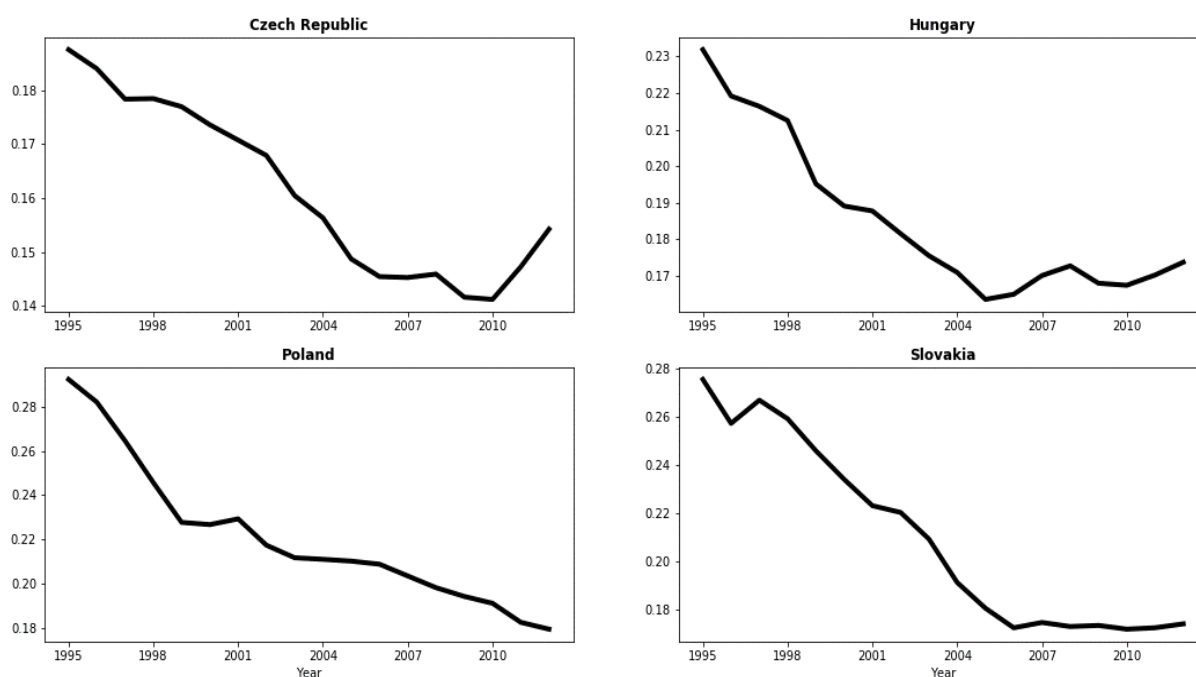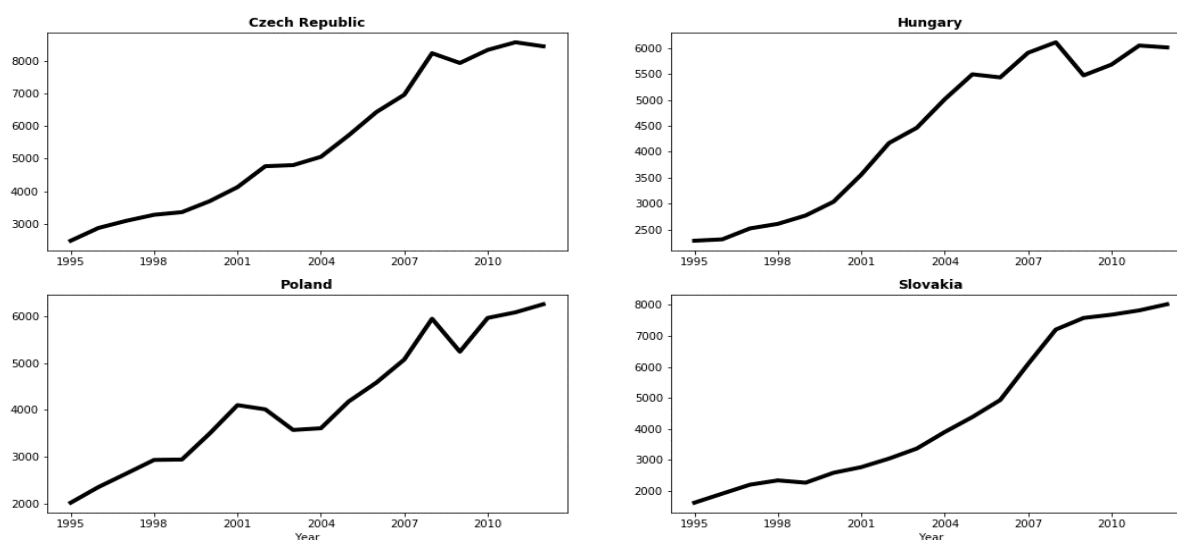

Source: authors own elaboration.

The visual analysis of Figure 2 shows that in the years 1995-2012 the disposable income *per capita* was growing dynamically. This was related to the significant increase in the level of socio-economic development of the countries that had significantly improved the macroeconomic indicators and competitive potential of their economies in the period of economic transformation (see: Cheba & Szopik-Depczyńska, 2017; Kruk & Wiśniewska, 2017). Also, in the case of disposable income, one can note a different nature of the upward trend for each country. Only in the case of Poland it is possible to forecast a sustained upward

trend. However, in the cases of the Czech Republic, Hungary and Slovakia, a slowdown in the value of disposable income *per capita* can be noted. This means that in the subsequent years in these countries the level of household income may be fluctuating around a stable level.

Fig. 2: Level of the disposable income per capita in the Visegrad Group countries in the years 1995-2012

Source: authors own elaboration.

Table 2 presents the values of shares of food expenditure in final household consumption expenditures and the value of disposable incomes in 1995 and 2012. Such a comparison allows to determine the percentage change in the value of researched variables in the period analysed. In the case of the shares of food expenditure, the highest share was noted in 1995 in Poland (29.24%) and Slovakia (27.54%). The shares of food expenditures in the Czech Republic and Hungary was at a much lower level in 1995 and amounted to 18.75% and 23.19%, respectively. In 2012, compared to 1995, there was a significant reduction in the level of shares in all of the countries studied, however, the situation changed, since for Hungary, Poland and Slovakia the level of shares was similar. Again, the Czech Republic had the lowest share of food expenditures which amounted to 15.43%. While analysing the level of disposable income, one can spot in all countries the relation of income to the level of expenditure on the consumption of food goods in 1995. It should be emphasized that in 2012 the nature of changes in disposable income changed. The high disposable income can be noted in the Czech Republic and Slovakia, EUR 8,454.28 and EUR 8,018.95, respectively. A significantly lower level of disposable income was recorded in the case of Poland and Hungary, EUR 6,252.61 and EUR 6,011.02 respectively. Among all of the countries examined, the situation in Slovakia should

be distinguished, with the highest percentage increase in the household disposable income *per capita* (399.77%) and a relatively high decline in the share of food expenditures in consumption structure (36.78%).

Tab. 2: Changes of shares of the food expenditures and disposable income per capita in the Visegrad Group economies

Country	Share of the food expenditures (%)			Disposable income p. c. (EUR)		
	1995	2012	Percentage change[2]	1995	2012	Percentage change
Czech Republic	18,75	15,43	-17,74%	2478,33	8454,28	241,13%
Hungary	23,19	17,38	-25,06%	2287,19	6011,02	162,81%
Poland	29,24	17,94	-38,65%	2020,47	6252,61	209,46%
Slovakia	27,54	17,41	-36,78%	1620,74	8018,95	394,77%

Source: authors own calculations.

Conclusion

The article presents the analysis of the share of food expenditures in the structure of expenditure for the Visegrad Group countries in the time period 1995-2012. In all of the countries studied there was a downward trend in the shares of this type of commodities. A dynamic increase in disposable income *per capita* in the years 1995-2012 for the countries examined was noted. There is a positive dependence between the level of disposable income of households and the share of their food expenditures. This means that changes in the consumption structure manifested by the decrease in the share of food expenditures result from the increase in the level of socio-economic development of the countries surveyed. However, it should be emphasized that the nature of the trends, both the share of food expenditures and the level of disposable income, was different depending on the country chosen. In the years 1995-2012, high percentages of changes in the share of food expenditures and the level of disposable income were obtained, which indicates a significant improvement in the macroeconomic situation of the Czech Republic, Hungary, Slovakia and Poland. Based on the results of the Törnquist function estimation, the level of saturation of the share of food expenditures for the Visegrad Group countries was determined. The lowest level of saturation was recorded in the Czech Republic and was followed by Hungary and Slovakia, and the highest level was reached in Poland. The received levels of saturation of food expenditures share reflect the hierarchy of V4 economies in terms of their economic development – out of the group of four, the Czech

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[2] The value was obtained on the basis of the equation $(Y_{2012} - Y_{1995})/Y_{1995}$.

Republic is the most economically developed country, while Poland seems to be at the other end, when taking into account the state of its economy. In 2012 all of the countries were close to the determined levels of saturation and one could observe a systematic slowdown in the downward trend for the share of food expenditures.

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