# THE INFLUENCE OF INCOME ON THE CONSUMPTION EXPENDITURES

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The contribution aims to identify the influence of income on Slovak household expenditures. Analyses are querying from the household income and expenditures data in the Slovak Republic during the period 2004–2018. The data source is the Statistical Office of The Slovak Republic. Descriptive statistics and regression analysis are used. The analysis of the goods and services expenditures reveals the major share of the expenditures is expended for the non-durable goods. The non-durable goods expenditures of the pensioners are 72% of their total consumption expenditures. Expenditures of employees, self-employees and other households for the non-durable goods present more than a half of their total expenditures. The share of services expenditures is also considerable. It is varying above 30% for all households kinds. The income influence on the household expenditures is analyzed using Engel's expenditures functions which are used as the basis for the income elasticities of household expenditures. The analysis results are pointing to the fact that the less elastic on the income change is the reaction of the Slovak household expenditures on non-durable goods. A significant reaction on the income change is observed in household durable goods expenditures.

**Keywords:** households expenditures; households; income Engel's expenditures curves; income elasticity of expenditures

## Introduction

Today, sustainable consumption is frequently discussed. It is such consumption of goods and services, whose goal is not only to satisfy consumer needs, but also to minimize the negative environmental impacts and exploitation of natural resources.

Considering the global natural resources shortage in the time of fast climate change and increasing energy demand, the EU introduces many polices and initiatives focusing on sustainable consumption and production. The environmental properties of goods over their whole life cycle, the demand for better products and production technologies, and the help to the consumers in accepting informed decisions should be improved (europarl. europa.eu, 2019).

The production and consumption of food with buildings and transportation has the highest influence on the environment (ec.europa.eu). Some EU countries that want to align the level of consumption expenditures do not pay attention to sustainability. It depends among others on the consumerism idea (Jankiewicz, 2018).

Average consumers thinks little about the impacts of their consumption on the environment. In front of their interests there is the decision of how to allocate disposable income in buying separate goods.

In households, there are close relationships between income and consumption (Grzywinska-Rapca, 2015). The expenditures, as a derivative of income level, structure, and changes in time, provide a relatively accurate image of the satisfaction degree from particular needs which in turn provides a complete image of standard of living (Grzega, 2018). Some often discussed issues like the relative increase of expenditures connected with housing, a decrease of the share of foodstuff, etc. can be proven now (Sixta et al., 2014). Data from household surveys are possibly the single most important source of information at the national, sub-national, and household level, and contribute the building blocks to global efforts to monitor progress towards the major international development goals (Zezza et al., 2017).

## Materials and methods

From the former research, it is clear that the understanding of consumer decision making is very important for policymakers of sustainable consumption. The contribution aims to clarify how the consumption expenditures of a household are influenced by its income. The Slovak household expenditures are analyzed using a comparison of different social groups of households sorted by the employment of the household head. Following the statistical office data, we distinguish the employees (1), self-employees (2), pensioners (3), and other (4) households. The observed period is 2004–2018. From the consumption time perspective, the household expenditures are differentiated to the short-term consumption expenditures, mid-term consumption expenditures, and long-term consumption expenditures. Income influence on household expenditures is quantified by the estimation of the Engel's expenditures functions using regression analysis. Engel's expenditures curve gives how the average expenditure on the good would change as the money income of the consumer increases (economicsdiscussion.net, 2020). We can therefore write:

$$TE_{xn} = b \times I_n \tag{1}$$

where:
$TE_{xn}$ – expenditures of the $n$-th social group on the $x$-th goods
$I_n$ – the income of the $n$-th social group

The estimated Engel's expenditures functions are next used for calculation of the household expenditures elasticity on the income change. It testifies about the percentual change of separate households on the goods by the consumption period if the income changes by 1%.

$$EIE_{xn} = \frac{\%\Delta TE_{xn}}{\%\Delta I_n} \tag{2}$$

where:
$EITE_{xn}$ – the elasticity of household expenditures on income change

## Results and discussion

### Short-term goods consumption expenditures

Short-term goods are represented by the daily consumption of goods and form the largest share of the monthly household expenditures. The share of the short-term goods consumption expenditures between separate households kinds varies from 52% in the self-employees households to 54% in employees households, 63% in other households, and finally 72% in pensioners households. The trend in consumption expenditures of short-term goods in employees and self-employees households has a decreasing character from 2014. It is caused by an increasing income for these kinds of households. "In The Slovak Republic, by the influence of the financial crisis in 2008–2010, the increase in nominal wages and consumption expenditures slowed down" (Stankovičová, 2019). Table 1 shows the overview of short-term consumption goods descriptive statistics. We recorded the highest average value in the pensioner's households, 195.35 EUR with a standard deviation of 16.14 EUR and a variation range of 58.38 EUR.

**Table 1**    Short-term goods consumption expenditures descriptive statistics data

|  | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| **Employees** | 15 | 129.33 | 169.40 | 156.70 | 12.43 |
| **Self-employees** | 15 | 123.72 | 165.20 | 149.70 | 12.11 |
| **Pensioners** | 15 | 161.06 | 219.44 | 195.35 | 16.14 |
| **Other** | 15 | 102.89 | 156.25 | 127.95 | 14.15 |

Source: author's calculations

Estimated Engel's expenditures functions are pointing on the positive correlation between household income and their short-term consumption goods expenditures. The income elasticity coefficient manifests inelastic reaction of the household expenditures on the income change. Provided the constant prices which are proving the fact, the short-term consumption goods are essential.

Separate households kinds short-term consumption goods Engel's expenditures functions:

| Huoseholds | Engel's expenditures curves | Elasticity value |
|---|---|---|
| ❑ employees | $108.97 + 0.29I_1$ <br> (0.01) | 0.31 |
| ❑ self-employees | $93.83 + 0.15I_2$ <br> (0.01) | 0.37 |
| ❑ pensioners | $122.02 + 0.20I_3$ <br> (0.01) | 0.38 |
| ❑ other | $40.82 + 0.38 I_4$ <br> (0.01) | 0.68 |

Figure 1 shows the Engel's expenditures function for the short-term consumption goods. All the curves are deviating from the notional 45° line (expects that all the household expenditures are spent on the short-term consumption goods). Expenditures on this kind of goods are increasing slowlier than income. The most elastic reaction on income change is observed by other households. These households have the lowest overall income.



**Figure 1**    Engel's expenditures curves of short term consumption goods
Source: author's calculations

### Mid-term consumption goods expenditures

The mid-term consumption goods serve for a longer period than short-term consumption goods and consumers consider the purchase better. Mid-term consumption expenditures are not a very significant part of the Slovak households budget.

"Slovak households have in their consumption basket a significant share of processed food and food with high energetical value. These essential expenditures are drawing the finances and subsequently decreasing the demand after mid-term consumption goods, whose share is significantly undervalued"(Kollárová and Vladová, 2009).

The expenditures share on the mid-term consumption goods on the total consumption expenditures is on average 6% in the pensioners and other households, 8% in self-employees households and 9% in employees households. The highest average mid-term consumption goods expenditures values are reaching the households of self employees (mean 27.11 EUR), whose expenditures are also having the highest variation range 10.24 EUR.

**Table 2**    Descriptive statistic of mid-term goods expenditures

|  | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| **Employees** | 15 | 20.14 | 27.91 | 24.55 | 2.01 |
| **Self-employees** | 15 | 20.85 | 31.09 | 27.11 | 3.28 |
| **Pensioners** | 15 | 13.22 | 21.58 | 17.38 | 2.82 |
| **Other** | 15 | 7.45 | 19.98 | 12.53 | 3.95 |

Source: author's calculations

Households Engel's expenditures function for the mid-term consumption goods reveals significant differences between separate households kinds. The employees and self-employees households are increasing their expenditures with only a slight increase in income. Vice versa, the other households are reacting on the income change elastically. According to the income elasticity of the expenditures, a 10% income increase can increase the expenditures by 13.5%. The mid-term consumption goods are luxurious goods for these households. The Engel's expenditures function for the pensioner's households is statistically insignificant so they are not presented.

| Households | Engel's expenditures curves | Elasticity value |
|---|---|---|
| ❑ employees | $18.5 + 0.02I_1$ <br> (0.02) | 0.24 |
| ❑ self-employees | $9.96 + 0.05I_2$ <br> (0.01) | 0.63 |
| ❑ other | $-4.47 + 0.07I_4$ <br> (0.01) | 1.35 |

Figure 2 provides the estimated Engel's expenditures curves for the mid-term consumption goods. We can see that if the Engel's expenditures curves of the employees and self-employees households are moving away from the notional 45° line, the other households' Engel's expenditures curve is slightly getting closer. It is caused by reality, the expenditures on the mid-term consumption goods are rising faster than income.



**Figure 2**　Engel's expenditures curves of mid-term consumption goods
Source: author's calculations

## Long-term consumption goods expenditures

The purchase of long-term consumption goods is preceded by a long-term comparison of different good parameters and considerations.

The time series analysis revealed a significant increase in expenditures on long-term consumption goods in all households from 2014.

It is caused by a steeper income increase in employees and self-employees households from the given year. This also caused a significant decrease in the share of short-term consumption goods expenditures. In the same way, the economy of the Slovak Republic recovered from the economic crisis and the general optimism occurred in society. Long-term consumption goods expenditures share on total expenditures is in observed households between 3.6% in other households, 3.8% in pensioners households, 6.4% in employees households, and 7.5% in self-employees households.

On average, the highest expenditures on long-term consumption goods are 22.39 EUR monthly in self-employees households. The variation range is 33.12 EUR. We found out that long-term consumption goods expenditures are reacting to the household's income change and social conditions more elastic than expenditures on other goods.

**Table 3**　Descriptive statistic of long term goods expenditures

|  | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| Employees | 15 | 9.70 | 34.04 | 19.17 | 9.18 |
| Self-employees | 15 | 9.35 | 42.47 | 22.39 | 13.34 |
| Pensioners | 15 | 5.69 | 15.94 | 11.15 | 3.92 |
| Other | 15 | 3.05 | 16.70 | 7.38 | 3.69 |

Source: author's calculations

The estimated regression parameters coefficients of Engel's expenditures function are suggesting a positive correlation between household income and long-term consumption goods expenditures. Where there are income elasticities higher than one, an increase in household income by 10% can lead to an increase in long-term consumption goods expenditures by 17.9% in employees households, and by 22.8% in self-employees households.

The analysis results confirmed that long-term consumption goods are luxurious for analyzed households. Engel's expenditures functions of pensioners households and other households are statistically insignificant.

| Households | Engel's expenditures curves | Elasticity value |
|---|---|---|
| ☐ employees | $-15.91 + 0.09I_1$ <br> (0.01) | 1.79 |
| ☐ self-employees | $-28.73 + 0.14I_2$ <br> (0.01) | 2.28 |

Figure 3 provides a view on estimated Engel's expenditures functions. When the households expenditures are reacting on its income change elastically, Engel's expenditures functions are getting closer to the imaginary 45° line. Self-employees households Engel's expenditures function is steeper than other households function.



**Figure 3**　Engel's expenditures curves – long term consumption goods
Source: author's calculations

## Services expenditures

Services represent a significant constituent of Slovak household expenditures. The services expenditures of employees households are 32%, self-employees 31%, other households 27%, and other households 23% of total household expenditures on average. Household services expenditures share on total expenditures is rising without significant variations in the observed period.

On average, the highest services expenditures are observed in employees households, 92.81 EUR, and self-employees households 91.55 EUR per household capita and month. In these two groups, the expenditures can have a significant impact on food services expenditures.

By the analysis of the services, we can notice that the household expenditures variation range is the biggest of all observed groups of consumption goods expenditures. Services are considered luxurious and are reacting very sensitively to the consumption conditions change.

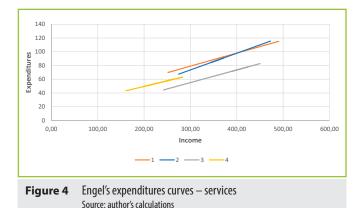**Table 4**　Descriptive statistic of services expenditures

|  | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| Employees | 15 | 64.76 | 111.78 | 92.81 | 14.15 |
| Self-employees | 15 | 69.52 | 118.38 | 91.55 | 15.91 |
| Pensioners | 15 | 45.28 | 81.95 | 66.71 | 12.17 |
| Other | 15 | 38.29 | 62.33 | 54.37 | 7.43 |

Source: author's calculations

The estimated Engel's expenditures function of services is pointing to a different household reaction on income change. Other households' 10% income increase can cause an increase in services expenditures by 6.9% on

average. The employees and self-employed household expenditures are increasing almost equally to the income increase.

| Households | Engel's expenditures curves | Elasticity value |
|---|---|---|
| ☐ employees | $22.07 + 0.19I_1$ <br> (0.01) | 0.76 |
| ☐ self-employees | $0.71 + 0.24I_2$ <br> (0.01) | 0.99 |
| ☐ pensioners | $-0.14 + 0.18I_3$ <br> (0.01) | 1.01 |
| ☐ other | $16.83 + 0.16 I_4$ <br> (0.01) | 0.69 |



**Figure 4**    Engel's expenditures curves – services
Source: author's calculations

Services Engel's expenditures curves of self-employees and pensioners households are almost parallel to the imaginary 45° line when the household services expenditures income elasticity is unitary. Less elastic is the employees and other households' reaction. Due to these reasons, the Engel's expenditures curves are flatter than the imaginary 45° line (expects that all the household expenditures are spent on the services) and are slightly deviating.

## Conclusion

The household expenditures analysis revealed the biggest variations from the expenditures development trend by the long-term consumption goods. This expenditures component is the one most vulnerable by social changes. This concerns all household social groups. From the Engel's expenditures curve estimation and derivated income elasticities, the long-term consumption goods are the most luxurious component of the household expenditures. The less elastic reaction to the household income change can be observe by short-term consumption goods expenditures, which are the biggest part of the household total expenditures. Judging by the previous Slovak households behaviour data, the upcoming economical crisis will probably break out in the fall, the most affected goods segments will be the long-term consumption of goods and services.

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