

## Analyzing Sports Activities as Part of the Household Economy

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**ABSTRACT :** Sports activities, by their importance with regard to the physical condition and health of the individual as well as part of the culture, are an integral part of the family program. This way, sports activities means expenses and are a part of the household economy. Household economy should cover a huge amount of various expenses to keep the household running, so spending devoted to the sports activities are planned carefully. As a sports activity we can imagine a range of activities from visiting the sports event as a fan of some particular sports game, through some physical training to professional sport. Every level relates to a specific amount of money to cover the costs of those sports activities. The article is based on the scientific research using the statistical methods. The monthly family income amount was divided into the intervals according to the Sturges rule. In the following construction of the probability density curve used the multitudes of the values in the interval. Determining correlation between the monthly family income [Euro] and monthly family costs devoted to the sports activities [Euro], using Pearson's correlation coefficient proved that monthly family income does not correlate with costs devoted to the sports activities.

**KEYWORDS :** Sports activities, family income, household economies, correlation, expenses

### I. INTRODUCTION

Household economy is a specific matter that is influenced with many components, including the policy, culture and family social status. It is obvious that some amount of money is necessary for the family running. If a family has more than the necessary amount of money it needs to meet the household's essential needs, it may also allow for greater individual development in a particular way. Taking this into account, income as such may also be linked to the attained level of education, [1]. To what extent family income, if so, affects the development of personality towards sporting activities, is a subject matter of the research regarding a household economy. One of the reasons why scientists are interested in the sports activities of family members and, in this context, their possibilities with regard to the household economy is also the direct association between leisure time activities, especially in the field of sports, and various health indicators. Focusing on the contrast between sports and non-sports participants of family means to explore the development of differences in lifestyles, health attitudes, health status and well-being as a leisure orientation, [2]. Also, the economic strategies seem as promising to stimulate taking part in sports activities, [3]. In this respect, the provision of basic needs appears to be a priority in the household economy, [4]. So, the portion of expenditure on sports activities makes a specific part of the household consumption basket, [5].

Family ability to support its members in sports activities is specific if we explore individual physical activities or expenses to sports facilities. However, although access to sports facilities plays an important part in sport activities, it does not affect the physical fitness of individuals and, in particular, predispositions to sports activities among young people, [6]. In this respect, we distinguish the significant influence of both economic and cultural capital, [7]. When considering active or passive sports, i.e. sports participants and sports spectators, it is obvious that members of better-situated families are naturally more likely to become both. On other hand, education and cultural capital can have significant impact on participation in sporting activities, irrespective of economic capital, only if it is in society that allows such participation through, for example, subsidized sports clubs. Although financial support to the clubs is not equal, competitive balance has remained [8]. Sometimes the club membership relates to a relatively high fee. Also, practicing some sports professionally means a relatively high cost for the family. A quality game, especially in team sports that have a tradition, can increase the interest of fans and also means additional revenue for the clubs. Quantitative and qualitative differences in club support might mean connection with the male or female team sport, [9].

As every company tries to increase their profit [10], also those who are involved in professional sport expect some reward for their efforts. If the reason for the sports activity means only some amusements and some physical as well as psychological conditioning, the family is usually careful regarding its expenses towards the sports activities. Public finance devoted to sports clubs, stadia and activities does not bring so much profit as the private, [11]. However, the public welfare is directly dependent on the public support to the sports clubs as well as other sports organizations and activities. The distribution of funds in favor of sports clubs also means better equipment, training opportunities and a chance to compete, [12]. The argument for the substantial public subsidization, which occurs is mostly connected with the indirect economic benefits, [13].

The article analyses mainly the family income in its relationship to the expenses devoted to the sports activities.

## II. METHODOLOGY

The article is based on the research performed using the method of the random sampling. The questionnaire comprised mostly the questions regarding the family income as well as the amount of money that is monthly devoted to the sports activities. The amount of hundred respondents was questioned. The results were divided into the intervals according to the Sturges rule (1). The rule determines the desirable number of intervals into which a distribution of observations should be classified. The number of intervals is denoted as  $k$ .

$$k = 1 + 3.322 \log 100 \quad (1)$$

Thus

$$k = 7.644$$

The monthly family incomes ranges from 400 Euro to 4000 Euro. As the difference between the highest and the lowest values makes the value range of 3600, using the Sturges rule (1) we decided to divide it into 8 intervals. After setting the intervals, the middle value was determined for each of them. The family income was analyzed through the construction of the probability density curve using the statistical methods. In the following the correlation between monthly family income and monthly costs devoted with the family members to the sports was tested.

## III. STATISTICAL METHODS IN ANALYZING THE FAMILY INCOME

The statistical methods, which were used to analyze the data comprise setting the median, mode and construction the probability density curve. The family monthly income was analyzed setting the median as the value separating the higher half from the lower half of a data set from 400 to 4000. When listed the range of numbers, the median was set as an arithmetic average of the values placed on the 50th and 51th. It means the arithmetic average of 1500 and 1550 that makes the value of 1525 Euro. The mode was set as the value that appears the most often. Thus, the mode equals to 1200 Euro that appears 9 times in the range of the data.

The probability density curve was constructed using the multitudes of the monthly family income values [Euro] according to their appearance in the intervals. The values are placed in the Table 1. The results are used to construct the probability density curve that is expressed in Figure 1.

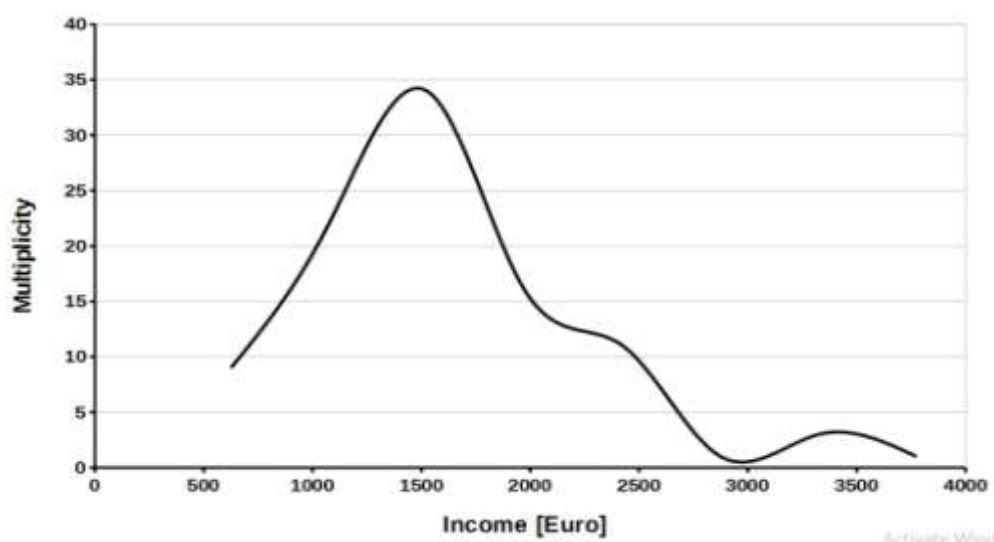


Figure 1. The probability density curve constructed using the multitudes of the monthly family income values [Euro] according to their appearance in the intervals (Table 1)

Table 1. Multitudes of the values in the intervals expressing the values of monthly family income [Euro].

Interval	The Middle of the Interval	Multiplicity
[400; 850)	625	9
[850; 1300)	1075	22
[1300; 1750)	1525	34
[1750; 2200)	1975	16
[2200; 2650)	2425	11
[2650; 3100)	3325	1
[3100; 3550)	3325	3
[3550; 4000)	3775	1

**IV. RESULTS AND DISCUSSION**

To determine correlation between the monthly family income [Euro] and monthly family costs devoted to the sports activities [Euro], Pearson's correlation coefficient  $r_{xy}$  is used.

$$r_{xy} = \frac{\sum x_i y_i - n \bar{x} \bar{y}}{\sqrt{(\sum x_i^2 - n \bar{x}^2)(\sum y_i^2 - n \bar{y}^2)}} \quad (2)$$

where

$x_i$  ... monthly family income [Euro],

$y_i$  ... monthly family costs devoted to the sports activities [Euro].

In the following, the statistical characteristic (3) is determined to be compared with the quantile  $t_{1-\frac{\alpha}{2}}(n-2)$  value.

$$\frac{|r_{xy}| \cdot \sqrt{n-2}}{\sqrt{1-r_{xy}^2}} \quad (3)$$

The value of the Pearson's coefficient that was determined using the formula (2) equals 0.129891286. The value of the statistical characteristic that was determined using the formula (3) equals 1.296844688. The quantile of  $t$ -distribution is determined on the confidence level  $\alpha = 0.1$  and equals  $t_{0.95} = 1.66$ .

As the value of the statistical characteristics is not higher than the quantile of  $t$ -distribution, it means that monthly family income [Euro] and monthly family costs devoted to the sports activities [Euro] does not correlate. The relationship is expressed in Figure 2 as the set of points with coordinates  $[x_i, y_i]$ .

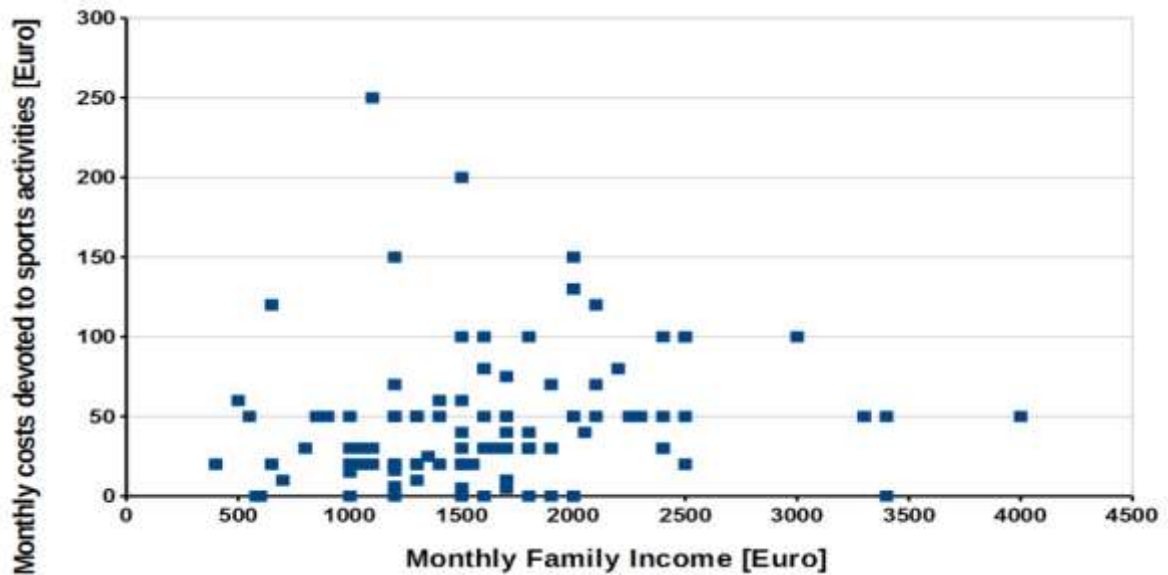


Figure 2. The relationship of monthly family income [Euro] and monthly family costs devoted to the sports activities [Euro]

## V. CONCLUSION

The scientific research examined expenses devoted in the family to the sports activities as a part of the household economy. Family income was analyzed using the statistical methods. The monthly family income amount was divided into the intervals according to the Sturges rule. In the following construction of the probability density curve used the multitudes of the values in the interval. The relationship between the monthly family income [Euro] and monthly family costs devoted to the sports activities [Euro] was examined using the Pearson's correlation coefficient. The used statistical method proved that monthly family income does not correlate with costs devoted to the sports activities.

Household economy covers a large amount of problems that are mostly based on various relationships between income and expenses and could serve as a subject matter for future research.

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