

*Biljana Radivojević**
*Petar Vasić***

HOUSEHOLD AGE STRUCTURE AND CONSUMPTION IN SERBIA

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ABSTRACT: *The influence of demographic variables on household consumption level and structure is understood but insufficiently studied in Serbia. This paper analyzes the connection between age as a demographic variable, and the size and structure of household consumption as economic phenomena. We discuss the research results, trying to explain the intensity and direction of the shown connection. The economic variables are usually set as determinants of demographic processes, but we set age*

as an independent demographic variable shaping household consumption without ignoring the household income level. It seems that the age structure of a household, particularly the age of the household head, has a significant influence on consumption structure.

KEY WORDS: *household consumption, age structure, consumption structure, household size.*

JEL CLASSIFICATION: J10, J12, D12, D91

* Faculty of Economics, University of Belgrade, Serbia, E-mail: biljana@ekof.bg.ac.rs

** Faculty of Geography, University of Belgrade, Serbia, E-mail: vasic.dem@gmail.com

1. INTRODUCTION

This paper analyzes the influence of age structure on individual consumption. We focus on the age variable, which is, besides gender, the basic characteristic of an individual, creating an age structure of the population. During the demographic ageing process age structure is a central issue in the demographic development of each population, especially when it is accelerating. On the macroeconomic level these changes in population will reflect the aggregate demand changes, and indirectly some sector production as well. Some authors, such as Gourinchas and Parker, find that there is substantial age-heterogeneity in consumption behaviour that results from the interaction between and the relative strengths of retirement and precautionary motives for saving at different ages (Gourinchas and Parker, 2002, p. 48).

This paper's goal is to confirm the influence of the chosen demographic variable (age) on the level and structure of individual consumption, and to explain the direction and intensity of this influence on a sample of households in Serbia. The consumption structure is considered in the household life-cycle context, where the age of the household head is a basic independent variable.

The main data source is the Household Budget Survey (HBS)¹. Individual consumption is taken as household consumption, that is, as the total consumption of all household members. The age as variable refers to the age of the household head, and the household life cycle is its duration from the beginning to the end of its existence. As most of the households in the HBS are one family households, we can consider a household life cycle as a family life cycle. It is significant to mention that the HBS does not provide age-specific data, so this study required additional data analysis of HBS questionnaires.

The analysis regards Serbia (no data for Kosovo and Metohija) in total and is positioned in 2007. Although the life-cycle consumption changes can be best presented in panel studies, the research methodology and available data do not provide that option. Yet the hypothesis is that the influence of a household's age structure on its consumption can emerge in one-year data. A similar study was conducted in Belgium, taking one-year data to identify the age-specific household consumption structure. In that study Lefebvre (2006, p. 14) took the year 2000

¹ The household budget (or consumption) survey has been conducted under that name in Serbia since 1983. New methodology based on international standardisation and EUROSTAT, ILO, and UN recommendations, conducted since 2003, provides international data comparison.

data to isolate the direct effect of age on consumption demand without any accompanying effects, and to project future demand changes. In the year 2007 Serbia experienced a certain level of macroeconomic stability. By choosing one year we avoid the eventual influence of goods and services price changes and the influence of income changes, which are not this paper's concern. The economic crisis affected Serbia at the end of 2008 and was reflected in spending capacity and consumption structure. The crisis mostly prioritised satisfying different needs, disturbing the usual age pattern of saving and consumption. Those influences would require a different approach, primarily recognizing the economic aspect of consumption in contrast to a household life cycle, which is the focus of this paper.

2. HOUSEHOLD CONSUMPTION FUNCTION

A household is a group of individuals who live, feed, and spend together. Household consumption is defined as aggregate expenditure on food and other current expenditures, which includes bought products, individual production, and gifts received (Poverty in Republic of Serbia, 2008-2010, page 3). Income aggregate includes wages, pensions, social security income, income from abroad, agricultural income, natural income, and other incomes; but imputed rent value is excluded from the analysis because of shortage of data in the HBS needed for their calculation (Poverty in Republic of Serbia, 2008-2010, page 3).

The household life cycle is the period from the beginning to the end of a household's existence. From an individual's point of view, the family's foundation (it's own household) is the usual beginning of this cycle, followed by birth of children (increasing family size), children leaving the parental household (decreasing family size), death of the marital partner (old-age bachelor households), and finally the death of the last household member (disappearance of a household).

The demographic aspect of household analysis means the inclusion of a large number of characteristics. The basic characteristics are household size and age structure. These characteristics directly depend on the basic demographic processes and their past trends. These characteristics determine the social and economic characteristics of a household (economic activity of household members, income sources, estate owning, etc.).

Many factors, including agrarian reform after World War II, rapid industrialization and urbanization, and massive transfer of rural population to non-agricultural activities in cities, have resulted in changes in the structure

and size of households in Serbia (Radivojević, 1995, p. 277). Households with many members and many families changed to households with one family and an average of three members. Concurrently, the household function gradually changed as its productive and consumptive functions separated. In contrast to the traditional household where the productive function was prime, this function weakened or completely disappeared. The modern household, especially in the urban environment, is reduced to a unit of consumption, and is dependent on socio-economic influences.

Household consumption is the consumption of all household members. In addition to economic factors and socio-historical circumstances, consumption is also influenced by demographic factors. The size and household member age structure are significant factors in the size and structure of its consumption. The life age of household members determines their demands, and those needs are satisfied by consumption according to income level and the price of goods and services. Economic theory emphasizes the influence of an individual's age on his/her saving and consumption model. According to Erlandsen and Nymoen (2004, p. 1) the life cycle model of Modigliani and his collaborators predicts, for instance, that the individual's consumption and saving behaviour is a function of his/her age; an individual borrows when young, saves when middle-aged, and dissaves when old. Modigliani and Brumberg presumed that households want to maximize the utility of their future consumption during their lifetime, wanting to spend equally over time. In the period of lower income an individual will borrow to be free to spend, and in the period of higher income will save so as to be free to spend in the following period of lower income.

3. SAMPLE HOUSEHOLDS' CHARACTERISTICS

The estimated number of households in Serbia in 2007 was 2,536,714, comprising 1,495,365 (58.9%) urban and 1,041,379 (41.1%) rural households. Regionally 49.6% are from Central Serbia without Belgrade, 27.8% from Vojvodina, and 22.7% from Belgrade. By random choice method 4,608 households were picked for the survey sample, which is 96% of the recommended number of 4,800 households (HBS in 2007. p. 17).

According to Vasić (2010, p. 514) there are many ways of using HBS data in demographic analysis, but the largest usability lies in the analysis and explanation of household consumption determination by the socio-demographic characteristics of its members. The additional processing of HBS data in 2007

for writing this paper made possible the recognition of relevant household characteristics by household head's age, which is presented in Table 1.

The total population age structure significantly determines the share of number of households in each age group. For ages of the household head up to 30 years the share is low, as a consequence of the delay in the age of the founding of own family and household. The share of households of age up to 40 is also relatively low. In the age group of household head of 40 to 60 years the number of households reflects the large share of these age groups in the total population age structure, and the fact that this is the population age group that has already founded its own household. The share of households with household heads of 60 to 70 years old decreases in relation to the previous age group. The main reason for the low share of this age group is that these people were born during World War II. The disproportionate increase of the age group 70+ is the consequence of it being the sum of all older ages. Its dismembering into five-year age groups confirms this and provides a closer look at the share of these households. The household share slowly increases towards the age group 70–74 because of the current population age structure, and then decreases because of mortality, and in the last age group is equal to the share of the age group from 35-39 years old.

Table 1. Households in Serbia by household head's age

Household Head's age	Number of sampled households (1)	Estimated number of households (2)	Average household size (3)	Average number of consumer units (4)
to 24 years	23	11,883.84	2.23	1.79
25 to 29	60	31,843.32	2.96	2.19
30 to 34	133	72,884.58	3.61	2.55
35 to 39	239	130,528.19	3.63	2.57
40 to 44	341	185,102.09	3.74	2.74
45 to 49	419	226,954.91	3.72	2.81
50 to 54	594	322,714.91	3.46	2.66
55 to 59	622	337,587.39	3.29	2.55
60 to 64	451	244,202.57	3.02	2.34
65 to 69	520	284,004.33	2.65	2.11
70+ years	1,206	656,678.73	2.37	1.93
Total	4,608	2,504,385	2.95	2.36

Source: authors' calculations from HBS

The number of household members changes depending on the age of the household head (Table 1, column 3). In the first age group “to 24 years” the average household size is the smallest of the whole life cycle. The household size increases up to age 45 of the household head, and then begins to fall towards the end of the life cycle. We can see that the majority of households end reproduction when the household head is 35. The largest share of children leave the parental household after the household head reaches the age of 50.

Besides household size, the age structure of a household is very significant in determining individual consumption. Every household member 15 years and older is considered as an adult in the HBS. Every household member 14 years and younger is considered a child.

During the household life cycle the age of the household head changes along with the number of adults and children in the household. According to the data for 2007, the Pearson correlation coefficients between household head age and average number of children 0 to 6 years old, and children 7 to 14 years old, are negative at the level of -0.798 and -0.747 respectively.

Although they belong to the group of adults, the number of household members 65 plus years old influences household expenditure and income structure. The number of these household members increases with household head age in one-family households. In intergenerational households with two or more families, the average number of old members is increased by the inclusion of old parents in the household. During a short period of time the average number of old household members decreases (because of the deaths of the old members). After that the number of old household members increases again as the household head and then other household members enter that (old) age. The correlation coefficient between household head age and average number of old household members is 0.806.

Household size and structure determine the number of consuming units. Regarding age structure, we presumed that not all household members spend equally to achieve an equal life standard level. The number of equal consumption units (ECU) is an indicator of the demographic side of real load to household budget. We used the OECD scale used in poverty estimates conducted by the Statistics Bureau of Serbia (Poverty in Republic of Serbia, 2008-2010, page 3), which looks as follows:

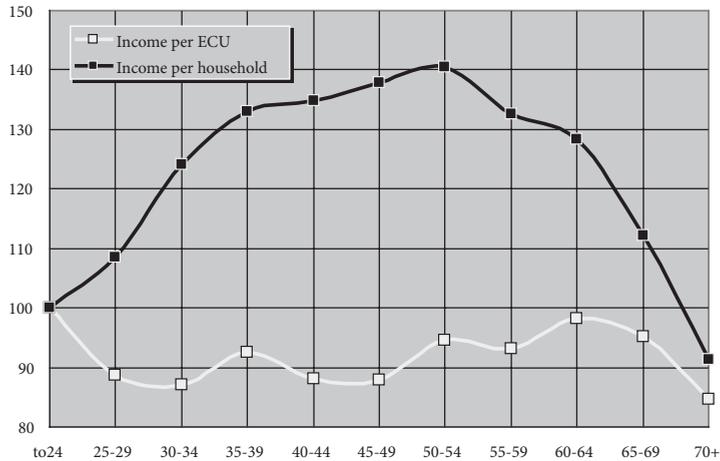
- First adult = 1
- Second and every next adult = 0.7
- Children from 7 to 14 years old = 0.5

The average number of consumer units per household according to age of household head is presented in Table 1, column 4. The index values are lowest in the first age group (up to age 24). The household size increases with household head age up to 50 years, and then starts to decrease. The average number of consumer units per household in the last age group is higher than the first age group index value only because of the aggregate nature of the last age group. Knowing that in the ages above 70 the number of single households increases, we cannot expect values of this index much above 1.

The average number of consumer units per household shows changes similar to the number of household members in the age groups above 40. There are differences in the first four age groups. This is the period when the number of household members increases due to reproduction. The increase of the consumer unit number is slower, because children in the ECU scale have lower values than adults. After the age of 50 the number of household members decreases faster than the number of consumer units because the other than the first adults (ECU value 0.7) leave the household.

The HBS also provides household income data, which also can be analyzed by age of household head. Chart 1 shows the basic index of total household income change, and the basic index of income change per ECU, both by the household head age. Household income by household head age increases to the age of 50-54, reaches its peak, and starts to decrease faster and faster with household head age, confirming Modigliani's LCH. The household income level shows strong negative correlation with household head age (-0.721).

Chart 1. Basic index of household income change, and income change per ECU



Source: authors' calculations from HBS

The average income per ECU shows different tendencies, representing the real household budget load. Although the income of the households in the youngest age group is almost the lowest, they have the highest average income per ECU because of their young age structure and small household size (only the households over the age of 70 have a lower income). Until the age of 50 the average income per ECU is at a relatively low level. After that age it starts to increase slowly and stays at a relatively high level to the age of 70, decreasing the household budget load.

4. CONSUMPTION LEVEL OVER THE HOUSEHOLD LIFE CYCLE

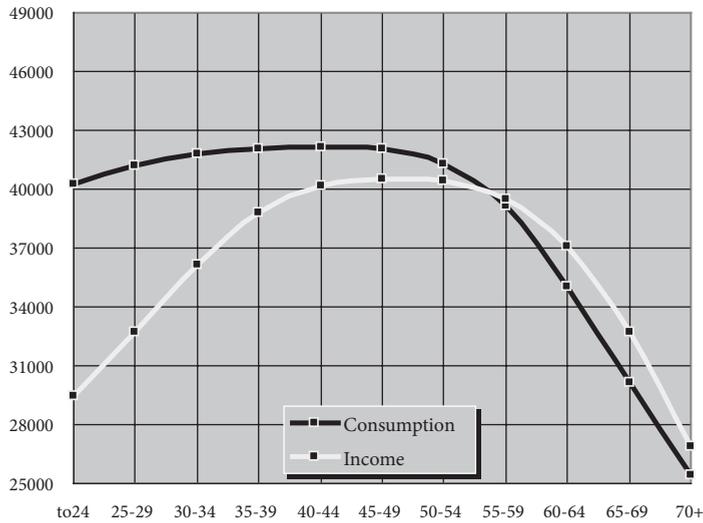
The households in Serbia show a relatively high and increasing consumption level in the first few age groups, and after the age of 30 the consumption level remains constant to a certain degree until the age of 60, when it starts to fall very rapidly to the end of the life cycle (Chart 2). The household consumption level shows a very strong negative correlation with the household head age (-0.891).

In the first few age groups the income level is relatively low but increasing, reaching its peak when the household head is age 50. The income level is lowest at the end of the life cycle. The household income level shows a strong negative correlation with household head age (-0.721).

If we compare the household income level and the consumption level we can see that to age 30 of the household head consumption exceeds the low income level by a large margin. This is at its highest at the period of household founding and the greatest increase of average household size. In this period most households record the highest expenditure for housing and equipment. After this period the household consumption level decreases but is still relatively high at a level above the household income level, mostly thanks to the biggest household size in the period to age 50 of the household head. For the first time the households record an equal level of income and consumption in the period of age 50-60 of the household head, thanks to a decreasing household size and a high income level. At the end, with the age group 60-64, which matches retirement age, the households start to save to the end of the life cycle.

During the household life cycle, households in Serbia spend more time spending than saving. Households borrow to maintain a certain level of consumption. In the first part of the life cycle the household consumption-saving model in Serbia is similar to LCH assumptions, but consumption exceeds income level to a greater extent and over a longer period of time. In the second part of the life cycle the income level is lower, but the consumption level is even lower, making saving possible. With the current life standard level, Serbian households can only save during a small period of time. There is no period of prime saving of the working population (from age 50 to retirement age), when the consumption level is high but the income level is even higher. In addition, in contrast to Modigliani's LCH, according to which an individual spends more than s/he is earning after retirement, household consumption in Serbia decreases faster than income level at the end of the life cycle.

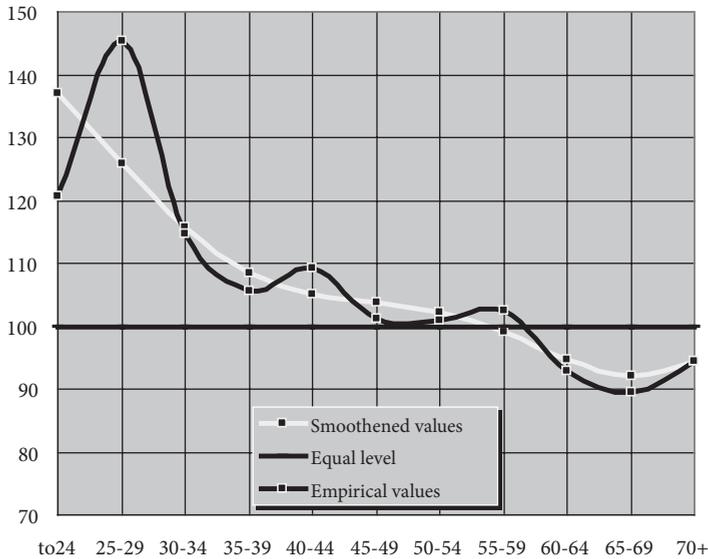
Chart 2. Age model of household income and consumption (smoothened values)



Source: authors' calculations from HBS

The relation between income and consumption, shown by relative share of consumption in household income, records a decrease during the household life cycle (Chart 3). The households at the beginning of the life cycle are clearly consumer-oriented, but during the life cycle the income and consumption levels become increasingly equal, and after age 55 of the household head the consumption level falls below the income level, so households in old age become saving-oriented. These conclusions are additionally confirmed by the household consumption structure.

Chart 3. Relative share of consumption in total income during the life cycle



Source: authors' calculations from HBS

5. CONSUMPTION STRUCTURE DURING THE HOUSEHOLD LIFE CYCLE

We classified the twelve categories in the household consumption structure according to the HBS into three large groups: necessary expenditures, possible expenditures, and expenditures of choice.

The necessary expenditures or priority expenditures comprise utilities, food, and health expenditures. Consuming these goods and services represents satisfying basic existential needs for residential living, food, and medical treatment. No matter what the demographic characteristics, all population categories have these needs.

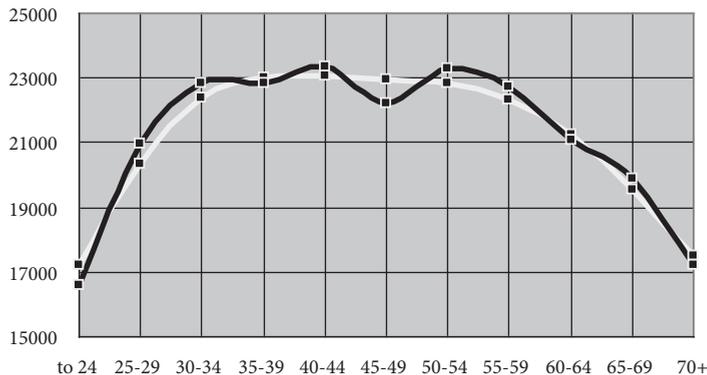
The possible expenditures or the second priority expenditures are non-existential goods and services. This category includes housing and equipment, communication, clothing, transport, and education. Consuming these goods and services satisfies the need for sustaining and improving the quality of life. These needs can vary significantly according to the socio-demographic characteristics of the population.

The expenditures of choice (the third priority expenditures) refer to luxury goods and services. These contain the following categories: recreation and culture, restaurants and hotels, other costs, and alcohol and tobacco. Consuming this type of goods and services satisfies needs which are not necessary or existential but are the expression of an obtained standard of living through satisfying the need for recreation and enjoyment; that is, for improving leisure quality.

5.1. Necessary expenditures

At the beginning of the household life cycle the total expenditures for the first priority increase according to the household head age (Chart 4). After that age the expenditures decrease, except health expenditures, which increase from a certain age as the entire household ages. The first priority expenditures show a strong negative correlation with household head age (-0.781).

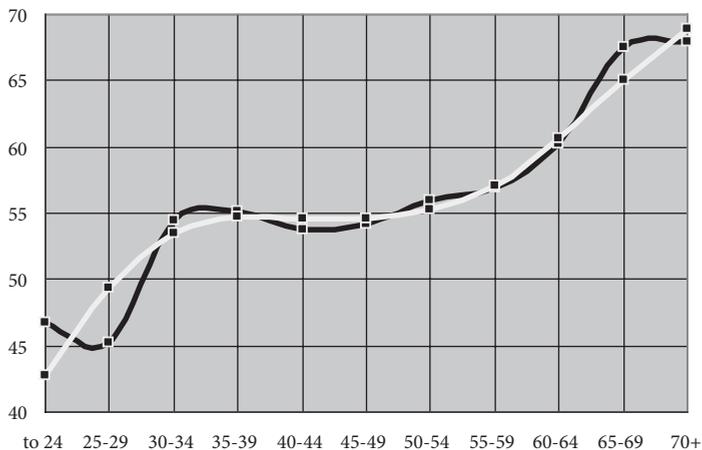
Chart 4. First priority expenditures (empirical and smoothened values)



Source: authors' calculations from HBS

The relative share of first priority expenditures in total household consumption is 59.2% in 2007. It increases rapidly in the few first and few last age groups, and is stagnant in the middle-aged households (Chart 5). The correlation coefficient regarding the household head age is positive at the level of 0.922.

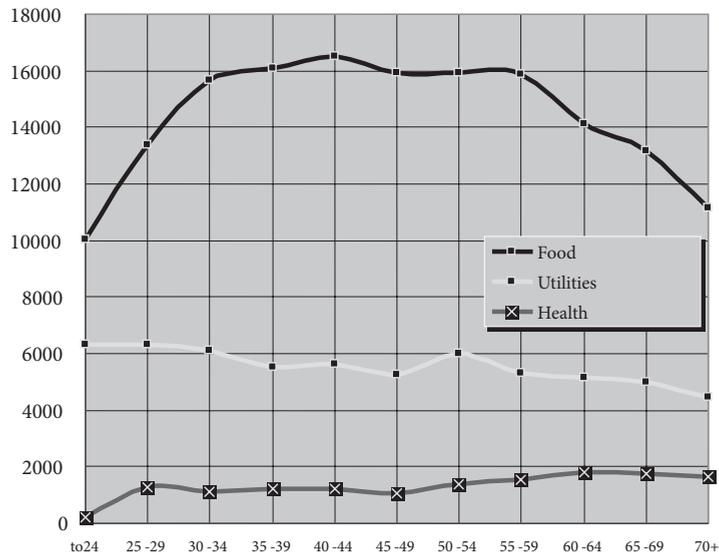
Chart 5. Relative share of first priority expenditures regarding household head age (empirical and smoothened values)



Source: authors' calculations from HBS

The relative share of food expenditures in total household consumption in Serbia in 2007 is 40.3%, which is the largest share of all the categories. Regarding the household head age, these expenditures are lowest in the first age group, and rapidly increase to the age of 30-34, staying at a high level until age 55-59 of the household head (Chart 6). A relative share of these expenditures increases during the whole household life cycle (Table 2). This increase is most intense at the beginning and at the end of the household life cycle.

Chart 6. Amount of food, utilities, and health expenditures



Source: authors' calculations from HBS

Table 2. Relative share of necessary expenditures by household head's age (%)

Age	Total	Food	Utilities	Health
to 24	46.8	28.3	17.9	0.6
25-29	45.2	28.9	13.6	2.7
30-34	54.5	37.3	14.6	2.6
35-39	55.2	38.9	13.4	2.9
40-44	53.8	38.1	12.9	2.8
45-49	54.2	38.8	12.8	2.6
50-54	55.9	38.2	14.4	3.3
55-59	56.9	39.8	13.3	3.8
60-64	60.2	40.3	14.7	5.2
65-69	67.5	44.7	16.9	5.9
70+	67.9	43.9	17.5	6.5
Total	59.2	40.3	14.7	4.2

Food expenditures show a strong or moderate positive correlation with all the analyzed household characteristics, except with the average number of old household members (negative correlation). In addition, this household

consumption category shows a strong negative correlation with household head age (-0.783).

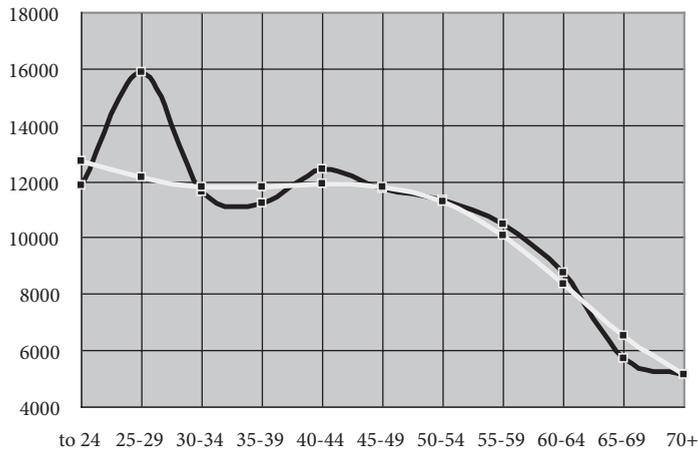
Expenditures on utilities are highest in the first few age groups and decrease with age. The relative share of these expenditures in total consumption of households is 14.7% in 2007. This consumption category shows a strong negative correlation with household head age (-0.853).

Expenditures on health represented 4.2% of the total household consumption average in 2007. In relation to household head age, they increase rapidly from the first to the second age group, thanks to a significant increase in average household size. The relative share of these expenditures shows an obvious increase related to the household head age. In the necessary expenditures category, but also in all other consumption categories, only health expenditures show a positive correlation with household head age (0.854).

5.2. Possible expenditures

Second priority expenditures decrease during the whole life cycle. These expenditures are highest but decreasing in the first few age groups, and stagnate to age 50 of the household head. From this age to the end of the life cycle the level of these expenditures decreases (Chart 7). The empirical data in relation to the smoothed values show a significant deviation in the age group 25-29. The reason for this deviation is extremely high clothing and communication expenditures, which are significantly higher than in any other age group. The high consumption, small family size, small average number of children, and effort to increase life comfort can explain this. The second priority expenditures show a very strong negative correlation with household head age (-0.917).

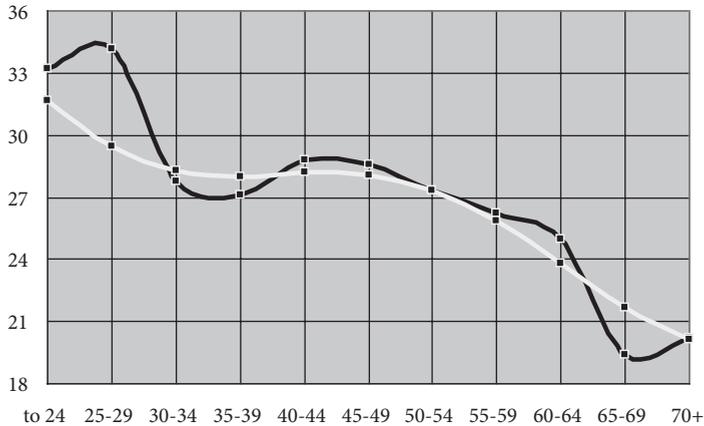
Chart 7. Second priority expenditures regarding household head age (empirical and smoothed values)



Source: authors' calculations from HBS

The relative share of second priority expenditures in the total household consumption average in Serbia in 2007 is 25.2%. Analyzed regarding the household head age, this share shows a similar trend as its absolute amount, but with one distinction: in the first two age groups this share is significantly higher than in any other age group (Chart 8). The relative share of second priority expenditures shows a very strong negative correlation with household head age (-0.905).

Chart 8. Relative share of second priority expenditures regarding household head age (empirical and smoothed values)

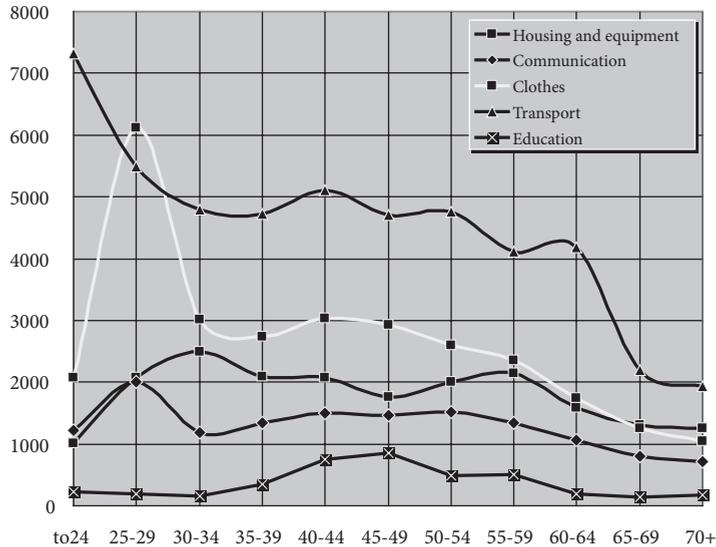


Source: authors' calculations from HBS

In the category of second priority expenditures, expenditures for housing and equipment and communication show an increase and then a decrease during the life cycle. Expenditures on housing and equipment increase to age 35 of the household head, mostly because the average household size increase. The rise of these expenditures at ages 50-60 of the household head can be explained by the highest level of household income in these age groups, but also by a sudden decrease of the average household size, which allows higher spending on renewing furniture and house equipping (Chart 9). This household consumption category shows a strong negative correlation with household head age (-0.807). Communications expenditures decrease after age 50 of the household head, and follow the average household size change during the life cycle. This household consumption category shows a strong negative correlation with household head age (-0.845).

Certain deviations in the age group 25-29 can also be seen for clothes expenditures (Chart 9). These households have the highest total consumption and a relatively small number of children. As these are young households we can presume that they give more importance to socializing and personal appearance, and are not loaded with the costs that are present to a larger extent in older households. All of this confirms that, when young, the households barely think about saving; that is, when young, people borrow to compensate a relatively low income, regarding LCH. This household consumption category shows a very strong negative correlation with household head age (-0.910).

Chart 9. Amount of equipment, communication, clothes, transport, and education expenditures



Source: authors' calculations from HBS

Transportation has the largest relative share in the total consumption of second priority expenditures (10.3%). Transportation expenditures are highest but decreasing at the beginning of the household life cycle (Chart 9). There is a significant reduction in these expenditures at the time of retirement. This consumption category shows a very strong negative correlation with household head age (-0.900).

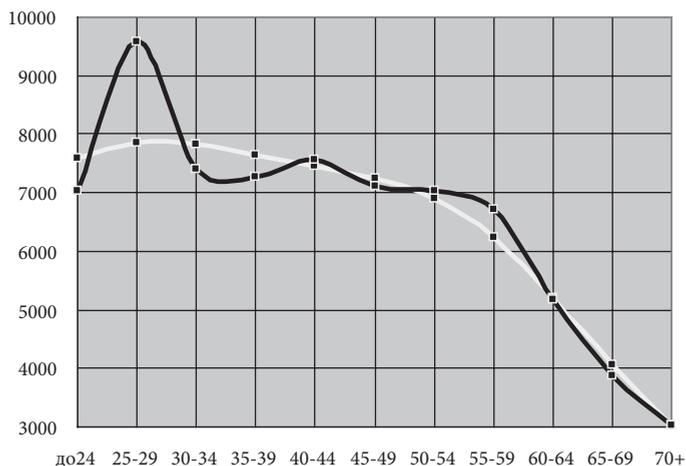
Expenditures on education have the lowest relative share in the household consumption structure in Serbia at 1.1%. These expenditures are low at the beginning of the life cycle, and then increase to age 50 of the household head when children to a largest extent finish their education (Chart 9). The correlation of education expenditures with household head age is negative at the level of -0.583.

5.3. Expenditures of choice

Expenditures of choice comprise expenditures on luxury goods and services. In the total household consumption structure in Serbia in 2007 these expenditures have a relative share of 15.6%. Expenditures of choice are highest at the beginning

of the life cycle and decrease during the whole life cycle (Chart 10). These expenditures show a very strong negative correlation with household head age (-0.921).

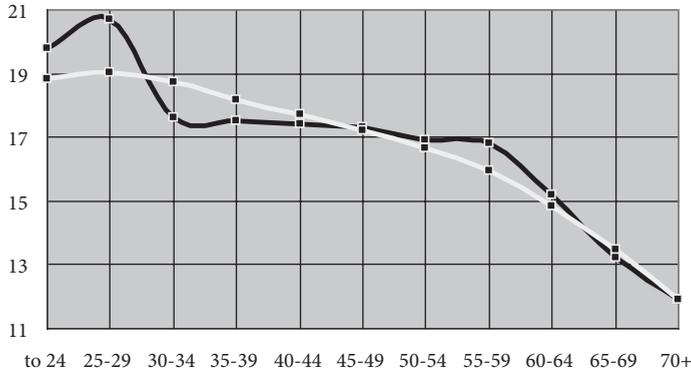
Chart 10. Expenditures of choice regarding household head age (empirical and smoothened values)



Source: authors' calculations from HCS

The relative share of these expenditures in total household consumption decreases as household head age increases (Chart 11). Their relative share is high in young households, stagnates at a lower level to age 60 of the household head, and after that age decreases further. The trend of the third priority expenditure change can be explained by the distinctive consumption behaviour of the young, the length of the economically active period (regarding LCH), and, at the end of the life cycle, by the distinctive saving behaviour of the elderly. The relative share of these expenditures shows a strong negative correlation with household head age (-0.922).

Chart 11. Relative share of third priority expenditures regarding household head age (empirical and smoothened values)



Source: authors' calculations from HBS

Expenditures on recreation and culture are relatively low at the beginning of the household life cycle, and increase to age around 40 of the household head, then start to decrease slowly towards the end of the life cycle (Chart 12). This trend of recreation and culture expenditures can be related to the average household size and the change in household income level. This household consumption category shows a very strong negative correlation with household head age (-0.932).

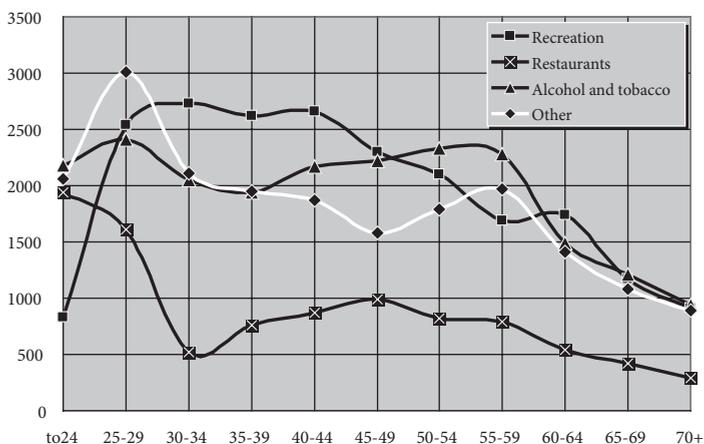
In contrast to the previous category, expenditures on restaurants and hotels are highest but decreasing at the beginning of the household life cycle. The decrease is very intense in the age group 35-39, and after that age it stagnates to age 60 of the household head, which matches the period of intense working activity and high income level. The high expenditures at the beginning of the household life cycle are related to the high consumption level in regard to income level, and small household size. The expenditure level for restaurants and hotels shows a strong negative correlation with household head age (-0.831).

Expenditures on alcohol and tobacco are very high at the beginning of the household life cycle regarding the total average (Chart 12). They stay at this level to age 60 of the household head, which is the period of most intense economic activity. It appears that consuming alcohol and tobacco is a general characteristic of households in Serbia during the whole working period. As for restaurants and hotels, consumption of alcohol and tobacco is to a great extent related to income level, and also to consumers' psychology, which is not the focus of this research.

Alcohol and tobacco consumption shows a strong negative correlation with household head age (-0.813).

Expenditures on other goods and services show a trend regularity during the whole life cycle. These expenditures are highest at the beginning of the life cycle, and their decrease accelerates towards the end of the household life cycle (Chart 12). This category shows a strong negative correlation with household head age (-0.874).

Chart 12. Amount of expenditures on recreation and culture, restaurants and hotels, alcohol and tobacco, and other expenditures



Source: authors' calculations from HBS

6. CONCLUSION

Analysis of individual consumption in Serbia based on data from 2007 shows that the total amount and structure of consumption changes during the household life cycle. At the beginning households make efforts to improve the quality of living by satisfying their needs for arranging life space, clothing (personal appearance), communicating, transportation, travelling, socializing and going out, and other goods and services which include cosmetics, make-up, and all other services which cannot be placed in any other consumption category.

In middle age households reach the peak of first priority expenditures, mostly because of household size increase. These households have the largest number

of children (0-14 years old), so that most of the household budget is redirected to raising children. Therefore expenditures on food, health, education, and recreation and culture increase.

The consumption of old households has an expressly existential character. The largest share of expenditure in total consumption goes on food, medical treatment, and utilities (almost 70% of total household consumption). After retirement and a decrease in household income level, total consumption decreases, except health expenditures.

The research has shown that household head age is a significant factor in the formation of the total amount and structure of household consumption. The age of the household head has a direct influence on household income level and determines the number and the age composition of the household members. This, in turn, affects the level and structure of household consumption.

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