

LEVEL OF SUSTAINABLE CONSUMPTION IN HOUSEHOLDS IN POLAND ACCORDING TO NON-INCOME FACTORS

Anita FAJCZAK-KOWALSKA¹, Daniel TOKARSKI^{2*}

¹Lodz University of Technology; anita.fajczak.kowalska@p.lodz.pl, ORCID: 0000-0002-5347-9735

²University of Lodz; daniel.tokarski@uni.lodz.pl, ORCID: 0000-0002-3475-1115

* Correspondence author

Purpose: The aim of the analysis was to demonstrate the relationship between the impact of selected (non-income) factors and the level of sustainable consumption of households in Poland in selected years.

Methodology: Analysis of data from the library of the Central Statistical Office.

Findings: The most important economic factors determining household expenses include income, which determines primarily the size and structure of expenses and the prices of goods.

Originality/value: The publication discusses the impact of selected (non-income) factors on the level of sustainable consumption in households. Combining interdisciplinary research in the areas of management and quality sciences with economics and finance.

Keywords: household budgets, households in Poland, sustainable consumption.

Category of the paper: General review.

1. Introduction

Consumption currently has a very large impact on changes taking place both in the environment and in society, where it emphasizes its stratification. Therefore, an important issue is sustainable development, the main goal of which is to manage in such a way as to meet the needs of both current and future generations, taking into account environmental protection. In the economic literature, most attention has been paid to the theory of the consumption function. In the second half of the 1930s, some economic theorists began to link consumption with income and, on this basis, predict changes in global consumption, relating their considerations to various types of income. This led to the creation of many concepts, called income hypotheses in the economic literature, the most important of which are the concept of permanent income and the life cycle theory (Bywalec, 2012; Zalega, 2012).

The literature states that the usefulness of treatments performed by representatives of this trend was measurable, the so-called cardinal utility, in the sense that it could be measured by every consumer and every household. The following objections can be raised against such theories (Jevons, 1871; Marshall, 1890).

- each consumer realizes the value of the purchased product only after using it for some time,
- when assessing the suitability of the purchased goods, natural and technical parameters characterizing the goods, economic parameters and parameters visible to the buyer's senses should be taken into account.

The authors built individual theories based primarily on the analysis of their own mental experiences, which they then tried to transfer to other people in order to explain the regularities observed in economic life.

In the works of the outstanding English economist Marshall (1890), who studied, among other things, the behaviour of households in making consumption decisions, the basis of the theory of demand is the theory of marginal utility in an approach similar to Jevons (1871) and Austrian economics. He formulated the "law of diminishing marginal utility". He referred to a generalization in the sphere of physiology: namely, the strength of the reaction to a given stimulus weakens - at a specific time - with each subsequent repetition of this stimulus. Marshall (1890) begins his theory of marginal utility by stating that "a well-known and fundamental feature of human nature" is reflected in "the law of satiation of wants or diminishing utility". Marshall (1890) provides no evidence for the existence of this law, but defends it against misinterpretation. As a result, we must settle for a tautological definition of the law of diminishing marginal utility relating to the tastes of a given moment, formulated in such a way as to cover all eventualities without exception.

Consumption is the process of using goods and services to meet human needs (Kramer, 1997). The theories of consumption presented by many authors were based mainly on the behaviour of a single household and did not take into account the issue of aggregation, which aims to establish certain regularities in the behaviour of specific communities, in accordance with the adopted laws governing behaviour. units. By the 1930s, these theories had become of little use. Economics' attention has focused mainly on issues related to long-term growth and the economic cycle. The basic aim of the analysis was to identify economic policy measures that would enable controlling these processes. This resulted in the main issue of consumption theory becoming the determination of factors influencing all consumption expenditures or expenditures on goods of fundamental importance for the development of the economic situation (residential houses, clothing, household appliances). The analysis of the structure of population expenditure and real consumption as well as changes in consumption patterns is based on taking into account demographic factors. Kudrycka (1996) divides factors into three groups: economic, demographic and social, and subjective. Mynarski (1967) distinguishes factors characterizing the family and directly related to it (family income, number of people in

the family, age, gender, degree of kinship, stage of family development, professional structure, role of husband and wife in decision-making, belonging to a socio-economic group, housing resources, level of savings, place of residence) and factors shaping the general market situation (national income and its division, prices of goods and their mutual relations, state of market supply, seasonal phenomena, fashion, quality of work of the commercial apparatus, state policy in the field of consumption management).

2. Literature review

2.1. Demographic factors

In the literature on factors influencing consumer demand, various criteria for their division are adopted. Brown (1954) divides demand factors into economic and social. Hodoly (1961) introduces a division into endogenous and exogenous factors. Schafer (1953) presents four divisions of factors: economic and non-economic, individual and social, biological and psychological, and primary and secondary. Among the demographic factors, the most basic are age and gender. Gender determines needs in terms of clothing, footwear and partly food. Age determines many needs, their intensity and the level and structure of consumption. The age factor is used for analyses in the form of age groups and the family life cycle. They constitute a collective criterion for relatively homogeneous groups that will behave similarly in the consumption process. An equally important demographic factor is the size of households. This coefficient is used to divide households into groups with very different characteristics (e.g. one-person, two-person households).

Demographic factors, classified by some authors as a large group of non-economic factors, are treated as the most important determinants of consumer demand after economic factors (farm income and commodity prices) (Zarzycka, 1992). Research on the impact of demographic factors on household consumption was conducted, among others, by: Zając (1962, 1966), Welfe (1962, 2003, 2005), Mynarski (1964, 1967), Banasiak (1967, 1969), Zarzycka (1980, 1992), Fajczak-Kowalska (2001), Więcek (1983, 2013, 2014).

Taking into account demographic factors in consumer demand functions is very important, because in modern societies there are tendencies to reduce the size of households. This phenomenon occurs both as a result of the decrease in the average number of children in a family and as a result of the reduction of multi-generational households to single- or two-generation families. The number of people in a household directly affects the amount of its expenses and the amount of income per household member. Increasing the number of people in a family usually results in a decrease in income. Changing the size of farms causes changes in the way they are managed. A larger number of people on the farm results in savings resulting

from the so-called increase in the scale of management. These savings result from more economical shopping and food preparation. Even greater savings results from the use of indivisible goods by a larger number of people (e.g. apartment, furniture, household appliances, car, etc.). The savings generated in this way can be used partly to increase the amount of basic goods and partly to purchase new higher-level items.

2.2. Sociological, psychological and social factors

Sociological factors determining consumption are closely related to demographic factors. Sociological factors include education, profession, place of residence, as well as nationality, marital status and professional activity (Kraśiński et al., 1984).

Psychological factors include habits, traditions, habits and motives (internal mechanisms of creating needs and actions in the area of consumption), human attitudes (lasting forms of responding to given stimuli in specific situations), opinions (which are the articulation of attitudes), predictions of the future (according to the individual's time horizon, both in terms of experience and future expectations) (Tymowski, 1966, 1968; Zarzycka, 1980, 1992).

Social factors, in accordance with the specification adopted for the econometric model, are: education of the head of the family, membership in a socio-economic group, size of the family's place of residence and region. Due to the increasingly stronger impact of the above variables on the level and structure of consumption, they are introduced into consumer demand models. The research conducted so far shows that education has a significant impact on the amount of expenditure per age of aggregates of goods. Education determines the nature of professional work and influences the intellectual level of a given individual, among others. increased education raises needs in terms of reading, transmitting and receiving cultural goods (Tymowski, 1966, 1968; Zarzycka, 1980, 1992).

It can be assumed that, for example, expenditure on books, magazines and daily press will be higher among people with higher education than among people with primary education. It can be assumed that in the case of many other goods satisfying cultural, food and housing needs, the hypotheses will be similar. This leads to the conclusion that the consumption pattern (model) is different and more diverse in the case of families that include people with higher education than in the case of other families. It should be noted that the general level of education of society is increasing, and therefore the differences in consumption are blurring. Despite the existence of such trends, it is known that certain environmental factors and related habits may have a significant impact on the development of the consumption model (Sikorska, 1979; Zarzycka, 1980, 1992).

Based on the analysis of the impact of income and the income-independent impact of the variable - education - on changes in expenses, four groups of expenses were distinguished, subject to differentiation. The first group of expenses is characterized by a decreasing tendency with increasing education, while the effect of income weakens. This variable causes changes in the consumption structure, expressed in a decrease in the relative level of expenditure satisfying

basic needs along with an increase in the level of education. An example would be consumers' reaction to food spending. An increase in the level of education generally causes its decline (Sikorska, 1979).

The second group concerns expenses that are characterized by an increase in income elasticity coefficients with a simultaneous decrease in expenses, regardless of the level of income, as the level of education increases. This phenomenon can be observed in the case of tobacco and alcohol. The income effect is related to qualitative changes occurring in the consumption of these products. In the case of incomplete primary, primary and basic vocational education, expenditure on tobacco products and alcohol is mainly influenced by income, while in the case of secondary and higher education, the impact of education is stronger than the impact of the income variable and causes a decrease in expenditure.

The third group includes expenses for housing and fuel, clothing and footwear. For these aggregates, no significant differences were observed due only to changes in the level of education. It can be suspected that in the area of clothing and footwear, differences resulting from education are qualitative rather than quantitative. In terms of housing and fuel expenses, the lack of differentiation is due to the fact that consumers have limited opportunities to influence their amount.

The fourth group includes expenses that increase with the increase in the level of education, regardless of changes in income. These are expenses on hygiene and health care, culture, sports and recreation, as well as transport and communication. Households whose "head" has higher education are, on average, characterized by a higher share of expenditure on transport and communication, hygiene and culture than households whose "head" has basic vocational education; however, the share of expenditure on alcohol, tobacco and food is smaller. The only aggregate for which there is quite significant variation also between the lowest levels of education (incomplete primary, primary, basic vocational) is hygiene and health care.

Another factor influencing the level and diversity of consumption is belonging to a socio-economic group. This factor was dealt with by many authors, including: Welfe (1962, 2003, 2005), Kudrycka (1977), Wąsik, Wydymus, Zeliński (1978), Podolec (1995), Fajczak-Kowalska (2001), Więcek (1983, 2013, 2014). Taking this feature into account is related to the hypothesis that the social and professional environment has a significant impact on household habits and preferences. Studying differences in expenditure and consumption (of food) between socio-economic groups is possible thanks to the fact that since 1993, the Central Statistical Office has published information on income, expenditure and consumption of households belonging to seven socio-economic groups. These are employees, unemployed people, agricultural workers, farmers, self-employed people, pensioners and people living on unearned sources.

3. Analysis results

The above statement that in modern societies there is a tendency to reduce the size of households is confirmed by the results of budget research for the years 1994-2022. Due to the fact that in consumer demand functions, the average number of people in a household and the average number of consumption units are most often taken as explanatory variables illustrating the effects of the impact of demographic variables. Changes in the average size of farms in the years 1994-2022 (or separately for retirees and pensioners in the years 1997-2022) are presented in the calculation results presented in tables 1 and 2.

Table 1 shows that the number of households of retirees and disability pensioners decreased the most - by 0.74 people. A high value of the range was also obtained in the case of self-employed households (0.70 person). The next places are occupied by farmers' households (range = 0.62), workers' households (0.52), total employees' households (0.50), total retirees' and pensioners' households (0.43), and non-working households (0.40), households, the smallest changes occurred in the households of retirees and pensioners (separately) and amounted to 0.32.

In the entire surveyed group of farms, the reduction in the average number of people per farm was 0.58. On average, in terms of the average number of people in the years 1994-2022, the largest households were agricultural (4.16), workers (3.64), self-employed (3.49), total workers (3.38), and the non-working class (3.06), households of pensioners (2.17), households of pensioners in total (2.17), households of pensioners (separate) (2.07). The average total farm size in the years 1994-2022 was 2.99.

The regularity of changes over time (1994-2022) is shown by the calculation results in table 2, according to the model:

$$Y_{ts} = \alpha_{0s} + \alpha_{1s}T_t + \varepsilon_{ts} \quad (1)$$

Y_{ts} - number of units of consumption in year „t”, t, in socio-economic group „s”.

α_{0s} , α_{1s} - structural parameter of the model.

T_t - time variable.

ε_{ts} - random variable.

The regularity and systematicity of changes in the examined period are indicated by the $a1$ scores obtained for the linear model of development trends. For all groups of farms, these assessments are negative and, what should be emphasized, statistically significant. The most regular changes over time occurred in households of the self-employed ($R^2 = 0.98$), households of employees in general ($R^2 = 0.895$) and households of pensioners ($R^2 = 0.851$). The largest fluctuations in terms of farm size occurred in agricultural farms ($R^2 = 0.466$). The average number of people in a household for the entire study population was very regular, as $R^2 = 0.966$.

Another demographic variable may be the average number of units of consumption. This variable takes into account the average number of people in the household, the gender and age of its members. The number of consumption units is calculated using the following scales, determining the individual caloric demand of consumed food depending on gender and age:

- | | |
|---|--|
| a) children under the age of: | b) men aged: |
| <ul style="list-style-type: none"> • up to 1 year: 0.25, • 1 year: 0.30, • 2 years: 0.40, • 3-7 years: 0.50, • 8-11 years: 0.60, • 12-13 years: 0.70; | <ul style="list-style-type: none"> • 14-17 years: 0.85, • 18 years and over: 1.0; |
| | c) women aged: |
| | <ul style="list-style-type: none"> • 14-17 years: 0.75, • 18 years and over: 0.85. |

Information on changes in the number of units of consumption in the analysed period 1994-2022 is presented in tables 3 and 4.

Table 3 shows that the largest changes in the number of units of consumption occurred in the years 1994-2022 in the households of retirees (range = 0.43), blue-collar workers (range = 0.39), and blue-collar households in total (range = 0.32), non-working - working class households (range = 0.31), pensioner households (range = 0.27). The total number of consumption units decreased by 0.42. Changes in the number of consumption units in the examined period are illustrated by the calculation results presented in Table 4, in accordance with model (1).

Table 4 shows that the number of consumption units systematically decreased, as evidenced by the negative a_1 evaluation values obtained for the linear development trend model. The a_1 ratings, except for farms, are statistically significant for all other groups of farms surveyed.

The greatest changes occurred in the households of retirees ($a_1 = - 0.030$), followed by the households of the self-employed ($a_1 = - 0.024$), the unemployed ($a_1 = - 0.014$), all employees ($a_1 = - 0.013$), retirees and pensioners in total ($a_1 = - 0.013$), retirees (separately), ($a_1 = - 0.012$), employee households ($a_1 = - 0.003$).

The smallest changes occurred on agricultural farms ($a_1 = - 0.004$). Over the entire period under study (1994-2022), the number of consumption units decreased by - 0.019 each year. The downward trend was quite regular, as the values of the determination coefficient R^2 are relatively high and range from 0.650 for households of retirees and disability pensioners in total to 0.986 for households of the self-employed.

The lowest value of the determination coefficient $R^2 = 0.088$ was obtained on agricultural farms. For workers' farms, a low value of the determination coefficient $R^2 = 0.401$ was also obtained.

Among the features expressing spatial differentiation of consumer demand, there are those that allow the characterization of regional differences in consumer preferences. This issue is very complex and many works have been devoted to it. The following works should be mentioned: Welfe (1962, 2003, 2005), Zajac (1962, 1966), Kramer (1977, 1980, 1997), Podolec (1995).

All the factors mentioned above, as well as many other, less frequently studied, create a system of interconnected elements. The behaviour of consumers and households accepting a specific consumption pattern, expenditure structure and consumption structure, both on a macroeconomic and microeconomic scale, depends on the system of psychological factors affecting demographic and sociological groups of people.

4. Conclusions

Currently, the development of sustainable consumption is of great importance, which assumes meeting the needs of society and raising its standard of living while maintaining an optimal and responsible level of consumption of natural resources. The topic of sustainable consumption is often discussed nowadays due to decreasing natural resources. The main goal of producers and consumers has become to get more with the least possible consumption. Sustainable consumption aims to reduce waste, especially food, reduce pollution levels and meet needs in such a way that future generations can also benefit from natural resources.

The decisions that households make regarding the selection of goods to meet their needs depend, as noted in the article, on many factors. Their number is very large and their impact is complex and changes over time. These include economic, demographic and social factors. The most important economic factors determining household expenses include income, which determines primarily the size and structure of expenses. Another factor influencing household spending decisions is commodity prices. Demographic factors, classified by some authors as non-economic factors, are: age, gender, family size and structure, and its developmental stage. Social factors include the education of the head of the family, the socio-economic group, the size of the city in which the family lives and the region.

Nowadays, sustainable consumption is a very important element of sustainable development, the aim of which is to improve the education of societies in the field of sustainable consumption and production. More and more actions are being taken to limit the spread of consumerism and start thinking in line with the idea of sustainable consumption. The problem is on a global scale, there are many places in the world where there is a problem with providing food, but there are also many places where there is too much food and it is wasted. Excessive consumption leads to a number of effects, the most important of which is excessive consumption of natural resources and thus the degradation of the natural environment.

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Appendix

Table 1.

Selected statistical characteristics of demographic variables of the average number of people in a household in the years 1994-2022

| Type of household | Value | | | | | |
|----------------------------------|-------|------|-------|------|--------------------|------------------------------|
| | Min | Max | Range | Mean | Standard deviation | Coefficient of variation [%] |
| Total | 2.66 | 3.24 | 0.58 | 2.99 | 0.189 | 6.32 |
| Working together | 3.09 | 3.59 | 0.50 | 3.38 | 0.146 | 4.32 |
| Working class | 3.30 | 3.82 | 0.52 | 3.64 | 0.139 | 3.82 |
| Non-working class | 2.87 | 3.27 | 0.40 | 3.06 | 0.119 | 3.89 |
| Farmers | 3.77 | 4.39 | 0.62 | 4.16 | 0.164 | 3.94 |
| Self-employment | 3.19 | 3.89 | 0.70 | 3.49 | 0.235 | 6.81 |
| Pensioners and annuitants | 1.85 | 2.28 | 0.43 | 2.11 | 0.141 | 6.68 |
| Pensioners* | 1.88 | 2.20 | 0.32 | 2.07 | 0.104 | 5.02 |
| Annuitants* | 1.78 | 2.47 | 0.74 | 2.17 | 0.245 | 11.29 |

* Data separately for retirees and disability pensioners covered the years 1997-2022.

Source: own study based on Central Statistical Office data.

Table 2.

Parameter estimates and statistical characteristics of the average number of people in a household

| Type of household | Model parameters | | | | | |
|----------------------------------|------------------|----------|--------|----------|-------|----------------|
| | a_0 | $t(a_0)$ | a_1 | $t(a_1)$ | Se | R ² |
| Total | 3.32 | 222.80 | -0.026 | 25.15 | 0.035 | 0.966 |
| Working together | 3.62 | 153.43 | -0.019 | 11.56 | 0.056 | 0.859 |
| Working class | 3.84 | 115.58 | -0.016 | 7.06 | 0.079 | 0.694 |
| Non-working class | 3.26 | 265.57 | -0.016 | 18.95 | 0.029 | 0.942 |
| Farmers | 4.36 | 84.20 | -0.016 | 4.38 | 0.123 | 0.466 |
| Self-employment | 3.90 | 271.08 | -0.032 | 32.69 | 0.034 | 0.980 |
| Pensioners and annuitants | 2.32 | 70.68 | -0.017 | 7.26 | 0.078 | 0.706 |
| Pensioners* | 2.22 | 86.09 | -0.014 | 6.91 | 0.057 | 0.715 |
| Annuitants* | 2.57 | 58.45 | -0.036 | 10.40 | 0.097 | 0.851 |

* Data separately for retirees and disability pensioners covered the years 1997-2022.

Source: own study based on Central Statistical Office data.

Table 3.

Selected statistical characteristics of demographic variables of the average number of consumption units in a household in the years 1994-2022

| Type of household | Value | | | | | |
|----------------------------------|-------|------|-------|------|--------------------|------------------------------|
| | Min | Max | Range | Mean | Standard deviation | Coefficient of variation [%] |
| Total | 2.26 | 2.68 | 0.42 | 2.52 | 0.139 | 5.52 |
| Working together | 2.57 | 2.52 | 0.35 | 2.80 | 0.104 | 3.71 |
| Working class | 2.76 | 3.15 | 0.39 | 3.00 | 0.091 | 3.03 |
| Non-working class | 2.38 | 2.69 | 0.31 | 2.55 | 0.100 | 3.92 |
| Farmers | 2.23 | 3.66 | 0.43 | 3.47 | 0.107 | 3.08 |
| Self-employment | 2.63 | 3.13 | 0.50 | 2.87 | 0.173 | 6.02 |
| Pensioners and annuitants | 1.70 | 2.02 | 0.32 | 1.88 | 0.109 | 5.79 |
| Pensioners* | 1.70 | 1.97 | 0.27 | 1.86 | 0.087 | 4.67 |
| Annuitants* | 1.53 | 2.14 | 0.61 | 1.89 | 0.201 | 10.63 |

* Data separately for retirees and disability pensioners covered the years 1997-2022.

Source: own study based on Central Statistical Office data.

Table 4.

Parameter estimates and statistical characteristics of the average number of consumption units in a household

| Type of household | Model parameters | | | | | |
|----------------------------------|------------------|----------|---------|----------|-------|-------|
| | a_0 | $t(a_0)$ | a_1 | $t(a_1)$ | Se | R^2 |
| Total | 2.76 | 173.84 | - 0.019 | 17.06 | 0.038 | 0.930 |
| Working together | 2.96 | 129.74 | - 0.013 | 7.91 | 0.054 | 0.740 |
| Working class | 3.10 | 102.12 | - 0.008 | 3.84 | 0.072 | 0.401 |
| Non-working class | 2.72 | 197.42 | - 0.014 | 14.01 | 0.033 | 0.899 |
| Farmers | 3.52 | 80.16 | - 0.004 | 1.46 | 0.104 | 0.088 |
| Self-employment | 3.17 | 356.94 | - 0.024 | 39.13 | 0.021 | 0.986 |
| Pensioners and annuitants | 2.04 | 71.84 | - 0.013 | 6.39 | 0.067 | 0.650 |
| Pensioners* | 1.99 | 89.69 | - 0.012 | 6.59 | 0.049 | 0.696 |
| Annuitants* | 2.22 | 58.76 | - 0.030 | 9.87 | 0.083 | 0.837 |

* Data separately for retirees and disability pensioners covered the years 1997-2022.

Source: own study based on Central Statistical Office data.