POST-PANDEMIC MANAGEMENT OF HOUSEHOLD SPENDING IN POLAND, PART II

ZARZĄDZANIE WYDATKAMI GOSPODARSTW DOMOWYCH W POLSCE PO PANDEMII COVID-19, CZ. II

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Abstract: Households are the oldest and most numerous units of society where the majority of social and economic processes start. For their effective operation, these economic entities need to have sufficient assets and acquire appropriate sources of financing them. The main purpose of this paper is to prepare a household expenditure forecast for 2023-25, assuming a large share of white-noise series resulting from the turbulent environment, and to verify the hypothesis about the linearity of the trend function and the statistical significance of the trend line coefficient. To eliminate random fluctuations and extract the development trend, an analytical method was used in which the parameters of the trend function were estimated. Using extrapolation of the trend function, forecasts of monthly per capita expenditures were calculated for subsequent years until 2025.

Keywords: finance management, household, forecast, spending, household indebtedness

Streszczenie: Gospodarstwo domowe to najstarsza i najliczniejsza komórka społeczna, w której swoje początki ma większość procesów społecznych i gospodarczych. Aby te podmioty gospodarcze mogły sprawnie funkcjonować, muszą być w posiadaniu wystarczającego majątku oraz zdobyć odpowiednie źródła jego finansowania. Głównym celem naukowym artykułu jest zbudowanie prognozy wydatków gospodarstw domowych na lata 2023-25 przy uwzględnieniu dużych wahań przypadkowych, spowodowanych niestabilnością i turbulencją otoczenia oraz weryfikacja hipotezy o liniowości funkcji trendu oraz istotności statystycznej współczynnika trendu. Do eliminacji wahań przypadkowych oraz wyodrębnienia tendencji rozwojowej wykorzystano metodę analityczną, w której oszacowano parametry funkcji trendu. Wykorzystując ekstrapolację funkcji trendu obliczono prognozy miesięcznych wydatków na 1 osobę na kolejne lata do 2025 r.

Słowa kluczowe: zarzadzanie finansami, gospodarstwo domowe, prognoza, wydatki, zadłużanie gospodarstw domowych

Introduction

The present maintenance costs all over the country are higher than a year ago; and the highest in the last 25 years according to the study by the Association of Financial Companies in Poland (ZPF), and the Research Institute for Economic Development, the Warsaw School of Economics. Importantly, the number of extreme pessimists has grown: now 43% of respondents, compared with 20% last year (and 30% being its all-time high). At the same time, only a little more than 5% believe that the maintenance costs in Poland are similar to those last year. Strong pessimistic opinions about the economic environment and personal financial situation, coupled with high inflation, have result in a tightening of household budgets.

Nearly all households in the sample (99%) noted a perceptible rise in spendings on food and drinks. Gas, electricity and heating bills take the second place (97% of respondents see a rise in prices there); 91% of the sample experience a rise in fuel prices. Fuel expenses are the most perceptible type of expenses hit by inflation: the average perception strength is 2.7 points in the scale from 1 to 3, and modal perception strength is 3. It is a surprising result in the light of the low unemployment rate and strong economic growth. The drop in the mood in that area, by over 15 pp in a single quarter, was a record low, excluding the pandemic shock in March last year.

The perspective of the ongoing satisfaction from consumption, current usefulness and the

whole family budget should serve as the basis for evaluating the influence of inflation on household budgets. A strong rise in prices forced households to resign from: better-quality products, entertainment and services that were accessible in the past. Over 88% of respondents expect that in the next 12 months "prices will rise faster" than they are at currently or that "prices will continue to rise in the same pace as now". The rate has not been this high for the last 10 years. 57% of respondents expect that inflation will accelerate (a 10 pp rise). The forecasts that inflation would stop in autumn were not confirmed. Only 2.6% do not believe that prices will continue to rise, and 9% expect inflation to grow more slowly (compared with 12% of respondents a quarter ago).

The percentage of households declaring that they are able to make savings has also dropped: about 41% of households, a drop of 16 pp in a year. 37% of them save a little (compared with 51% a year ago), and only 4% save a lot. In relation to historical data, the group of households that are able to make savings on their income is still relatively high, but we have been observing a clear downward tendency in that scope. The share of households with income that is just enough to cover ongoing spending has increased by 2.5 pp (from 33% to 35.5%). The percentage of households that have run up debts has gone up to about 10% (a rise of 6 pp). Therefore, the share of respondents who are not able to save is on the increase: as many as 23% of respondents have cut their savings or have slipped into debt, compared with 16% last year (a 7 pp rise).

Similarly to entrepreneurs, households plan their income and spending in advance. All factors resulting in deviations from the plan, e.g. caused by the launching of new regulations, lead to confusion and impact the perception of that social group (Szopa, Sieradzki, Michorowski, 2020). Hence, apart from economic factors that doubtless affect the ability to make savings much, one should also pay attention to the geopolitical environment and the general situation relating to the new regulations, e.g. the so-called Polish New Deal, that touch household budgets. The factor most often indicated by respondents (83%) that results in an inability to make savings has been the recently observed rise in maintenance costs. A high inflation rate increases spending and consequently reduces the free resources that can be saved. At the same time, as much as 84% of respondents fear a further rise in prices and a double-digit inflation rate. The second factor most-frequently mentioned by households is "low income" (54%) and the third factor is, "chaos relating to the introduction of the Polish New Deal"

(38%). 30% of respondents point to the pandemic; and 34% to the increase in loan instalments.

The current inflation rate has reached levels not reported for 20 years according to the data from the Statistics Poland (GUS), and the basket of consumption goods and services of an average citizen was 14% more expensive in May than a year before. It is commonly agreed that a low and stable inflation rate is an optimal solution for an economy. For those reasons, the inflation-related objectives of central banks are usually set at about 3%. At present, when the real inflation rate by far exceeds the established goal, we are seeing both beneficiaries and losers (Sytuacja gospodarstw domowych, 2022).

It is not only the inflation rate that affects bottom lines, but also its wider context. For example the manner in which inflation relates to interest rates; the latter – despite a rise recorded in the past few months – remain very negative in real terms in Poland. Other important factors include the liability structure, financial asset structures, and the effect of inflation on income and spending.

In the short term (1-2 years), in the situation observed in the conditions of a strong rise in prices, the nominal values (GDP, consumption, import, etc.) should go up, which translates into a higher tax-base level, and thus higher budget revenue. The real cost of various budget liabilities not indexed to inflation or indexed but not fully decreases. The child-support benefit 500+ may serve as an example of a liability which is nominally the same each year (about 40 billion zlotys per year), but in real terms its value is falling year on year and constitutes a smaller and smaller part of increased income. In the conditions of strongly negative real interest rates, the cost of handling debts in relation to income remains relatively low owing to the fact that the average maturity of liabilities is 4-5 years. Hence, some time will have passed before the majority of debts change into liabilities at a higher interest rate. The factors listed above have allowed the government to do more, and not worry about the consequences for the debt-to-GDP ratio. The forecast included in the long-term financial plan for 2022 and 2023 assumes that the deficit of the public finance sector will be at 3.5-4.5% of GDP, which results in the ratio of the indebtedness of the public finance sector to GDP gradually falling to 52.1% in 2022 and 51.5% in 2023 (having amounted to 53.8% in 2021).

Generally, the negative consequences of high inflation rates exceed the advantages for the vast majority of households. Much more so if one takes into account the consequences of the current situation for long-term savings, e.g. those in the

pension system. It is not easy to maintain the real value of such a type of savings with high inflation rates; the requirements of those managing such assets are becoming much more demanding.

Literature review

Households are mainly formed through family relations, which allow them to perform economic, protective, rearing, recreational and reproductive functions. All of those relations are not only proof of the constancy of a household as a family, but also their dynamic role in producing changes in a socio-economic, political and natural environment, and in technical and technological novelties. It is claimed that households establish the foundations of enterprises as it is the reliability of people constituting them that ensure the reliability of those same entities.

Meeting family needs forces family members to collect necessary goods or capital (Paluch, Kurovs, 2017). This shows that the functions of households that are supposed to aspire to fulfilling their needs can be grouped as follows: the consumption function and the production and supply function.

The first one comprises tasks beneficial to physical development and tasks facilitating psychological development. The actions relating to the physical aspects of a human life include those that ensure appropriate living conditions, that is accommodation, food and health.

On the other hand, among the actions affecting intellectual development there are enhancing internal personal development and catering for needs deriving from various sources (Maslow, 2018). A. Maslow describes all those in his hierarchy of needs as *higher-level needs*.

It is fundamental for family members to find time not only for rest and entertainment, but also for intellectual development by taking advantage of the universality of education, acquiring skills and broadening experience. In that sense, consumption may be internal because household members share their knowledge and skills with each other, but what needs to be stressed is that such a situation takes place only within a household.

When fulfilling their production and supply functions, households can accumulate both capital and assets (Bywalec, 2012). Yet, what is most important is the production of goods (building a house), acquiring finished consumer goods and articles on the market that are next processed to be consumed, or obtaining consumer goods in other ways, producing or acquiring them (medical services, inheriting donations, etc.).

According to the Polish National Population and Housing Census, a private household is defined as a group of people living together in a housing unit and jointly maintaining themselves. People living alone or together with others, but paying for their needs with their own financial means, are representatives of one-person households. A one-person household can live in one room or share it with a different household. The determinant here is the sphere of activity of people from a single household; but the division is still insufficient. There are various criteria that may be taken into account when classifying households, as differences between them are significant (Wysocka, Szałtys, 2014).

What completes the division into one- and multi-person households, which takes into account the size of the community, is the categorisation into one-, two- and multi-generation households (Łabęda, 2012). The differences between such households are in their sizes, and also in the consequences that derive from that. One can conclude that needs and desires of a single entity in the case of a one-person household, and the individual needs of all members of a household are important in the case of multi-person households.

Cz. Bywalec describes individual households in the following way (Bywalec, 2012):

− a one-person household – formed by only one person. That person's individual needs and behaviour condition its operation. There is no distinction between personal and common desires, the latter which appear in relation to the needs of a household as a whole. The behaviour of an individual is recognised to be the behaviour of the whole household;

− multi-person households – formed by at least two people; there is no upper limit.

Multi-person households are divided into two-person, three-person, etc. These households function based on the personal needs of each and every member and also common desires. Oscillations between private desires and the needs of all household members differ depending on the household size, stage of development at which the household is, and the preferred lifestyle (D'Alessio, Neri, 2015). All those features are visible in the level and structure of spending for consumption (Chmielewska, 2015).

The following indicators serve studying household budgets (Świecka, 2008):

− household socio-economic groups;
− household size;
− biological type of a household;
− quintile and decile groups;
− income groups;
− hometown classes;

- provinces, regions, and country urbanization;
- sources of acquiring certain disbursements;
- nature of household residence;
- disability of a household member;
- area of agricultural land (in the case of a farm).

When taking the source of household income as a classification criterion, one can list the following household socio-economic groups (Frańczuk, 2014):

- households of employees – households in which the main source of income is paid work in the public or private sector. Apart from that, additional money can come from an old-age pension, disability pension (or any other unearned source of income), self-employment, a private farm, or a freelance profession. Without exception one should follow the rule that income from additional sources is lower than the income from paid work;
- households of farmers – households that earn their living by running a farm. An additional source of income can be an old-age pension, disability pension (or any other unearned source of income), paid work, self-employment, or a freelance profession. Without exception one should follow the rule that the main source of income exceeds the additional one.
- self-employed households – households that get the majority of their finance from self-employment other than running a private farm or practising a freelance profession. Paid work, running a private farm, an old-age pension or retirement pension (or any other unearned source of income) can be a marginal source. Without exception, one must follow the rule that income from an additional source should be lower than income from self-employment other than running a private farm;
- households of old-age pensioners – households whose members live off their retirement pensions they receive every month. Other unearned sources of income apart from the retirement pension include e.g. income from property owned, family allowances with supplements and gifts, paid work, running a private farm, self-employment or a freelance profession. Without exception, the amount of the retirement pension needs to exceed the income received from marginal sources.
- households of disability pensioners – households whose members receive monthly disability pensions and live off them. On the other hand, other unearned sources of income apart from the disability pension include income from property owned, family allowances with supplements and gifts, paid work, running a private farm, self-employment or a freelance profession. Without exception, the amount of the disability pension cannot be lower than the income from additional sources;
- households living off unearned sources of income – households whose members have funds for supporting themselves from unearned sources other than old-age or disability pension, e.g.: unemployment benefits, benefits in cash and in kind received under the Act on social assistance, in-cash housing benefits, family benefits with supplements, maintenance, donations, property income and property rental income. They may also collect money for paid work, old-age or disability pension, self-employment, a freelance profession, or running a private farm. Without exception, the total of funds collected from additional sources cannot exceed the total income generated from unearned sources other than old-age or disability pension.

The size of households is changing both structurally and organisationally in Poland. We are currently dealing with a negative birth rate, a rise in the number and share of one-person households, longer and longer average life expectancy, ageing society and gradual dominance of people at the post-working age (65+). Non-traditional types of relationships are becoming more and more popular, e.g. cohabitation, married couples that are childless by choice, and shared rental of flats in order to reduce maintenance costs. It has been observed that multi-family households are becoming less and less frequent – these are mainly multi-generational households – and the incomplete households quite the opposite (in the majority of cases a woman, acting as the head of the household, bringing up children on her own; apart from that a nuclear family, childless couples and households experiencing an extended empty nest period). What is becoming popular is various forms of patrilocal or matrilocal residence with parents after starting an own family due to a lack of sufficient financial means to own a flat (Grzywińska-Rąpca, 2021). Moreover, certain social changes are taking place in which the roles of household members are no longer traditional, e.g. the vanishing division of male and female roles, the fading of the roles of local family traditions and consumer customs; a

more practised urban lifestyle, and increasing urban consumption patterns. The mechanism fuelling these changes has become a catalyst of these transformations in consumption (Borowska, Mikuła, Raczkowska, Utzig 2020). We are witnessing a turning point in civilisation and technology; one that no generation has ever experienced. Information, speed of transfer and multi-sidedness lifting former space-time barriers are of great importance to households at present. A dwelling is a space filled with various objects, facilitating communication and consumption processes. The number and quality of appliances determine the degree in which needs are catered for, influence the satisfaction from living conditions and are the basis for doing work, not only housework but also professional work (cocooning).

In 2021 the material situation of households improved despite the COVID-19 pandemic[1], which influenced the level and structure of expenses a lot. Households generated higher income and increased their spending as well. The average monthly disposable income per capita was 2,062 Polish zloty (zl) in 2021 and, in real terms, was 2.2% higher than the income in 2020, which was 1,919 zl. This way the upward tendency of disposable income continued and its dynamics remained at a level similar to that seen a year before. The average monthly spending per capita in households went up and reached 1,316 zl in 2021, being in real terms 3.5% higher than spending in 2020. The expenditures on consumer goods and services amounted to 1,269 zl and were 3.6% higher in real terms than in 2020[2].
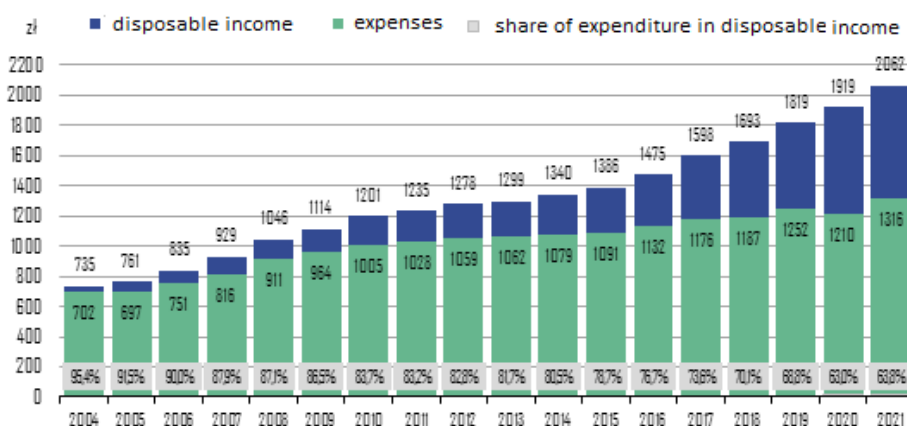

Figure 1. Monthly income and spending and its share in household disposable income (per capita)

Source: Own work based on the Statistics Poland's (GUS) data for 2005-2022.

This spending changed along with the dynamics of the pandemic and the resulting restrictions. In 2020 the average monthly household spending was 1,210 zl (per capita) and was 6.5% lower in real terms than in 2019. The expenditure on consumer goods and services amounted to 1,165 zl and was 6.2% lower than in 2019 in real terms. At the same time, the spending on food and non-alcoholic drinks went up when compared with 2019.

The strongest rise in spending took place in the area of education, restaurants and hotels, transportation, clothes, shoes, and health. The changes were triggered by a gradual return to spending levels from before the pandemic, the spending that was drastically curbed in 2020.

In 2020, there was an exceptionally strong rise in cash levels held by households: cash financial

assets went up by 82 billion zl, an increase of fourfold over the previous years. The higher shares of cash and bank deposits showed that Polish households preferred the safe ways of managing financial surplus. At the end of 2020, deposits in banks and in savings and credit unions totalled 61% of household financial assets; and as much as 81.8% when cash savings and treasury securities were added (table 1). The increase in deposits in Polish zlotys in 2020, in quarter 2 of the year in particular, might have resulted from the withdrawal of money from riskier forms of investment by households that feared the looming economic crisis. The rise in deposits in Polish zloty kept by the self-employed, who constitute a subsector of households, was exceptionally strong compared with the past few years (of over 22 billion zl, i.e. 44%). That resulted

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[1] Due to the disease situation experienced from 2020, the information was collected from respondents in 2021 by phone.

[2] Since 2013 a new classification of individual consumption according to purpose based on the harmonized COICOP for all studies in the European Statistical System.

from the fact that the self-employed and micro companies received funds under support schemes.

The share of participation units in investment funds in the household purse went up by 3.7%. The change in the value of that part of the household purse resulted from a change in its valuation because in quarter 1 of 2020 households withdrew 17.7 billion zl from investment funds in net terms.

Table 1. Level and structure of household financial assets in 2018-2020

Financial assets	2018	2019	2020	2018	2019	2020
	Level (in billion zl)			Composition (in %)		
Bank deposits	819	898	994	63.5	63.1	60.5
Deposits in savings and credit unions	9	9	9	0.7	0.6	0.5
Participation units in investment funds	129	147	153	10.0	10.3	9.3
Life insurance	61	61	63	4.8	4.3	3.8
Treasury securities	20	27	41	1.5	1.9	2.5
Non-Treasury securities	5	6	3	0.4	0.4	0.2
Stock listed on the GPW markets	48	56	81	3.7	3.9	4.9
Currency in circulation	199	219	301	15.4	15.4	18.3
Total	1,289	1,423	1,645	100	100	100

Source: Own work based on the data from the Polish Financial Supervisions Authority (UNF), the National Bank of Poland (NBP) 2019-21.

The inflow of households' financial means to investment funds in the following quarters of 2020 nearly balanced that drop. The selection of riskier funds resulted from continuing low bank deposit interest rates. In 2020, households paid as much as 3.1 billion zl net to specialized open-end investment funds; which was connected with the fact that households had increased savings in the voluntary pension system. Looking for forms of investing capital other than deposits was also the reason why the value of shares in household assets went up by 43.8% (to 80.8 billion zl), and the value of treasury securities by 48.9% (to 40.8 billion zl) in the period under analysis.

Methodology and theoretical basis

The method of analytical smoothing (in which an appropriate function is adjusted to the time series data) was used to calculate the trend function parameters. The equation for a linear trend function describing the household spending per capita (in zl) between 2004-2021 is as follows:

$Y_t = 702.04 + 33.926*t$

The estimated coefficient $\alpha_1 = 33.926$, or a flexibility coefficient, informs that household spending per capita rose by 33.93 zl each year in 2002-2021. The absolute term $\alpha_0 = 702,04$ stands for the theoretical household spending per capita in 2001. Having considered the calculated ex-ante or ex-post errors of predictions covering periods before the studied period of prediction, the author deems the prediction sufficient and acceptable, and hence also applicable.

The data for years 2004-2021 were used to construct a prediction of household spending until 2025 (Table 2). An analytical method was used to smooth the income level, in other words to eliminate fluctuations and isolate the trend estimation (Gajda, 2017). Figure 2 shows the equation of the trend of household spending per capita in 2004-2021. The coefficient of determination, i.e. the square of the correlation coefficient close to one (0.9706), shows good adjustment of the household spending trend function in the analysis period.

Table 2. Auxiliary calculations to determine the parameters of the trend function of household monthly spending per capita (in zl) in 2004-2020

Year	t*	yt spending*	Yt·t	t²	Ŷt*	(yt- Ŷt)²
2004	1	702	702	1	736	1,180.129
2005	2	697	1,394	4	770	5,359.118
2006	3	751	2,253	9	804	2,815.257
2007	4	816	3,264	16	838	480.136
2008	5	911	4,555	25	872	1,539.385
2009	6	964	5,784	36	906	3,408.458
2010	7	1,005	7,035	49	939	4,294.050
2011	8	1,028	8,224	64	973	2,989.465
2012	9	1,059	9,531	81	1,007	2,685.623
2013	10	1,062	10,620	100	1,041	439.741
2014	11	1,079	11,869	121	1,075	16.950
2015	12	1,091	13,092	144	1,109	314.566
2016	13	1,132	14,716	169	1,143	112.127
2017	14	1,176	16,464	196	1,176	0.195
2018	15	1,187	17,805	225	1,210	542.657
2019	16	1,252	20,032	256	1,244	61.654
2020	17	1,210	20,570	289	1,278	4,624.136
2021	18	1,16	23,688	324	1,312	17.189
–	–	–	∑191,598	∑2,109	∑18,434	∑30,880.836

t – time variable (consecutive no. of years); yt spending* – empirical values; Ŷt* – theoretical values derived from the trend function*

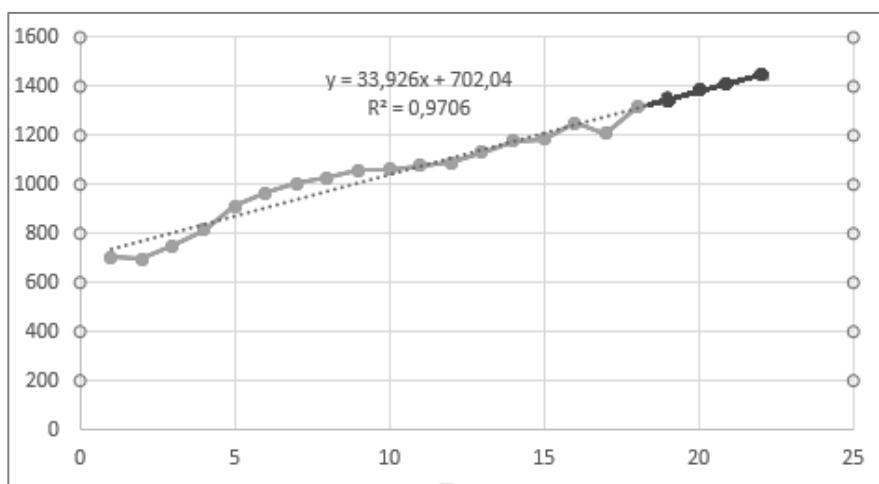Source: Own work based on the Statistics Poland's (GUS) data for 2004-2021.

Figure 2. Trend equation of household monthly spending in 2004-2021, predicted spending 2022-25 (in zl)

Source: Own work based on the Statistics Poland's (GUS) data for 2004-2020.

Findings and discussion

The predictions of spending by 2025 were made based on the constructed trend function to use forecasting in the decision-making process of household spending management (Table 3). The forecast spending systematically rose year by year and in 2022 reached 1,347 zl per capita. The residual standard deviation error, coefficient of convergence, and coefficient of residual variation were calculated to verify the conformity of empirical data with the theoretical data. The coefficient of convergence informs that only 6.2% of information about spending is not explained by the variable describing spending. The coefficient of residual variation indicate that random deviations in the trend function constitute on average 4.5% of the average level.

Table 3. Predicted monthly spending and prediction errors in household monthly spending per capita

Years	Predicted monthly spending per capita in zl	Residual standard deviation error in zl	Coefficient of residual variation in %	Coefficient of convergence
2022	1,347	45.361	4.504	0.0619
2023	1,381	45.361	4.504	0.0619
2024	1,414	45.361	4.504	0.0619
2025	1,448	45.361	4.504	0.0619

Source: Own work.

To confirm the hypothesis; whether there is a trend in the time series considered, the following null hypothesis has been verified: trend function parameter – the trend coefficient is statistically significant H_0: $\alpha_1=0$ in relation to an alternative hypothesis H_1: $\alpha_1 \neq 0$ (Ostasiewicz, Rusnak, Siedlecka, 2011). The value received from testing the null hypothesis was $|t|=26.046$. The result was confronted with the critical value taken from the tables of t-distribution, assuming confidence level $\alpha=0.05$ and 15 degrees of freedom, which was $t_{0,05}^{15} = 2.131$. Hence, null hypothesis H_0: $\alpha_1=0$ was rejected in favour of alternative hypothesis H_1: $\alpha_1 \neq 0$ because the value received from testing the null hypothesis was higher than the critical value taken from the tables of t-distribution (26.046 > 2.131). The trend coefficient is statistically significant, which confirms that there is a trend in the time series considered.

Conclusions

The average monthly household spending per capita in 2021 went up to 1,316 zl and was 3.5% higher in real terms than spending in 2020. The spending in 2023-2025 is also predicted to rise.

At present, households are facing a strong rise in the inflation rate, a factor the effect of which is neither easy nor clear to assess. This is because the situation of each and every household depends on how the inflation rate translates into income and costs, and what the net effects are from the point of view of savings and debts. 20% of households, which are the lowest-income units, are in the worst situation: even if the rise in their income keeps up with the average inflation rate, their spending will go up much faster. This is because the basket of the poorest households mainly includes goods and services (food, dwelling maintenance) the prices of which are going up faster than the average nowadays. These households often experience negative balance sheet effects, a rise in loan servicing expenses, and a lack of income surplus.

In average-income households, which usually have large debts (e.g. housing loans) and some savings, the rise in loan servicing expenses is much higher than the rise in income from savings, among others due to low interest rate on deposits. Such a situation is forcing some households to repay earlier (or prepay) loans.

The group of households that are able to make savings is becoming smaller and smaller – only 40% of Poles are still managing to do so. This represents a drop of 16 pp compared with last year. Inflation is the prevailing factor that affects households' ability to make savings; 23% of households have problems with maintaining financial liquidity; in other words, the majority them are either living off their savings, or running up debt.

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