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Formation of household opinions and the situation in the labour market in Poland

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Abstract. Consumer sentiment and opinion indicators are fundamentally driven by respondents' economic circumstances and financial status. The volatility of these variables is hypothesised to correlate significantly with labour market dynamics, particularly unemployment rates. This study investigates these relationships by analysing quantitative and qualitative labour market indicators. The methodological approach incorporates consumer survey metrics, business tendency indicators for projected employment, and macroeconomic variables. The findings reveal a distinct dichotomy in how respondents evaluate macroeconomic conditions versus their household circumstances. For macroeconomic assessments, the data necessitated transformation into annual relative increments, whereas household-specific evaluations demonstrated stronger correlations with economic trend-cycle data. Labour market conditions emerged as the predominant factor influencing household sentiment, with particularly robust correlations between macroeconomic indicators and consumers' savings potential and feasibility assessments. Among the macroeconomic variables examined, the highest predictive validity was exhibited by consumer assessments regarding durable goods purchasing rationale, savings capacity, and the aggregate consumer confidence indicator (CCI).

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1. INTRODUCTION

Consumer confidence indicators are significant among the variables created based on survey responses. This interest stems from the belief that consumer perceptions and expectations translate into decisions regarding consumption size (McIntyre, 2007). Moreover, consumer spending is often the main component of aggregate consumption in economies (Curtin, 2007). In developed economic systems, where analyses of the applicability of consumer confidence indicators have a longstanding history, much attention is paid to such data. The most-watched in the USA are those published by the Survey Research Center at the University of Michigan and by the Conference Board. For instance, the CB indexes – the consumer confidence index and the expectations index – average the responses to five of the questions the survey participants are asked (about current general business conditions in their area, expected business conditions six months from now, current job availability in their area, expected job availability six months from now, and expected total family income six months from now), and only to the three questions about expected economic conditions, respectively (Lahiri & Zhao, 2016). Such information constitutes components of composite leading indicators constructed by, among others, the American Department of Commerce (*Leading Indicator Composite Index*) and the European Commission (*Economic Sentiment Indicator*) (Kwan & Cotsomitis, 2004; Silgoner, 2007).

The analysis presented in this paper focuses primarily on the relationship between consumer opinion and confidence and the situation in the labour market. The latter is illustrated using three different quantitative indicators: the number of registered unemployed in thousands (UN), the registered unemployment rate as a percentage (UR), and the average total employment in the business sector in thousands (EA). Qualitative BTS indicators on expected employment in the construction, trade, manufacturing, and service sectors were also utilised.

In Poland, information relating to the confidence of households can be obtained from several sources. In 1997, the Condition of Households programme was launched, and representatives from the Central Statistical Office and the National Bank of Poland cooperated. The Research Institute for Economic Development (RIED) at the Warsaw School of Economics also collects, processes and analyses information on the situation of households (Kozak & Mrówczyńska-Kamińska, 2022; Wongsaen et al., 2023; Li et al., 2023). RIED, like GfK Polonia, uses the harmonised method developed by the European Commission. IPSOS is another research company that prepares analyses of consumer opinion for Poland. Although this research centre does not use the harmonised method, this source is interesting for at least two reasons. Firstly, it contains the most extended data series compared to other databases. Secondly, the above-mentioned indicators are calculated based on questions that have not been changed since the surveys began. The IPSOS data has been included in the statistical material analysed and described in this paper.

The paper is organised as follows: First, we present a literature review focusing on two main issues: how consumer sentiment indicators are used in economic analyses; second, we search for research concerning the sources of information that affect consumer opinions. Next, we describe our research methods, which are followed by the results of the analysis. The article is finished with a short discussion and conclusions.

2. LITERATURE REVIEW

Analyses of consumer sentiment indicators most frequently determine the suitability of such indicators for forecasting, with one of the most apparent aims concerning consumption expenditure. Many researchers believe consumer surveys provide valuable insights into purchasing behaviour and economic trends. Bovi (2005) found that Italian consumer surveys improved consumption equation fit and forecasting, especially when linking specific consumption types to particular sentiment sub-indices.

Kwan & Cotsomitis (2004) discovered that the Index of Consumer Expectations in the US outperforms the Index of Consumer Sentiment in forecasting household spending, rejecting the random walk hypothesis. In their following paper, Cotsomitis & Kwan (2006) examined consumer confidence indices' ability to forecast household spending across various countries. They found diverse in-sample forecasting performance and limited out-of-sample predictive power for European countries. However, Kwan & Cotsomitis (2006) also reported that the Index of Consumer Attitudes reliably predicts household spending in Canada, both nationally and regionally. Gausden & Hasan (2018) investigated the European Commission's consumer confidence indicator (CCI) in the UK, finding that disaggregation of survey data beyond the CCI components improved forecast quality for specific spending categories. These studies suggest that consumer confidence indices can help predict household spending, but their effectiveness varies across countries and specific measures used.

Gausden and Hasan (2020) have researched the comparative performance of consumer and economic sentiment measures in forecasting household consumption across multiple countries. The EU's headline consumer confidence indicator performed consistently well across five European countries (Blazevic Devic et al., 2024; Eratalay & Kaasa, 2024). However, its effectiveness varied based on spending on durable goods and consumption behaviour.

Johnsson & Linden's paper (2009) examines different consumer confidence indicators and finds that indicators focused on the household rather than the general economy have higher predictive power for private consumption growth. Consumer and business sentiments are significant predictors of consumption expenditure, improving forecast accuracy by 4-13% (Juhro & Iyke, 2020). Despite the COVID-19 pandemic, consumer confidence showed improvement, driven by perceptions of current economic conditions (Ilmiah & Wonoseto, 2021).

Klopocka (2017) demonstrated the predictive power of consumer confidence indexes for Poland's household saving and borrowing rates. Consumer confidence indicators have shown varying degrees of predictive power for household saving and spending behaviours across European countries (Klopocka & Górska, 2021). Moreover, Klopocka & Górska (2021) found that the Consumer Confidence Indicator and its components can independently forecast household saving rates in 14 European countries alongside economic fundamentals.

The aim of the paper by Batchelor (2001) has been to evaluate the usefulness of consumer and business confidence indexes in anticipating turning points in economic activity in the US and UK. The author did not obtain unambiguous results in the sense that for the US, there was a better fit with the levels of economic activity and, in the case of the UK, with growth rates. Batchelor's study employs a time-varying parameter Markov switching model to examine the relationships between business confidence, consumer confidence, and economic states. The research finds that declining business confidence significantly increases the likelihood of subsequent economic downturn while rising consumer confidence notably enhances the probability of recovery. However, these correlations do not provide a reliable method for predicting business cycle turning points. Also, Taylor & McNabb (2007) analysed the ability of consumer and business confidence indicators to predict the economic activity and turning points. However, the relationship between sentiment indicators and output varies across countries and measures, with consumer confidence indicators typically being less valuable than business confidence indicators.

Also, research on consumers' inflation expectations reveals several key findings. Socio-economic factors like income, age, gender, and education influence expectations, with lower-income and less-educated individuals typically overestimating inflation. The paper of Ehrmann et al. (2015) studies consumers' inflation expectations using micro-level data from the Surveys of Consumers conducted by the University of Michigan. The authors try to find the determinants of consumers' inflation-forecast errors. While it is well known that several socio-economic characteristics affect inflation expectations, the authors show that

the same holds for consumer attitudes (Ehrmann et al., 2015). Having pessimistic attitudes, for example, toward purchasing durables or homes or experiencing financial problems, as well as shrinking household income, affects inflation expectations substantially, increasing the upward bias already inherent in consumer inflation expectations. Consumer inflation expectations are also highly sensitive to perceived news about rising prices, which are tightly connected to the changing level of gasoline prices.

Also, Arioli et al. (Arioli et al., 2017) show that financial situation and purchasing attitudes play a role, as those experiencing financial difficulties or pessimism about major purchases tend to have higher forecast errors and upward biases in their expectations. Consumers generally understand relative inflation levels during high and low periods despite overestimation. Media reporting on inflation can help reduce biases, especially for those with initially higher estimates. These findings underline consumer inflation expectations' complexity and importance in monetary policy decision-making.

Another aim of such analyses is to explore the factors that may affect consumers' opinions and the information content of such variables. Consumer sentiment and opinions are influenced by various factors, as revealed in recent studies (Musova et al., 2021; Rybaczewska et al., 2021). News sentiment has impacted consumer expectations and behaviour (Uhl, 2011). The author creates a news sentiment index with positive and negative sentiment from over 300,000 newspaper articles in the economics section of chosen newspapers in the US, taking them from 1995 to 2009. He also tests macroeconomic variables such as personal income, inflation, and interest rates, raising the question of how they explain consumer sentiment and behaviour. The author finds that a statistically significant relationship exists between news sentiment, changes in personal income and consumer prices, and consumer sentiment and expectations.

Lahiri and Zhao (2016) found important determinants of consumer sentiment. They mention consumer perceptions of recent economic news, government economic policies' performance, consumer expectations of economic employment situations, and overall inflation.

Keyfitz (2004) underlines the importance of the non-economic component of consumer confidence. The author maintains that, especially in turbulent times (close war, a threat of using mass destruction weapons, etc.), non-economic factors may predominate in the movements of the consumer confidence indicators. Economic shocks have been large enough to impact consumption, significantly lowering growth in 2002 and 2003.

Vuchelen (2004) tested that several variables can explain consumer sentiment. He reduced the unexplained part of consumer sentiment by introducing variables that account for frequently formulated explanations for changes in consumer sentiment, i.e., expected economic conditions and uncertainty. The proxy for these variables was the consensus of the forecasted real rate of economic growth and by a measure of the degree of disagreement between forecasters.

Some Authors raise an important question: "What is the economic meaning and significance of consumer?" (Barsky & Sims, 2012). Changes in consumer confidence indices contain income information many periods into the future, much of which is not reflected in current consumption or income innovations. The unexpected changes in the confidence indexes should not be attributable to tangible news. Barsky and Sims (2012) claim that there is empirical evidence that consumer confidence indicators include information about economic fundamentals.

3. METHODOLOGY

As with the questions that European respondents answer every month, the issues examined in the Polish IPSOS survey can be divided into two groups (Dominitz & Manski, 2004). On the macroeconomic level, the questions concern the diagnosis and forecast relating to the general economic situation in the country (Q2 and Q3, respectively), the unemployment forecast (Q4), and the inflation forecast (Q9). The

microeconomic level, that is, the condition of households, is described using questions relating to the diagnosis and forecast of the economic situation of a household (Q5 and Q6); a diagnosis of its financial situation (Q7); an assessment of the possibility and justifiability of purchasing durable goods during the analysed period (Q8: Is now a good time to buy durable goods?); expectations regarding the possibility of saving money in the next 12 months; and an assessment as to whether it is worth making savings under current circumstances.

The Polish consumer confidence index (WOK – Wskaźnik Optymizmu Konsumentów), also included in the study, is the arithmetic mean of Q2, Q3, Q5, Q6 and Q8 response balances. The analysis took into account data for the years 2000-2024. However, due to the availability of BTS data for the service sector, the econometric analysis only covered 2003-2024 regarding indicators describing entrepreneurs' expectations regarding employment in the service sector. The above time horizon was adopted not only because of the availability of selected indicators but also because of the specific character of the first decade of the political and economic transformation that began in Poland in the early 1990s.

In order to identify relationships and time shifts, macroeconomic data must be appropriately prepared for comparison with the qualitative series. To achieve this, the structure of the questions used in the household survey was considered. These questions relate to observed or forecasted changes in a twelve-month horizon and opinions on the current situation. Therefore, two versions of the macroeconomic variables were used. In the first variant, they were decomposed, with the seasonal component and random fluctuations being removed. In the second variant, the variables are expressed as annual percentage increases. In each of the two variants, the series containing monetary values (e.g. average monthly wages) were adjusted for inflation and expressed in fixed prices for December 2000.

The next step used multiple regression analysis with a forward stepwise procedure. In individual regression models, the dependent variables were simple consumer opinion indicators assessing the microeconomic situation. These include the following:

- Q5 – Assessment of the economic situation of your household compared to the situation 12 months ago
- Q6 – What will be the financial situation in your household in 12 months?
- Q7 – What is the current financial situation in your household?
- Q8 – Is now a good time to buy durable goods?
- Q10 – Will you be able to save any money in the next 12 months?
- Q11 – Is it worth saving money in the current situation?

In this case, the consumer confidence index (CCI) is the only qualitative indicator that includes assessments of the economy's state.

As a measure of the differences between values predicted by an estimator and the values observed, root-mean-squared error (RMSE) was used:

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(Y_i - Y_i^*)^2} \tag{1}$$

where:

N – the number of observations,

Y_i – actual value of the variable,

Y_i^* – predicted value of the variable.

To more accurately evaluate the results of the calculations, the series of theoretical values were divided into the descriptive part and the forecast. For each fragment of a time series divided in this way, the values of the RMS error were estimated. The values of the analogous naive forecast errors served as reference

points for the results obtained. The naive method is based on the assumption that in the subsequent period, the level of the analysed phenomenon will not change. This was considered the most straightforward way of determining the future realisation of the observed processes. It was also assumed that evaluations of the forecast errors generated in this way were an appropriate reference point for the results of multiple regression estimation.

For direct comparisons of the quality of forecasts provided by the individual models, one version of Theil's coefficient – U_2 – was used:

$$U_2 = \frac{RMSE_S}{RMSE_N} \tag{2}$$

where

U_2 – Theil's coefficient,

$RMSE_S$ – forecast error generated by the multiple regression method,

$RMSE_N$ – forecast error obtained by the naive method.

Following the adopted convention, the more complicated and time-consuming method should be abandoned in favour of the naive forecast for U_2 values greater than 1; and the closer the U value is to zero, the better the multiple regression model is than the simple forecasting method.

Statistical tests of a model's forecast performance are commonly conducted by splitting a given data set into an in-sample period, used for the initial parameter estimation and model selection, and an out-of-sample period to evaluate forecasting performance. Other analyses suggest that simple statistical models can explain a large part of the variation in the consumer confidence indices (Stokman & Neisingh, 2013). To examine the forecasting ability of consumer opinions, the parameters of a multiple regression function were estimated:

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_p x_{ip} + \varepsilon_i \; for \; i = 1, 2, \dots n \tag{3}$$

where:

α, β – parameters of the model,

ε_i – an error term.

4. EMPIRICAL RESULTS

The analysis of linear relationships is based on cross-correlations. In order to find lags and leads, there were estimated Pearson correlation coefficients for shifts ±15 months. Including time lags in the study of correlation ratio aims to, apart from helping to identify factors affecting consumer opinions, also recognise whether consumer confidence modifications predict variability of selected economic values. The practical application of consumer confidence indicators for forecasting has been analysed many times, while the analyses of factors triggering changes in consumer attitudes are considerably less popular (Ludvigson, 2004). Table 1 presents the strongest correlations between variables together with relevant time lags.

The summary of results does not include indicators relating to consumer forecasts due to the greater uncertainty connected with their formulation and the weaker linear relationships of such values with macroeconomic data. The only element that includes the expectations of household representatives is the WOK composite indicator.

Table 1

Linear relationships and time shifts between consumer opinion and quantitative macroeconomic indicators – percentage changes and trend-cycle variables

Macroeconomics and expectations	Consumer opinion indicators										
	Assessments of the macroeconomic situation				Assessments of the microeconomic situation						WOK
	Q2	Q3	Q4	Q9	Q5	Q6	Q7	Q8	Q10	Q11	
GDP_tc	0 (0.59)	0 (0.25)	0 (0.52)	2 (0.39)	0 (0.73)	0 (0.67)	0 (0.72)	0 (0.08)	0 (0.77)	0 (0.89)	0 (0.52)
Cons_tc	0 (0.55)	0 (0.20)	0 (0.49)	3 (0.36)	0 (0.69)	0 (0.63)	0 (0.68)	4 (-0.4)	0 (0.73)	0 (0.88)	0 (0.48)
PWMtc	0 (0.61)	0 (0.29)	0 (0.52)	-11 (0.43)	0 (0.74)	0 (0.67)	0 (0.75)	0 (0.14)	0 (0.78)	0 (0.87)	0 (0.55)
UN_tc	-7 (-0.74)	-9 (-0.48)	-11 (-0.71)	-15 (-0.29)	-7 (-0.84)	-9 (0.82)	0 (-0.84)	-5 (-0.38)	0 (-0.87)	0 (-0.90)	-8 (-0.71)
UR_tc	-11 (-0.71)	-11 (-0.47)	-14 (-0.67)	-15 (-0.29)	-10 (-0.81)	-12 (0.80)	-7 (-0.83)	-6 (-0.35)	0 (-0.87)	-5 (-0.87)	-10 (-0.68)
EA_tc	-11 (0.51)	-10 (0.23)	-14 (0.44)	-15 (0.34)	-11 (0.64)	-13 (0.63)	-5 (0.69)	-2 (0.08)	0 (0.79)	-9 (0.88)	-10 (0.46)
CPI_tc	15 (-0.68)	15 (-0.45)	14 (-0.63)	-3 (-0.70)	14 (-0.67)	14 (-0.61)	15 (-0.48)	15 (-0.48)	15 (-0.53)	15 (-0.42)	15 (-0.62)
PRO_tc	0 (0.63)	0 (0.28)	0 (0.59)	-15 (0.40)	0 (0.74)	0 (0.69)	0 (0.72)	1 (0.55)	2 (0.75)	0 (0.86)	0 (0.55)
GDP_pc	-2 (0.65)	-2 (0.66)	-1 (0.71)	-4 (-0.30)	-1 (0.55)	-2 (0.57)	-1 (0.51)	-2 (0.77)	-3 (0.37)	-3 (0.13)	-2 (0.66)
Cons_pc	0 (0.51)	1 (0.57)	0 (0.55)	-4 (0.30)	0 (0.44)	1 (0.37)	1 (0.36)	0 (0.66)	2 (0.21)	0 (0.04)	0 (0.54)
PWMpc	0 (0.67)	-3 (0.65)	-1 (0.66)	-12 (0.41)	-1 (0.66)	-3 (0.66)	0 (0.62)	0 (0.63)	-1 (0.52)	-1 (0.24)	0 (0.69)
UN_pc	0 (-0.83)	-3 (-0.73)	-1 (-0.83)	-15 (-0.38)	0 (-0.78)	-2 (-0.73)	0 (-0.64)	0 (-0.73)	0 (-0.55)	15 (-0.35)	0 (-0.81)
UR_pc	0 (-0.88)	-2 (-0.75)	-1 (-0.86)	-15 (-0.32)	0 (-0.84)	-2 (-0.79)	0 (-0.64)	0 (-0.74)	0 (-0.65)	15 (-0.44)	0 (-0.85)
EA_pc	0 (0.87)	-2 (0.71)	-1 (0.90)	-15 (0.20)	0 (0.86)	-2 (0.83)	-15 (-0.18)	0 (0.69)	0 (0.70)	0 (0.57)	-10 (0.46)
PRO_pc	4 (0.22)	4 (0.21)	4 (0.34)	-14 (0.45)	4 (0.15)	4 (0.11)	3 (0.09)	6 (0.29)	11 (0.02)	-1 (-0.02)	4 (0.20)

Source: own calculations based on Central Statistical Office and Eurostat data.

A negative sign indicates a leading character for the consumer opinion indicator, and a positive sign indicates a lagged character. The highest values of correlation coefficients are given in brackets.
Explanations:
_tc – trend – cycle,
_pc – percentage change,
GDP – gross domestic product in fixed prices (quarterly),
Cons – consumption (quarterly),
PRO – total sold production in industry,
UN – registered unemployed in thousands,
UR – total unemployment according to the ILO definition,
EA – average employment in the business sector,
CPI – consumer price index,
PWM – average gross monthly wage in the business sector.

Based on the measurement of the strength of the linear correlation, it can be noticed that the country's macroeconomic situation is more strongly correlated with consumer confidence indicators that describe the households' situation rather than the state of the economy. However, this happens only when the macroeconomic variables are expressed as a trend-cycle. When presented as percentage increases, they are

much more strongly correlated with consumers' opinions about the general economic situation and less with the quantitative description of the condition of their households. This may mean that the respondents assess their situation differently than they assess the situation of the economy as a whole. Their perception of the macroeconomic situation is undoubtedly partly affected by how it is presented in the media. It is common practice for economists and journalists to use percentage increases. Undoubtedly, further research ought to devote more attention to this issue.

Stepping off the level of an aggregated indicator (such as the WOK) to simple indicators of consumer opinions seems desirable since a single aggregate, such as the consumer confidence index, cannot be equally suitable for predicting all types of expenditure or the propensity to save (Curtin, 2007).

The index of consumer prices certainly displays the most substantial relationships with household opinions quantified into price trends over the last 12 months. The results show that household representatives are usually quite good at recognising price trends, and the balance series is suitable for describing changes in consumer prices.

Expectations regarding the unemployment level correspond fairly well with the indicators of unemployment. However, other qualitative indicators (e.g., regarding the financial standing of households) manifest stronger relationships with these quantitative variables. In some instances, the quantitative indicators lagged against consumer opinion indications, which was expected due to the prognostic character of the latter. It can, therefore, be established that consumer confidence is primarily shaped by a change in purchasing power and the probability of retaining it. Moreover, the lagged or coincident character of the quantitative indicator prevails here. Consequently, the prognostic applicability of the consumer confidence indicator becomes apparent.

Table 2 shows the relationships between consumer opinion indicators and qualitative BTS indicators. In the latter case, only entrepreneurial forecasts regarding future employment were considered. The entrepreneurs whose opinions were quantified for the analysis represented the construction industry, the processing industry, trade, and services.

Table 2

Linear relationships and time shifts between indicators of consumer opinion and indicators of entrepreneurs' forecasts regarding employment

Expectations	Consumer opinion indicators										
	Assessments of the macroeconomic situation				Assessments of the microeconomic situation						WOK
	Q2	Q3	Q4	Q9	Q5	Q6	Q7	Q8	Q10	Q11	
CC_tc	0 (0,85)	0 (0,79)	-1 (0,89)	-15 (0,18)	0 (0,77)	-1 (0,79)	1 (0,67)	0 (0,82)	1 (0,57)	15 (0,44)	0 (0,85)
RC_tc	0 (0,90)	0 (0,66)	0 (0,89)	-15 (0,37)	0 (0,94)	0 (0,92)	0 (0,87)	0 (0,58)	2 (0,81)	0 (0,76)	0 (0,86)
IC_tc	4 (0,85)	3 (0,64)	2 (0,87)	-14 (0,40)	3 (0,85)	2 (0,84)	4 (0,72)	4 (0,54)	15 (0,68)	0 (0,61)	3 (0,80)
H_tc	0 (0,79)	0 (0,72)	0 (0,69)	-15 (0,49)	0 (0,81)	0 (0,81)	0 (0,88)	0 (0,65)	0 (0,92)	0 (0,66)	0 (0,80)
I_tc	0 (0,79)	0 (0,79)	0 (0,74)	-11 (0,19)	0 (0,74)	0 (0,76)	0 (0,73)	0 (0,82)	0 (0,76)	0 (0,46)	0 (0,81)
J_tc	0 (0,78)	-3 (0,76)	-2 (0,74)	-15 (0,34)	0 (0,76)	-2 (0,74)	0 (0,75)	0 (0,77)	0 (0,74)	0 (0,47)	-1 (0,80)
L_tc	-1 (0,65)	-4 (0,63)	-3 (0,58)	9 (0,28)	0 (0,63)	-3 (0,66)	-2 (0,62)	0 (0,56)	-1 (0,70)	-1 (0,47)	-2 (0,66)
M_tc	0 (0,81)	-1 (0,78)	0 (0,75)	-15 (0,26)	0 (0,77)	0 (0,79)	0 (0,78)	0 (0,77)	0 (0,81)	0 (0,53)	0 (0,82)
N_tc	0 (0,74)	0 (0,72)	-1 (0,70)	-15 (0,45)	0 (0,74)	-1 (0,73)	0 (0,78)	0 (0,77)	0 (0,70)	-1 (0,47)	0 (0,78)
R_tc	0 (0,39)	0 (0,59)	-1 (0,38)	14 (-0,21)	0 (0,27)	13 (0,25)	1 (0,22)	0 (0,72)	10 (0,07)	-1 (-0,40)	0 (0,44)
S_tc	0 (0,65)	0 (0,60)	0 (0,58)	8 (0,38)	0 (0,66)	0 (0,61)	0 (0,69)	0 (0,61)	0 (0,67)	0 (0,49)	0 (0,67)

Source: own calculations based on Central Statistical Office and Eurostat data.

Explanations:
CC – expected employment in the construction sector
RC – expected employment in trade
IC – expected employment in manufacturing
H – expected employment in transporting and storage
I – expected employment in accommodation and food service activities
J – expected employment in information and communication
K – expected employment in financial and insurance activities
L – expected employment in real estate activities
M – expected employment in professional, scientific and technical activities
N – expected employment in administrative and support service activities
R – expected employment in arts, entertainment and recreation
S – expected employment in other service activities

Table 2 excludes services in the following areas: K—Finance and insurance; P—Education; Q—Health care and social assistance; R—Arts, entertainment, and recreation. The linear relationships between the individual qualitative indicators were so weak that they were decided not to be included in further analysis.

The next step used multiple regression analysis with a forward stepwise procedure. In individual regression models, the dependent variables were simple consumer opinion indicators assessing the microeconomic situation. Table 3 presents estimates of the equation parameters, the basic statistics describing the individual models, and Theil's coefficients. The absolute values of the t statistic are given in brackets. The forecasts were prepared for six months ahead (2023.10 - 2024.03).

Table 3

Parameters of regression models describing consumer opinion indicators using employment expectations in enterprises

No. of a model	Dependent variable:	Independent variables (BTS indicators) and parameters
1	Q5	-109.5 + 1.53RC + 0.19R + 0.31N (28.2) (24.2) (12.3) (4.7) Adj.R2 = 0.94 F = 908.83 RMSEin = 2.64 RMSEout = 0.86
2	Q6	-34.2 + 1.4RC + 0.2R (7.52) (30.35) (5.53) Adj.R2 = 0.86 F = 482.92 RMSEin = 11.63 RMSEout = 6.58
3	Q7	25.54 + 0.74RC (11.62) (33.14) Adj.R2 = 0.82 F = 1092.02 RMSEin = 6.18 RMSEout = 6.79
4	Q8	21.00 + 0.28CC + 0.40N + 0.14R (6.20) (15.53) (11.4) (9.62) Adj.R2 = 0.87 F = 467.91 RMSEin = 3.22 RMSEout = 2.01
5	Q10	-49.60+ 1.05H (15.55) (30.24) Adj.R2 = 0.86 F = 983.42 RMSEin = 6.76 RMSEout = 8.40
6	Q11	1.38+ 1.34RC (0.17) (14.09) Adj.R2 = 0.53 F = 195.10 RMSEin = 10.84 RMSEout = 11.38
7	WOK	-60.03+ 1.24M + 0.26R (12.22) (28.09) (11.08) Adj.R2 = 0.87 F = 472.61 RMSEin = 9.80 RMSEout = 10.15

Source: Own calculations, GUS data

Where: in – in sample; out – out-of-sample; U2 – Theil's U coefficients

Other explanations as in table 2.

The values of Theil's U_2 coefficients were below 1 only in models with the dependent variables Q8, Q11, and WOK. This means that only for these variables did the forecasts estimated using the multiple regression method prove better than those obtained using the simple naive method.

The results show that the situation in the labour market in specific sectors of the economy has the most substantial impact on consumer opinions regarding the justifiability of buying durable goods and the propensity to save. A third of the forecasts that turned out to be better than the naive method concern the values of the composite consumer sentiment indicator, which includes both macroeconomic assessments and respondents' opinions on the situation in their households.

Table 4

Parameters of regression models describing macroeconomic variables expressed as trend-cycles using consumer opinion indicators

Dependent variable:	Independent variables (CS indicators) and parameters			
UN_tc	8598.8 - 37.9P11 - 17.32P5 (27.8) (22.9) (12.2)			
	Adj.R2 =0.86	F = 640.24	RMSEin = 234.88	RMSEout = 239.79
UR_tc	43.23 - 0.22P11 - 0.13P10 (29.24) (8.83) (8.66)			
	Adj.R2 = 0.81	F = 492.60	RMSEin = 1.52	RMSEout = 0.78
EA_tc	2063.83 + 20.34P11 + 12.63P10 (10.61) (8.90) (4.52)			
	Adj.R2 = 0.74	F = 289.45	RMSEin = 190.01	RMSEout = 282.34

Source: Own calculations, GUS data.

Despite the strong linear relationships identified between the variables and the leading character of consumer opinion indicators about the indicators about activity in the labour market, none of the multiple regression estimations provided better results than the naive forecasts. Relatively, the best results were obtained when forecasting the variable relating to registered unemployed in thousands, but also, in this case, a better result according to the adopted criteria was obtained by the simple method.

Table 5

Parameters of regression models describing macroeconomic variables expressed as percentage increases using consumer opinion indicators

Dependent variable:	Independent variables (CS indicators) and parameters			
UN_pc	35.90 - 0.49P2 (20.10) (22.20)			
	Adj.R2 =0.71	F =471.21	RMSEin = 7.15	RMSEout = 5.22
UR_pc	40.60 - 1.01P2 (24.36) (25.13)			
	Adj.R2 = 0.77	F = 711.34	RMSEin = 6.46	RMSEout = 5.12
EA_pc	-5.88 + 0.16P4 (25.11) (27.98)			
	Adj.R2 = 0.82	F = 829.82	RMSEin = 1.43	RMSEout = 0.59

Source: Own calculations, GUS data.

Qualitative consumer opinion indicators are much better suited for forecasting quantitative macroeconomic series describing activity in the labour market when the latter is expressed as relative annual increases. Although the superiority of multiple regression estimation over naive forecasts has not yet been demonstrated, in this situation, compared to the results presented in Table 4, the results of using the

econometric procedure are only slightly worse. This applies, in particular, to forecasting average employment in the business sector. Regarding estimating the current and future values of the macroeconomic variables that describe activity in the labour market, the indicator relating to a diagnosis of the economic situation in Poland and the one relating to unemployment forecasts turned out to be the most useful.

5. DISCUSSION

Composite qualitative indicators are often used in statistical and econometric analyses as an additional variable, which, along with the dynamics of GDP, inflation and unemployment, helps illustrate the economic situation of a country (McIntyre, 2007). However, as Dominitz and Manski (Dominitz & Manski, 2004) point out, interpreting changes in composite indicators can be problematic. They consist of balances of responses to questions that deal with such diverse issues that some of the component assessments may indicate an improvement, while others a deterioration of the situation. For example, the Consumer Confidence Indicator (CCI) is constructed as an arithmetic average of the balances of responses to questions about the expected change in the financial condition of households, the general economic situation of the country, the level of national unemployment, and the probability of respondents making savings in the future. Analyses conducted by Souleles (Souleles, 2004) show that the answers to questions about the microeconomic level contain more helpful information for forecasting household spending than the qualitative indicators describing the macroeconomic situation.

Representatives of households who take part in consumer opinion and confidence surveys often possess a relatively small amount of information on the general economic situation of their country (Dominitz & Manski, 2004). The results of analyses conducted by Curtin (Curtin, 2010) seem to confirm the moderate interest of households in changes to macroeconomic indicators. This is illustrated by the results of research conducted in the USA in 2007 and 2009. Respondents' knowledge about three fundamental indicators describing the economy's condition (GDP growth rate, inflation rate and unemployment rate) was relatively small. Even dramatic events in the financial markets did not create an increased demand for information on the country's macroeconomic situation (Curtin, 2010). Therefore, it can be assumed that when making decisions, consumers are more likely to consider informal sources of information about the local conditions in their immediate environment rather than follow official statistics and economic analyses. One of the reasons for such behaviour may be the effort (cost) involved in observing and interpreting the fundamental macroeconomic values.

Personal consumption in a state of equilibrium depends on the willingness to consume (measured by the confidence indicator) and capabilities determined by one's disposable income (Howrey, 2001). That is why out of the quantitative variables published every month, those that describe consumer spending and inform us about the purchasing power of households were chosen. The study also focused on macroeconomic data describing the state of the economy, whose published values can affect the respondents' answers on the consumer situation during the survey. These are GDP, unemployment, inflation and income. At the same time, there is also the possibility of preliminarily testing consumer opinion's applicability in predicting such variables.

The activity influences the economic situation of the households in the labour market (Vuchelen, 2004). That is the way it influences consumer sentiment development. The unemployment rate often serves as a proxy for the labour market conditions (Cotsomitis & Kwan, 2006; Jankiewicz, 2013). Fig. 1 presents fluctuations in the household opinion index regarding their financial situation and unemployment rate in the economy. However, there can be a more important source of information in this respect. Many of the household representatives work in enterprises. The opinions of the respondents taking part in consumer

surveys are influenced by the information relating to the employment prospects in their workplaces. If the situation is deteriorating, such information is often spreading among employees. What is more, it can be passed and discussed with the family. Therefore, it was considered that the opinions of the management staff regarding expected employment in their enterprises may also be related to the development of consumer opinions. The fluctuations of the index of households' opinions regarding their financial situation and the index of expected employment in manufacturing are shown in Fig. 2

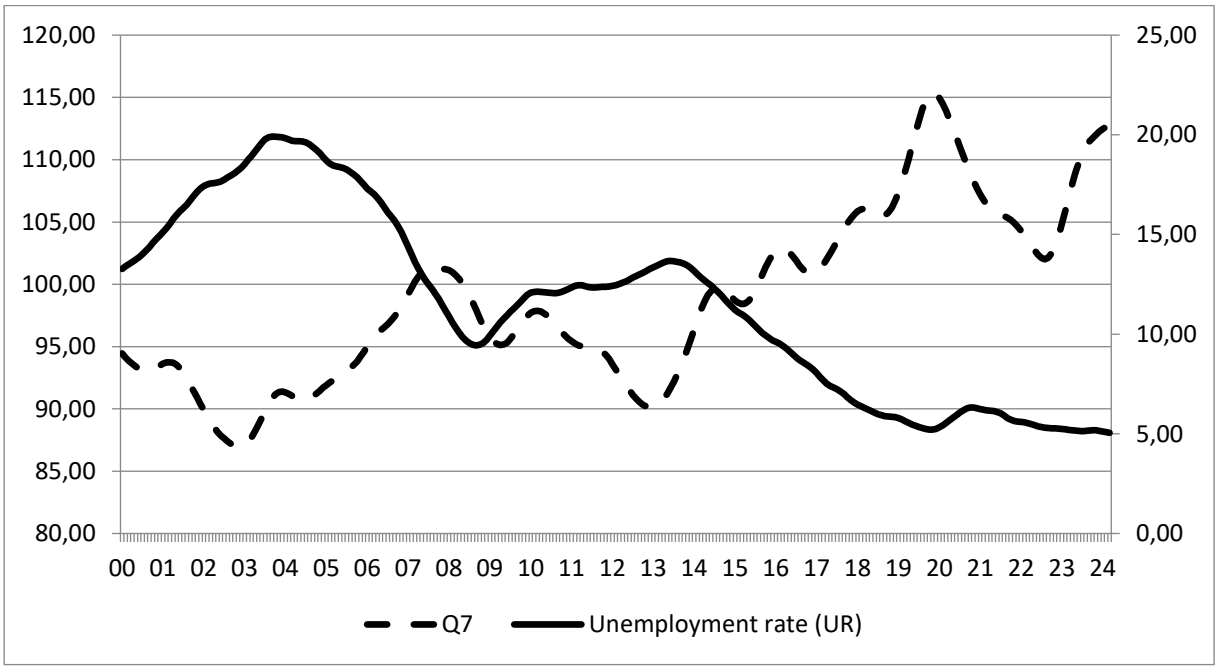

Figure 1. Index of the financial situation of the households and unemployment rate

Source: own calculations based on Polish Central Statistical Office.

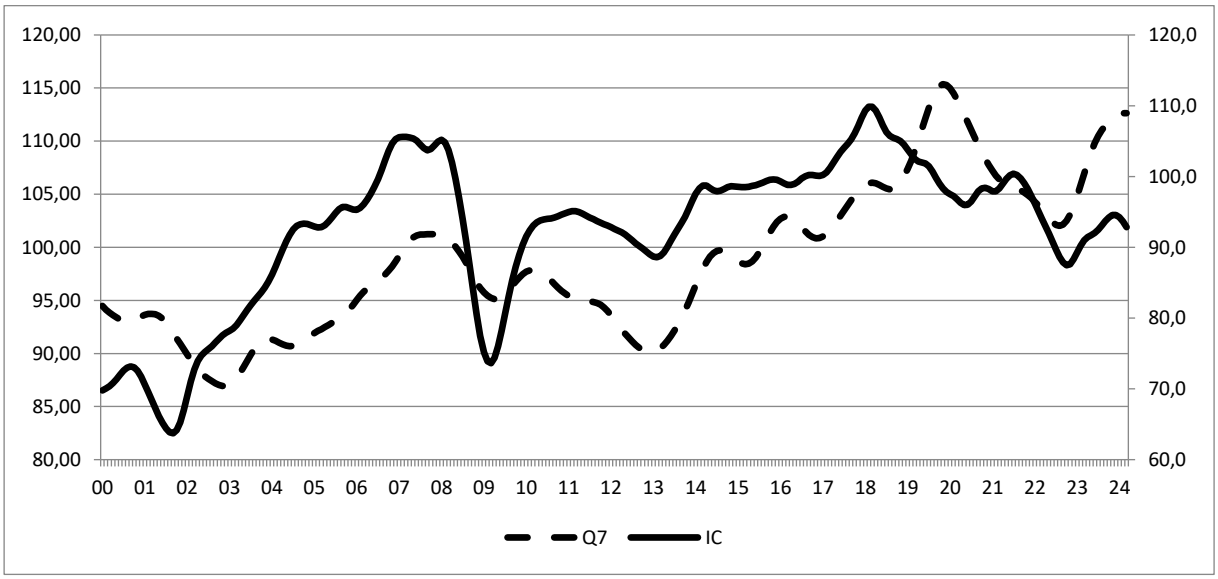

Figure 2. Index of households' financial situation and expected employment in manufacturing

Source: own calculations based on Polish Central Statistical Office.

5. CONCLUSION

This study investigated the relationship between consumer sentiment indicators and macroeconomic variables, particularly those related to the labour market in Poland. The analysis of linear relationships revealed that household representatives assess the condition of the country's economy differently than their own household's situation. Simple opinion indicators exhibited stronger linear relationships with selected macroeconomic variables and business tendency indicators compared to the composite consumer confidence index. The labour market situation emerged as the most influential factor affecting household representatives' opinions, with macroeconomic data correlating most strongly with consumers' microeconomic assessments of the possibility and justifiability of saving. The service sector also demonstrated a considerable impact on consumer confidence, with business tendency test results on employment forecasts in various service sectors proving helpful in constructing models describing consumer confidence.

Multiple regression analysis showed that consumer opinions on the justifiability of purchasing durable goods, the possibility of making savings, and the composite consumer confidence index provided the highest prognostic value for the studied macroeconomic variables. However, the superiority of multiple regression estimation over naive forecasts was not consistently demonstrated, suggesting that further research is needed to refine the predictive models.

This study has several limitations that should be considered when interpreting the results. First, the analysis focused solely on the Polish economy and consumer sentiment data from a single source (IPSOS). The findings may not generalise to other countries or regions with different economic conditions and consumer behaviour. Second, the period covered in the study (2000-2024) included significant economic and political events, such as the global financial crisis, the COVID-19 pandemic and War in Ukraine, which may have influenced consumer sentiment and macroeconomic variables in unique ways. Third, the study relied on linear relationships and multiple regression analysis, which may not capture non-linear or more complex interactions between the variables. Finally, the study did not account for potential confounding factors or other macroeconomic variables influencing consumer sentiment and labour market indicators.

In future research, it would seem worthwhile to examine the differences in how respondents formulate their assessments and opinions about the economy's condition and the situation in their households. To this end, partial responses from consumer surveys, including their variants, will undoubtedly be necessary, and they will then be used to calculate the balances.

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