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Consumer Confidence and Economic Indicators: A Macro Perspective

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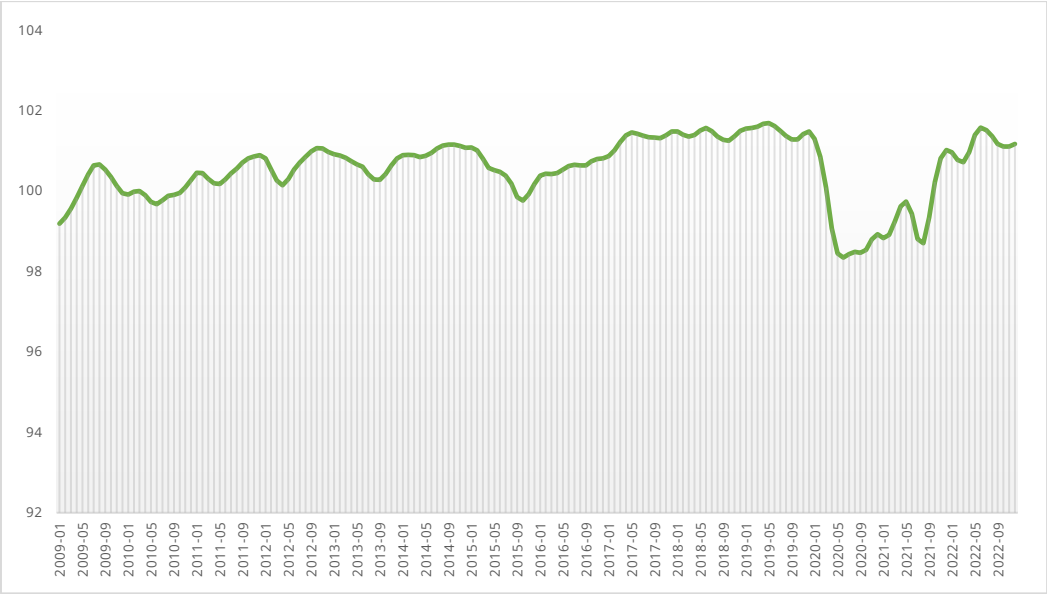
Abstract

This study examines the impact of the determinants of consumer confidence in Indonesia, one of the largest consumer markets in the world. Various macroeconomic factors are assessed, including economic growth, government expenditure, the consumer price index, interest rates, unemployment, and stock price index, using monthly data from January 2009 to December 2022. The study employs the Autoregressive Distributed Lag (ARDL) model as the primary method, with robustness checks using Fully Modified Ordinary Least Squares (FMOLS) and Canonical Cointegrating Regressions (CCR). The results indicate that all selected factors significantly influence consumer confidence, particularly from a long-term perspective. Economic growth and unemployment have a positive impact, while government expenditure, the consumer price index, interest rates, and stock prices exert a negative effect. These findings suggest that businesses should align their strategies with economic trends to capitalize on periods of strong consumer sentiment and mitigate risks during downturns. Simultaneously, policymakers should prioritize effectively managing key macroeconomic factors to sustain and enhance overall consumer confidence.

1. Introduction

Consumer confidence is a critical measure of the economic outlook, often reflecting how optimistic or pessimistic households feel about the current and future state of the economy [1]. This sentiment directly impacts consumer behavior, as high confidence levels typically lead to increased spending on goods and services, thereby stimulating economic growth, while low confidence levels can lead to reduced spending, potentially slowing economic momentum [2]. As such, consumer confidence has become an integral indicator for economic analysis and policymaking, especially in emerging economies like Indonesia, where the consumer sector is vital to sustaining growth and economic stability.

Indonesia, as Southeast Asia's largest economy, has undergone significant economic transformation in recent decades. Factors such as rapid urbanization, a growing middle class, and increased global economic integration have positioned the consumer sector as a central component of Indonesia's economic performance [3–5]. Changes in consumer confidence can therefore have profound effects on the broader economy, influencing key metrics such as GDP growth, employment rates, and inflation [6]. As shown in Figure 1, Indonesia's consumer



Note: Above 100 points indicate consumer optimism and below 100 points indicate consumer pessimism.

Figure 1. Trend of consumer confidence index in Indonesia, 2009-2022.
Source: OECD [7]

confidence index fluctuated from 2009 to 2022, reflecting variations in economic sentiment in response to changes in macroeconomic conditions. Consequently, the role of consumer sentiment has garnered attention from policymakers, given its potential to both drive and stabilize economic growth. Notably, fluctuations in macroeconomic conditions directly affect consumer confidence, shaping household financial decisions in ways that can either reinforce or mitigate these economic shifts [8, 9]. Analyzing these relationships within the Indonesian context can provide valuable insights for managing economic cycles and guiding policy interventions.

Consumer confidence in developing countries like Indonesia faces several challenges due to economic, social, and structural issues. These challenges undermine the stability and predictability of consumer behavior, thereby affecting overall economic growth. A significant gap between urban and rural incomes, as well as among socioeconomic groups, restricts overall consumer spending and confidence [10–12]. Individuals with lower incomes are more likely to remain pessimistic about their economic prospects. Additionally, Indonesia's heavy reliance on exports, particularly of natural resources, makes its economy vulnerable to global economic downturns or declines in commodity prices, which can diminish consumer optimism about future economic conditions [13–16]. Frequent natural disasters, such as floods, earthquakes, and forest fires, further disrupt livelihoods and exacerbate insecurity regarding economic stability [17, 18]. Addressing these challenges through targeted policies and economic reforms is essential to fostering a more resilient and confident consumer base.

Despite the importance of consumer confidence as a determinant of economic activity, there remains a limited understanding of how specific macroeconomic factors impact consumer sentiment in Indonesia. Existing studies on consumer confidence have largely focused on developed economies [19–21], with relatively few examining the nuances within emerging markets like Indonesia, where the structure of the economy and household financial behaviors may differ. Additionally, the volatility of macroeconomic variables within emerging markets poses unique challenges and uncertainties for consumer sentiment [22, 23]. This study, therefore, seeks to address this gap by examining the relationship between consumer confidence and key macroeconomic indicators, namely economic growth, government expenditure, consumer price index, interest rates, unemployment, and stock market performance. Understanding these relationships is essential for designing policies that support consumer confidence, especially during periods of economic fluctuation.

The theoretical basis for exploring consumer confidence and its macroeconomic determinants stems from Keynesian economics, which emphasizes the role of aggregate demand in driving economic growth [24]. According to Keynesian theory, consumer spending is a primary component of aggregate demand and is heavily influenced by psychological factors, including consumer confidence. High confidence levels encourage consumption, which fuels production, investment, and employment. Conversely, low confidence can lead to

reduced spending and a contraction in economic activity [25, 26]. Additionally, the life-cycle hypothesis and the permanent income hypothesis contribute to understanding consumer spending, suggesting that households adjust their consumption based on anticipated lifetime income and broader economic expectations [27–29]. In this framework, macroeconomic factors are critical to shaping consumer expectations and confidence, which in turn influence spending decisions.

Several empirical studies have examined the link between consumer confidence and macroeconomic factors. For instance, a study in Croatia by Matošec & Obuljen Zoricic [8] indicates a bidirectional causality between consumer confidence and macroeconomic factors. A study by Acuña et al. [30] in Chile demonstrates a positive relationship between consumer confidence and subsequent consumption growth, suggesting that consumption tends to rise following periods of high consumer confidence, which then leads to better economic growth. A study by Ahmed & Cassou [19] in the USA shows the connection between consumer confidence and certain types of consumer purchases during both good and bad economic times, confirming its relationship with economic variables. A study by Ferrer et al. [20], using data from Europe and the USA, identifies a relationship between consumer confidence and stock market fluctuations. A study by Choudhry & Wohar [21] in the USA also finds a stable long-term relationship between consumer confidence and its economic determinants, even during periods of crisis. Lastly, a study by Nowzohour & Stracca [6] reveals that consumer confidence exhibits the strongest co-movement with economic variables, supporting the idea that economic sentiment is a key driver of economic activity.

However, studies specifically focused on Indonesia remain limited, and existing literature does not sufficiently address the influence of macroeconomic fluctuations on consumer confidence in the country. Recent studies, such as that by Juhro & Iyke [3], focus on enhancing policymakers' forecast accuracy by incorporating the consumer confidence aspect; a study by Rachmawati et al. [31] examines the relationship between consumer confidence and spending behavior; a study by Naedi & Iksan [32] focuses on crisis shocks, like the COVID-19 pandemic, on consumer confidence; and a study by Wibawa et al. [33] looks at consumer confidence as a mediator between service quality and purchase intentions. This lack of research highlights the need for a comprehensive analysis of the dynamic interplay between consumer sentiment and macroeconomic indicators in Indonesia. Furthermore, this study addresses these gaps by employing the Autoregressive Distributed Lag (ARDL) model, which allows for the analysis of both short-term and long-term effects, as well as robustness checks using Fully Modified Ordinary Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) to confirm the stability of the results.

This study aims to provide a comprehensive analysis of the impact of key macroeconomic indicators—economic growth, government expenditure, consumer price index, interest rates, unemployment, and stock price index—on consumer confidence in Indonesia using monthly data from January 2009 to December 2022. By identifying and quantifying these relationships, the study seeks to offer insights that can inform economic policy, enhance consumer confidence, and support Indonesia's sustained economic growth. For businesses, the study's results can offer valuable guidance on consumer behavior, helping companies adjust their strategies to align with shifts in consumer confidence, optimize marketing approaches, and make informed decisions on pricing, production, and investments during varying economic conditions.

2. Literature Review

2.1. Consumer Confidence and Its Measurement

Consumers are highly influential economic agents whose behavior determines the state of the economy. When consumers form expectations about their desires based on a comprehensive judgment of employment, income, interest rates, and the prices of goods and services in light of economic circumstances, they build their confidence—this is known as consumer confidence. The inclusion of intellectual factors and emotions to measure expected changes in consumption is also part of consumer confidence [34]. Gintis [35] revealed that consumers do not always maximize their satisfaction, and their behavior does not follow the rationality assumption proposed by neoclassical theory. In fact, various studies, such as those by Dragouni et al. [36], Gabriele et al. [37], Kemp et al. [38], and Larson & Shin [39] argue that consumer decisions are influenced by psychological, social, political, and other factors. Several studies have assessed consumer confidence, as it helps us understand consumers' economic behavior. Additionally, policymakers, statisticians, and analysts can improve the quality of their analysis and make more effective decisions to foster the economic development of a country [8]. The United Nations Statistics Division [40] believes that consumer confidence is a statistical indicator which forecasts consumer spending, trends of consumer spending and provide information to assess the present situation and economic prospects of a country.

Numerous empirical studies have examined the relationship between consumer confidence and economic behavior, grounded in economic theory, and have confirmed that when consumer confidence is high, consumer spending tends to increase while saving decreases [8]. Most studies have found that the Consumer Confidence Index (CCI) explains consumer consumption, which tends to rise when households experience changes in the economy. This includes: i) the Consumer Satisfaction Index, which reflects consumers' evaluation of their current economic situation, and ii) the Consumer Expectation Index, which reflects consumers' expectations of future economic conditions [41]. However, Fuhrer [42], Carroll et al. [43], Acemoglu & Scott [44] and Matsusaka & Sbordone [45] used the Index of Consumer Sentiment (ICS) from the University of Michigan to assess consumer confidence. Similarly, Howrey [46] found that the ICS is a better instrument for measuring consumer confidence, as it also predicts GDP changes and household spending. Desroches & Gosselin [47], Souleles [48], Dees & Soares Brinca [49] and others have also revealed that the ICS is a valuable measure of consumer confidence. On the other hand, Batchelor & Dua [50], Ludvigson [51], Croushore [52], and Claveria et al. [53] found that the ICS has limitations, such as lower RMSEs, which are significant in only a limited number of cases. Easaw et al. [54], Bovi [55], and Bruno [56] identified an asymmetric threshold effect in consumer confidence, contrasting with the convergence of the index, which they argue is not true.

The literature shows wide acceptance and consistency in using the Consumer Confidence Index (CCI) to reflect consumer confidence. Among the studies, Ou et al. [57] claimed that the CCI is a measure of consumer sentiment, useful for analyzing household consumption and forecasting economic phenomena. Caleiro [58], Acuna et al. [30], Benhabib & Spiegel [59], Dragouni et al. [36] and Mounrougane & Roma [60] concluded that the CCI not only addresses a variety of economic issues but also provides accurate predictions of consumption, even when controlling for macroeconomic variables. In the case of Indonesia, the Danareksa Research Institute (DRI) [61] measures the CCI based on a sample of at least 1,700 households across six regions, conducting face-to-face interviews that represent consumer characteristics, demographics, and economic status.

In conclusion, consumer confidence is a pivotal economic indicator that reflects the sentiments and expectations of consumers regarding the current and future state of the economy. It serves as a valuable tool for policymakers, analysts, and statisticians to understand consumption patterns and predict economic trends. The CCI, widely used in empirical studies, has proven to be a reliable measure for analyzing household consumption and forecasting macroeconomic phenomena. Despite some limitations in certain indices, the CCI remains instrumental in solving diverse economic problems and offering accurate predictions even when controlling for macroeconomic variables.

2.2. Linkage between Economic Indicators and Consumer Confidence

Various studies have explored the relationship between consumer confidence and macroeconomic trends. In Croatia, Matosec & Zoricic [8] investigated consumer confidence using the Consumer Confidence Index (CCI), consumption, GDP, and additional variables such as savings. Their findings indicated that consumer confidence Granger-causes all the nominated macroeconomic variables. Acuna et al. [30] found that the CCI is positively associated with consumption in Chile. Madlopha [1] revealed that the CCI had a positive relationship with economic growth in South Africa from 1994Q1 to 2017Q4 and suggested considering other variables to further investigate consumer confidence. Pavithra and Velmurugan [62] found that India's CCI was influenced by inflation and interest rates, with consumers anticipating higher income growth and increased spending. Ramlho et al. [63] showed that inflation, unemployment, exchange rates, and the political climate strongly and significantly influenced the CCI in Portugal. Hallanders & Vliegenthart [64] identified similar associations between macroeconomic variables, such as inflation, unemployment, and income, and consumer confidence. Van Raaij [65] also found that unemployment, the political climate, and interest rates positively and significantly influenced consumer confidence, supporting Barsky and Sims' argument on the crucial role of consumer confidence in business activities.

A study by Paradiso et al. [66] estimated the Consumer Confidence Index (CCI) for Italy from 1985 to 2010 and found a positive long-term association between CCI, inflation, and interest rates when important political events were considered. Additionally, they found that consumers respond asymmetrically to various disequilibrium errors, which aligns with the psychological bias approach. Celik & Deniz [67] examined whether globalization influenced the CCIs of developing and developed countries. They found that globalization in these countries was strongly associated with CCI. Ghosh [68] explored the relationship between consumer confidence, consumer spending, and other macroeconomic variables in Brazil over the period 1995 to 2018. The study revealed that consumer spending had

Table 1. Synopsis of variables.

Status	Variable	Symbol	Unit Measurement	Source
Dependent	Consumer Confidence Index	CCI	Points	OECD [7]
Independent	Gross Domestic Product	GDP	Constant Rupiah	WDI [69]
	Government Expenditure	GE	Constant Rupiah	WDI [69]
	Consumer Price Index	CPI	Points	BI [70]
	Interest Rates	ITR	Percent	BI [70]
	Unemployment	UNEMP	Person	WDI [69]
	Composite Stock Price Index	IDXC	Points	IDX [71]

asymmetric impacts on CCI, while interest rates exhibited negative asymmetries with CCI in the short run. However, unemployment rates, the stock market, and interest rates positively influenced CCI in the long run.

Iyke & Ho [72] assessed the effects of exchange rates on real consumption in Asian countries using flexible dynamic panel data and found that consumption in the long run was impeded by uncertainty, providing evidence of asymmetric uncertainty. They also concluded that inflation and exchange rates influence consumption. Later, Juhro & Iyke [3] estimated consumer confidence and consumption expenditure in Indonesia. From the three standard predictors of consumption—labor income, stock prices, and interest rates—they found that consumer confidence predicts consumption growth. Bannigidadmath [73] examined how consumer sentiment predicts returns in the Indonesian stock market. Using a regression model with a feasible quasi-generalized least squares-based estimator and accounting for structural breaks, the study found that returns in both the aggregate market and the Indonesian equity market influenced consumer confidence. Similarly, Trang & Hang [74] found a strong positive relationship between consumer confidence and the stock market index, proposing that other macroeconomic variables, such as the consumer price index and government expenditure, should be considered to assess consumer confidence. A similar conclusion was reached by Eyuboglu & Eyuboglu [75] in their study of Turkey.

CCI plays a crucial role in decision-making and economic forecasting by policymakers. Islam & Mumtaz [76] evaluated the association between CCI and economic growth in selected European countries for the period from 1996Q1 to 2012Q4. The results revealed the existence of a long-term relationship between consumer confidence and economic growth in these countries. Another study by Aberu [77] claimed that issues such as poverty, inflation, interest rate spread, and unemployment rates affect consumer confidence. Using ARDL modeling, it was found that consumer confidence has a strong positive relationship with inflation and economic growth. With the aim of investigating consumer confidence across various countries and time periods, a study by Grzywinska-Rapca & Ptak-Chimelewska [78] found that higher indices of financial situation, economic situation, prices, and income lead to a higher CCI.

In summary, extensive research highlights the significant relationship between consumer confidence and macroeconomic trends across different countries and time periods. Studies consistently show that the CCI is influenced by numerous key macroeconomic factors. These findings affirm that CCI serves as a vital tool for policymakers and analysts in economic forecasting and decision-making. By addressing these factors, CCI can provide a more comprehensive understanding of economic dynamics and inform strategies for sustainable economic development and business growth.

3. Materials and Methods

3.1. Data and Variables

This study examines seven variables, with the consumer confidence index serving as the dependent variable. Macroeconomic indicators—including economic growth (measured by Gross Domestic Product or GDP), government expenditure, consumer price index, interest rates, unemployment, and the composite stock price index (represented by the Indonesia Stock Exchange (IDX) composite index)—are analyzed as independent variables.

The dataset covers the period from January 2009 to December 2022, starting with the availability of Indonesia's interest rate data in January 2009 and concluding in December 2022, the latest point for which Indonesia's consumer confidence index is available. Data were obtained from the Organisation for Economic Co-operation and Development (OECD), the World Development Indicators (WDI) of the World Bank, Bank Indonesia (BI), and the Indonesia Stock Exchange (IDX). A summary of these variables is provided in Table 1.

3.2. Model Specification

This study utilized a combination of Keynesian economics, life-cycle hypothesis, and the permanent income hypothesis in choosing the macroeconomic factors as independent variables. Higher GDP growth

signals a strong economy, which leads to greater consumer confidence as people feel more secure about their financial future [1]. Similarly, increased government expenditure stimulates economic activity, influencing consumer confidence through improved public services and infrastructure [79, 80]. At the same time, rising CPI (inflation) affects purchasing power, which in turn shapes consumer sentiment regarding the cost of living [81]. Additionally, changes in interest rates influence consumer behavior, as higher rates can affect spending and borrowing, while lower rates may encourage different patterns of economic activity [68]. Alongside these factors, unemployment rates reflect labor market conditions, impacting consumer confidence based on perceptions of job security [82]. Finally, stock prices serve as an indicator of economic health, with fluctuations affecting consumer outlook and behavior [20]. The mathematical function of these relationships is illustrated in Equation 1.

$$CCI = f(GDP, GE, CPI, ITR, UNEMP, IDXC) \quad (1)$$

Here, CCI refers to the consumer confidence index, GDP stands for gross domestic product, GE represents government expenditure, CPI denotes consumer price index, ITR indicates interest rates, $UNEMP$ refers to the unemployment rates, and $IDXC$ symbolizes the composite stock price index.

Next, the econometric model based on the function in Equation 1 is expressed in Equation 2.

$$CCI_t = \beta_0 + \beta_1 GDP_t + \beta_2 GE_t + \beta_3 CPI_t + \beta_4 ITR_t + \beta_5 UNEMP_t + \beta_6 IDXC_t + \varepsilon_t \quad (2)$$

To interpret the coefficients from the regression analysis as percentage changes instead of absolute changes, Equation 2 was converted into natural logarithmic (ln) form (with the exception of the ITR variable, which is already expressed as a percentage), as demonstrated in Equation 3.

$$lnCCI_t = \beta_0 + \beta_1 lnGDP_t + \beta_2 lnGE_t + \beta_3 lnCPI_t + \beta_4 lnITR_t + \beta_5 lnUNEMP_t + \beta_6 lnIDXC_t + \varepsilon_t \quad (3)$$

In this context, t represents study period, β_0 denotes the intercept, $\beta_1 - \beta_6$ are the coefficients, and ε is the error term.

3.3. Methods

3.3.1. Autoregressive Distributed Lag (ARDL)

The ARDL approach is considered an advantageous econometric technique because it effectively captures both short-term dynamics and long-term relationships among time series variables. This method offers flexibility by accommodating various types of relationships, allowing for variables with different integration orders, and performing robustly even with small sample sizes. Furthermore, the ARDL approach excels in addressing issues such as serial correlation and heteroskedasticity, providing reliable estimates and easily interpretable coefficients. These attributes make the ARDL method particularly suitable for analyzing business and economic phenomena. [83–88].

In this study, the ARDL model is represented in Equation 4, where t denotes the time within the study period, and Δ represents the first-difference operator. The coefficients $\beta_1 - \beta_6$ capture the long-term impacts, while $\delta_1 - \delta_6$ reflect the short-term effects. Finally, q and p represent the optimal lag lengths.

$$\Delta lnCCI_t = \beta_0 + \sum_{i=1}^{q} \beta_1 \Delta lnCCI_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta lnGDP_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta lnGE_{t-i} + \sum_{i=0}^{p} \beta_4 \Delta lnCPI_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta ITR_{t-i} + \sum_{i=0}^{p} \beta_6 \Delta lnUNEMP_{t-i} + \sum_{i=0}^{p} \beta_7 \Delta lnIDXC_{t-i} + \delta_1 lnCCI_{t-1} + \delta_2 lnGDP_{t-1} + \delta_3 lnGE_{t-1} + \delta_4 lnCPI_{t-1} + \delta_5 ITR_{t-1} + \delta_6 lnUNEMP_{t-1} + \delta_7 lnIDXC_{t-1} + \varepsilon_t \quad (4)$$

3.3.2. Fully Modified Ordinary Least Squares (FMOLS)

FMOLS incorporates additional lagged values of both dependent and independent variables, which helps address potential endogeneity and serial correlation issues. By adding these lagged variables, FMOLS effectively mitigates autocorrelation and simultaneity bias, leading to more accurate parameter estimates and robust inferences. Its key strength is its ability to provide consistent estimates even in the presence of non-stationary or endogenous time series data, making it particularly useful for cointegration analysis [89–91]. Therefore, FMOLS is well-suited for validating the robustness of ARDL long-term estimation results.

3.3.3. Canonical Cointegrating Regressions (CCR)

CCR directly estimates cointegrating vectors while addressing potential endogeneity by incorporating lagged variable values. This method enhances robustness against specification errors and enables more efficient estimation of cointegrating relationships. Its primary advantage is its ability to deliver consistent and reliable estimates of cointegrating vectors, allowing for accurate modeling and understanding of equilibrium relationships between variables over time [92–95]. Consequently, CCR, alongside FMOLS, is well-suited for confirming the robustness of ARDL long-term estimation results.

Table 2. Descriptive statistics.

Variables	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis
lnCCI	4.6108	4.6123	4.6219	4.5885	0.0079	-0.9760	3.4832
lnGDP	36.738	36.759	36.999	36.405	0.1856	-0.3116	1.8276
lnGE	25.189	25.198	25.475	24.669	0.1929	-1.1662	4.5209
lnCPI	4.5441	4.5801	4.9197	4.0712	0.2642	-0.3392	1.9763
ITR	1.7202	1.7492	2.1691	1.2528	0.2528	-0.5111	2.1060
lnUNEMP	1.7531	1.7672	2.0869	1.3985	0.2468	-0.0497	1.4044
lnIDXC	8.4554	8.5326	8.8858	7.1589	0.3365	-1.5117	5.6131

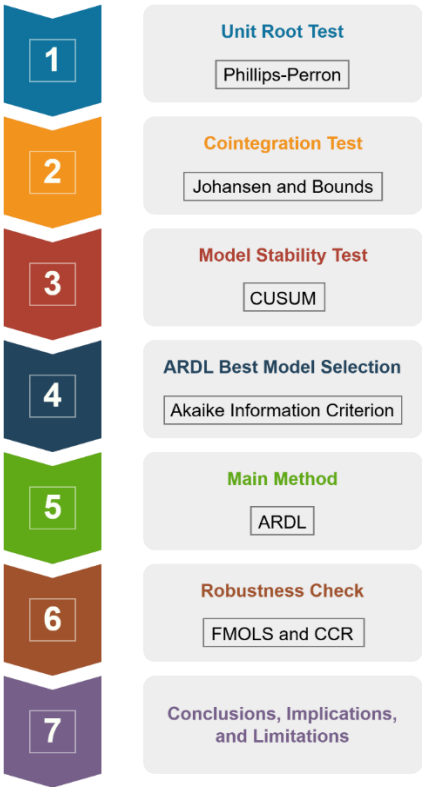


Figure 2. Systematic flow of analysis.

3.4. Systematic Flow of Analysis

The study's systematic analysis, illustrated in Figure 2, begins with the Phillips-Perron unit root test. Next, the Johansen and bounds cointegration tests are employed to identify long-term equilibrium relationships. After establishing cointegration, model stability is evaluated using the CUSUM test, and the best ARDL model is selected based on the Akaike Information Criterion. The parameters of the cointegrating equation are then estimated through the ARDL method, with robustness checks using FMOLS and CCR techniques. Finally, the empirical findings are discussed, followed by conclusions, implications, and limitations for future research.

4. Results and Discussion

4.1. Descriptive Statistics

Table 2 presents descriptive statistics for each variable, revealing important characteristics regarding their central tendency, variability, and distribution shape. For lnCCI, the mean (4.6108) and median (4.6123) are very close, and the low standard deviation (0.0079) indicates stability in this variable. A skewness of -0.9760 shows a slight leftward skew, and the kurtosis of 3.4832 suggests a moderately heavy-tailed distribution. Similarly, lnGDP has closely aligned mean and median values (36.738 and 36.759) with a standard deviation of 0.1856, indicating low variability. Its skewness of -0.3116 indicates a slight leftward skew, and the kurtosis of 1.8276 suggests a light-tailed, near-normal distribution.

In the case of lnGE and lnCPI, we observe moderate variability and slight leftward skewness. The mean and median of lnGE are close at 25.189 and 25.198, with a standard deviation of 0.1929. It has a skewness of -1.1662 and a kurtosis of 4.5209, indicating a heavy-tailed distribution with some outliers. lnCPI has a mean of 4.5441 and median of 4.5801, with moderate dispersion (standard deviation of 0.2642). The skewness (-0.3392) and kurtosis (1.9763) values suggest a fairly symmetric and lightly-tailed distribution.

Finally, ITR, lnUNEMP, and lnIDX exhibit some unique characteristics. ITR has a moderate standard deviation (0.2528) and a slight leftward skew (-0.5111), with a kurtosis of 2.1060, indicating near-normality. lnUNEMP displays minimal skewness (-0.0497) and a light-tailed distribution (kurtosis of 1.4044), suggesting a nearly symmetrical shape. lnIDX shows the highest variability (standard deviation of 0.3365), with a pronounced leftward skew (-1.5117) and a high kurtosis (5.6131), indicating a heavy-tailed distribution with potential outliers. Overall, most variables are stable with slight leftward skewness, and the high kurtosis of lnGE and lnIDX suggests the presence of extreme values, though still within an acceptable range.

4.2. Initial Test

4.2.1. Unit Root Test

The results of the Phillips-Perron (P-P) unit root tests in Table 3 assess the stationarity of each variable at both the level and first-difference forms, under two conditions: with an individual intercept and with both an individual

Table 3. Results of P-P unit root test.

Variable	Individual Intercept		Individual Intercept and Trend	
	Level (I(0))	*1st Diff. (I(1))*	*Level (I(0))*	*1st Diff. (I(1))*
	Prob.	**Prob.**	**Prob.**	**Prob.**
lnCCI	0.1166	0.0091*	0.3407	0.0493**
lnGDP	0.5507	0.0000*	0.3247	0.0000*
lnGE	0.1171	0.0000*	0.1947	0.0000*
lnCPI	0.5725	0.0000*	0.3088	0.0000*
ITR	0.2474	0.0000*	0.5200	0.0000*
lnUNEMP	0.9228	0.0000*	0.4620	0.0000*
lnIDXC	1.0000	0.0000*	0.9999	0.0000*

Note: * and ** indicates 1% and 5% significance levels, respectively.

Table 4. Results of Johansen cointegration test.

Hypothesized No. of CE(s)	**Value Referral**	None **No Intercept No Trend**	None **Intercept No Trend**	Linear **Intercept No Trend**	Linear **Intercept Trend**	Quadratic **Intercept Trend**
None	Trace Stat.	106.52	135.23**	115.33	156.15**	148.75**
	Crit. Value	111.78	134.68	125.62	150.56	139.28
At most 1	Trace Stat.	63.415	80.949	62.584	97.924	90.607
	Crit. Value	83.937	103.85	95.754	117.71	107.35

Note: ** indicate 5% significance level.

Table 5. Results of ARDL bounds cointegration test.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**
F-statistic	4.4169**	10%	2.12	3.23
K	6	5%	2.45	3.61
		1%	3.15	4.43

Note: ** indicate 5% significance level.

intercept and trend. The probability values indicate that most variables are non-stationary at their level form (I(0)), as the probabilities generally exceed the 1% significance level under both conditions. However, all variables become stationary after differencing once, as indicated by probability values below 0.01 in the first-difference form under both conditions. This implies that all variables are integrated of order one, or I(1). These results confirm that the variables are stationary after first differencing, which is a prerequisite for using ARDL, FMOLS, and CCR to avoid spurious results. Consequently, this supports the application of these time-series techniques to analyze relationships among the variables in a stable and reliable manner.

4.2.2. Cointegration Test

The Johansen and ARDL Bounds cointegration test results in Tables 4 and 5 provide evidence of a long-term equilibrium relationship among the variables under specific trend specifications. In the Johansen cointegration test, for the Intercept No Trend, Linear Intercept Trend, and Quadratic Intercept Trend conditions, the trace statistics exceed the critical values at the 5% significance level, suggesting at least one cointegrating equation in each case. In contrast, the weaker evidence for cointegration under the No Intercept No Trend and Linear Intercept No Trend specifications suggests that these trend assumptions may be less suitable. However, as three out of five tests indicate a stable long-term relationship among the variables, this supports the use of ARDL, FMOLS, and CCR to analyze both short- and long-term dynamics. Similarly, the Bounds test also indicates a long-term equilibrium relationship for ARDL model, as the F-statistic is significant at the 5% level. Overall, the results of both tests validate the chosen methods in effectively capturing the underlying dynamics.

4.2.3. Model Stability Test

The Figure 3 presents the results of a CUSUM (Cumulative Sum of Recursive Residuals) test, with the green line representing the cumulative sum of the residuals and the dashed red lines denoting the 5% significance level boundaries. The CUSUM test is used to assess the stability of the estimated model parameters over time, which is important for conducting ARDL, FMOLS, and CCR methods. The CUSUM line remains within these critical bounds, indicating that the estimated model parameters are stable over time. Although there are noticeable fluctuations, especially at certain points, the fact that the line does not cross the significance boundaries suggests that there is no evidence of structural instability in the

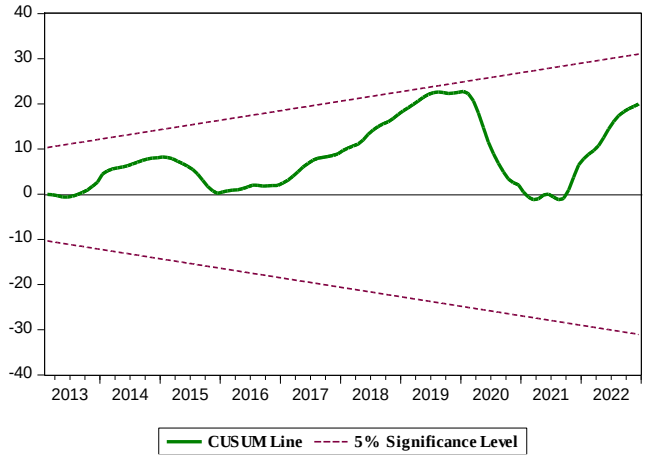


Figure 3. Results of CUSUM test.

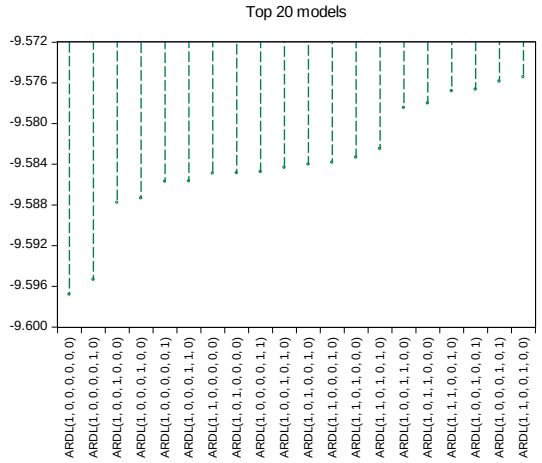


Figure 4. Results of the Akaike Information Criterion (AIC).

Table 6. Results of ARDL estimation.

Dependent Variable: lnCCI						
Independent	Long-run			Short-run		
Variables	**Coeff.**	**t-Stat.**	**Prob.**	**Coeff.**	**t-Stat.**	**Prob.**
lnGDP	0.5643	4.9971*	0.0000	0.0613	4.5065*	0.0000
lnGE	-0.1249	-3.1411*	0.0020	-0.0136	-3.6134*	0.0004
lnCPI	-0.2431	-4.4192*	0.0000	-0.0264	-3.7762*	0.0002
ITR	-0.0295	-2.3343**	0.0208	-0.0032	-2.9211*	0.0040
lnUNEMP	0.1284	4.0542*	0.0001	0.0139	4.5657*	0.0000
lnIDXC	-0.0149	-1.8024***	0.0734	-0.0016	-1.9238***	0.0562
C	-11.916	-3.6398*	0.0004	n/a	n/a	n/a
CointEq(-1)	n/a	n/a	n/a	-0.1087	-4.0019*	0.0001

Note: *, ** and *** indicates 1%, 5% and 10% significance level, respectively. 'n/a' denotes not applicable.

model. Given the stability of the model, the ARDL, FMOLS, and CCR methods are appropriate for examining the long-run relationships in this context. Overall, the results imply that the model maintains structural stability throughout the observed sample period.

4.2.4. ARDL Model Selection

The Figure 4 shows the Akaike Information Criterion (AIC) results for selecting the top 20 ARDL models. Lower AIC values indicate better model fit, and models are arranged from left (best fit) to right (worse fit) based on their AIC values. The upward trend in AIC values across models suggests that the fit decreases as we move from the optimal model. The dashed lines represent the AIC values for each model, highlighting differences in performance among various lag structures and combinations. The best-fitting model is ARDL(1,0,0,0,0,0,0), thus indicating it provides the most suitable specification for the data.

4.3. Results of Main Method: ARDL

The ARDL estimation results in Table 6 illustrate the effects of various macroeconomic independent variables on lnCCI, with all variables showing statistically significant impacts in both the long run and the short run. In the long run, lnGDP has a coefficient of 0.5643, indicating that a 1% increase in GDP leads to an approximate 0.56% rise in consumer confidence, demonstrating a positive relationship. Conversely, lnGE has a negative coefficient of -0.1249, suggesting that a 1% increase in government expenditure is associated with a 0.125% decline in consumer confidence. Similarly, lnCPI negatively affects consumer confidence, with a coefficient of -0.2431, meaning that a 1% increase in consumer prices reduces consumer confidence by 0.243%. The ITR variable has a negative long-run coefficient of -0.0295, indicating that a 1% increase in the interest rate leads to a 0.03% decline in consumer confidence. Interestingly, lnUNEMP displays a positive coefficient of 0.1284, indicating that a 1% increase in unemployment correlates with a 0.128% rise in consumer confidence—an unexpected result. The coefficient for lnIDXC is -0.0149, suggesting a 0.015% reduction in consumer confidence for every 1% increase in stock prices. Lastly, the constant term is -11.916, representing the baseline level of the dependent variable when all predictors are set to zero.

In the short run, lnGDP maintains a positive effect with a coefficient of 0.0613, meaning a 1% increase in GDP raises consumer confidence by approximately 0.061%. lnGE has a short-run negative coefficient of -0.0136, indicating that a 1% increase in government expenditure

Table 7. Results of FMOLS and CCR estimations.

Dependent Variable: lnCCI						
Independent	FMOLS			CCR		
Variables	**Coeff.**	**t-Stat.**	**Prob.**	**Coeff.**	**t-Stat.**	**Prob.**
lnGDP	0.3753	13.814*	0.0000	0.3753	13.835*	0.0000
lnGE	-0.0539	-5.7088*	0.0000	-0.0539	-5.7224*	0.0000
lnCPI	-0.1784	-12.365*	0.0000	-0.1784	-12.389*	0.0000
ITR	-0.0054	-1.8875***	0.0609	-0.0055	-1.8990***	0.0594
lnUNEMP	0.0660	9.2616*	0.0000	0.0660	9.2735*	0.0000
lnIDXC	-0.0045	-2.0744**	0.0396	-0.0044	-1.8682***	0.0636
C	-7.0745	-8.6465*	0.0000	-7.0775	-8.6788*	0.0000
S.E. of Regression	0.0055			0.0054		
Long-run Variance	0.0001			0.0001		

Note: *, ** and *** indicates 1%, 5% and 10% significance level, respectively.

results in a 0.014% decline in consumer confidence. Similarly, lnCPI has a short-run coefficient of -0.0264, suggesting that a 1% increase in consumer prices leads to a 0.026% drop in consumer confidence. The ITR also exhibits a negative impact in the short run, with a coefficient of -0.0032, implying that a 1% rise in the interest rate reduces consumer confidence by 0.003%. lnUNEMP shows a positive short-run effect with a coefficient of 0.0139, indicating that a 1% increase in unemployment raises consumer confidence by approximately 0.014%. lnIDXC has a short-run coefficient of -0.0016, implying a 0.002% decrease in consumer confidence with each 1% rise in stock prices. The error correction term (CoinEq(-1)) is -0.1087 (p-value = 0.0001), showing that approximately 10.87% of the previous period's disequilibrium is corrected each period, reflecting a strong speed of adjustment toward long-run equilibrium.

Overall, the findings reveal that GDP growth positively influences consumer confidence in both the long and short run, whereas government expenditure, consumer prices, interest rates, and stock price index generally have negative impacts. The positive relationship between unemployment and consumer confidence in both timeframes is unexpected and warrants further investigation. The model also highlights significant adjustment dynamics, suggesting that consumer confidence quickly responds to short-term changes while gradually aligning with long-run equilibrium levels.

4.4. Results of Robustness Check: FMOLS and CCR

Table 7 presents the results of the FMOLS and CCR estimations, conducted as robustness checks for the long-term results of the ARDL model. Starting with the FMOLS estimation, all variables show statistically significant effects. lnGDP has a positive coefficient of 0.3753, suggesting that a 1% increase in GDP leads to a 0.375% rise in consumer confidence. lnGE has a negative coefficient of -0.0539, indicating that a 1% increase in government spending results in a 0.054% decrease in consumer confidence. Similarly, lnCPI shows a negative relationship with consumer confidence, with a coefficient of -0.1784, implying that a 1% rise in consumer prices reduces consumer confidence by 0.178%. The ITR exhibits a negative coefficient of -0.0054, indicating that a 1% increase in interest rates leads to a 0.005% decrease in consumer confidence. Additionally, lnUNEMP has a positive and significant coefficient of 0.0660, meaning a 1% increase in unemployment is associated with a 0.066% increase in consumer confidence. Lastly, lnIDXC has a negative coefficient of -0.0045, indicating that a 1% increase in this variable corresponds to a 0.0045% reduction in consumer confidence. The constant term is -7.0745, representing the model's intercept.

The CCR estimation yields similar results to FMOLS, with all variables also statistically significant. Here, lnGDP again shows a positive coefficient of 0.3753, suggesting that a 1% increase in GDP results in a 0.375% rise in consumer confidence. The coefficient for lnGE remains negative at -0.0539, indicating that a 1% increase in government expenditure decreases consumer confidence by 0.054%. For lnCPI, the coefficient is -0.1784, confirming that a 1% rise in consumer prices reduces consumer confidence by 0.178%. The ITR again shows a negative coefficient, this time -0.0055, implying that a 1% rise in interest rates reduces consumer confidence by 0.006%. lnUNEMP shows a positive and significant coefficient of 0.0660, once more indicating a positive relationship with consumer confidence. Finally, lnIDXC has a coefficient of -0.0044, indicating a marginally significant negative effect on consumer confidence. The constant term is -7.0775, representing the intercept. In summary, the FMOLS and CCR estimations yield results consistent with the ARDL findings, thereby reinforcing the robustness of the ARDL results.

4.5. Discussion

The findings of this study provide important evidence into the relationships between key macroeconomic indicators and consumer confidence in Indonesia. As one of world's

largest consumer markets, understanding these dynamics is crucial for formulating policies that sustain economic growth and promote financial stability. This discussion elaborates on the effects of each macroeconomic factor on consumer sentiment, offering a nuanced interpretation of the results. While the study reveals expected patterns for most variables, some findings challenge conventional wisdom, highlighting the complexity of consumer behavior in the Indonesian context.

The results indicate that economic growth (GDP) has a significant positive effect on consumer confidence in both the short and long term. This finding aligns with the Keynesian perspective, where higher GDP growth signals a robust economy, encouraging households to feel optimistic about their financial future [24]. As economic expansion creates job opportunities and boosts incomes, it fosters consumer sentiment, ultimately leading to increased spending [25, 96]. This relationship underscores the critical role of sustained economic growth in bolstering consumer confidence and suggests that policies focused on maintaining stable GDP growth are essential for enhancing economic stability and consumer optimism.

Government expenditure, on the other hand, has a counterintuitive negative impact on consumer confidence. While increased public spending typically stimulates economic activity, the negative effect observed may stem from concerns about fiscal sustainability, higher future taxation, or inefficient allocation of resources [79, 97]. For instance, excessive or misdirected government expenditure could lead to public skepticism regarding the long-term health of the economy, eroding confidence [98]. This highlights the importance of strategic and transparent fiscal policies to maximize the positive impact of government spending on economic sentiment.

The consumer price index (CPI) negatively affects consumer confidence, consistent with economic theory. Rising prices erode purchasing power, making households less optimistic about their ability to afford goods and services [99]. High inflation can also introduce uncertainty about the future, further dampening consumer sentiment [81]. This finding underscores the need for effective inflation management through monetary and fiscal measures to maintain consumer confidence and ensure stable economic conditions.

Interest rates are found to negatively influence consumer confidence, both in the short and long term. Higher interest rates increase the cost of borrowing, discouraging consumption and investment [100]. Additionally, they raise the cost of debt servicing for households, reducing disposable income and financial security [101]. These results reinforce the significance of prudent monetary policy in balancing the need for controlling inflation while maintaining consumer confidence levels.

Interestingly, unemployment shows a positive relationship with consumer confidence, a result that challenges conventional expectations. This outcome may reflect unique labor market dynamics in Indonesia, where rising unemployment could coincide with increased government intervention or social support mechanisms that boost household confidence [82, 102]. Alternatively, this finding might indicate statistical peculiarities that warrant further investigation to disentangle potential confounding effects and clarify the true nature of this relationship.

Lastly, the composite stock price index negatively impacts consumer confidence. Declining consumer sentiment with rising stock prices could stem from perceptions of economic inequality or volatility in financial markets. When stock markets flourish, benefits may not trickle down to the broader population, leading to skepticism among consumers about the overall economic direction [103, 104]. This finding also underscores potential gaps in financial inclusion and accessibility. Policymakers and financial institutions could address these disparities by promoting equitable financial access and reducing perceived inequality can help bridge the gap between stock market performance and consumer confidence.

Together, these findings highlight the multifaceted relationships between macroeconomic factors and consumer confidence in Indonesia. While GDP growth consistently supports consumer sentiment, other variables like inflation, interest rates, and government spending require careful management to avoid unintended adverse effects. The study also reveals complexities in the effects of unemployment and stock prices, calling for deeper investigation into their underlying mechanisms. Policymakers must adopt an integrated approach that balances economic growth, fiscal responsibility, monetary stability, and financial inclusivity to foster a resilient consumer base and a robust economic environment. Businesses, too, can leverage these insights to better align their strategies with consumer sentiment, adapting to changes in the macroeconomic landscape to ensure sustainable success.

5. Conclusions, Implications and Limitations

This study provides a comprehensive analysis of the relationships between consumer confidence and key

macroeconomic indicators in Indonesia. The findings reveal that both in the short and long term, economic growth positively influences consumer confidence, while government expenditure, inflation, interest rates, and stock prices negatively affect it. An unexpected positive relationship between unemployment and consumer confidence highlights unique local dynamics that warrant further exploration. These results underline the importance of managing macroeconomic factors to sustain consumer optimism, which is vital for economic stability and growth, and business success. A thriving consumer sentiment can drive demand for goods and services, creating a multiplier effect that stimulates broader economic activity.

The study's implications for policymakers are significant, emphasizing the need for a balanced approach to macroeconomic management. Economic growth must remain a priority, given its consistently positive effect on consumer confidence. Policymakers should also address the adverse impacts of inflation and interest rates by implementing targeted monetary policies that stabilize prices and promote affordable credit access. Strategic fiscal management is crucial to counteract the negative perception of government spending, ensuring that expenditures are both efficient and transparent. Moreover, enhancing labor market policies to align with consumer expectations and perceptions of job security can mitigate unexpected effects observed in this study. A focus on inclusive economic policies that promote stability and equity will further strengthen consumer sentiment.

Businesses can also draw valuable insights from the findings to adapt their strategies to changes in consumer confidence. In periods of economic growth, companies can capitalize on heightened consumer sentiment by launching new products, expanding services, or increasing investments. Conversely, during periods of inflation or rising interest rates, businesses may need to adopt strategies that enhance affordability and offer value to cost-sensitive consumers. The negative relationship between stock prices and consumer confidence suggests that businesses in financial sectors should prioritize building trust and fostering inclusivity to counteract public skepticism. Overall, aligning business strategies with macroeconomic trends will help firms navigate market fluctuations and better cater to consumer needs.

This study offers valuable insights into the relationship between consumer confidence and macroeconomic indicators in Indonesia, but it is not without limitations. First, its findings are specific to Indonesia, and the unique local dynamics, such as the unexpected positive relationship between unemployment and consumer confidence, may not be generalizable to other countries. Broader studies encompassing multiple countries or regions could provide a more comprehensive understanding of these relationships and allow for cross-country comparisons. Second, the study primarily focuses on macroeconomic indicators, potentially overlooking other important factors such as cultural, social, and psychological influences on consumer confidence. Including these dimensions in future research could yield a more nuanced analysis. Lastly, while the study captures key macroeconomic variables, the complexity of their interactions over time may require advanced econometric models or a longitudinal approach for deeper insights. Addressing these limitations in future research could enhance the robustness and applicability of the findings.

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