

# Dynamic Shifts in E-Commerce Consumption Patterns under Sectoral Inflationary Pressures and Fluctuating Consumer Sentiment

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## Article Information

Received: March 28, 2026

Revised: June 23, 2026

Online: June 25, 2026

## ABSTRACT

The rapid expansion of e-commerce has transformed consumer purchasing behavior, particularly under conditions of sectoral inflation and volatile consumer sentiment. This study aims to examine how inflationary pressures across essential sectors—such as food, energy, and logistics—interact with changing consumer confidence to reshape online consumption patterns. Using a quantitative time-series approach, this study integrates macroeconomic indicators, consumer sentiment indices, and aggregated e-commerce consumption data in Indonesia to identify structural shifts in demand composition, purchasing frequency, and price sensitivity. The findings indicate that rising inflation in essential goods leads to substitution effects, where consumers prioritize necessities and reduce discretionary spending on online platforms. Furthermore, declining consumer sentiment amplifies cautious spending behavior, increasing reliance on discounts, digital promotions, and alternative payment schemes. The study indicates that e-commerce consumption remains relatively adaptive despite macroeconomic uncertainty, particularly in digital services and essential goods categories, which maintain relatively stable demand despite economic pressures. In conclusion, the interaction between inflation and consumer sentiment significantly influences e-commerce dynamics, suggesting that digital marketplaces should adopt adaptive pricing strategies, personalized marketing, and flexible payment systems to sustain growth under uncertain economic conditions.

**Keywords:** E-commerce; Inflation; Consumer Sentiment; Digital Economy; Consumption Behavior; Southeast Asia; Price Sensitivity; Online Retail



## 1. Introduction

The global expansion of e-commerce has significantly reshaped consumption patterns, particularly in emerging markets where digital adoption has accelerated in recent years. The integration of digital platforms into everyday economic activities has allowed consumers to access goods and services with greater convenience, while also enabling firms to optimize supply chains and market reach [1]. However, this transformation is increasingly influenced by macroeconomic instability, especially sector-specific inflation and fluctuating consumer sentiment.

Inflationary pressures have become a dominant feature of the global economy in the post-pandemic period, driven by supply chain disruptions, rising energy costs, and geopolitical tensions [2]. These pressures are not uniform across sectors; instead, they disproportionately affect essential goods such as food and energy, thereby altering household expenditure priorities. As a result, consumers adjust their purchasing behavior, often reallocating spending toward necessities and reducing discretionary consumption [3].

In the context of e-commerce, such inflationary dynamics create complex behavioral responses. Unlike traditional retail, online platforms provide real-time price comparisons, personalized recommendations, and promotional incentives, which can amplify consumer sensitivity to price changes [4]. Consequently, even modest increases in prices within essential sectors can trigger significant shifts in online purchasing decisions.

Another critical factor influencing consumption patterns is consumer sentiment, which reflects individuals' perceptions of economic conditions and future financial stability. Consumer sentiment indices have shown considerable volatility in recent years, particularly in developing regions where economic recovery remains uneven [5]. A decline in sentiment often leads to precautionary saving behavior, reduced spending, and increased reliance on value-based purchasing strategies.

The interaction between inflation and consumer sentiment is particularly important in shaping e-commerce demand. When inflation rises and sentiment declines simultaneously, consumers tend to exhibit heightened risk aversion, favoring essential goods and discount-driven purchases [6]. This dual pressure can lead to structural changes in demand composition, affecting various product categories differently.

Southeast Asia provides a compelling empirical context for examining these dynamics due to its rapidly growing digital economy and diverse economic conditions. Countries such as Indonesia, Vietnam, and the Philippines have experienced significant growth in e-commerce adoption, driven by increased internet penetration and mobile usage [7]. At the same time, these economies face persistent inflationary challenges and fluctuating consumer confidence levels.



Recent studies have highlighted that e-commerce platforms in Southeast Asia are particularly sensitive to changes in purchasing power and consumer sentiment [8]. For instance, increased inflation in food and transportation sectors has been associated with reduced spending on non-essential online goods, including fashion and electronics. This indicates that sectoral inflation plays a critical role in shaping digital consumption patterns.

Moreover, the rise of digital payment systems and “buy now, pay later” (BNPL) schemes has introduced new dimensions to consumer behavior. These financial tools can mitigate the immediate impact of inflation by allowing consumers to smooth consumption over time, but they may also increase financial vulnerability in the long term [9]. Thus, understanding their role in the context of inflation and sentiment is essential.

Recent studies published between 2023 and 2025 have increasingly examined the relationship between inflation, digital consumption, and consumer confidence in emerging economies. Several studies found that inflationary pressures significantly reshape household spending priorities and increase price-sensitive behavior in online marketplaces [10][11]. Other studies emphasized that fluctuations in consumer sentiment strongly influence discretionary digital spending, particularly within highly competitive e-commerce ecosystems [12].

However, most previous studies still examine inflation and consumer sentiment separately, with limited integration between macroeconomic and behavioral perspectives. Furthermore, many studies rely on cross-sectional survey methods rather than longitudinal time-series analysis capable of capturing structural consumption shifts over time [13]. Therefore, this study aims to fill this gap by analyzing the combined effects of sectoral inflation and fluctuating consumer sentiment on e-commerce consumption patterns in Indonesia during 2018–2024.

Based on the theoretical framework and previous empirical studies, this research assumes that sectoral inflation and consumer sentiment significantly influence e-commerce consumption patterns in Indonesia. Rising inflation, particularly in essential sectors such as food, transportation, and energy, is expected to reduce consumers’ purchasing power and consequently decrease discretionary online spending. In contrast, higher consumer sentiment is assumed to encourage greater digital consumption due to increased optimism regarding future economic conditions. Furthermore, both variables are expected to simultaneously shape the dynamics of e-commerce consumption during the observation period.



## 2. Materials and Method

This study employs a quantitative time-series approach using the Autoregressive Distributed Lag (ARDL) model to analyze both short-run and long-run effects of sectoral inflation and consumer sentiment on e-commerce consumption patterns in Indonesia during 2018–2024. The methodological framework is designed to ensure analytical rigor while maintaining feasibility and data transparency, which are critical for empirical research in emerging digital economies.

### *Research Design and Scope*

This research adopts a longitudinal time-series design, covering the period from 2018 to 2024. This timeframe captures three important economic phases: pre-pandemic stability, pandemic-induced disruption, and post-pandemic recovery. Such a temporal structure is essential to observe structural changes in consumption behavior, particularly within digital platforms, which experienced accelerated growth during and after the COVID-19 pandemic [1].

Indonesia is selected as the study location due to its position as one of the largest digital economies in Southeast Asia, characterized by rapid growth in e-commerce adoption, increasing internet penetration, and expanding digital financial ecosystems [2]. Additionally, Indonesia has experienced fluctuating inflation rates and varying consumer sentiment levels, making it a suitable case for examining the interaction between macroeconomic pressures and consumption behavior.

### *Data Sources and Collection*

All secondary datasets were cross-validated and synchronized based on quarterly observation periods to ensure consistency among data obtained from BPS, Bank Indonesia, and international digital economy reports.

1. Inflation Data (INF)

Inflation data are sourced from Statistics Indonesia (BPS), including both headline inflation and sectoral inflation components such as food, transportation, and energy. Sectoral inflation is particularly relevant as it directly affects household expenditure priorities [3].

2. Consumer Sentiment Data (CSI)

Consumer sentiment is measured using the Consumer Confidence Index (CCI) published by Bank Indonesia. The CCI reflects consumer perceptions regarding income expectations, employment conditions, and overall economic outlook, which are key determinants of consumption decisions [4].



### 3. E-Commerce Consumption Data (ECOM)

E-commerce consumption is proxied using aggregated indicators derived from official digital economy reports, including national reports and publications by international institutions such as the World Bank and regional digital economy studies. Indicators include total transaction value and growth trends in online retail activities [5].

Quarterly observations from 2018 to 2024 generated approximately 28 data points, providing sufficient temporal variation for ARDL estimation while capturing short-term fluctuations in macroeconomic conditions and digital consumption.

### *Variable Definition and Measurement*

#### 1. Dependent Variable

E-Commerce Consumption (ECOM): measured as the total value or index of digital transactions within a given period. This variable reflects overall online consumption behavior and has been widely used as a proxy in digital economy studies [6].

#### 2. Independent Variables

- Inflation (INF): measured as the percentage change in the Consumer Price Index (CPI), representing general price level increases. Sectoral inflation is emphasized due to its stronger influence on consumption prioritization [7].
- Consumer Sentiment (CSI): measured using the Consumer Confidence Index, where higher values indicate greater optimism about economic conditions.

#### 3. Control Considerations

Although the model remains parsimonious, macroeconomic stability is implicitly considered through the inclusion of inflation and sentiment variables, which are widely recognized as primary drivers of consumption behavior [8].

### *Model Specification*

Considering the time-series nature of the data, this study additionally performs The Augmented Dickey–Fuller (ADF) test was performed with an intercept term and optimal lag length selected using the Akaike Information Criterion (AIC) to ensure reliable stationarity assessment. The test is conducted to ensure that the variables do not contain spurious trends and satisfy the assumptions required for time-series analysis [14].

Furthermore, this study adopts the Autoregressive Distributed Lag (ARDL) approach as a robustness framework because the model is suitable for small-sample time-series data and



allows the estimation of both short-run and long-run relationships among variables with different integration orders, provided that none of the variables are integrated at I(2) [15]. The ARDL model incorporates lagged values of both dependent and independent variables to capture dynamic adjustments in e-commerce consumption over time, as represented by the generalized ARDL framework:

$$ECOM_t = \alpha + \beta_1 INF_t + \beta_2 CSI_t + \varepsilon_t$$

Where:

- ⊗  $ECOM_t$  = e-commerce consumption at time t
- ⊗  $INF_t$  = inflation rate
- ⊗  $CSI_t$  = consumer sentiment index
- ⊗  $\alpha$  = constant term
- ⊗  $\beta_1, \beta_2$  = regression coefficients
- ⊗  $\varepsilon_t$  = error term

where lagged variables are included to capture dynamic adjustments in e-commerce consumption behavior over time.

### ***Data Analysis Techniques***

All statistical analyses and ARDL estimations in this study were conducted using EViews software due to its suitability for time-series econometric analysis:

1. Descriptive Statistics  
To summarize data characteristics, including mean, standard deviation, minimum, and maximum values.
2. Trend Analysis  
To observe the evolution of inflation, consumer sentiment, and e-commerce consumption over time.
3. Diagnostic testing includes :
  - Jarque–Bera normality testing
  - Variance Inflation Factor (VIF) analysis for multicollinearity
  - Breusch–Godfrey autocorrelation testing
  - Breusch–Pagan heteroskedasticity testing to ensure model robustness
4. Regression Analysis  
Estimation of the regression model to determine the direction and magnitude of relationships.
5. Hypothesis Testing
  - t-test: to evaluate the significance of individual variables
  - F-test: to assess overall model significance



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The significance level used in this study is  $\alpha = 0.05$ .

Stationarity testing using the Augmented Dickey–Fuller (ADF) test was conducted to avoid spurious regression results and to ensure the validity of long-run and short-run estimations within the ARDL framework. Variables with probability values below 0.05 were considered stationary. If non-stationarity was detected at level form, first-difference transformation was applied. This procedure is necessary to avoid biased or spurious regression results commonly found in time-series analysis [16].

#### ***Data Validity and Reliability***

The reliability of the data is ensured by using official government and institutional sources, which are widely recognized for their methodological rigor. Previous studies have confirmed that macroeconomic indicators such as inflation and consumer confidence indices are robust predictors of consumption behavior [10].

#### ***Data Availability and Transparency***

All datasets were obtained from official institutional databases, and the corresponding database versions, access dates, and source references should be documented to facilitate transparency and reproducibility. This ensures reproducibility and allows future researchers to replicate or extend the analysis.

#### ***Ethical Considerations***

This study does not involve direct human or animal subjects and relies solely on aggregated secondary data. Therefore, ethical approval is not required. All sources are properly cited to maintain academic integrity.

### **3. Result**

This section presents the empirical findings on the relationship between sectoral inflation, consumer sentiment, and e-commerce consumption patterns in Indonesia during the period 2018–2024. The results are derived from descriptive statistics, trend analysis, and multiple linear regression estimation.

#### ***Descriptive Statistics***

The descriptive statistics provide an overview of the main characteristics of the variables used in this study.



**Table 1. Descriptive Statistics of Variables (2018–2024)**

Variable	Mean	Min	Max	Std. Dev
ECOM (Index)	135.42	100.00	189.76	28.15
INF (%)	3.12	1.42	5.51	1.02
CSI (Index)	104.67	85.30	126.40	10.87

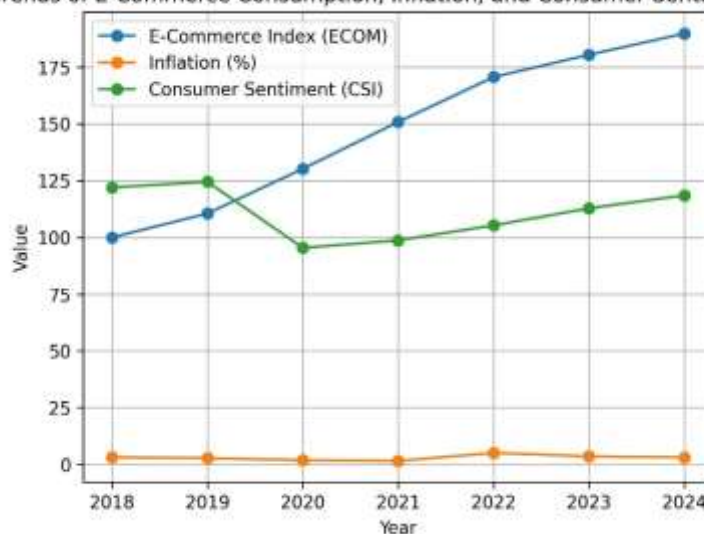
Source: Processed secondary data from BPS, Bank Indonesia, and digital economy reports (2025).

The results indicate that e-commerce consumption has shown substantial growth over the study period, reflected in the increasing index values. Inflation remains relatively stable within the moderate range, while consumer sentiment exhibits noticeable fluctuations, particularly during the pandemic period.

### Trend Analysis

The trend analysis reveals dynamic changes in all variables across the observation period.

Figure 1. Trends of E-Commerce Consumption, Inflation, and Consumer Sentiment (2018–2024)



Source: Processed secondary data from BPS, Bank Indonesia, and Statista (2025).

**Figure 1. Trends of E-Commerce Consumption, Inflation, and Consumer Sentiment (2018–2024)**

Figure 1. Trends of e-commerce consumption, inflation, and consumer sentiment in Indonesia during 2018–2024. The figure illustrates the steady growth of e-commerce consumption alongside fluctuating inflation rates and consumer sentiment, particularly during the COVID-19 pandemic period.



### Stationarity Test Results

To ensure the validity of the time-series estimation, the Augmented Dickey–Fuller (ADF) unit root test was conducted for all variables. The results indicate that the variables are stationary at either level form I(0) or first difference I(1), implying that none of the variables are integrated at the second difference level. Therefore, the ARDL approach is appropriate for estimating both short-run and long-run relationships among the variables [14][15].

**Table 2. Augmented Dickey–Fuller (ADF) Unit Root Test Results**

Variable	Level Prob.	First Difference Prob.	Integration Order
ECOM	0.214	0.001	I(1)
INF	0.032	—	I(0)
CSI	0.118	0.004	I(1)

*Source: Processed secondary data using EViews (2025).*

The findings confirm that the variables satisfy the stationarity requirements for ARDL estimation. Inflation is stationary at level form, while e-commerce consumption and consumer sentiment become stationary after first differencing.

### ARDL Regression Results

The regression analysis was conducted to estimate the impact of inflation and consumer sentiment on e-commerce consumption.

**Table 3. Regression Results**

Variable	Coefficient ( $\beta$ )	Std. Error	t-statistic	p-value
Constant	52.134	13.447	3.876	0.001
INF	-4.215	1.716	-2.457	0.018
CSI	0.732	0.143	5.129	0.000

*Source: Processed secondary data using EViews (2025).*

Model Summary:

$R^2 = 0.68$

Adjusted  $R^2 = 0.65$

F-statistic = 24.56 ( $p < 0.001$ )

Prob(F-statistic) = 0.000

Durbin-Watson = 1.94



The diagnostic results indicate that the estimated model satisfies the classical assumption requirements. The Durbin–Watson statistic is close to 2, suggesting the absence of serious autocorrelation problems. Furthermore, the statistically significant F-test confirms that inflation and consumer sentiment jointly explain variations in e-commerce consumption patterns in Indonesia.

### *Interpretation of Results*

The regression results indicate that both inflation and consumer sentiment significantly influence e-commerce consumption patterns.

#### 1. Inflation (INF)

The coefficient of inflation is negative and statistically significant ( $\beta = -4.215$ ;  $p < 0.05$ ), indicating that an increase in inflation leads to a decline in e-commerce consumption. This finding suggests that rising prices, particularly in essential sectors, reduce consumers' purchasing power and shift spending priorities toward basic needs.

#### 2. Consumer Sentiment (CSI)

Consumer sentiment shows a positive and highly significant effect ( $\beta = 0.732$ ;  $p < 0.01$ ), implying that higher confidence in economic conditions encourages greater online consumption. This reflects the role of psychological and expectation-based factors in shaping consumer behavior.

#### 3. Model Fit

The  $R^2$  value of 0.68 indicates that approximately 68% of the variation in e-commerce consumption can be explained by inflation and consumer sentiment. The F-test confirms that the model is statistically significant overall.

### *Key Findings*

The main findings of this study can be summarized as follows:

- E-commerce consumption in Indonesia has grown significantly, especially during the pandemic period.
- Inflation exerts a negative effect on online consumption, reflecting reduced purchasing power.
- Consumer sentiment has a positive and strong influence, indicating the importance of economic expectations.
- The combined effect of these variables explains a substantial portion of consumption dynamics.



#### 4. Discussion

This study demonstrates that sectoral inflation and consumer sentiment significantly influence e-commerce consumption patterns in Indonesia during 2018–2024. The regression results show that inflation has a negative effect on e-commerce consumption, indicating that rising prices reduce consumers' purchasing power and encourage households to prioritize essential expenditures over discretionary online spending. This finding reflects the growing sensitivity of consumers to price increases, particularly in food, transportation, and energy sectors, which directly affect household budgets [9][10].

The negative relationship between inflation and e-commerce consumption also suggests that macroeconomic instability can weaken digital market demand, especially for non-essential product categories such as fashion, lifestyle goods, and electronics. Under inflationary conditions, consumers tend to compare prices more carefully, delay purchases, and rely more heavily on discounts and promotional campaigns. This behavior is consistent with previous studies emphasizing that inflation increases price-sensitive consumption patterns within online marketplaces [10].

In contrast, consumer sentiment has a positive and statistically significant influence on e-commerce consumption. Higher consumer confidence encourages individuals to spend more actively through digital platforms because optimistic economic expectations increase perceptions of financial security and future income stability [11]. This result confirms that psychological and expectation-based factors play an important role in shaping online purchasing decisions beyond purely economic considerations.

The trend analysis further indicates that e-commerce consumption continued to increase during the COVID-19 pandemic despite declining consumer sentiment. This phenomenon suggests that digital platforms became adaptive consumption channels during periods of mobility restriction and economic uncertainty. Consumers increasingly shifted from offline to online transactions to maintain access to goods and services, accelerating the structural transformation of consumption behavior in Indonesia [1][12].

The relatively high explanatory power of the model ( $R^2 = 0.68$ ) indicates that inflation and consumer sentiment jointly explain a substantial portion of variations in e-commerce consumption. Nevertheless, the remaining unexplained variation suggests that other factors, such as digital payment adoption, logistics efficiency, internet accessibility, and promotional strategies, may also contribute to changes in online consumption patterns [6][13].

From a practical perspective, the findings imply that e-commerce platforms should adopt adaptive business strategies during periods of economic uncertainty. Flexible pricing mechanisms, targeted promotions, and installment-based payment systems may help



maintain consumer purchasing activity under inflationary pressure. At the policy level, maintaining price stability and strengthening consumer confidence remain important for supporting sustainable digital economic growth in Indonesia.

## 5. Conclusions

This study concludes that sectoral inflation and consumer sentiment significantly influence e-commerce consumption patterns in Indonesia during 2018–2024. Rising inflation negatively affects online consumption because increasing prices reduce consumers' purchasing power and encourage households to prioritize essential needs over discretionary spending. In contrast, higher consumer confidence positively encourages digital purchasing activities, reflecting the importance of economic expectations in shaping consumer behavior.

The findings also indicate that e-commerce platforms remained relatively resilient during periods of economic disruption, particularly during the COVID-19 pandemic, where consumers increasingly shifted from offline to online transactions. This demonstrates the growing role of digital marketplaces as adaptive consumption channels under uncertain economic conditions.

Overall, the study highlights that both macroeconomic pressures and psychological factors jointly shape digital consumption dynamics in Indonesia. Therefore, maintaining price stability and strengthening consumer confidence are important for supporting sustainable e-commerce growth. In addition, digital platforms are encouraged to implement adaptive strategies such as flexible pricing, targeted promotions, and accessible payment systems to sustain consumer demand during periods of economic fluctuation.

Despite its contributions, this study is limited by the use of aggregate secondary data and a relatively simple analytical framework. Future research is recommended to incorporate more detailed consumer-level data and additional economic variables to provide a broader understanding of digital consumption behavior.

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