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Consumption and GDP within the Greek Economy. A statistical analysis for the time range of 2013 - 2023

Abstract

This study analyses the relationship among Greece's Gross Domestic Product (GDP), Consumer Price Index (CPI), and Private Final Consumption Expenditure (PFCE) from 2013 to 2023, a period marked by economic instability and post-crisis adjustment. Using quarterly data and an Ordinary Least Squares (OLS) regression framework, the research investigates whether consumption and price levels significantly explain changes in GDP. Moreover, extensive diagnostic testing was applied, including assessments for normality, autocorrelation, heteroskedasticity, model specification and covariance relations. Furthermore, results show highly volatile CPI behavior, a crisis-skewed GDP distribution and a stable PFCE series. However, neither CPI nor PFCE proved statistically significant in explaining GDP fluctuations, and overall model explanatory power remained low. Findings suggest that the traditional consumption-led growth structure may have weakened during this decade due to external shocks, inflation instability and pandemic disruption. Finally, the study contributes contemporary empirical insight into Greece's evolving macroeconomic dynamics.

Introduction

The Greek economy has experienced a prolonged period of instability, marked by recession and external shocks including the COVID-19 pandemic. Historically, private consumption has served as the primary driver of domestic economic activity and a key contributor to GDP growth, influencing both expansionary phases and downturns. This study aims to clarify whether private consumption continues to play this central role in recent years by analyzing the contemporary relationship among GDP, consumption and price levels. Clarifying the persistence of this pattern is essential for economic forecasting, policy decisions, and growth planning.

This study investigates the relationship among GDP, Consumer Price Index (CPI), and Private Final Consumption Expenditure (PFCE) in Greece between 2013 and 2023. Using an econometric time-series approach, the analysis tests whether consumption continues to significantly influence GDP and whether price fluctuations affect output behavior over short-term and shock-driven cycles. The model is estimated using Ordinary Least Squares (OLS) with full diagnostic procedures to ensure validity, including tests for normality, autocorrelation, heteroskedasticity, and correct functional specification.

Literature Review

Private consumption has historically played a central role in shaping the trajectory of the Greek economy, accounting for a larger share of GDP than in most Eurozone economies. This structural feature is widely acknowledged in empirical research. Athanassiou and Tsouma (2017) provide clear evidence that consumption accounts for approximately 70% of Greek GDP, especially during the post-2000 period, and served as the driving factor of both pre-crisis expansion and subsequent recession. This dominance of consumption is supported by Sideris and Pavlou (2021), who show that household expenditure remains the largest component of aggregate demand in Greece, with its influence largely determined by disposable income and wealth. Together, these studies provide a basis for modeling GDP using private final consumption expenditure (PFCE), since consumption fluctuations substantially transmit into macroeconomic output.

However, the relationship between consumption and GDP in Greece cannot be understood solely through aggregate expenditure shares, it is also shaped by income distribution, wealth effects, and structural shifts. Marsellou's (2025) large-scale analysis of the Greek economy from 1960 to 2017 concludes that Greece operates under a wage-led demand regime, implying that increases in labour income stimulate consumption and, by extension, GDP growth. A later empirical application of the Bhaduri-Marglin framework, interpreted by Marsellou (2024), confirms this demand-led and wage-responsive structure across multiple decades of Greek data. These findings indicate that consumption is not only large in scale but also dynamically sensitive to income distribution, meaning that policies that improve household liquidity or wage share can strengthen aggregate demand.

Methodology

This study examines the effect of consumer price levels and private final consumption expenditure on GDP from 2013 to 2023 using time-series regression analysis. The classical Linear Regression Model (CLRM) is applied through Ordinary Least Squares (OLS), selected because it provides unbiased and efficient estimates when assumptions are satisfied and allows for reliable interpretation of coefficient significance (Gujarati and Porter, 2009). Consistent with Wooldridge's (2009) applied econometric framework, regression is appropriate where the aim is to measure how changes in explanatory variables translate into variation in economic output.

The estimated regression equation is specified with the below form, where GDP_t denotes total output at time t, $PFCE_t$ represents household consumption expenditure, and CPI_t measures the general consumer price level, and ε_t is the error term. Quarterly observations are used to ensure sufficient sample size and stronger inferential robustness.

$$GDP_t = \beta_0 + \beta_1 PFCE_t + \beta_2 CPI_t + \varepsilon_t$$

A full suite of diagnostic tests will be applied to ensure the reliability and validity of the regression results. Since time-series macroeconomic data often violate classical assumptions, each diagnostic forms an essential part of the empirical process.

Autocorrelation diagnostic procedures will be examined using the Durbin-Watson and Breusch-Godfrey tests. Serial correlation is common in macroeconomic series and, if ignored, may distort standard errors and hypothesis tests (Kumar, 2023).

In addition, Ordinary Least Squares (OLS) is used as the main estimation technique. However, OLS is only considered efficient when its assumptions hold, including homoskedasticity, no autocorrelation and, a correct functional form (Gujarati and Porter, 2009). Wooldridge (2009) emphasizes that OLS remains the appropriate foundation for macro-modeling, but only when supplemented with diagnostic checking.

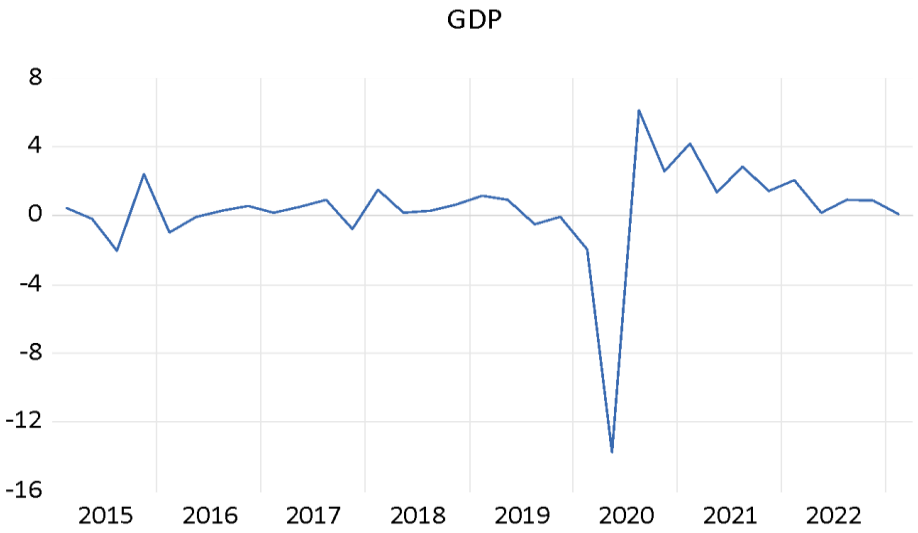
Moreover, Heteroskedasticity will be tested through the Breusch-Pagan-Godfrey approach. If residual variance is not constant, hypothesis testing becomes unreliable, and the model may require robust standard errors or transformation (Gujarati and Porter, 2009).

Furthermore, the Ramsey RESET test will be used to detect functional specification errors. Wooldridge (2009) identifies RESET as a standard diagnostic for identifying omitted variables or non-linearity, ensuring that the fitted model reflects the true underlying relationship.

Finally, covariance analysis will be included to assess how strongly independent variables move with GDP and with each other. Covariance patterns support understanding of linear interdependence and provide context for interpreting the regression structure alongside Variance Inflation Factor (VIF) values.

Results and Discussion of Findings

Figure 1



Source: Federal Reserve of St. Louis

A large negative drop in GDP occurred in Q2 2020, followed by an increase in GDP in Q3 2020. Specifically, the GDP increased by 7,65% between Q2 and Q3 of 2020.

Figure 2

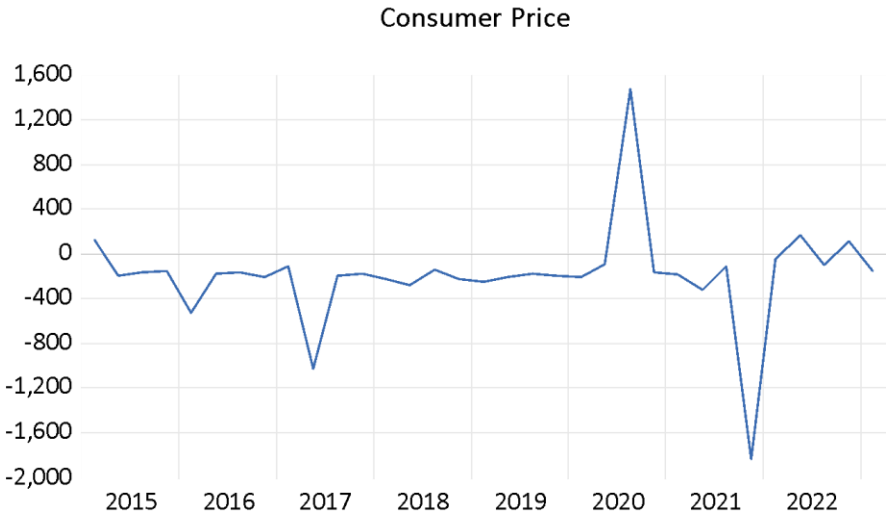
	GDP
Mean	0.373573
Median	0.532320
Maximum	6.129730
Minimum	-13.77611
Std. Dev.	2.998270
Skewness	-3.029308
Kurtosis	16.57436
Jarque-Bera	303.8340
Probability	0.000000
Sum	12.32791
Sum Sq. Dev.	287.6680
Observations	33

Source: Federal Reserve of St. Louis

The descriptive results show that the median exceeds the mean, indicating a left-skewed GDP distribution, meaning negative shocks dominated positive growth periods. This aligns with Athanassiou, E. and Tsouma E. (2017), who highlight Greece's strong dependence on consumption, making downturns particularly damaging.

The maximum reflects a positive shock, whereas the minimum is more than twice as large in the negative direction, suggesting crisis-driven contraction, consistent with Marsellou's (2024) findings on Greece's vulnerability under a wage and consumption-led regime. High standard deviation confirms volatility, as reflected in the "cafe economy" pattern described by Nikiforos, et al., (2025). Negative skewness and high kurtosis indicate heavy-tailed crisis behavior, consistent with Viren's (2023) argument that consumption-based economies are prone to unstable growth. The Jarque-Bera result (p=0) confirms non-normality, reinforcing the need for diagnostic testing as Gujarati and Porter (2009) and Wooldridge (2009) recommend.

Figure 3



Source: Federal Reserve of St. Louis

The Consumer Price graph indicates that prices fluctuate around zero, suggesting no obvious long-term upward or downward trend. However, there are two noticeable spikes. The first spike is positive with a sudden, sharp increase. The second spike is extremely negative. These spikes represent Q3 of 2020 and Q4 of 2021, possibly due to high inflation and deflation shocks.

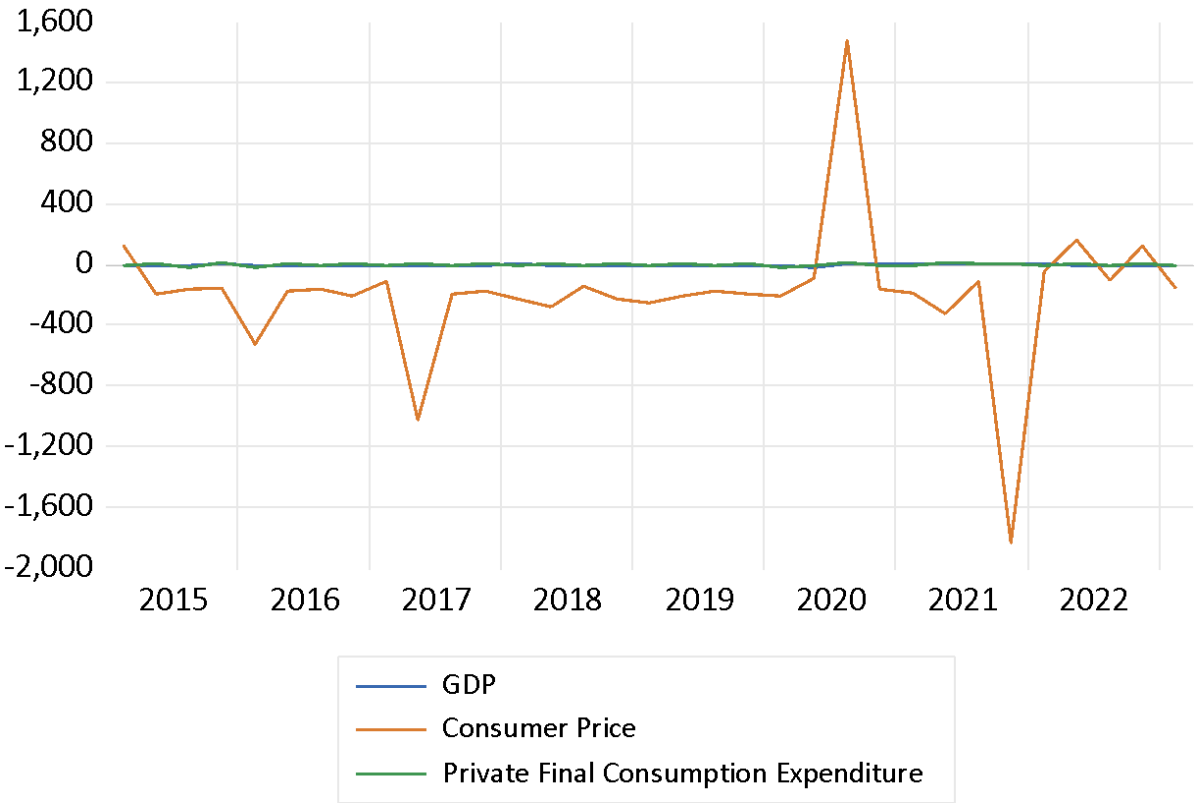
Figure 4

	CONSUMER PRICE
Mean	-184.6022
Median	-171.7520
Maximum	1474.479
Minimum	-1835.523
Std. Dev.	457.6243
Skewness	-0.153410
Kurtosis	11.42702
Jarque-Bera	97.77466
Probability	0.000000
Sum	-6091.871
Sum Sq. Dev.	6701439.
Observations	33

Source: Federal Reserve of St. Louis

The close values of mean and median suggest only a mild average price decline and a fairly symmetrical distribution with no persistent directional movement. However, the maximum, minimum, and high standard deviation indicate strong volatility, consistent with Maitra's (2025) view that price series often react to sudden economic shocks rather than follow stable patterns. The negative skewness and kurtosis above 10 further imply heavy-tailed crisis behavior, aligning with Athanassiou and Tsouma's (2017) findings that negative shocks in Greece's consumption-driven economy become disproportionately severe. Finally, the Jarque-Bera p-value rejects normality, indicating instability and extreme values.

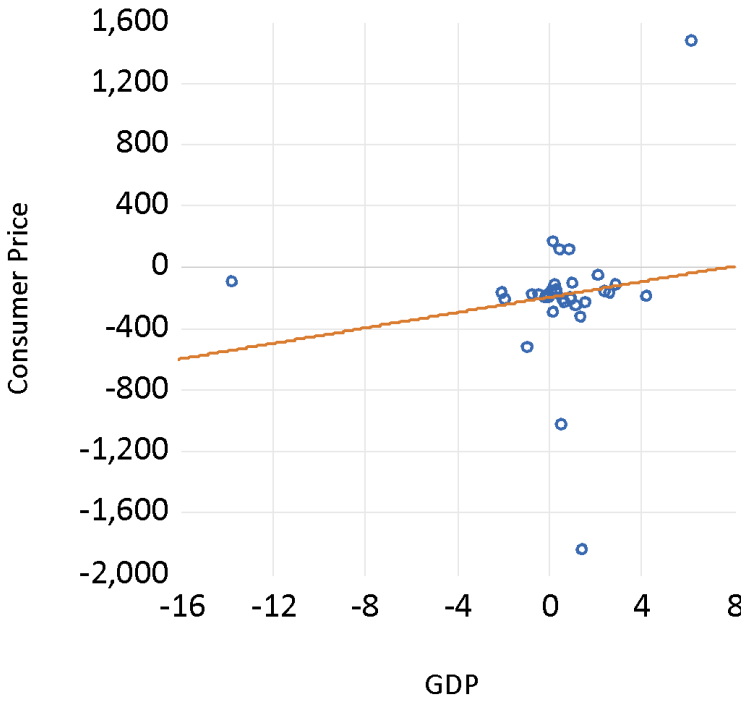
Figure 5



Source: Federal Reserve of St. Louis

The multivariate time series shows large CPI swings, with positive and negative inflation movements indicating sensitivity to economic shocks. CPI volatility exceeds fluctuations in GDP and PFCE, reflecting market instability likely linked to pandemic disruption. This behavior aligns with Maitra's (2025) view that price variables react sharply to external events rather than moving smoothly. GDP (blue) remains relatively stable aside from a previously observed major downturn, consistent with Athanassiou and Tsouma's (2017) findings on asymmetric shock transmission. PFCE (green) changes gradually, with no extreme shocks. No strong visual correlation appears between CPI spikes and GDP or PFCE.

Figure 6



Source: Federal Reserve of St. Louis

The scatter plot provides evidence of the relationship between consumer price and GDP, with the regression line indicating that higher GDP is associated with slightly higher price levels. This aligns with macroeconomic theory which suggests that increased economic activity boosts demand, placing upward pressure on prices. However, the pattern is weakly clustered, showing that the relationship is present but not strong.

Figure 7

Dependent Variable: GDP
Method: Least Squares
Date: 12/01/25 Time: 21:03
Sample: 2015Q1 2023Q1
Included observations: 33

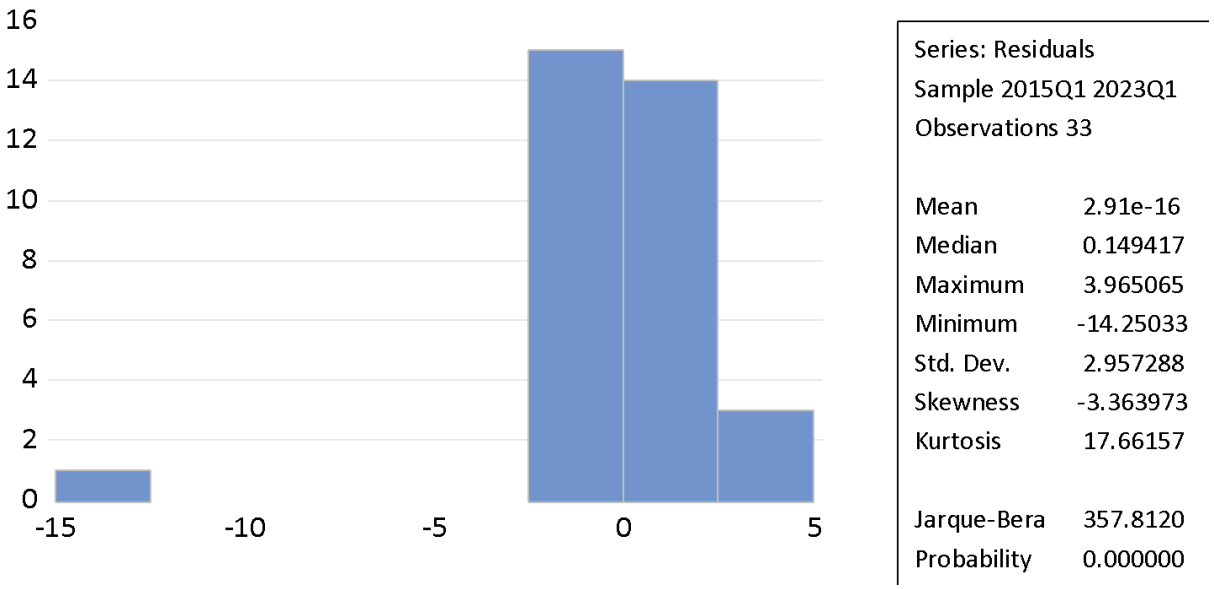
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSUMER PRICE	0.001080	0.001161	0.930137	0.3595
C	0.572864	0.565219	1.013525	0.3187

R-squared	0.027150	Mean dependent var	0.373573
Adjusted R-squared	-0.004232	S.D. dependent var	2.998270
S.E. of regression	3.004607	Akaike info criterion	5.096863
Sum squared resid	279.8576	Schwarz criterion	5.187560
Log likelihood	-82.09823	Hannan-Quinn criter.	5.127380
F-statistic	0.865154	Durbin-Watson stat	1.958586
Prob(F-statistic)	0.359487		

Source: Federal Reserve of St. Louis

The OLS regression shows no significant relationship between the two variables. The CP coefficient is positive but insignificant, with very low explanatory power and an F-statistic that is also insignificant.

Figure 8



Source: Federal Reserve of St. Louis

Most residuals cluster tightly near zero, but a few extreme values cause long tails. This indicates that the OLS model suffers from non-normal residuals and outliers, reducing the reliability of standard inference.

Figure 9

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.010365	Prob. F(2,29)	0.9897
Obs*R-squared	0.023573	Prob. Chi-Square(2)	0.9883

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 12/01/25 Time: 21:04
Sample: 2015Q1 2023Q1
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSUMER PRICE	0.000146	0.001572	0.092951	0.9266
C	0.026592	0.612712	0.043400	0.9657
RESID(-1)	0.034797	0.242266	0.143630	0.8868
RESID(-2)	0.003236	0.186718	0.017330	0.9863

R-squared	0.000714	Mean dependent var	2.91E-16
Adjusted R-squared	-0.102660	S.D. dependent var	2.957288
S.E. of regression	3.105378	Akaike info criterion	5.217360
Sum squared resid	279.6577	Schwarz criterion	5.398755
Log likelihood	-82.08644	Hannan-Quinn criter.	5.278394
F-statistic	0.006910	Durbin-Watson stat	2.000139
Prob(F-statistic)	0.999191		

Source: Federal Reserve of St. Louis

The Breusch-Godfrey Serial Correlation LM test indicates no evidence of serial correlation in the residuals. This can be presented through the values of F-statistics (p = 0.9897) and Chi-square (p= 0.9883) which, both p-values are above 0.05.

Figure 10

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.117562	Prob. F(1,31)	0.7340
Obs*R-squared	0.124674	Prob. Chi-Square(1)	0.7240
Scaled explained SS	0.916552	Prob. Chi-Square(1)	0.3384

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/01/25 Time: 21:05
Sample: 2015Q1 2023Q1
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.352144	6.706017	1.394590	0.1731
CONSUMER PRICE	0.004722	0.013771	0.342873	0.7340

R-squared	0.003778	Mean dependent var	8.480535
Adjusted R-squared	-0.028358	S.D. dependent var	35.15306
S.E. of regression	35.64802	Akaike info criterion	10.04396
Sum squared resid	39394.22	Schwarz criterion	10.13465
Log likelihood	-163.7253	Hannan-Quinn criter.	10.07447
F-statistic	0.117562	Durbin-Watson stat	1.968400
Prob(F-statistic)	0.734008		

Source: Federal Reserve of St. Louis

The Breusch-Pagan-Godfrey test shows that all p-values are above 0.05 as well (F-Statistic = 0.7340, Chi-square = 0.7240 and 0.3384). These values show that there is no evidence of heteroskedasticity in the model's residuals. Also shows that the Consumer Price Index is not significant in explaining the residual variance.

Figure 11

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: GDP CONSUMER_PRICE C

	Value	df	Probability
t-statistic	1.744275	30	0.0914
F-statistic	3.042495	(1, 30)	0.0914
Likelihood ratio	3.187704	1	0.0742

F-test summary:

	Sum of Sq	df	Mean Squares
Test SSR	25.76880	1	25.76880
Restricted SSR	279.8576	31	9.027666
Unrestricted SSR	254.0888	30	8.469628

LR test summary:

	Value
Restricted LogL	-82.09823
Unrestricted LogL	-80.50438

Unrestricted Test Equation:
Dependent Variable: GDP
Method: Least Squares
Date: 12/01/25 Time: 21:05
Sample: 2015Q1 2023Q1
Included observations: 33

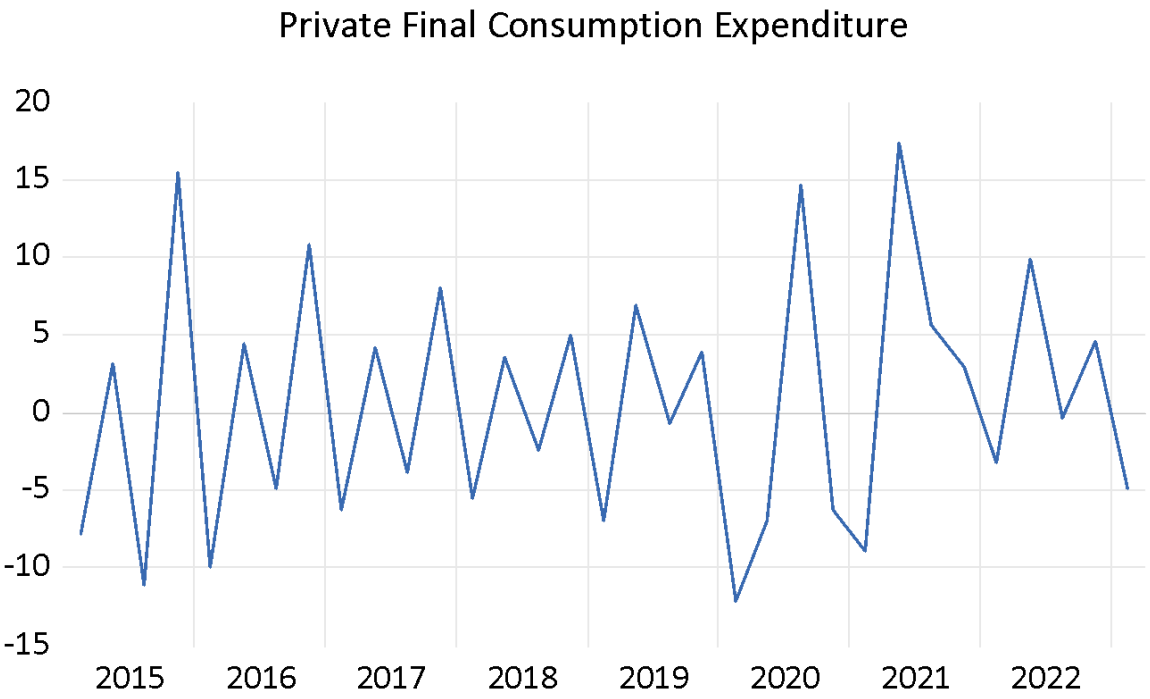
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSUMER_PRICE	0.000239	0.001223	0.195525	0.8463
C	-0.017794	0.643734	-0.027642	0.9781
FITTED^2	1.157566	0.663637	1.744275	0.0914

R-squared	0.116729	Mean dependent var	0.373573
Adjusted R-squared	0.057844	S.D. dependent var	2.998270
S.E. of regression	2.910263	Akaike info criterion	5.060872
Sum squared resid	254.0888	Schwarz criterion	5.196918
Log likelihood	-80.50438	Hannan-Quinn criter.	5.106647
F-statistic	1.982326	Durbin-Watson stat	1.723433
Prob(F-statistic)	0.155386		

Source: Federal Reserve of St. Louis

The Ramsey test's p-values are greater than 0.05, which shows that the null hypothesis of correct model specification cannot be rejected. Moreover, there is no strong evidence of functional form misspecification, but the p-values suggest a marginal indication that a non-linear term might slightly improve the model.

Figure 12



Source: Federal Reserve of St. Louis

The graph shows a stationary series fluctuating around zero with frequent up-and-down movements and several noticeable spikes. There is no clear trend, but the pattern indicates high short-term volatility and occasional large deviations, suggesting the variable experiences repeated shocks rather than smooth changes.

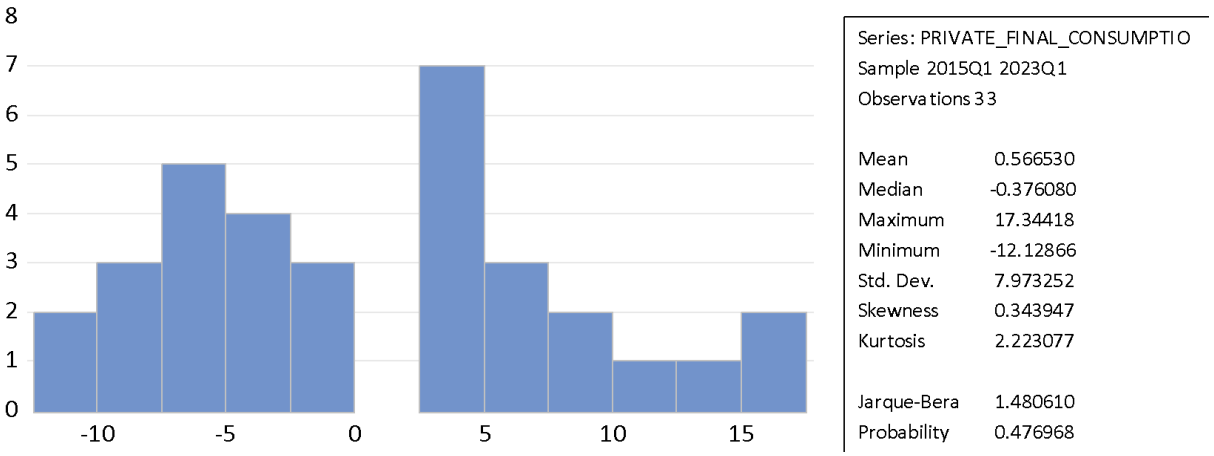
Figure 13

	PRIVATE FINAL CONSUMPTION EXPENDITURE
Mean	0.566530
Median	-0.376080
Maximum	17.34418
Minimum	-12.12866
Std. Dev.	7.973252
Skewness	0.343947
Kurtosis	2.223077
Jarque-Bera	1.480610
Probability	0.476968
Sum	18.69549
Sum Sq. Dev.	2034.328
Observations	33

Source: Federal Reserve of St. Louis

PFCE shows moderate variability ranging from -12.13 to 17.34. The distribution appears close to normal: skewness is small, kurtosis is near 3, and the Jarque-Bera is not significant, indicating normality cannot be rejected. Overall, PFCE is a stable and well-behaved series compared to the other variables.

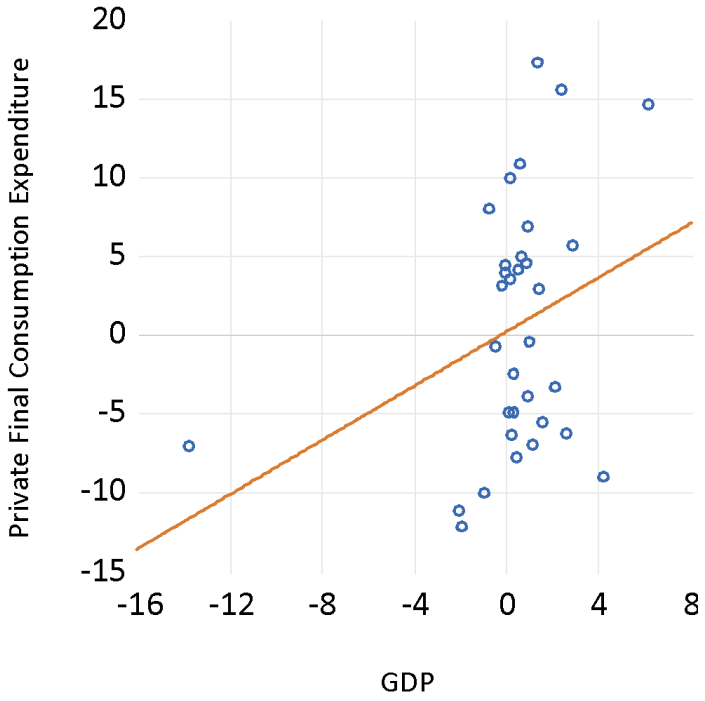
Figure 14



Source: Federal Reserve of St. Louis

The histogram of PFCE shows a fairly balanced distribution with no extreme skewness and moderate spread. Most values cluster around the center, and the Jarque-Bera test is not significant, indicating that the data are approximately normally distributed. In general, PFCE behaves as a stable, well-distributed variable with few outliers.

Figure 15



Source: Federal Reserve of St. Louis

The scatter plot shows a positive but weak relationship between the two variables. Although the trend line slopes upward, indicating that higher PFCE is associated with slightly higher GDP, the points are widely scattered and not tightly clustered around the line. This suggests that PFCE explains GDP only weakly and that the relationship has low predictive power.

Figure 16

Dependent Variable: GDP
Method: Least Squares
Date: 12/02/25 Time: 10:34
Sample: 2015Q1 2023Q1
Included observations: 33

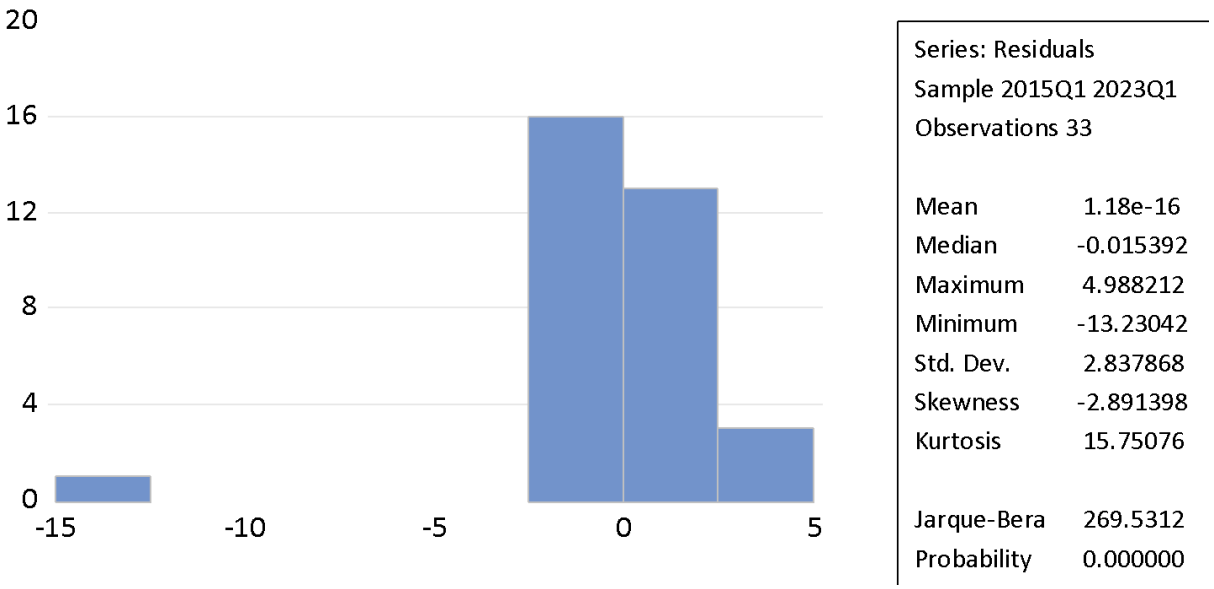
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CONSUMER PRICE	0.000774	0.001137	0.680880	0.5012
PRIVATE FINAL CONSUMPTION EX...	0.114548	0.065255	1.755395	0.0894
C	0.451583	0.551494	0.818835	0.4193

R-squared	0.117768	Mean dependent var	0.373573
Adjusted R-squared	0.058952	S.D. dependent var	2.998270
S.E. of regression	2.908550	Akaike info criterion	5.059695
Sum squared resid	253.7899	Schwarz criterion	5.195741
Log likelihood	-80.48496	Hannan-Quinn criter.	5.105470
F-statistic	2.002328	Durbin-Watson stat	2.094417
Prob(F-statistic)	0.152666		

Source: Federal Reserve of St. Louis

Neither Consumer Price nor Private Final Consumption Expenditure is statistically significant at the 5% level, though PFCE shows a weak borderline effect at 10%. The model's explanatory power is low, and the overall F-test is not significant, indicating that the regressors do not meaningfully explain GDP variations.

Figure 17



Source: Federal Reserve of St. Louis

The residuals are highly non-normal, with strong left skewness and very high kurtosis. Most values cluster near zero, but a few large negative outliers create long tails. The significant Jarque-Bera statistic confirms rejection of normality, indicating that the OLS residuals do not follow a normal distribution. This supports Gujarati and Porter's (2009) argument that macroeconomic data often depart from normality during turbulent periods, requiring diagnostic checks to ensure valid inference and avoid misleading interpretation.

Figure 18

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.238468	Prob. F(2,29)	0.7894
Obs*R-squared	0.533938	Prob. Chi-Square(2)	0.7657

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 12/01/25 Time: 21:12
Sample: 2015Q1 2023Q1
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVATE FINAL CONSUMPTION EX...	-0.004031	0.065965	-0.061102	0.9517
C	0.000886	0.516079	0.001716	0.9986
RESID(-1)	-0.127808	0.186330	-0.685922	0.4982
RESID(-2)	-0.000573	0.186147	-0.003079	0.9976

R-squared	0.016180	Mean dependent var	1.18E-16
Adjusted R-squared	-0.085595	S.D. dependent var	2.837868
S.E. of regression	2.956828	Akaike info criterion	5.119323
Sum squared resid	253.5420	Schwarz criterion	5.300718
Log likelihood	-80.46884	Hannan-Quinn criter.	5.180357
F-statistic	0.158978	Durbin-Watson stat	1.987183
Prob(F-statistic)	0.923027		

Source: Federal Reserve of St. Louis

The Breusch-Godfrey test shows that p-values are greater than 0.05 [Prob (F) = 0.7894, Prob (Chi-Square) = 0.7657], which means that there is no evidence of serial correlation in the residuals (up to 2 lags).

Figure 19

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.023318	Prob. F(1,31)	0.3196
Obs*R-squared	1.054528	Prob. Chi-Square(1)	0.3045
Scaled explained SS	6.863381	Prob. Chi-Square(1)	0.0088

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/01/25 Time: 21:13
Sample: 2015Q1 2023Q1
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.196322	5.314007	1.542400	0.1331
PRIVATE FINAL CONSUMPTION EX..	-0.682883	0.675058	-1.011592	0.3196

R-squared	0.031955	Mean dependent var	7.809449
Adjusted R-squared	0.000728	S.D. dependent var	30.45858
S.E. of regression	30.44749	Akaike info criterion	9.728576
Sum squared resid	28738.53	Schwarz criterion	9.819273
Log likelihood	-158.5215	Hannan-Quinn criter.	9.759093
F-statistic	1.023318	Durbin-Watson stat	1.914053
Prob(F-statistic)	0.319564		

Source: Federal Reserve of St. Louis

The Breusch-Pagan-Godfrey test shows that both p-values are as well above 0.05 [Prob(F) = 0.3196, Prob(Chi-Square) = 0.3045], which means that there is no evidence of heteroskedasticity in the residuals.

Figure 20

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: GDP PRIVATE FINAL CONSUMPTION EXPENDITURE C

	Value	df	Probability
t-statistic	0.111134	30	0.9123
F-statistic	0.012351	(1, 30)	0.9123
Likelihood ratio	0.013583	1	0.9072

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.106054	1	0.106054
Restricted SSR	257.7118	31	8.313284
Unrestricted SSR	257.6058	30	8.586859

LR test summary:

	Value
Restricted LogL	-80.73799
Unrestricted LogL	-80.73120

Unrestricted Test Equation:
Dependent Variable: GDP
Method: Least Squares
Date: 12/01/25 Time: 21:13
Sample: 2015Q1 2023Q1
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIVATE FINAL CONSUMPTION EX...	0.113598	0.095307	1.191918	0.2426
C	0.246990	0.729657	0.338501	0.7373
FITTED^2	0.059415	0.534627	0.111134	0.9123

R-squared	0.104503	Mean dependent var	0.373573
Adjusted R-squared	0.044803	S.D. dependent var	2.998270
S.E. of regression	2.930334	Akaike info criterion	5.074618
Sum squared resid	257.6058	Schwarz criterion	5.210664
Log likelihood	-80.73120	Hannan-Quinn criter.	5.120393
F-statistic	1.750478	Durbin-Watson stat	2.234021
Prob(F-statistic)	0.190968		

Source: Federal Reserve of St. Louis

All Ramsey Reset test statistics show very high p-values (around 0.91), indicating no evidence of functional form misspecification in the model.

Figure 21

Covariance Analysis: Ordinary
Date: 12/01/25 Time: 21:22
Sample: 2015Q1 2023Q1
Included observations: 33

Covariance	GDP	CONSUM...	PRIVATE_F...
GDP	8.717211		
CONSUMER PR...	219.2323	203073.9	
PRIVATE FINAL...	7.480655	541.5025	61.64631

Correlation	GDP	CONSUM...	PRIVATE_F...
GDP	1.000000		
CONSUMER PR...	0.164774	1.000000	
PRIVATE FINAL...	0.322699	0.153045	1.000000

Source: Federal Reserve of St. Louis

The above table shows that the correlations are relatively weak. The correlation between GDP and Consumer Price is 0.1648, indicating a very weak positive relationship. Moreover, the correlation between GDP and PFCE is 0.3227, indicating a weak positive relationship. Finally, the correlation between Consumer Price and PFCE is 0.1530, indicating a very weak relationship. Overall, none of the variables are strongly correlated, indicating the GDP, Consumer Price, and PFCE move largely independently of each other in this sample.

Conclusion

This study explored the relationship between GDP, Consumer Price Index (CPI), and Private Final Consumption Expenditure (PFCE) in Greece from 2013 to 2023, applying a time-series OLS framework with full diagnostic validation. Although the literature consistently describes Greece as a consumption-driven economy, the empirical results indicate that neither the CPI nor the PFCE is statistically significant in explaining GDP during this period. Descriptive analysis revealed volatility, asymmetric crisis distributions, and non-normal price behavior, while regression results showed weak explanatory power, suggesting that recent economic shocks may have disrupted traditional demand-output transmission channels. However, several limitations should be acknowledged. The study uses only quarterly data and focuses on a limited set of explanatory variables, which may omit potentially important factors such as investment, government spending, or labor market dynamics. Additionally, the sample period is marked by consecutive crises that could distort underlying relationships, and the reliance on OLS assumes linear connections that may not fully capture complex macroeconomic interactions. These limitations indicate that the findings should be interpreted with caution and further research using alternative models or broader variable sets may yield deeper insights.

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