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Factors Influencing Inflation: Insights from the Nepalese Economy

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Abstract

Inflation is a persistent issue in developing nations such as Nepal, resulting in serious economic and social consequences. This article examines the macroeconomic determinants of inflation in Nepal, considering the variables as government expenditure, exchange rate remittances, real GDP, and the consumer price index of India. Using the time series data from 1975 to 2023. It employs the Engel-Granger two-step cointegration test to examine the short- and long-term causal connections between Nepal's consumer price index (inflation) and all of these variables. The augmented Dickey-Fuller unit root test confirms that the variables are stationary at first difference, suggesting they possess an integrated order of I. The Engel-Granger test established that there is co-integration among the variables. Additionally, the error correction term (ECT) was found to be statistically significant, with a negative coefficient. The causal association between the selected dependent and explanatory variables in Nepal is both significant and persistent. The empirical findings suggest that India's inflation highly affects inflation in Nepal. Furthermore, the enduring effects of broad money supply and government expenditure are also substantial factors. The results indicate an inverse relationship between inflation and real GDP in Nepal, whereas remittances have no significant impact on consumer prices in the nation. So, it is vital to control inflation to be able to deal with poverty and economic growth. Policies are needed to keep the inflation target range around the optimum inflation rate to accelerate the pace of economic growth and ensure that the adverse effect inflation has on economic growth is minimized.

Key words: consumer price index, government expenditure, money supply, Engel-Granger test, error correction

Introduction

A monetary phenomenon, inflation has garnered the attention of economists worldwide due to its persistent nature. A major economic threat that undermines stability is inflation, which is defined as a decline in the value of money per unit of purchasing power. While high inflation increases uncertainty and distortions as well as lowers capital costs, investment, and saving, moderate inflation encourages growth and lowers unemployment. The association between economic growth and inflation is one of the most conversed issues and remains controversial in both theory and empirical findings (Acharya, 2019). In common, Inflation is characterized as a sustained and ongoing increase in the overall price level, resulting in a decrease in the ability to purchase goods and services. In accordance with Friedman's (1963) analysis, inflation is a type of taxation that can be implemented without the need for legislation. In general, inflation has been commonly defined as a monetary phenomenon, as stated by (Kemmerer, 1942).

Inflation is a critical concern in developing countries such as Nepal, as it has significant economic and social consequences. As the adverse effect that inflation can have on economies, as well as the well-being of citizens, there has been ongoing interest in studying the relationship between inflation, money supply, and budget deficit both theoretical and empirical perspectives (Adom et al., 2018). The inflation rate is directly influenced by several economic and business factors, including gross domestic product, money supply, exports, import prices, exchange rate, interest rate, fiscal deficit, government expenditure, and tax revenue. Inflation affects every citizen and every sector of the economy to varying degrees (Shapiro, 2003). The widespread use of the consumer price index (CPI) in measuring inflation, this study also acknowledges CPI as a main variable for measuring inflation. In addition to the Consumer Price Index (CPI), GDP at constant prices, investment, broad money supply, remittances, interest rate, and consumer price index of India are also comprised as variables in the examination.

The classical economic model ignores inflation and assumes full employment and an open market, while the quantity theory of money suggests that as money supply increases, general price levels rise, lowering money value. Inflation arises from a condition where there is an excessive amount of demand compared to the available supply. This occurs when the economy is operating at the level of full employment (Keynes, 1936).

Based on the quantity theory of money, monetarist economists claimed that too much money chasing too few goods is what leads to inflation and that this excess money in circulation is the main cause of inflation (Friedman, 1963).The proponents of the structure argue that inflation is necessary for economic growth, while the monetarists contend that inflation is harmful to economic growth (Khan & Khan, 2018).

A new trend in literature on inflation has emerged, referred to as the political economy approach to macroeconomic policy (Selialia, 1995). Contemporary theories on inflation have

redirected attention from traditional economic factors, like the creation of money, towards political and organizational factors that contribute to the emergence of inflationary pressures. These theories are hypothetical and mainly belong to developed nations (Iya & Aminu, 2014).

The government of Nepal has made efforts to ensure a low and stable inflation rate in order to enhance the welfare of people and boost savings and investment in the economy. Nevertheless, despite these deeds, government have not achieved the desired outcome, as the inflation rate in the economy persists in fluctuating and remains unstable. In 2015/16, the inflation rate in Nepal stood at 9.94 percent. The rate experienced a decline and reached a level of 4.45 percent in the fiscal year 2016/17. The rate experienced a further increase and reached 6.15 in the financial year 2019/20. The rate experienced a decrease to 3.6 percent in 2020/21, followed by an increase to 6.32 in 2021/22, and then remained constant in 2022/23 (MOF, 2023). This clearly demonstrates that the inflation rate has been volatile, which could have a detrimental impact on significant economic decision. Likewise by the resent data published by NRB (2024) indicates that inflation moderated to 4.61 % in mid-April 2024 compared to 7.76 percent a year ago. Food and beverage category inflation stood at 5.21 % whereas non-food and service category inflation stood at 4.14 % in the review month.

Inflation is a substantial macroeconomic concern in today's world, with wide-ranging effects that impact various macroeconomic variables including saving, real interest investment, revenue, and wage (Chaudhary, 2018). Inflation is one of the economic problems that developing countries such as Nepal continue to face. Inflation growth is always controlled for stability so that problems in the macro economy do not occur. One of the main purposes of both developed and developing economies is, therefore, to attain a reasonable level of inflation (Tufail & Batool, 2013). High Inflation reflects the general condition of rising prices for goods and services (Sugihyanto, 2021). The inflationary process has remained an area of great concern for the past many years. The relationship between the price level and other macroeconomic aggregates has remained an area of concern despite the years of research. The price level in the economy is being influenced by the number of factors.

Inflation is considered as a major challenge particularly for developing countries like Nepal. Price stability often remains as a main objective of economic policy in these countries. To control inflation is a challenging task as it is influenced by several factors in economy. The formulation of appropriate policy action in this regard, needs a sound analysis of the determinants of inflation in the economy. In this study the researcher is going to investigate the determinants of inflation and establish the direction and magnitude of relationship between inflation and its determinant.

Chaudhary and Xiumin (2018) conducted a study on the factors influencing inflation in Nepal using data from 1975-2016 and applied OLS model for their analysis. The study only includes the variables of broad money supply, real GDP, and Indian prices. The study indicated

that all the variables examined have a significant impact in the long term, indicating that these variables are the factors that determine inflation in Nepal. The findings align with the principles of monetary theory. The study indicates that inflation in the long run is influenced by the money supply and Indian prices.

Using time series data from 1975 to 2018, Byanjanakr (2020) investigated the factors that influence Nepalese inflation by applying the ARDL cointegration method. The price level on Nepal is the dependent variable, and the independent variables are crude oil price, money supply, government deficit, and Indian inflation. The study indicates that the primary factor influencing Nepalese inflation is the inflation rate in India. In a similar vein, both the exchange rate and the government deficit have long- and short-term positive effects on prices. Form the study, a government deficit raises the money supply, which drives up prices.

Humagai (2023) conducted a study examining the influence of macroeconomic factors on inflation in Nepal. The study spanned from 1975 to 2022. The study examined a specific set of variables, namely broad money supply, real GDP, and Indian prices. The research has demonstrated that all the specified indicators exert a significant influence on inflation in Nepal over an extended duration. These factors are the primary drivers of inflation in the country. Regarding the ordinary least squares regression model, long-term inflation is strongly influenced by both the money supply and Indian prices.

The empirical study found that over an extended period of time, the primary factors influencing inflation in Nepal are Indian inflation and exchange rate Furthermore, the impact of Indian inflation the exchange rate and government deficit(0.039) on the short-term is noteworthy.

The issue of inflation takes primary importance in the developing countries like Nepal as the rising inflation has far reaching economic and social implications. The GDP, money supply, exports, import prices, interest rates, fiscal deficit, government spending, tax revenue, and other factors are all directly impacted by the inflation rate from an economic and business standpoint. The effects of inflation are felt to some degree by every citizen and in every corner of the economy (Shapiro, 2003).

The primary objective of this study is to evaluate the key determinant factors that influence inflation in Nepal, by analyzing the relationships between government expenditure, money supply, remittances, real GDP at constant price, and India's consumer price index. Therefore, it becomes essential to examine the linkages between inflation and its determining factors in order to establish precise policies regarding Nepal. In order to implement effective policy, it is imperative to have a comprehensive understanding of the primary factors that influence inflation.

Monetary policy foremost targeted is to control the price stability, without considerate the main issues determining inflation, effective policies cannot be implemented. So it is necessary to study the relationship between inflation and its determinants to accomplish appropriate policy measures in Nepal, This study unlike the previous literature, considers real gross domestic product long with the remittance inflows to examine the relationship between inflation and economic growth. Moreover, the existing literature though provides sufficient in-depth insights into the overall effect of inflation on economic growth but few lacks to in-depth analysis with incorporating recent data with effect of remittance inflows is one of the agent of external financing Hence, it is imperative to examine the associations between inflation and its factors to develop accurate economic policies concerning Nepal. This study employs the Engel-Granger cointegration method and to analyze the long- and short-term determinants of the key variables influencing inflation in Nepal

Methodology

This study is based upon the quantitative research design. The study seeks to explore the relationship between the consumer price index, Government expenditure, broad money supply, remittance, Gross Domestic Product, exchange rate and the consumer price index of India. The annual time series data from the year 1975 to 2023 has been taken from the world development indicator of World Bank, Nepal Rastra Bank, economic survey, published by ministry of finance for the analysis of the model. This study investigates macroeconomic variables influencing Nepal's inflation, including NCPI, GEXP, MS, REM, CPIIN, and RGDP, using theoretical and empirical studies. The aim is to establish a fundamental econometric model to identify inflation-influencing factors.

The primary objective of the study is to investigate the factors that determine inflation using specific variables. This study employs the residual-based two-step cointegration test. This method was developed by Engle and Granger (Engle& Granger, 1987). Furthermore, an error correction model was applied to determine the rate at which short-term imbalances in the model converge or diverge towards long-term equilibrium. In addition, CUSUM and CUSUMSQ tests were performed to assess the stability of the parameters.. The data were analyzed using the e-views 10 statistical tool. In order to examine whether the data were stationary or not, unit root test was conducted.

The body of existing literature, recognized economic theory, and previous research are all taken into consideration in the model developed for this study. It follows that Nepal's inflation will be determined by the variables under consideration. The consumer price index (CPI) for Nepal is the dependent variable, and the exchange rate, government spending, remittances, broad money supply, and the CPI for India are the independent variables. The model under study is based on the empirical research conducted by (Gautam, 2023; Humagai, 2023; Lim & Sek, 2015; Neupane, 2022).

CPIN= f (GEXP, EXR, MS, REM CPIIN, RGDP) …… (i)

Where, CPIN is Consumer price index of Nepal, GEXP is the government expenditure, MS is the money supply, REM is the remittance, EXR is the exchange rate and CPIIN represents the Consumer price index of India respectively.

The specific econometric model under this analysis in the log form is

$LnCPIN = \beta_0 + \beta_1 \ln GEXP + \beta_2 LnEXR + \beta_3 \ln MS + \beta_4 LnREM + \beta 5 \ln CPIIN + \mu_t$….. (ii)

Results and Discussion

Unit Root Test

The Augmented Dickey-Fuller test (ADF) is employed to determine the presence of a unit root. The error terms are suspected to be correlated with one another through the utilization of the variable's lag times. One of the advantages of employing this test is its ability to include a sufficient number of terms, which leads to the error term becoming uncorrelated.

Table 1: ***Result of Unit Root Test***

Variables	Level Form		First Difference		Remarks
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
LnNCPI	-1.8007 (0.37)	-0.0858 (0.99)	-4.6995 (0.0004)*	-5.2530 (0.0005)*	I (1)
LnGEXP	-1.5456 (0.50)	-2.3408 (0.40)	-5.0096 (0.0001)*	-5.0473 (0.0008)*	I (1)
LnEXR	- 1.8877 (0.33)	-0.5190 (0.98)	-5.2873 (0.0001)*	-5.4286 (0.0003)*	I (1)
LnMS	- 1.5657 (0. 49)	-0.3513 (0.98)	-5.1967 (0.0001)*	-5.5384 (0.0002)*	I (1)
LnREM	-0.2550 (0.92)	-2.0012 (0.58)	-7.7846 (0.000)*	-7.6981(0.0000)*	I (1)
LnCPIIN	-1.0450 (0.72)	-1.0290 (0.93)	-4.4646 (0.0008)*	-4.5260 (0.0038)*	I (1)
LnRGDP	-0.4127 (0.89)	-3.0939 (0.11)	-7.6104 (0.000)*	-4.5156 (0.0040)*	I (1)

Source: *Author's calculation E-views 10*

In Table 1, the ADF test statistics for the selected variables employed in the study are presented. Based on the augmented Dickey-Fuller tests, all variables are stationary at the one

percent level of significance at the first difference that is integrate in order 1, or I(1). This study employs the Engle-Granger approach to evaluate the long-term co-integration of the variables.

Engle-Granger Cointegration Test

The Engle-Granger co-integration test posits that the long-run co-integration of the variables can be determined by testing the stationary value of the residual term error correction term. Utilizing models, to investigation endeavors to establish a relationship between inflation and its determinant. The long-run model was developed by the study using the OLS method, as illustrated below.

Table 2: ***Result of OLS Regression Methods***

Dependent Variable LnNCPI No. of Obs. = 49 Prob> F =0.000000 R^2 = 0.999483 SER = 0.027369 D.W. = 1.390328				
Independent Variables	**Coefficient**	**Robust Std. Error**	**t- statistic**	**Prob**
LnGEXP	0.127776	0.040997	3.116730	0.0033
nEXR	0.118710	0.039611	2.996893	0.0046
LnMS	0.213068	0.071325	2.987298	0.0047
LnREM	-0.018693	0.012946	-1.444006	0.1562
LnCPIIN	0.669193	0.095075	7.038565	0.0000
LnRGDP	-0.505001	0.146484	-3.447471	0.0013
C	3.905517	1.626116	2.401746	0.0208

Table 2 displays the long-run model of the selected variables. First and foremost, solve the residual term, which is in the stationary stage, in order to check the long-term relationship between the variables. If the residual of the long-run model is stationary at level 1, then the variables are co-integrated and there is a long-run relationship. This means the model is not spurious, and we may conclude that the result is an ordinary least squares result. Below, you can view the ADF test result for the residual term.

Table 3: ***Residual test***

Null Hypothesis: RESDUAL1 has a unit root Exogenous: None Lag Length: 0 (Automatic - based on SIC, maxlag=10)			
		t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic		-4.875250	0.0000
Test critical values:	1% level	-2.614029	
	5% level	-1.947816	
	10% level	-1.612492	
*MacKinnon (1996) one-sided p-values.			

Source: *Authors calculation through EViews-10.*

Table 3 shows that the result of ADF test of residual. From the table p- value of Augmented Dickey-Fuller test statistics confirms that residual has no unit root. So the null hypothesis is rejected. Thus the residual term is stationary at level form it is confirm that there exist the co-integration among the variable and the long run model is not false hence we can interpreted the model.

The coefficient of LNGEXP 0.127776 indicates that a 1% increase in government expenditure (GEXP) is associated with a 0.127776% increase in LNNCPI, holding other variables constant. The p-value (0.0033) is less than 0.05, indicating this variable is statistically significant. This result confirms that there is positive association between government expenditure and the inflation. The coefficient value of LNEXR is statistically significant at the 5% level of significance. The data indicates that a 1 percent unit rise in the exchange rate leads to a 0.118 percent increase in the NCPI. Likewise, Results show that an increase in the money supply of 1% causes the Consumer Price Index of Nepal (CPIN) to rise by 0.21%. Over an extended period. The money supply's impact on inflation becomes comparatively less substantial in relation to other variables. The coefficient of CPIIN, which is 0.67, is the highest compared to all other variables. At a significance level of 1%, the coefficient is statistically significant. An increase of one percent in the Consumer Price Index for of India (CPIIN) leads to a corresponding increase of 0.67 percent in the Consumer Price Index of Nepal. (NCPI). This confirms that the Indian inflation highly effects the Nepalese inflation at a significance level of 5%, the long-run coefficient of LnRGDP is -0.5055, indicating statistical significance. According to this hypothesis, if all else stays constant, a 1% increase in the real gross domestic product (RGDP) causes the National Consumer Price Index (NCPI) to fall by 0.505%. The coefficient of R-squared, is equal to 0.9995. This indicates that explanatory variables explain 99.95 percent of the total variation in NCPI. Similarly, the probability value of the F-statistic is 0.0000 percent, indicating that the model is statistically significant overall.

The empirical results show that the coefficients of government expenditure, exchange rate money supply, consumer price of India (CPIIN) and real GDP have the expected signs. All the coefficients of the independent variables are statistically significant except remittances. The coefficient of Indian consumer price India is highly significant that is larger than that of other independent variables: this indicates that Indian price index has more impact on inflation in Nepal. The empirical result suggests that inflation in Nepal is mainly determined by inflation in India with broad money supply, and government expenditure having an effect in the long-run. This result is similar with (Chhetri, 2023), Money supply has significant impact on inflation however it has less impact compare to other explanatory variables. The results show that the inflation and real GDP are negatively related but remittance does not significant to consumer price of Nepal

From the test of Brecsch- pagan – Godfrey the coefficient of F- statistics is 0.6456 and observed R-squared is 0.5679 which is also more than 5 percent level .The null hypothesis is rejected and the model is free from Heteroscedasticity. Likewise the F –statistic of LM test is 0.8029 which is greater than 5 percent level. This confirms that the model is free form autocorrelation (from Appendix). The estimated result for CUSUM test and CUSUM of squared test is form in Appendix clearly indicates stability in the equation during the sample period at 5 percent significance.

Table: 4 ***Error correction (ECM)***

Dependent Variable: D(LNNCPI)

Method: Least Squares

Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXR)	0.117959	0.045142	2.613088	0.0125
D(LNMS)	0.198291	0.052342	3.788362	0.0005
D(LNREM)	-0.030186	0.013441	-2.245741	0.0302
D(LNCPIIN)	0.281594	0.102998	2.733970	0.0092
D(LNRGDP)	-0.291559	0.125047	-2.331604	0.0247
D(LNGEXP)	0.847762	0.122240	6.935229	0.0000
ECT-1)	-0.040079	0.008705	-4.603857	0.0000
R-squared	0.772950	Mean dependent var		0.074106
Adjusted R-squared	0.739723	S.D. dependent var		0.037966
S.E. of regression	0.019369	Akaike info criterion		-4.916245
Sum squared resid	0.015382	Schwarz criterion		-4.643362
Log likelihood	124.9899	Hannan-Quinn criter.		-4.813122
Durbin-Watson stat	1.756678			

*(**Source:** Author's calculation through E-views -10)*

The table 4, demonstrate that he high R-Squared values shows that 77.29% of the variations in inflation (CPIN) are explained by variations in the estimated determinants. The D-W test value exceeds R-square, signifying that there are no spurious variables in the regression model. Inflation is negatively related to remittance and real GDP and government expenditure with highly significant whereas exchange rate, money supply and CPI of India are positively significant with inflation in short run. The findings also exhibit that error correction coefficient have the negative sign and are statistically significant at the 1% level, establishing that long-term equilibrium may be reached after a system shock. The coefficient of ECTt-1 measures the adjustment speed of inflation to long-run equilibrium due to changes in the inflation covariates. Following a deviation from the long-run in the previous period, convergence to the steady state is corrected by 4 .079% in the present year.

Conclusion

Evaluating pertinent research and utilizing Nepal as the reference nation, the primary goal of this study was to determine the relationship between inflation of Nepal with government expenditure, exchange rate, money supply, remittance, Consumer price of India (Indian inflation) and real gross domestic product of Nepal. The study employ Engle- granger two step test procedure for analysis the time period form 1975to 2023.

The growth of Indian inflation, the cost of exchange rate, and government spending are clearly the most important factors influencing Nepalese inflation. According to this study, prices in Nepal are heavily influenced by Indian prices due to a lackluster domestic supply that is accompanied by an increase in Indian imports.

The results found that all the coefficients of the independent variables are statistically significant except remittances. It is also indorses that the residual term is stationary at level form and confirmed that there exist the co-integration among the variable and the long run. With open borders to large nations and a heavy reliance on imports for both basic needs and other forms of development, Nepal faces challenges in keeping inflation under control. In this case, the primary source of inflation is shocks to supply from outside the country. The apparent lack of effect of the monetary and fiscal policies intended to do so makes the task of controlling inflation for the monetary authorities more challenging and intricate. It does not, however, mean that such policy implications have no place at all.

References

Adom, P. K., Agradi, M. P. & Quaidoo, C. (2018). The transition probabilities for inflation episodes in Ghana. *International Journal of Emerging Markets, 13*(6), 2028-2046.

Chaudhary, S. K., & Xiumin, L. (2018). Analysis of the determinants of inflation in Nepal. American *Journal of Economics*, 8(5), 209-212.

Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica,* 55(2), 251-276

Friedman, M. (1963). Inflation: Causes and consequences. Asia Publishing House.

Friedman, M. (1977). Nobel lecture: Inflation and unemployment. *Journal of Political Economy, 85*(3), 451-472.

Humagai, R. P. (2023). Factors of the inflation in Nepal. *Patan Prospective Journal, 3*(01), 106–115. https://doi.org/10.3126/ppj.v3i01.59007.

Kemmerer. W. (1942). The ABC of inflation. McGraw- Hill**.**

Khan, M. & Khan, S. (2018). Inflation and Economic growth: Evidence from five Asian countries. Pakistan, *Journal of Applied Economics, 28*(2), 235-252.

Lim, Y. C., & Sek, S. K. (2015). An examination on the determinants of inflation. *Journal of Economics, Business and Management*, *3*(7), 678-682.

Iya, I. B., & Aminu, U. (2014). An empirical analysis of the determinants of inflation in Nigeria. *Journal of Economics and Sustainable Development*, *5*(1), 140-150.

Selialia, F. L. (1995). The dynamics of inflation in Lesotho. *Unpublished MA Thesis, University College, Dublin.*

Tufail, S. & Batool, S. (2013). An analysis of the relationship between inflation and gold prices: Evidence from Pakistan. *The Lahore Journal of Economics*, 18(2), 1-35.

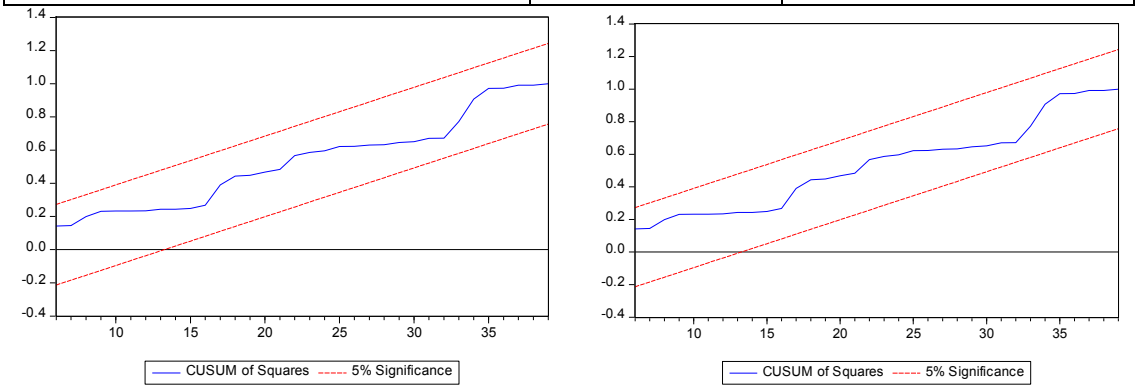
MoF (2023). Current Macroeconomic and Financial Situation of Nepal (Based on Six Months. Ministry of Finance.

Lim, Y. C., & Sek, S. K. (2015). An examination on the determinants of inflation. *Journal of Economics, Business and Management*, *3*(7), 678-682.

Appendix

Diagnostic test

Test Criteria	F-Statistics	Probability
Breusch- Godfrey LM Test	0.221196	0.8029
Hedroskedasticity test	0.829401	0.6456
Normality test (Jarque- Bera Test)	2.005757	0.36688



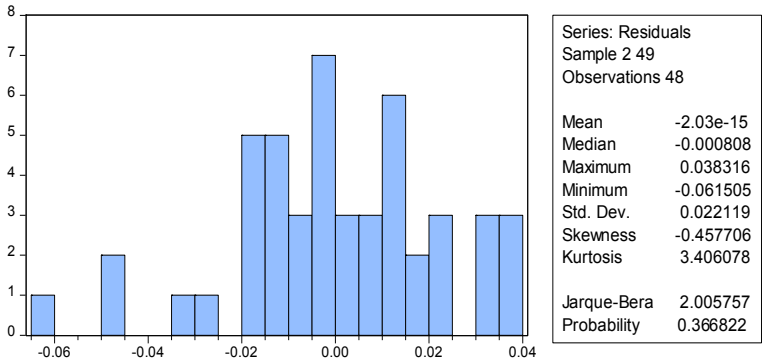


Figure 1. Cusum and Cusum of Square Test