Economic Policy Uncertainty and Oil Price Uncertainty: An Empirical Analysis on Selected Asia-Pacific Economies

Ahmed Oluwatobi ADEKUNLE[1]
[1]Senior Lecturer, Department of Accounting Science, Faculty of Economics & Financial Sciences, Walter Sisulu University, South Africa, aadekunle@wsu.ac.za

ARTICLE DETAILS

History
Received:
April 28, 2025
Revised:
June 25, 2025
Accepted:
June 30, 2025
Published:
July 01, 2025

Keywords
Economic Policy Uncertainty
Oil Price Uncertainty
Inflation
Output Gap
Broad Money

ABSTRACT

Purpose
This paper examines the impact of Economic Policy Uncertainty (EPU) and Oil Price Uncertainty (OPU) on inflation in five Asian Pacific countries, including Pakistan, China, India, Japan, and South Korea.

Methodology
Data was collected from January 2010 to August 2024. The analysis employed the Autoregressive Distributed Lag (ARDL) framework, using broad money and the output gap as control variables to account for monetary and demand-side impacts.

Findings
The results indicate that EPU exerts a significant inflationary effect in Pakistan and India, while OPU remains insignificant in both countries. Broad money also drives inflation in India. In China, OPU reduces CPI inflation, likely due to policy interventions. Japan exhibits a negative output gap effect, with EPU and OPU insignificant. For South Korea, EPU has a disinflationary short-run impact, but no long-run association is observed.

Conclusion
The results, in general, point to country-specific dynamics, which reflect varying monetary policy frameworks, institutional credibility, and resilience to uncertainty shocks, with significant implications for inflation management in the Asia-Pacific region.

Implication
The policymakers should endeavor to decrease the uncertainty to balance inflation. Monetary policy should be rigorous to accomplish long-term price growth perspectives. Mitigate the external oil shocks by inventing and executing novel energy techniques.

Corresponding author's email address: aadekunle@wsu.ac.za

1. Introduction

Knowledge of inflation determinants has been of central priority to scholars and central to the policymaking of monetary roles of central banks, leading to proper prediction about inflation, which is difficult without understanding the determinants of inflation (Anderl & Caporale, 2023a; Sengupta et al., 2025). Over recent decades, the global economy has been extremely uncertain owing to a set of factors that have led to problems such as financial crisis, pandemic attacks, and geopolitical matters, which have had significant implications on economic decision-making and macroeconomic stability. The circumstances undergoing these changes make the forecast of the significant macroeconomic variables, such as consumer price index (CPI) inflation, a challenging task, especially. With these dynamics, economic policy uncertainty, oil price uncertainty, and geopolitical risk have become some major externalities affecting inflationary pressures in different economies (Sengupta et al., 2025).

Economic Policy Uncertainty (EPU), as uncertainty in the variation of government economic policies, i.e., fiscal, monetary, or regulatory actions, may have a significant impact on economic activity and inflation (Akshaya & Gopalakrishna, 2025; Anderl & Caporale, 2023a; Che et al., 2024; Sengupta et al., 2025). These are typically quantified by analyzing news articles through textual content, utilizing specific economic and policy-related keywords (Anderl & Caporale, 2023; Kim, n.d.; Nguyen et al., 2025; Sengupta et al., 2025). Increased EPU may deter purchasing of durable items, postpone the investment plans companies are making via the real options channel, and risk premiums will rise; all these reduce economic activity forcefully. The EPU effect on inflation, however, has either no effect or a mixed effect on inflation across economies. There are indications that EPU has the capacity to reduce inflation through reducing the strength of demand. Still, there are also those who indicate that it raises inflation with the potential effect of raising the prices of energy or through precautionary price-setting effects (Akshaya & Gopalakrishna, 2025; Anderl & Caporale, 2023b). Higher levels of EPU in China are associated with elevated inflation (Nguyen et al., 2025), while studies that incorporate EPU have also improved the accuracy of CPI inflation forecasting in BRIC (Brazil, Russia, India, China) (Sengupta et al., 2025). In India, EPU is positively correlated with WPI inflation in the short run (Akshaya & Gopalakrishna, 2025). On the other hand, some studies reveal that China, Japan, and South Korea are seemingly better with the influence of EPU on the financial stress, relative to other G-20 countries, whereby China has relied on a high volume of foreign exchange reserves, as well as aggressive monetary policies, to cushion its economy (Ahmed et al., 2025). Innovations in EPU have been shown to predict deteriorations in Japan's macroeconomic performance, with fiscal imbalances remaining a key policy concern (Arbatli et al., 2017). Moreover, EPU affects loan pricing, as evidenced by China indicates that higher uncertainty exerts a negative influence on loan pricing, while simultaneously contributing to increased inflation (Nguyen et al., 2025).

Oil Price Uncertainty (OPU), the oil volatility and measure of unpredictability in oil prices and the driver of macroeconomic fluctuations, is of great importance (Abiad & Qureshi, 2023). Oil price uncertainty is typically measured using estimated volatility from models such as GARCH (1,1) or through textual analysis of news related to oil markets (Abiad & Qureshi, 2023; Anderl & Caporale, 2023b). Its primary effects are transmitted directly to real oil prices and inventories (Anderl & Caporale, 2023b; Arce-Alfaro, 2025). Sudden surges in OPU will have a detrimental impact on the industrial output and economic activity worldwide, similar to that of an oil supply shock, in that it would slow down investment and spending decisions, except that the impact is felt more so in the energy-

sensitive sectors (Abiad & Qureshi, 2023). The effect can be magnified at a time when monetary policy is bound, like at the Zero-Lower Bound (Abiad & Qureshi, 2023). Although the direct effect of OPU on inflation has received less attention than the effect that the level of oil prices has on inflation, there is no doubt of its effect on the dynamics of inflation (Anderl & Caporale, 2023b). To illustrate, an inflation hike in oil prices because of geopolitical risks may directly increase inflation rates, especially in those economies that depend on commodities, such as the BRIC countries (Sengupta et al., 2025). The effect of OPU on inflation may be differential depending on the country and inflation may go up or, in other instances, have a long-run diminishing effect (Anderl & Caporale, 2023b). Moreover, the greater energy expenses caused by fluctuation in the cost of oil can also result in inflationary situations, therefore leading to increased cost of production, which affects profit margins and leads towards innovation on energy-efficient systems (Collins et al., 2025).

Global economic dynamics are further complicated by the interaction between oil price uncertainty (OPU) and economic policy uncertainty (EPU), which exhibit a strong positive correlation. OPU tends to intensify during periods of domestic economic downturns, while global EPU (GEPU) rises when the world economy weakens, suggesting that their interplay amplifies overall economic fluctuations. For instance, positive GEPU shocks may trigger volatility in oil prices, thereby raising OPU and generating an amplification effect on global economic activity (Che et al., 2024).

Given the individual significance of OPU and EPU and their respective impacts on inflation and the broader economy, it is essential to consider their combined influence in policy formulation. While prior studies have largely examined the isolated effects of EPU and oil price shocks on financial markets and macroeconomic variables, it remains crucial to analyze both shocks within a unified framework, assessing their linear, short-run, and long-run effects on inflation. Further, there are other macroeconomic factors like output gap (Akshaya & Gopalakrishna, 2025; Sharma et al., 2025). Inflation is widely regarded as a critical issue arising from the dynamics of broad money and money supply (Akshaya & Gopalakrishna, 2025; Anderl & Caporale, 2023b). Since these uncertainties are usually multidimensional and even interact with each other, a thorough study of the various and combined impacts of these factors on inflation is very important in directing policy actions, especially in economically vibrant regions such as the Asia-Pacific.

This paper particularly uses a linear autoregressive distributed lag (ARDL) framework for the specific reasons, including the methodological robustness of accommodating integration order variations and due to its versatile empirical applications of the variables (Anderl & Caporale, 2023b). This study employs monthly data from January 2010 to August 2024, with inflation as the dependent variable, EPU and OPU as the primary explanatory variables, and the output gap and broad money as controls. Unit root tests are applied to assess stationarity, complemented by standard diagnostic checks. CUSUM (cumulative sum of residuals) tests are done to monitor the stability of a model (Akshaya & Gopalakrishna, 2025; Anderl & Caporale, 2023b). This systematic procedure will give strong country-specific data on how these two different forms of uncertainty affect the inflation trends in the target economies.

Previous studies focused on the determinants of inflation. However, limited literature is available on the combined impacts of EPU and OPU in the Asia–Pacific economies, namely Pakistan, China, India, Japan and South Korea. Most of the literature in this scope either concentrates on one-country dynamics or ignores endogeneity among

uncertainty, growth, and monetary aggregates. This void has left policymakers with limited evidence as to how uncertainty shocks spread into inflation in economies with varying structures. The current study has emphasized filling the gap by empirically analyzing the short-run and long-run impact of EPU and OPU on inflation for five Asia–Pacific countries by employing the ARDL bounds testing approach. To consider the heterogeneous country responses, the two control variables are also included in this study, the broad money and the output gap. The study investigates how uncertainty impacts the inflation channels and explores monetary policy recommendations for managing inflation.

The theoretical and empirical contribution of this study lies in its incorporation of uncertainty indicators into the existing literature, thereby offering a more comprehensive framework for modeling inflation. By extending the discourse in energy and monetary economics, this research provides valuable insights into the interconnectedness of uncertainty shocks and inflationary dynamics. The empirical evidence generated establishes a foundation for understanding how policy uncertainty and oil price volatility influence inflation across different economies, yielding important implications for policymakers. Moreover, for investors and market participants, the study enhances awareness of inflation risks associated with uncertainty shocks, thereby contributing to more informed financial planning and investment decision-making.

The paper proceeds as follows: section two reviews the relevant literature, section three outlines the data and methodology, section four presents the empirical findings, and section five concludes with policy implications and future research directions

2. Literature Review

Economic policy uncertainty (EPU) and oil price movements result in the complexity of inflation dynamics in both emerging and developed nations. These difficulties highlight how important it is to approach inflation analysis thoroughly and accurately. This literature review presents important discoveries in relation to the interaction of these factors holding output gaps and broad money constant. The context of Pakistan, India, China, Japan, and South Korea has special consideration, and it uses monthly data between 2010 and 2024.

EPU is one of the key determinants that influence macroeconomic variables such as inflation. Baker et al. (2016) came up with a quantifiable index of EPU, which represents the uncertainty created due to government policies of different economies, and it is noticed that the index has a major impact on economic activity (Farooq et al., 2023). Specifically, with lower EPU, more consistent inflation rates were observed, where the Master of Policy's credibility encourages the financial markets to act with confidence and stabilize inflation expectations within the country in India (Sahu et al., 2025). Economic policy uncertainty (EPU) exerts influence beyond short-term inflationary pressures; its persistent nature can contribute to long-term economic stagnation by undermining investor confidence and dampening capital formation (Sahu et al., 2025). The study reveals that in addition to increasing inflation uncertainty, EPU also makes it difficult to effectively steer the monetary policy to preserve price stability (Santiyano et al., 2025).

In conjunction with economic policy uncertainty (EPU), fluctuations in oil prices contribute further inflationary pressure—especially in net oil-importing nations like Pakistan and India, where foreign price shocks can markedly disrupt domestic price

stability (Qian, 2023). The connection between oil prices and inflation is established in literature, as these price distresses caused a direct surge in transport costs and inflationary pressures in the economy at large (Kuncoro, 2023). Aladwani (2025) argued that geopolitical tensions are making these pressures even stronger, with direct references to the Russia-Ukraine situation as a factor that led to higher inflation rates across various economies in the Asian region or in China specifically. Moreover, the oil price volatility may disrupt the anchor on inflation causing households to change their expectations of inflation in the northeast direction (Chua & Tsiaplias, 2024).

Understanding the roles of output gaps and broad money is crucial in determining inflation's response to economic upheaval. The output gap, defined as the disparity between actual and expected output, can significantly influence inflation trends (Yu-xin & Shi, 2023). Since the positive output gap tends to be associated with inflationary expectations, it can be observed that demand-pull inflation shows with an increasing EPU or oil price uncertainty (Trabelsi & Khaled, 2023). Recent findings suggest that a monetary policy framework focused on production gaps may be better equipped to navigate the problems posed by economic policy uncertainty (EPU) and oil prices (Sule et al., 2024). On the other hand, changes in the broad money supply can impact the amount of aggregate demand, which in turn can impact inflation (Ginn & Saadaoui, 2025). Monetary policy changes must be particularly cautious when anchoring steps to lower inflation expectations because any increase in the money supply could exacerbate inflation expectations, particularly in an environment where high EPU is prevalent (Mamman et al., 2025).

The comparative study of the inflation dynamics in the five nations selected for investigation shows that different regions react differently to the uncertainties in the oil price and the EPU. Better financial systems are substantial evidence that Japan and South Korea can be classified as having a higher shock-absorbing ability than the weaker economies of Pakistan and India (Sahu et al., 2025). Indicatively, based on the declaration that low EPU regimes in India are easier to convey the success of transport of monetary policy signs, which can quantify the inflation expectations (Sahu et al., 2025). Conversely, the economists have emphasized that greater volatility of emerging markets and policy uncertainty are the factors that may trigger even harsher forces of an inflation process, and the solution is the special monetary policies to maintain the balance of the pricing level (Ma et al., 2023).

To examine the long-term balance relationships between variables while accounting for short-term changes, a new generation of methods has focused on using Autoregressive Distributed Lag (ARDL) models (Kotz et al., 2024). On the one hand, this is especially helpful in studying the relationships, between EPU, oil price uncertainty, and on the one hand, inflation outcomes in different states of different economies. This study is particularly useful for examining the relationships between Economic Policy Uncertainty (EPU), oil price volatility, and inflation outcomes across different economic conditions. To analyze the dynamic responses of inflation to exogenous shocks in a systematic manner, Trabelsi and Khaled (2023) advocate the use of Structural Vector Autoregressive (SVAR) models. Furthermore, recent research on the long-term impacts of EPU on inflation and macroeconomic stability demonstrates methodological rigor and reinforces the relevance of uncertainty indicators in macroeconomic analysis (Drager & Nghiem, 2025).

The literature suggests that policymakers should implement a dual strategy, incorporating direct interventions to manage the impact of oil prices and to mitigate policy uncertainty in the economy (Ren & Sakouba, 2024). The study underscores the necessity for central banks to enhance the transparency of monetary policy actions, particularly in contexts characterized by significant uncertainty, as this may be crucial for stabilizing inflation expectations (Santiyano et al., 2025). To mitigate the dual pressures of Economic Policy Uncertainty (EPU) and oil price fluctuations, research advocates for a proactive fiscal policy to strengthen monetary policy (Tsang, 2024).

The prevailing economic policies and the volatility of oil prices necessitate comprehensive longitudinal research of the population that includes socio-economic and climatic variables (Trabelsi & Khaled, 2023). Future analysis can be improved by incorporating variables, particularly the insertion of climate policy uncertainty, which would provide a more comprehensive understanding of inflationary dynamics in our interconnected global economy. Moreover, the region-specific analyses of disparities will further augment our understanding of context-specific policy interventions (Majumder, 2024).

The study concludes that the interrelations among economic policy uncertainty, oil price volatility, and inflation are contingent upon many intervening factors, including the production gap and the aggregate money supply. The new research is intended to build upon current literature and ensure that policymakers are equipped with evidence-based information to navigate the uncertainties of inflation management.

3. Methodology

To examine the relationship between inflation and the macroeconomic factors that cause it, we will first use a linear Autoregressive Distributed Lag (ARDL) model to estimate the estimation. In case the regressors can take the form I(0) and I(1) but not I(II), the ARDL technique of estimating the short-run and long-run parameters is given by (Pesaran et al., 2001). This is entirely in conformity with the findings of this study, with stationarity at different levels.

$$\begin{aligned}\Delta INF_t = \propto + \sum_{i=1}^{p} \emptyset i \Delta INF\ t-j\ + \sum_{j=1}^{q2} \beta_2 \Delta EPU_{t-j} + \sum_{j=1}^{q2} \beta_3 \Delta OPU_{t-j} \\ + \sum_{j=1}^{q1} \beta_4 j \Delta OUTGAP_{t-j} + \sum_{j=1}^{q1} \beta_5 j \Delta BM_{t-j}\ + \gamma_1 INF_{t-1} + \gamma_2 EPU_{t-1} \\ + \gamma_3 EPU_{t-1} + \gamma_4 OPU_{t-1} + \gamma_1 OUTGAP_{t-1} + \gamma_1 BM_{t-1} + \in t\end{aligned} \quad (1)$$

Where,

INF_t:	Inflation
EPU_t:	Economic policy uncertainty
OPU_t:	Oil price uncertainty
$OUTGAP_t$:	Output Gap
BM_t:	Broad money
Δ:	Operator of first difference
$\in t$:	Error term

To ascertain the order of variable integration in this model, Elliott, Rothenberg, and Stock (1996) employ the Augmented Dickey–Fuller Generalized Least Squares (ADF-GLS) test, which has greater power than the traditional ADF test. The degree of the order of the lag in ADF-GLS regression, as well as the ADF-GLS regression, is assessed via the Ng-Perron (2001) sequential t-test criterion to prevent overfit or underfit lag. The null hypothesis is that there is a unit root, implying the variable is differenced stationary instead of trend stationary.

Ordinary Least Squares (OLS) seeks to estimate the model. The bounds testing methodology employs the null hypothesis of no cointegration $H_0: \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$ (Pesaran and Shin1998), where rejection of the null hypothesis means a long-run connection in the variables.

To ensure model adequacy, several stability and specification checks were used. The residuals from the Breusch-Pagan (BP) test are homoscedastic(H_0) instead of heteroscedastic $(H)_1$ (Breusch and Pagan 1979). Serial Correlation Bresuch-Godfrey LM Test where(H_0) is no serial correlation to lag k and(H_1) means there is autocorrelation (Breusch, 1978; Godfrey, 1978). The CUSUM Test of Parameter Stability checks the stability of estimated coefficients over time (Brown, Durbin, & Evans, 1975). Robust inference is obtained using HAC Standard Errors- Newey-West heteroscedasticity and autocorrelation consistent estimators (Newey & West, 1987).

The ARDL model is reparametrized into error-correction form, where there is cointegration:

$$\Delta INF_t = \propto + \sum_{i=1}^{p} \emptyset i \Delta INF\ t-j + \sum_{j=1}^{q2} \beta_2 \Delta EPU_{t-j} + \sum_{j=1}^{q2} \beta_3 \Delta OPU_{t-j} + \sum_{j=1}^{q1} \beta_4 j \Delta OUTGAP_{t-j} + \sum_{j=1}^{q1} \beta_5 j \Delta BM_{t-j} + \psi ECT_{t-1} + \in t \quad (2)$$

Where ECT_{t-1} is the lagged error-correction in the long-run equation. The speed of adjustment through a shock to reach equilibrium is measured by ψ. There is a significant negative ψ, indicating convergence to the long-run equilibrium.

4. Data and Empirical Result

4.1. Data Description

The study uses monthly data for five Asian economies including Pakistan, India, China, Japan, and South Korea. Data ranges from January 2010 to August 2024. The necessity for a useful comparison with seven distinct economic groups in Asia led to the selection of these nations: China is the world's factory and has a significant influence on the local market and demand for commodities, South Korea and Japan are mature economies with established monetary regimes and demonstrated sensitivity to uncertainty, Pakistan and India are rapidly growing economies with chronic inflation tendencies (Aizenman et al., 2016; Park & Shin, 2020). This is due to the fact that this combination will allow us to examine the dynamics of both established and emerging economies in the context of unpredictable oil prices and economic policies. The International Monetary Fund's (IMF) International Financial Statistics database provides the statistics necessary to calculate inflation (INF), which is the rate of change in the Consumer Price Index (CPI) (IMF, 2024). Oil Price Uncertainty (OPU) and Economic Policy Uncertainty (EPU) are available on the Baker, Bloom, and Davis (BBD) website. The prevalence of newspaper stories that provide indicators of the economy, policy, and uncertainty places restrictions on the EPU index (Baker et al., 2016). The OPU index is also a similar index that

measures uncertainty in oil prices with similar methodology (Baker, Bloom, & Davis, 2024). The values of Broad Money (BM) are borrowed by the Federal Reserve Economic Data (FRED) database, where the M3 (or very close to that in terms of broad money aggregates) is observed by nation (Federal Reserve Bank of St. Louis, 2024). Output Gap (OUTGAP) is computed based on real GDP data series from the World Bank's Development Indicators (WDI) (World Bank, 2024). The output gap is a measure of the deviation of actual GDP from the long-term trend, expressed as a percentage, where the trend is estimated using the Hodrick-Prescott (HP) filter (Ravn and Uhlig, 2002). All series are converted into a logarithmic scale where necessary, and variables are organized in identical monthly series.

4.2. Results for Unit Root Test

Table.1.ADF Test Results for Individual Series

Level Series					
	INF	**EPU**	**OPU**	**Output gap**	**BM**
Pakistan	-2.878*	-2.878*	-7.950*	-2.448	-2.879*
India	-9.154*	-3.959*	-7.950*	-0.553	-2.033
China	-8.987*	-2.927	-7.950*	-10.646*	-4.617*
Japan	-10.720*	-5.462*	-7.950*	-2.853	-0.877
South Korea	-3.200*	-4.711*	-7.950*	-3.768*	-0.394
Differenced Series					
	ΔINF	**ΔEPU**	**ΔOPU**	**ΔOutput gap**	**ΔBM**
Pakistan	-2.879*	-2.878*	-14.036*	-2.878*	-2.878*
India	-9.720*	-18.652*	-14.036*	-10.464*	-13.695*
China	-12.717*	-9.732*	-14.036*	-2.220	-8.728*
Japan	-10.850*	-15.264*	-14.036*	0.026*	-13.836*
SouthKorea	-12.328*	-9.886*	-14.036*	13.969*	-13.969*

Note: Significant at 5% level (*)
ADF test hypothesis: H_0 = Unit root series. H_1= stationary series
Constant and Linear Trend

Source: Author's own elaboration

To prevent spurious regression and ensure the stationarity of the variables, the augmented Dickey-Fuller (ADF) was applied at both the level and first difference for all variables. Table 1 reports the Unit Root test result. In the case of Pakistan, the inflation (INF), economic policy uncertainty (EPU), oil price uncertainty (OPU), and broad money (BM) showed stationarity at the level, whereas the output gap was non-stationary. There were stationary variables in India, and these were inflation, OPU, and EPU, whereas output gap and BM were non-stationary series. In China, all variables were stationary at the level, and only EPU is non-stationary. For Japan, the output gap and BM show non-stationary results at the level. On the same note, inflation, EPU, OPU, and output gap in South Korea are stationary, and BM was non-stationary at the level. While performing unit root testing the order of integration was mixed in the selected countries. Consequently, the panel of examined variables includes both I(0) and I(1) types. The findings align with other research (Acar et al. 2022; Narayan, 2005). Hence, validating the significance of employing the ARDL/bounds testing approach to examine both long-term and short-term interactions.

4.3. Linear ARDL Test Results

Table.2.Linear ARDL Test Results

	Pakistan	India	China	Japan	South Korea
U	7.814	8.5	-5.588	35.532	-81.495*
EPU	-	0.193	0.021	-0.139	-
EPU (t-1)	0.667*	-	-	-	0.110
ΔEPU	-0.091	-	-	-	0.006
ΔEPU (t-1)					-0.164*
OPU	0.051	-0.051	-0.105	-0.019	0.048
Gapout	3.172	-0.552	2.085		
Gapout(t-1)		-	-	-0.92	-2.782*
Δ OUTGAP		-	-	-24.316*	-3.322*
Δ OUTGAP (t-1)		-	-	-	-3.360*
INF (t-1)		0.197	-	-	0.320*
Δ INF(t-1)		0.197*	-	0.150721	-
BM	-2.895*		-	-0.225	-
BM (t-1)	-	0.217	-1.738	-	2.385*
Δ BM	-	-2.508	5.584	-	4.606*
ΔBM(t-1)	-	-6.399*	-	-	-
Ecm (t-1)	-0.935*	-0.897*	-0.861*	-1.033*	-1.104*
EPU	-	0.215*	0.024	-0.135	0.099
OPU	0.055	-0.057	-0.122*	-0.019	0.043
BMCON	-3.096	0.242	-2.018	-0.217	2.159*
GAPOUT	3.393	-0.613	2.421	-0.89	2.533
Bound Test	22.949*	15.251*	25.409*	16.181*	22.455*
BP test	0.000*	0.243	0.004*	0.667	0.179
LM test	0.328	0.042*	0.000*	0.809	0.017*

Note: *Significant at 5%

We have used HAC standard errors

Breusch-Pagan (BP) a Heteroscedasticity check test : H0 : errors are homoscedastic, H1: errors are heteroscedastic

Breusch-Godfrey Test i.e. LM test for serial correlation: H0 : there is no serial correlation, H1: serial correlation exists.

Used Hac standardized output

Source: Author's own elaboration

The significant positive correlation of 0.667 in Pakistan suggests that the present level of inflation is significantly influenced by lagging economic policy. The findings align with existing literature, indicating that the escalation of inflationary pressure correlates with an increase in the Economic Policy Uncertainty (EPU) (Nguyen, Minhaj, & Doan, 2025). Elevated EPU might reduce the aggregate demand while pushing enterprises to boost prices to offset the future risks, particularly in times of economic uncertainty. A positive correlation exists between EPU and inflation (Nguyen et al., 2025). The economic uncertainty in Pakistan and its reliance on oil imports and exchange rate fluctuations encourages inflationary pressure by creating a burden on the current account deficit(Khan, Karim, Naz, & Lucey, 2025). EPU affects the decision-making and supply chain process that further fuel inflation. This problem prevails in emerging markets, where uncertainty shocks transmitted through institutional weaknesses in the markets (Che et al., 2024).

The insignificant negative coefficient ΔEPU (-0.091) of the short-term variance in EPU indicates that an immediate variation in economic policy uncertainty does not have any statistically distinguishable effect on present inflation. It implies that markets and economic agents in Pakistan also have adjusted to block short-term signals, to a certain degree, hence delaying the immediate reaction of prices. This is inconsistent with studies demonstrating instant reactions in most areas but consistent with the notion of delayed or longer-term effects in the long run (Sharma, Hayat, Affandi, & Rishanty, 2025).

The insignificant Oil Price Uncertainty (0.051) indicates that oil price-related uncertainty does not have a significant impact on the situation in Pakistan in terms of rising inflation. The effect of OPU on inflation is mostly limited to producer prices as opposed to consumer prices. Overall, its effect in terms of economy may also vary between countries as structural factors and operational decisions may influence the output of OPU directly (Anderl & Caporale, 2023).

The output gap (3.172) is insignificant and positive, and indicates a low or unverified connection between demand and inflation in the Pakistani economy. Although a positive output gap theoretically shows excess demand and inflationary pressure, its lack of significance here means that the demand-side pressures, as shown by the output gap, are not a statistically significant and immediate driver of inflation in Pakistan (Sharma et al., 2025). This may be because of several factors, including supply-side constraints or structural constraints in the economy, which decouple demand pressures and the price move. In several economically sound nations, the effects of the output gaps on inflation may be minor or with a delay (Anderl & Caporale, 2023).

The negative and significant coefficient of Broad Money (BM) suggests that monetary expansion is associated with higher inflation, consistent with the quantity theory of money. This finding aligns with previous observations indicating that increases in the money supply exhibit a strong positive relationship with inflation levels (Akshaya & Gopalakrishna, 2025). The Breusch-Pagan test value (p-value = 0.000) indicates that the data exhibits heteroskedasticity. Although this does not bias the coefficients, it suggests that the standard errors are not efficient and can be considered incorrectly estimated, therefore, resulting in a spurious conclusion (Abiad & Qureshi, 2023). The Chi-square (p-value = 0.328) in the LM test shows that there is no strong serial correlation of the residuals.

India’s Economic Policy Uncertainty (0.193) indicates that a one-period lag of EPU change has no statistically significant effect on India's current inflation. Although extensive literature is present in the context of EPU impacting inflation behavior in many countries (Arbatli, Davis, Ito, & Miake, 2022; Sengupta et al., 2024). The coefficient of the first difference of the lagged inflation (0.197) is significant, implying short-run inflation persistence in India. It means that future periods of inflation are strongly affected by the past periods of inflation, showing an intrinsic momentum in the process of price changes (Sengupta et al., 2025). $BM_{(t-1)}$has a negative coefficient, which became statistically insignificant. Although the broad money upsurge is theoretically related to inflationary forces, the lack of importance drawn implies that at least on a one-period lagged basis, broad money dynamics hardly have a noteworthy and significant impact on inflation in India in such a model. However, the Error Correction Term (-0.897) indicates the long-run equilibrium relationship between the variables. The long run estimate of EPU is positive and significantly different than zero (0.215), which supports the relationship between economic policy uncertainty and the level of inflation.

It is a significant conclusion since it is consistent with evidence that the risks of the uncertainty in policy provoke greater inflammatory effects due to the influence on the decision-making process of economic subjects (Akshaya & Gopalakrishna, 2025). Co-integration in the results of the Bounds Test shows that there is a stable long-run relationship between inflation and the explanatory variables, thus supporting the use of the ARDL model. The Breusch-pagan test (p=0.243) indicates the absence of heteroskedasticity, indicating that the standard errors are efficient. The LM test (p=.042) shows that there is some serial correlation in residuals, which should be fixed by means of defining robust standard errors (e.g., Newey-West) or including extra lags in the model.

In the short run, Economic Policy Uncertainty (EPU), Oil Price Uncertainty (OPU), the output gap, and lagged broad money are found to be insignificant, indicating the absence of any short-run impact on inflation in China. However, the Error Correction Term (−0.861) is negative and statistically significant, confirming a strong adjustment toward long-run equilibrium. Notably, OPU exhibits a significant negative long-run effect (−0.122), reflecting the role of China's price control mechanisms and policy interventions in mitigating external shocks (Nguyen, Minhaj, & Doan, 2025). The diagnostic tests suggested that there was cointegration, but it showed the existence of heteroskedasticity (BP test, p = 0.004) and serial correlation (LM test, p = 0.000), which required the inclusion of robust standard errors or a re-specification of the model. In Japan, the short-run coefficients on EPU, OPU, and lagged output gap, lagged inflation, and broad money were statistically insignificant and denote minimal influence on inflation. The change in the output gap is negative and statistically significant (−24.316), suggesting that increases in excess demand prompt a swift policy response by the Bank of Japan, resulting in disinflationary effects. This outcome is consistent with Japan's historical pattern of monetary tightening and well-anchored inflation expectations (Arbatli et al., 2022). The Error Correction Term (-1.033) was highly significant and showed a great adjustment towards the long-run equilibrium. Diagnostic tests verified cointegration, and the diagnostic tests BP (p=0.667) and LM (p=0.809) showed absence of heteroskedasticity and serial correlation. The results for Japan indicate a highly responsive macroeconomic environment. The strong negative feedback of inflation on changes in the output gap reflects the Bank of Japan's (BOJ) substantial policy credibility, whereby monetary signals effectively influence expectations and price dynamics. The significant Error Correction Mechanism (ECM) further confirms a rapid adjustment toward equilibrium, reinforcing the effectiveness of monetary policy transmission. Moreover, the limited significance of EPU and OPU in the short-run period suggests that uncertainty shocks exert minimal direct influence on inflation, likely due to the BOJ's sustained anti-deflationary stance (Balcilar, Oluseye Olasehinde-Williams, & Shahbaz, 2019).

South Korea, being a relatively small and open economy, remains susceptible to international shocks. The results indicate that Economic Policy Uncertainty (EPU) exerts no significant long-term effect on inflation; however, short-run fluctuations in inflation display disinflationary tendencies associated with EPU (Nguyen et al., 2025). Oil Price Uncertainty (OPU) is insignificant across all periods, which is notable given that its influence is more pronounced on producer rather than consumer prices (Anderl et al., 2023). The negative short-run effects observed on the output gap suggest an inverse Phillips curve relationship, while the limited long-run effects appear minor. Inflation persistence is evident, and broad money supply, both current and lagged emerges as a significant driver of inflation, though its impact is complex, reflecting a delayed

contractionary effect. The Error Correction Term (−1.104) indicates a rapid adjustment toward equilibrium, with evidence of potential overshooting. Diagnostic tests confirm cointegration and the absence of heteroskedasticity, though the presence of serial correlation suggests that model refinement or the application of robust standard errors may be warranted.

4.4. CUSUM Results

The CUSUM test results in Appendix 1 demonstrate that these economies' stability dynamics vary. In the case of Pakistan, evidence suggests structural instability in the inflationary process over time, which may be attributed to the sensitivity of economic policy uncertainty, fluctuations in oil prices, or underlying domestic macroeconomic imbalances (Khan et al., 2025). Due to greater macroeconomic stability and policy credibility, India's relationship between inflation, the uncertainty index, and control variables is comparatively invisible during the sampling period (Anderl & Caporale, 2023).

In the case of China, the test statistic remains within the 5% critical bounds throughout the sample, though it demonstrates a clear upward drift in the later years, suggesting the presence of moderate but manageable instability pressures as the economy became more integrated with global markets and faced episodes of financial volatility (Sengupta et al., 2025). CUSUM indicates a declining tendency but consistently within the confidence bands, showing a steady adjustment mechanism in Japan. This pattern indicates the effectiveness of Japan’s monetary policy credibility and institutional capability to absorb shocks without producing systemic instability (Arbatli et al., 2022). Collectively, the evidence suggests that while China’s inflationary dynamics are increasingly sensitive to both external and domestic shocks, Japan continues to maintain a more stable and resilient macroeconomic environment. The CUSUM plot for South Korea over the period 2015–2024 indicates that the cumulative sum (CUSUM) statistic remains within the 5 percent significance bounds throughout, suggesting the absence of structural breaks in the underlying model during this period. This finding implies that the estimated parameters for South Korea’s model are stable and robust across the examined years (Tudor et al., 2025).

5. Conclusion

The findings provide a key overview of the impact of Economic policy uncertainty and oil price uncertainty on inflation in five Asia Pacific economies. Both short-term and long-term dynamics were explored by employing the Autoregressive Distributed Lag (ARDL) bound testing approach on monthly data from 2010 to 2024. Strong and durable influence of lagged EPU on inflation underlines the outstanding importance of putting up transparent, consistent, stable economic policy tools in place to diffuse inflationary tendencies (Ahmed, Sohag, Mariev, & Islam, 2025). Since Pakistan is highly vulnerable to external shocks and because the energy sector is import-intensive, policymakers must focus on stabilizing the rupee and developing alternative energy sources by investing in the same and improving the production capacity of energy sources in the country. The ECM indicates the high speed at which the economy can respond to correct itself after disturbances, pointing to the efficacy of the timely policy rearrangement. The negative correlation between broad money and inflation is an area that should be more thoroughly examined in the context of the Pakistani individual monetary transmission processes, possibly in terms of using financial deepening or central bank sterilization functions during times of money growth. Although OPU and demand-side pressures related to the output gap have seemingly low values in explaining inflation, it is critical to continue

closely monitoring these aspects because they have indirect impacts on the stability of the economy in question (Khan et al., 2025).

Policymakers of the selected countries must make consistent economic policies clear and communicated to offset these long-run risks of anchoring inflationary expectations. Although short-term policy uncertainty may not be reflected in the price in the present, its accumulation effect cannot be ignored. The robust error-correction process is an indication that the Indian economy responds readily to shocks that push it away from its long-term path, suggesting that policy moves once made could be effective in ensuring inflation returns to its equilibrium levels. China shows how specific state capacity and policy instruments are in dealing with external uncertainties and inflation. The minimal short-run effect of EPU and the disinflationary long-run effect of OPU imply that policymakers of China have effective tools that may include direct or indirect price controls and strategic reserves to protect the domestic economy against the shocks of foreign prices and price uncertainty. This is contrary to the market-oriented economies. This, to the policymakers, means that they can continue to exploit the state-driven mechanisms to stabilize their prices, albeit with a keen thought on the possibility of causing distortions (Nguyen et al., 2025).

Since South Korea's economy is small and open, it is heavily impacted by global hazards, such as the geopolitical threats posed by Russia and the unpredictability of U.S. monetary policy, which discourage investment, industrial production, and exports. Of essential importance is the fact that South Korea can absorb such shocks because of high-quality institutions, autonomous monetary policy, and huge foreign exchange reserves. As such, policymakers must address the desire to see clarity and integrated economic policy frameworks to hedge against negative pressures (Moon, Lee, Kim, & Choi, 2025).

Author Contributions

Ahmed Adekunle carried out the conceptualization, formal analysis, revised, results estimation, tabulation of data, and response to reviewers' comments.

Funding

The author received no external funding

Conflicts of Interest

No conflict of interest

References

Abiad, Abdul, and Irfan A. Qureshi. "The macroeconomic effects of oil price uncertainty." *Energy Economics* 125 (2023): 106839.

Acar, M., & Sever, E. (2022). The effect of innovation on employment: An ARDL bounds testing approach for Turkey. *Sosyoekonomi, 30*(51), 33–52. https://doi.org/10.17233/sosyoekonomi.2022.0

Ahmed, F., Sohag, K., Mariev, O., & Islam, M. M. (2025). Financial stability in G-20 economies: Asymmetric effects of institutional quality, economic policy uncertainty, and oil price shocks. *Sustainable Futures, 10*, Article 100962. https://doi.org/10.1016/j.sftr.2025.100962

Aizenman, J., Cheung, Y. W., & Ito, H. (2016). International reserves before and after the global crisis: Is there no end to hoarding? *Journal of International Money and Finance, 66*, 48–78. https://doi.org/10.1016/j.jimonfin.2016.02.014

Akshaya, A., & Gopalakrishna, B. V. (2025). Impact of climate and economic policy uncertainties on inflation in India: Using the vector error correction model approach. *Asia-Pacific Journal of Regional Science, 9*(2), 585–604. https://doi.org/10.1007/s41685-025-00381-x

Aladwani, J. (2025). Influence of oil price fluctuations on inflation uncertainty. *Journal of Chinese Economic and Foreign Trade Studies, 18*(1), 44–85. https://doi.org/10.1108/jcefts-06-2024-0045

Anderl, C., & Caporale, G. M. (2023). Asymmetries, uncertainty and inflation: Evidence from developed and emerging economies. *Journal of Economics and Finance, 47*(4), 984–1017. https://doi.org/10.1007/s12197-023-09639-6

Arbatli, E. C., Davis, S. J., Ito, A., & Miake, N. (2017, revised 2022). Policy uncertainty in Japan (NBER Working Paper No. 23411). National Bureau of Economic Research. https://doi.org/10.3386/w23411

Arce-Alfaro, G. (2025). The economic implications of oil supply uncertainty. *Energy Economics, 145*, Article 108425. https://doi.org/10.1016/j.eneco.2025.108425

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *Quarterly Journal of Economics, 131*(4), 1593–1636. https://doi.org/10.1093/qje/qjw024

Balcilar, M., Oluseye Olasehinde-Williams, G., & Shahbaz, M. (2019). Asymmetric dynamics of insurance premium: The impact of monetary policy uncertainty on insurance premiums in Japan. *International Journal of Monetary Economics and Finance, 12*(3), 233–247. https://doi.org/10.1504/IJMEF.2019.100625

BBD. (2024). *Economic policy uncertainty and oil price uncertainty indices*. PolicyUncertainty.com. https://www.policyuncertainty.com/

Breusch, T. S. (1978). Testing for autocorrelation in dynamic linear models. *Australian Economic Papers, 17*(31), 334–355.

Breusch, T. S., & Pagan, A. R. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica*, *47*(5), 1287–1294.

Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society: Series B (Methodological), 37*(2), 149–163.

Che, M., Wang, L., & Li, Y. (2024). Global economic policy uncertainty and oil price uncertainty: Which is more important for global economic activity? *Energy, 310*, Article 133305. https://doi.org/10.1016/j.energy.2024.133305

Collins, A., Morris, D., & Wattanadumrong, B. (2025). Rising energy costs and heterogeneous innovation outcomes in Thailand. *Energy Economics, 145*, Article 108438. https://doi.org/10.1016/j.eneco.2025.108438

Dräger, L., & Nghiem, G. (2025). Inflation literacy, inflation expectations, and trust in the central bank: A survey experiment. *The Review of Economics and Statistics*, 1–45. https://doi.org/10.1162/rest_a_01576

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient tests for an autoregressive unit root. *Econometrica, 64*(4), 813–836.

Federal Reserve Bank of St. Louis. (2024). *FRED economic data*. https://fred.stlouisfed.org/

Godfrey, L. G. (1978). Testing for higher order serial correlation in regression equations when the regressors include lagged dependent variables. *Econometrica, 46*(6), 1303–1310.

International Monetary Fund (IMF). (2024). *International financial statistics*. https://data.imf.org/

Khan, M., Karim, S., Naz, F., & Lucey, B. M. (2025). How do exchange rate and oil price volatility shape Pakistan's stock market? *Research in International Business and Finance, 76*(C), Article 102796. https://doi.org/10.1016/j.ribaf.2025.102796

Kim, J. (2025). The impact of external uncertainty shocks on the Korean economy. *KDI Journal of Economic Policy, 47*(1), 19–66. https://doi.org/10.23895/kdijep.2025.47.1.19

Kotz, M., Kuik, F., Lis, E., & Nickel, C. (2024). Global warming and heat extremes to enhance inflationary pressures. *Communications Earth & Environment, 5*(1). https://doi.org/10.1038/s43247-023-01173-x

Ma, Y., Liu, Z., Ma, D., Zhai, P., Guo, K., Zhang, D., & Ji, Q. (2023). A news-based climate policy uncertainty index for China. *Scientific Data, 10*(1). https://doi.org/10.1038/s41597-023-02817-5

Majumder, S. (2024). Is cryptocurrency a new digital gold? Evidence from the macroeconomic shocks in selected emerging economies. *Journal of Economic Studies, 52*(1), 88–103. https://doi.org/10.1108/jes-08-2023-0410

Mamman, S., Nadarajah, S., Iliyasu, J., & Hassan, M. (2025). Emerging contemporary monetary policy issues in Africa: An application of wavelet and quantile techniques to climatic shocks on inflation. *PLOS ONE, 20*(5), e0319797. https://doi.org/10.1371/journal.pone.0319797

Moon, S., Lee, J., Kim, J., & Choi, H. (2025). Analysis on the acceptance of coal phase-out policy considering public preferences: Policy implications and future direction based on empirical evidence from South Korea. *Energy Economics, 145*, Article 108453. https://doi.org/10.1016/j.eneco.2025.108453

Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics, 37*(17), 1979–1990. https://doi.org/10.1080/00036840500278103

Newey, W. K., & West, K. D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica, 55*(3), 703–708.

Ng, S., & Perron, P. (2001). Lag length selection and the construction of unit root tests with good size and power. *Econometrica, 69*(6), 1519–1554.

Nguyen, T. P. T., Bin Minhaj, A., & Doan, A.-T. (2025). How do economic policy uncertainty and inflation individually and collectively influence bank loan pricing decisions in China? *Journal of Chinese Economic and Foreign Trade Studies*. Advance online publication. https://doi.org/10.1108/JCEFTS-09-2024-0072

Park, C. Y., & Shin, K. (2020). Economic resilience and recovery from COVID-19: Lessons from Asian economies. *Asian Economic Papers, 19*(3), 41–65. https://doi.org/10.1162/asep_a_00755

Pesaran, M. H., & Shin, Y. (1998). An autoregressive distributed-lag modelling approach to cointegration analysis. *Econometric Society Monographs, 31*, 371–413.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326.

Ravn, M. O., & Uhlig, H. (2002). On adjusting the Hodrick–Prescott filter for the frequency of observations. *Review of Economics and Statistics, 84*(2), 371–376. https://doi.org/10.1162/003465302317411604

Ren, P., & Sakouba, I. (2024). Exchange rate movements and China–East Africa trade balance: A new perspective from RMB. *SAGE Open, 14*(1). https://doi.org/10.1177/21582440241230805

Sahu, A., Debata, B., & Sachdeva, P. (2025). Monetary policy, stock market and inflation amid economic uncertainty: Fresh evidence from an emerging market (the Indian case). *International Review of Finance, 25*(2). https://doi.org/10.1111/irfi.70016

Santiyano, B., Tanty, V., Hariwinarta, J., & Havidz, S. (2025). Assessing the impact of macroeconomic and environmental concerns on bitcoin in lower-income countries. *IOP Conference Series: Earth and Environmental Science, 1441*(1), 012032. https://doi.org/10.1088/1755-1315/1441/1/012032

Sengupta, S., Chakraborty, T., & Singh, S. K. (2025). Forecasting CPI inflation under economic policy and geopolitical uncertainties. *International Journal of Forecasting, 41*(3), 953–981. https://doi.org/10.1016/j.ijforecast.2024.08.005

Sharma, S. S., Hayat, A., Affandi, Y., & Rishanty, A. (2025). A note on how Asia-Pacific giants Australia, China and Japan manage the geopolitical risk for prices. *Emerging Markets Finance and Trade, 61*(9), 2695–2703. https://doi.org/10.1080/1540496X.2025.2460656

Trabelsi, E., & Khaled, A. (2023). Monetary policy and inflation targeting under global uncertainty: A SVAR approach for Tunisia. *Journal of Financial Economic Policy, 15*(4/5), 368–395. https://doi.org/10.1108/jfep-02-2023-0035

Tsang, A. (2024). Uncovering heterogeneous regional impacts of Chinese monetary policy. *Empirical Economics, 67*(3), 915–940. https://doi.org/10.1007/s00181-024-02575-2

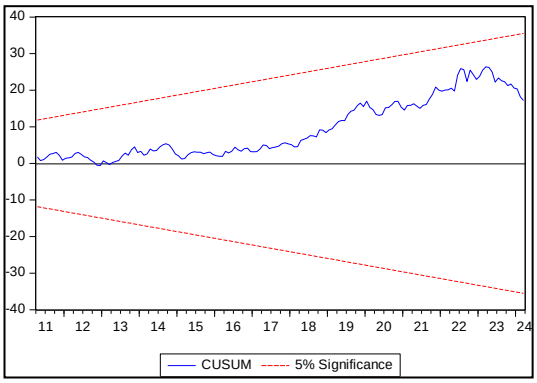
Tudor, C., Girlovan, A., Sova, R., Sierra, J., & Stancu, G. R. (2025). From policy to prices: How carbon markets transmit shocks across energy and labor systems. *Energies, 18*(15), 4125. https://doi.org/10.3390/en18154125

World Bank. (2024). *World development indicators*. https://databank.worldbank.org/source/world-development-indicators

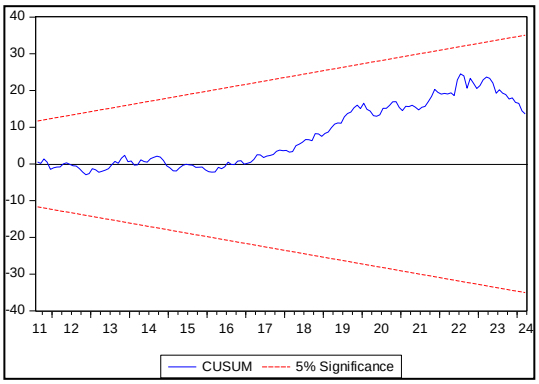
Appendix-1

CUSUM Graphs

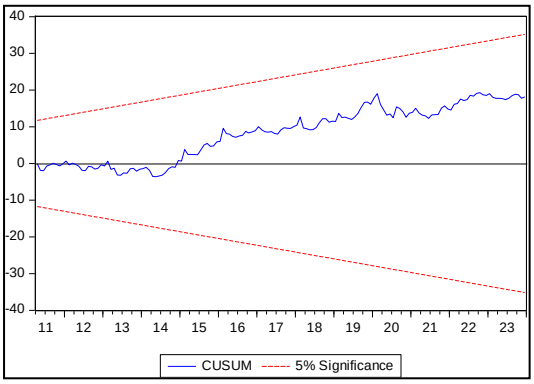
Pakistan



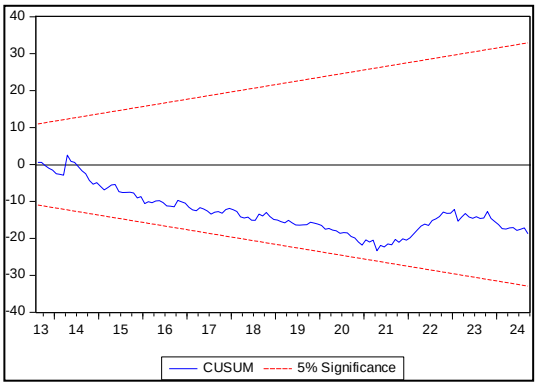
India



China



Japan



South Korea