



Exploring the Nexus Between Geopolitical Risk, Economic Growth, and Inbound Tourism: An Empirical Study of India

Mohammad Shadab Hussain¹, Dr. Deepika Abhijeet Kininge²

¹Research Scholar, Department of Commerce AKI's Poona College of Arts Science and Commerce Savitribai Phule Pune University Pune, 411001, Maharashtra Camp, Pune-1

shaan.data@gmail.com

²Asst. Prof. AKI's Poona College of Arts Science and Commerce Arts Science and Commerce Savitribai Phule Pune University Pune, 411001, Maharashtra Camp, Pune-1

Abstract: This study investigates the dynamic interplay between geopolitical risk, economic growth, and inbound tourism in India over the period 1990–2024. Drawing on the Tourism-Led Growth and Growth-Led Tourism hypotheses, the analysis integrates macroeconomic variables—exchange rate, inflation, and trade openness—alongside the Caldara–Iacoviello Geopolitical Risk index. Employing the Bayer–Hanck cointegration approach and an autoregressive distributed lag (ARDL) framework, the study examines both short-run and long-run relationships using annual data sourced from the World Bank, Reserve Bank of India, and other reputable databases. Empirical results reveal a significant long-run cointegrating relationship: heightened geopolitical risk exerts a negative effect on inbound tourism, while economic growth and exchange rate movements display positive influences. The error correction model indicates that deviations from long-run equilibrium are corrected at an annual speed of approximately 33%. Diagnostic tests confirm the model's robustness, with no evidence of serial correlation, heteroskedasticity, or non-normality. The findings underscore the vulnerability of India's tourism sector to geopolitical disturbances and highlight the importance of sustained economic expansion and currency stability to bolster tourism resilience. Policy implications include the need for targeted risk mitigation strategies, investment in tourism infrastructure, and flexible economic policymaking to safeguard and promote inbound tourism in the face of geopolitical uncertainty.

Keywords: Geopolitical risk, Economic policy uncertainty, Tourism demand, Economic growth, India.

1. Introduction

Tourism is widely recognized as one of the world's fastest-growing industries, playing a crucial role in enhancing economic development, generating employment, and fostering international cooperation. The sector contributes significantly to global GDP and foreign exchange earnings, especially in emerging economies such as India. According to the World Travel and Tourism Council (WTTC, 2023), the tourism industry contributed approximately 7.6% to global GDP and generated nearly 300 million jobs worldwide before the COVID-19 pandemic. In the context of developing nations, tourism acts as a catalyst for infrastructure development, regional integration, and socio-economic transformation (UNWTO, 2022). However, the tourism sector is highly sensitive to external shocks, including geopolitical risks, economic instability, pandemics, and policy uncertainty, which can significantly influence the flow of international tourists and the overall performance of the economy.

In recent years, geopolitical risks (GPR) have become a critical determinant of international tourism patterns. Geopolitical risks encompass a broad range of threats such as political instability, terrorism, armed conflicts, and diplomatic tensions that directly or indirectly affect tourists' perceptions of safety and destination attractiveness (Caldara & Iacoviello, 2018). Such risks not only deter potential travelers but also influence macroeconomic conditions, foreign investment, and trade openness. The sensitivity of tourism to geopolitical disruptions has been



demonstrated in multiple global contexts, including the Middle East, Africa, and South Asia, where events such as terrorist attacks, border conflicts, and political upheavals have led to significant declines in international arrivals (Bianchi, 2020; Hall & Page, 2019). For India, a country with vast cultural heritage and diverse tourism potential, understanding how geopolitical risks interact with economic growth and tourism demand is essential for ensuring sustainable development and resilience in the tourism industry.

The relationship between tourism and economic growth has been extensively investigated under the Tourism-Led Growth Hypothesis (TLGH), which posits that tourism expansion contributes to higher economic output through increased foreign exchange earnings, job creation, and investment in infrastructure (Balaguer & Cantavella-Jordá, 2002; Brida et al., 2016). Conversely, the Growth-Led Tourism Hypothesis (GLTH) suggests that economic growth itself stimulates tourism development by improving infrastructure, income levels, and destination competitiveness (Katircioglu, 2009). However, both relationships can be moderated or disrupted by geopolitical and economic uncertainties. For instance, political tensions or cross-border disputes can reduce inbound tourist arrivals, while strong economic growth may mitigate such effects by enhancing stability and confidence (Seetanah, 2011). Hence, understanding the interconnections among geopolitical risks, economic growth, and inbound tourism provides valuable insights for policy formulation in emerging economies like India.

India has emerged as one of the major global tourism destinations in recent decades. The country's rich cultural heritage, historical monuments, natural landscapes, and spiritual tourism attract millions of international visitors each year. According to the Ministry of Tourism (Government of India, 2023), India recorded over 10.9 million foreign tourist arrivals in 2019, contributing approximately USD 30 billion in foreign exchange earnings. However, this progress has been periodically disrupted by regional conflicts, border tensions, terrorism incidents, and global geopolitical shifts. For instance, episodes of cross-border conflict between India and Pakistan, domestic insurgencies, and global political tensions have all exerted varying degrees of influence on the perception of safety and tourism demand (Bhatia, 2021). Moreover, external shocks such as the Russia–Ukraine war, fluctuations in global oil prices, and changes in international travel regulations have added layers of uncertainty to India's tourism performance.

From an economic perspective, tourism plays a strategic role in India's development agenda. The sector supports more than 40 million jobs and contributes significantly to rural and regional economies (WTTC, 2023). Yet, tourism's dependence on external stability makes it vulnerable to both geopolitical disruptions and macroeconomic volatility. Geopolitical uncertainty often leads to reduced investor confidence, exchange rate fluctuations, and declining consumer spending—all of which can indirectly influence tourism demand (Ahmed & Awan, 2020). Moreover, in an interconnected global economy, events such as terrorist attacks or regional conflicts can trigger spillover effects that transcend borders, amplifying the challenges for policymakers and tourism managers (Khalid et al., 2022).

The nexus between geopolitical risk, economic growth, and tourism in India remains relatively underexplored in the existing literature. While numerous studies have examined the impact of economic factors on tourism demand, only a limited number have incorporated geopolitical and policy uncertainty indices into their empirical frameworks. For example, studies by Dogru et al. (2019) and Raza et al. (2020) highlighted how political stability and security influence tourism performance globally, but region-specific analyses focusing on India are scarce. Furthermore, most existing works rely on conventional econometric methods that do not adequately capture the long-run cointegration or dynamic causality among these variables. Addressing this gap, the present study employs the Bayer and Hanck (2013) cointegration approach and the autoregressive distributed lag (ARDL) model to explore both the short-run and long-run relationships among geopolitical risk, economic growth, and inbound tourism in India. This research also extends the scope of traditional tourism models by integrating additional macroeconomic variables—such as exchange rate, inflation, and trade openness—into the analytical framework. These factors are crucial for understanding the broader economic environment that influences tourism flows. For



instance, an appreciating exchange rate can make India a relatively expensive destination, whereas high inflation may reduce tourism competitiveness (Narayan et al., 2010). Similarly, trade openness can facilitate tourism through improved connectivity, foreign partnerships, and policy liberalization (Oh, 2005). Thus, the combined analysis of these factors alongside geopolitical risks and economic growth provides a comprehensive understanding of the determinants of inbound tourism.

The theoretical foundation of this study is grounded in the demand theory of tourism and the macroeconomic uncertainty framework. The demand theory posits that tourists' destination choices are influenced by both economic and non-economic factors, including income levels, prices, and perceptions of safety (Song et al., 2012). The macroeconomic uncertainty framework, on the other hand, suggests that heightened geopolitical and economic uncertainty discourages consumption and investment activities, thereby affecting tourism decisions (Bekaert et al., 2016). In this context, geopolitical risks act as a proxy for destination insecurity, which can significantly alter tourists' behavioral intentions and travel patterns (Sönmez & Graefe, 1998). By analyzing these relationships, the present study makes several important contributions. First, it provides new empirical evidence on the impact of geopolitical risks on inbound tourism in India—an area that has received limited academic attention. Second, it integrates both economic and geopolitical dimensions to offer a multidimensional understanding of tourism demand determinants. Third, it employs advanced econometric techniques to ensure robust long-run and short-run inference, addressing methodological gaps in previous research. Lastly, the findings are expected to inform policymakers, tourism authorities, and business stakeholders in developing pre-crisis and post-crisis strategies to mitigate the adverse effects of geopolitical instability on India's tourism sector.

The rest of the paper is structured as follows: Section 2 reviews the existing literature on geopolitical risk, tourism, and economic growth. Section 3 outlines the data sources, model specification, and methodological framework. Section 4 presents and discusses the empirical findings. Section 5 concludes with key policy implications and recommendations for enhancing tourism resilience in India.

2. Literature Review

2.1 Geopolitical Risk and Tourism Demand

Geopolitical risks encompass a range of factors, including political instability, conflicts, and diplomatic tensions, which can significantly impact tourism demand. Studies have shown that such risks often lead to a decline in tourist arrivals due to safety concerns and altered travel preferences. For instance, research indicates that increasing geopolitical tensions have a persistent negative effect on tourism demand in several countries Gupta, (2024).

In the Indian context, geopolitical risks have similarly affected tourism patterns. A study examining the impact of geopolitical risk on tourism demand in India found that such risks negatively influence tourist arrivals, highlighting the vulnerability of the tourism sector to external political factors Aboagye, (2023).

2.2 Economic Growth and Tourism Nexus

The relationship between economic growth and tourism is multifaceted, with tourism contributing to economic development and vice versa. Economic growth can lead to increased disposable income, enhancing domestic and international travel demand. Conversely, a thriving tourism sector can stimulate economic growth through job creation, infrastructure development, and foreign exchange earnings. In India, the tourism sector has been a significant contributor to economic growth. The World Travel & Tourism Council reported that the Indian tourism industry contributed approximately 7.6% to the country's GDP in 2023, generating millions of direct and indirect jobs Sharma, & Pal, (2019). Additionally, the sector's growth has led to increased foreign exchange earnings, further bolstering the economy.

2.3 Economic Policy Uncertainty and Tourism



Economic policy uncertainty refers to the unpredictability regarding government policies that can affect economic decisions. Such uncertainty can influence tourism by affecting travel costs, visa regulations, and overall destination attractiveness. In India, economic policy uncertainty has been observed to impact various sectors, including tourism. A study found that rising uncertainty in economic policies adversely affects firm-level decisions, including investment and leverage, which can indirectly influence tourism development. However, the impact of economic policy uncertainty on tourism development in India is relatively less pronounced compared to geopolitical risks

2.4 Exchange Rate Volatility and Tourism Demand

Exchange rate fluctuations can affect tourism demand by altering the relative cost of travel. A favorable exchange rate can make a destination more attractive to foreign tourists, while an unfavorable rate can have the opposite effect Aboagye, (2023) and Tabash, (2023).

Research indicates that exchange rate volatility has an asymmetric relationship with tourism demand in India. The study suggests that while depreciation of the Indian Rupee may make India more attractive to foreign tourists, excessive volatility can deter potential visitors due to perceived risks. Soudager, M. A. (2023)

2.5 Trade Openness and Tourism Development

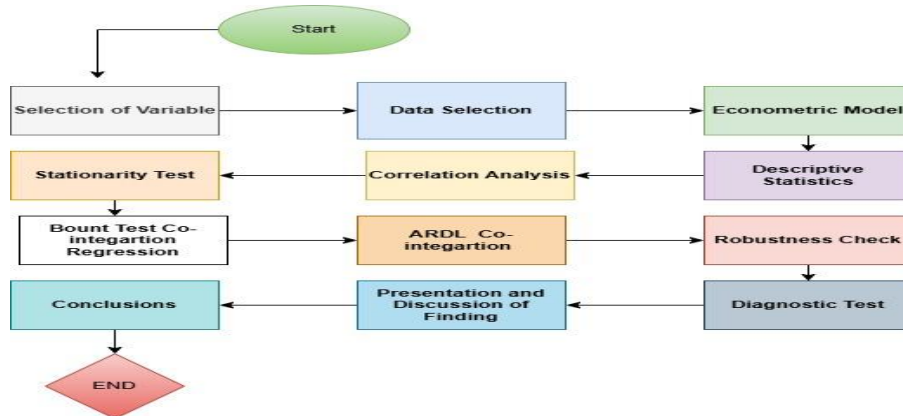
Trade openness refers to the extent to which a country allows free trade with other nations. Increased trade openness can lead to improved infrastructure, better connectivity, and enhanced destination competitiveness, all of which can boost tourism. In the context of India, trade openness has been linked to tourism development. A study examining the relationship between tourism, trade openness, and economic growth in BRICS-T countries found that trade openness positively influences tourism development, which in turn contributes to economic growth Gupta, (2024); Devi, (2024); French, (2024); Sharma, & Mohapatra, (2022).

2.6 The Indian Context

India's tourism sector is characterized by its rich cultural heritage, diverse landscapes, and historical significance, attracting millions of international visitors annually. However, the sector faces challenges such as geopolitical risks, economic policy uncertainty, and infrastructure constraints. Recent developments highlight the sector's resilience and growth potential. For instance, the rejuvenation of the Kashi Vishwanath Dham in Varanasi has significantly contributed to Uttar Pradesh's economy, generating an estimated ₹1.25 lakh crore by September 2025 and attracting millions of visitors Qayoom, (2025). D'Souza, (2025). Gupta, (2024). Additionally, the Ministry of Tourism reported that India recorded 18.89 million international tourist arrivals in 2023, with foreign exchange earnings through tourism surging to ₹2.31 lakh crore, underscoring the sector's economic significance.

3. Research and Methodology

The study employed secondary time series data obtained from reputable public sources, including the World Bank (WB) and the Reserve Bank of India (RBI) handbook, covering the period from 1990 to 2024. Table 1 presents a detailed overview of the data used in the analysis. By relying on these authoritative sources, the research ensures the accuracy and reliability of the information utilized to examine the impact of geopolitical risk on India's international tourism demand. Additionally, the study investigates the influence of economic policy uncertainty, economic growth, exchange rates, inflation, and trade openness on tourism inflows. This methodological framework enables a comprehensive assessment of temporal trends and patterns, providing valuable insights into how geopolitical risk and key economic factors collectively shape India's inbound tourism over time.



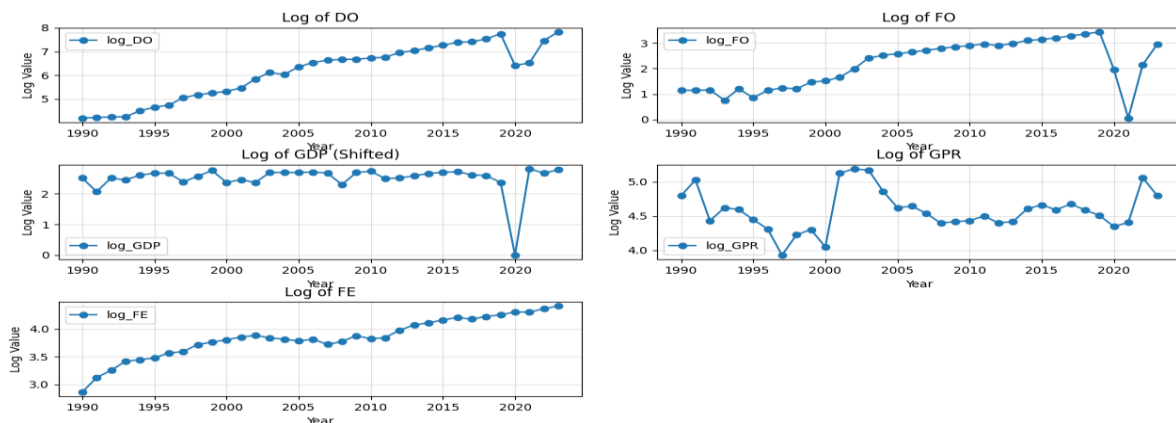
Research of frame work of the study

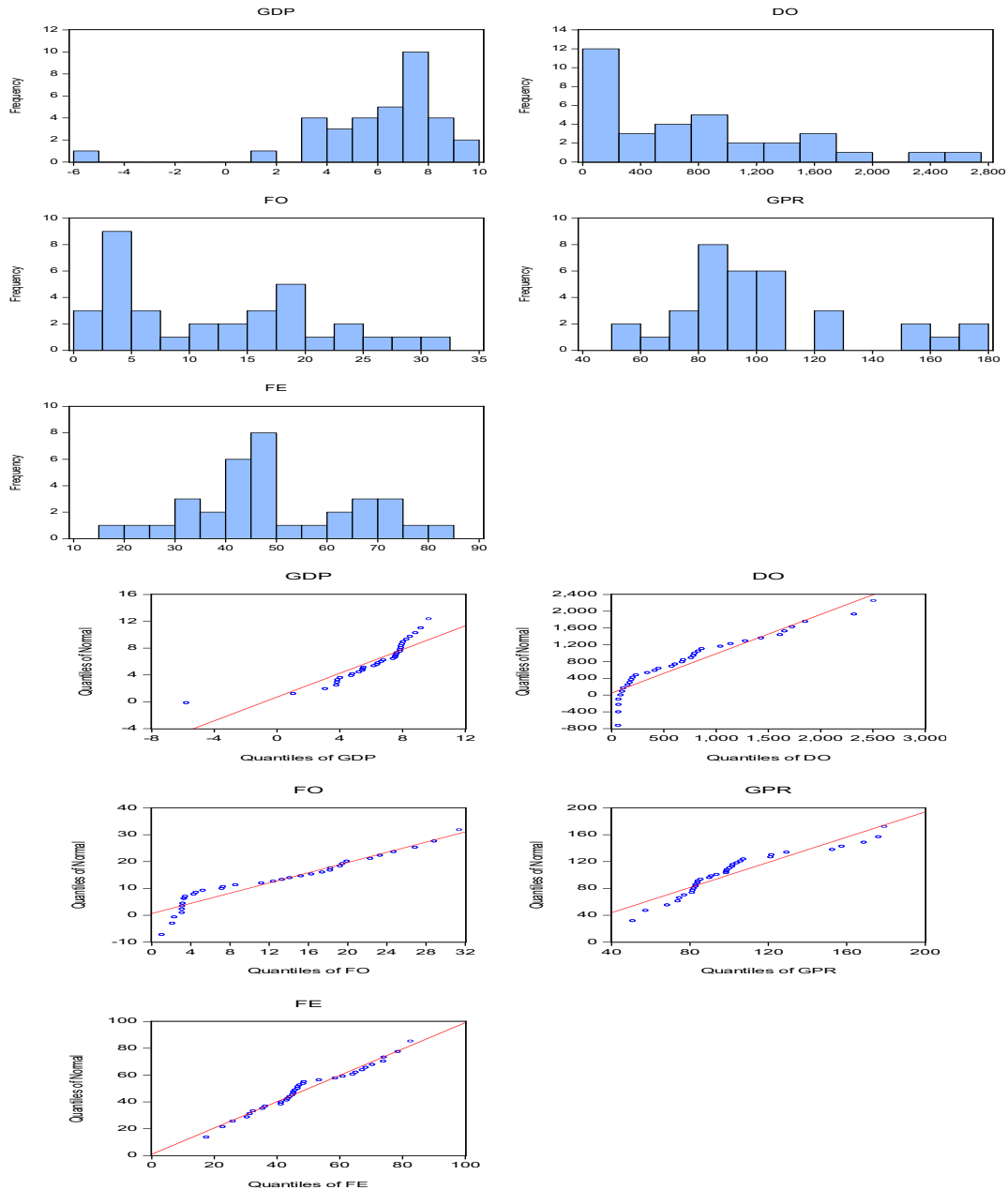
Table 1: Variable names and description

Symbol	Variable Name	Measurement Unit	Source
GDP	Gross Domestic Product	Annual % growth	WB
FT	Foreign Tourist	US dollar	WB
IT	Indian Tourist	Indian rupees	WB
GPR	Geopolitical Rist	Foreign direct investment, net inflows (% of GDP)	Caldara and Iacoviello (2022)
FE	Foreign Exchange	Official exchange rate (LCU per US\$, period average)	WB

Sources; World Bank

Sources; RBI Handbook, IMD





Hypothesis Formulation

H₀₁: Geopolitical risk does not significantly influence inbound tourism in India.

H₁₁: Geopolitical risk significantly influences inbound tourism in India.

H₀₂: Economic growth does not have a significant impact on inbound tourism in India.

H₁₂: Economic growth has a significant impact on inbound tourism in India.

H₀₃: Geopolitical risk does not significantly affect economic growth in India.

H₁₃: Geopolitical risk significantly affects economic growth in India.

3.1 Econometric Model:

In order to describe the relationship between rice production, rainfall, maximum temperature, minimum temperature, and mean temperature this study uses the following equation,

$$LNGDP_t = \alpha + \beta_1 LNDO_t + \beta_2 LNFO_t + \beta_3 LNGPR_t + \beta_4 LNFE_t \dots \dots (1)$$

In the specified model, LNRP denotes the natural logarithm of the dependent variable, whereas LNFT, LNIT, LNFDI, and LNFE correspond to the natural logarithms of foreign tourists, Indian tourists, geopolitical risk, and foreign exchange, respectively. The parameters α , β_1 , β_2 , β_3 , and β_4 represent the constant term and respective elasticities, while ε_t captures the stochastic error component. To examine the stationarity of the variables, both the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests are applied separately, incorporating an intercept and a deterministic trend. The optimal lag length is determined using the Schwarz Information Criterion (SIC), where lag lengths of 1 and 3 are found to be suitable. The ADF test accounts for potential serial correlation in the residuals by including lagged differences of the dependent variable. Equation (2) presents the ADF unit root specification, while Equation (3) illustrates the Phillips–Perron test formulation.

$$\Delta Y_t = \alpha Y_{t-1} + x_t^l \delta + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_p Y_{t-p} + V \dots \dots (2)$$

$$t_\alpha = t_\alpha \left(\frac{y_0}{t_0} \right)^{1/2} - \frac{T(t_0 - y_0)(Se(\alpha))}{2f_0^{1/2} S} \quad (3)$$

The equation employed for ARDL bounds testing in the model, as outlined by Ali, et., al., 2022: Ansari et al. (2022, 2023; 2024; 2024; 2025)), and Khan et al. (2024), is denoted as Equation (4).

$$\begin{aligned} \Delta LNGDP_t = & \gamma_0 + \sum_{i=1}^n \gamma_{1i} LNGDP_{t-1} + \sum_{i=1}^n \gamma_{2i} LNFO_{t-1} + \sum_{i=1}^n \gamma_{3i} LNDO_{t-1} + \sum_{i=1}^n \gamma_{4i} LNGPR_{t-1} \\ & + \sum_{i=1}^n \gamma_{5i} LNFE_{t-1} + \varepsilon_t \dots \dots (4) \end{aligned}$$

The long-run ARDL model to be estimated is presented in Equation (5).

$$\begin{aligned} \Delta LNGDP = & \beta_0 + \sum_{i=1}^q \omega_1 LNGDP_{t-1} + \sum_{i=1}^q \omega_2 LNFO_{t-1} + \sum_{i=1}^q \omega_3 LNDO_{t-1} + \sum_{i=1}^q \omega_4 LNGPR_{t-1} \\ & + \sum_{i=1}^q \omega_5 LNFE_{t-1} + \varepsilon_t \dots \dots (5) \end{aligned}$$

In Equation (5), ω represents the long-run variance of variables. The short-run ARDL model incorporating the error correction term is expressed as follows:

$$\begin{aligned} \Delta LNGDP_t = & \beta_0 + \sum_{i=1}^q \pi_1 \Delta LNGDP_{t-1} + \sum_{i=1}^q \pi_2 \Delta LNFO_{t-1} + \sum_{i=1}^q \pi_3 \Delta LNDO_{t-1} + \sum_{i=1}^q \pi_4 \Delta LNGPR_{t-1} \\ & + \sum_{i=1}^q \pi_5 \Delta LNFE_{t-1} + ECT_{t-1} + \varepsilon_t \dots \dots (6) \end{aligned}$$

In Equation (6), π captures the short-run dynamics among the variables, while the Error Correction Term (ECT) reflects the speed at which deviations from the long-run equilibrium are corrected. The ECT coefficient, expected to lie between -1 and 0 , signifies the rate of adjustment toward equilibrium. The influence of explanatory variables on the dependent variable was further examined through graphical analysis. Several diagnostic tests were

performed to verify model robustness, including the Breusch–Godfrey LM test for serial correlation, the Breusch–Pagan–Godfrey and ARCH tests for heteroscedasticity, the Ramsey RESET test for model specification, and the Jarque–Bera test for normality of residuals. Moreover, model stability was evaluated using CUSUM and CUSUMSQ tests based on recursive residuals.

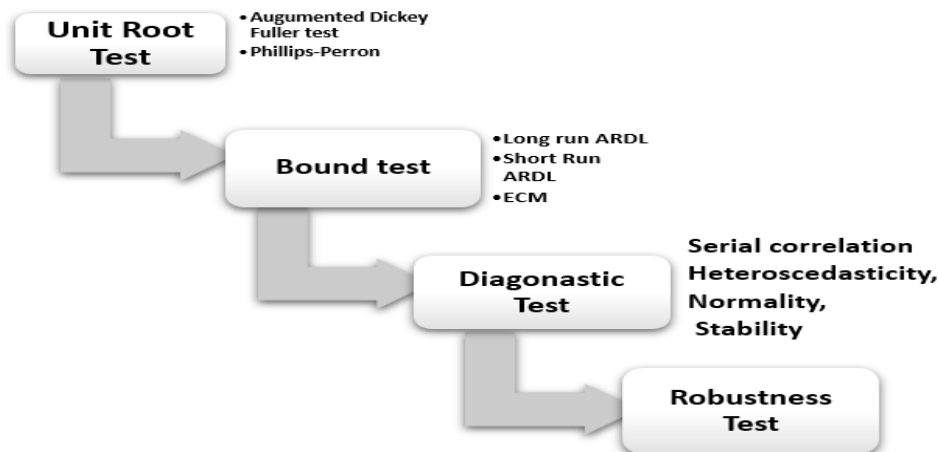


Figure 3, Framework Research Methodology

3. Result and Discussion

Table 2, descriptive analysis

	GDP	DO	FO	GPR	FE
Mean	6.11	763.33	12.30	101.96	49.46
Median	6.73	643.92	11.83	96.14	46.15
Maximum	9.69	2509.63	31.41	179.30	82.60
Minimum	-5.78	66.67	1.05	50.92	17.50
Std. Dev.	2.88	683.40	8.97	32.24	16.45
Skewness	-2.21	0.95	0.44	1.04	0.22
Kurtosis	9.70	3.01	1.97	3.41	2.33
Jarque-Bera	91.43	5.13	2.60	6.41	0.91
Probability	0.00	0.08	0.27	0.04	0.64

figure 4, Calculated by Author through python Software

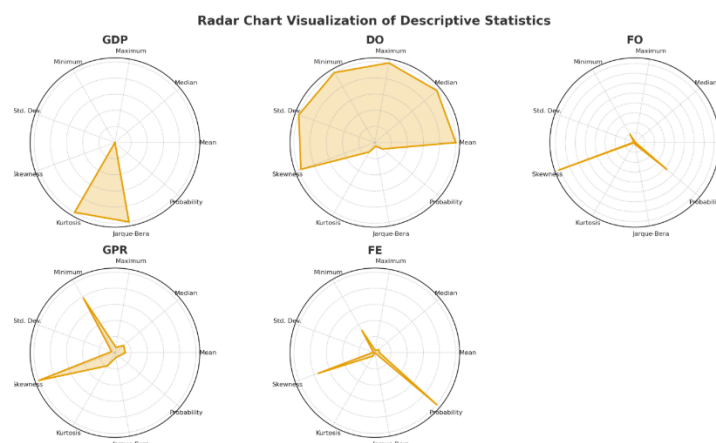
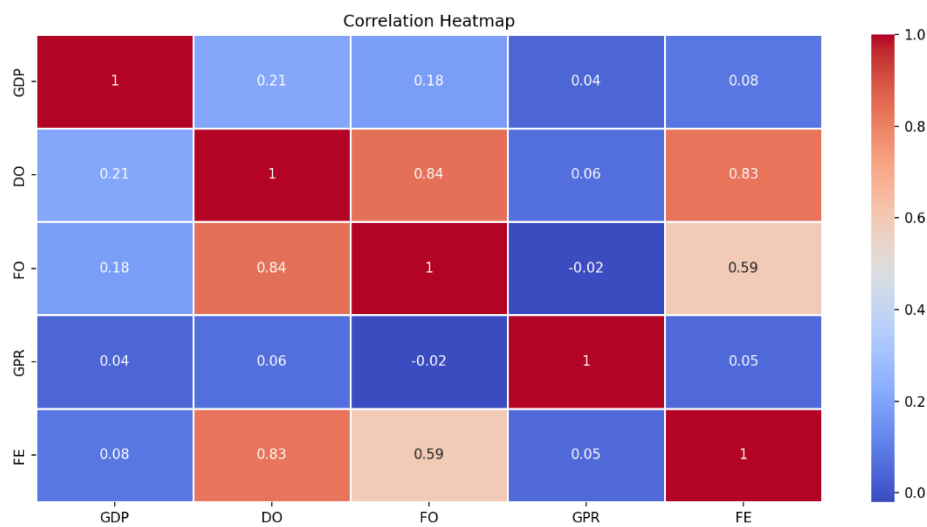


Table 3, Correlation Analysis

	GDP	DO	FO	GPR	FE
GDP	1				
DO	0.21	1.00			
FO	0.18	0.84	1.00		
GPR	0.04	0.06	-0.02	1.00	
FE	0.08	0.83	0.59	0.05	1.00



Calculated by through Python

The table 3, presents a correlation matrix among five economic variables: GDP (Gross Domestic Product), DO, FO, GPR, and FE. Correlation matrices are used to examine the strength and direction of linear relationships between variables, with values ranging from -1 to 1. A value close to 1 indicates a strong positive correlation, while a value close to -1 indicates a strong negative correlation; a value near 0 suggests little or no linear relationship. From the matrix, GDP shows a moderate positive correlation with DO (0.21) and FO (0.18), indicating that changes in domestic output (DO) and foreign output (FO) are slightly associated with variations in GDP. The correlation between GDP and GPR is minimal (0.04), suggesting little connection between GDP and government policy responses. Similarly, GDP has a weak correlation with FE (0.08), implying limited association with financial expenditures.

Interestingly, DO and FO exhibit a very strong positive correlation (0.84), suggesting that domestic and foreign outputs tend to move in tandem. FE is also strongly correlated with DO (0.83) and moderately with FO (0.59), indicating that financial expenditures are closely linked to both domestic and foreign outputs. GPR, however, maintains very low correlations with other variables. The table presents a correlation matrix among five economic variables: GDP (Gross Domestic Product), DO, FO, GPR, and FE. Correlation matrices are used to examine the strength and direction of linear relationships between variables, with values ranging from -1 to 1. A value close to 1 indicates a strong positive correlation, while a value close to -1 indicates a strong negative correlation; a value near 0 suggests little or no linear relationship.

From the matrix, GDP shows a moderate positive correlation with DO (0.21) and FO (0.18), indicating that changes in domestic output (DO) and foreign output (FO) are slightly associated with variations in GDP. The correlation between GDP and GPR is minimal (0.04), suggesting little connection between GDP and government

policy responses. Similarly, GDP has a weak correlation with FE (0.08), implying limited association with financial expenditures.

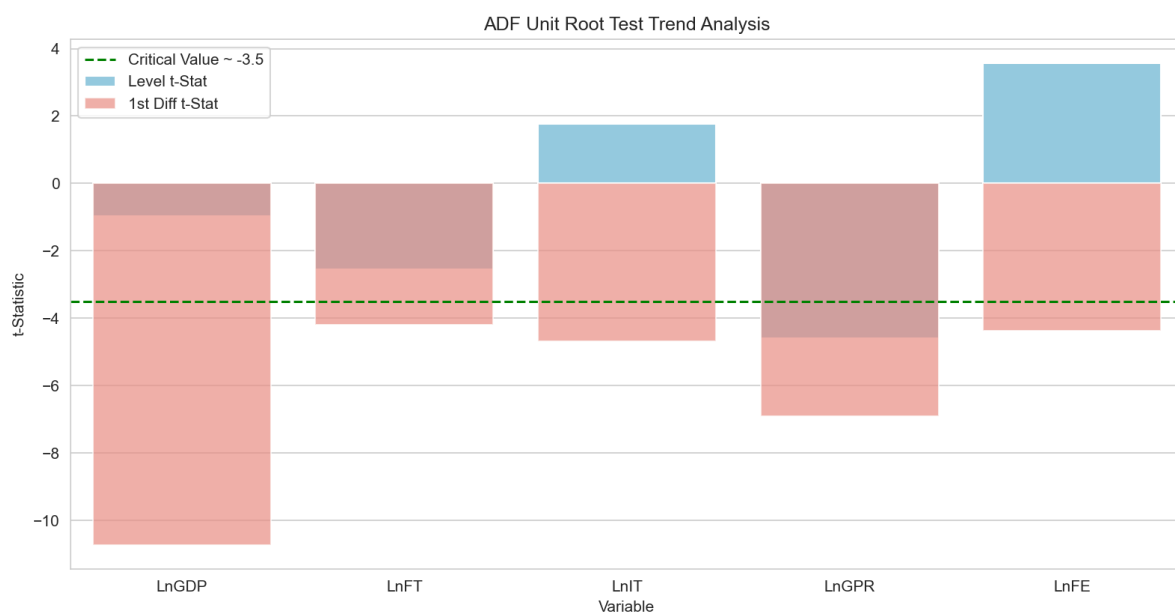
Interestingly, DO and FO exhibit a very strong positive correlation (0.84), suggesting that domestic and foreign outputs tend to move in tandem. FE is also strongly correlated with DO (0.83) and moderately with FO (0.59), indicating that financial expenditures are closely linked to both domestic and foreign outputs. GPR, however, maintains very low correlations with other variables, implying its independence in this dataset.

Table 3: Results of ADF and PP Unit root test

UNIT ROOT TEST TABLE (ADF)						
At Level			at First Difference			
Variable	t-Statistic	Prob.	Variable	t-Statistic	Prob.	Decision
LnGDP	-0.97	0.29	d(LnGDP)	-10.73	0.00	I(1)
LnFT	-2.56	0.01	d(LnFT)	-4.19	0.00	I(0)
LnIT	1.77	0.98	d(LnIT)	-4.68	0.00	I(1)
LnGPR	-4.59	0.00	d(LnGPR)	-6.91	0.00	I(0)
LnFE	3.56	1.00	d(LnFE)	-4.38	0.00	I(1)

Unit root test PP						
At Level			At First Difference			
Variable	t-Statistic	Prob.	Variable	t-Statistic	Prob.	Decision
LnGDP	-0.72	0.40	d(LnGDP)	-10.83	0.00	I(1)
LnFT	-2.58	0.01	d(LnFT)	-4.12	0.00	I(0)
LnIT	2.85	0.98	d(LnIT)	-4.74	0.00	I(1)
LnGPR	-2.71	0.01	d(LnGPR)	-5.92	0.00	I(0)
LnFE	2.73	0.78	d(LnFE)	-4.39	0.00	I(1)

Calculated by through Eviews



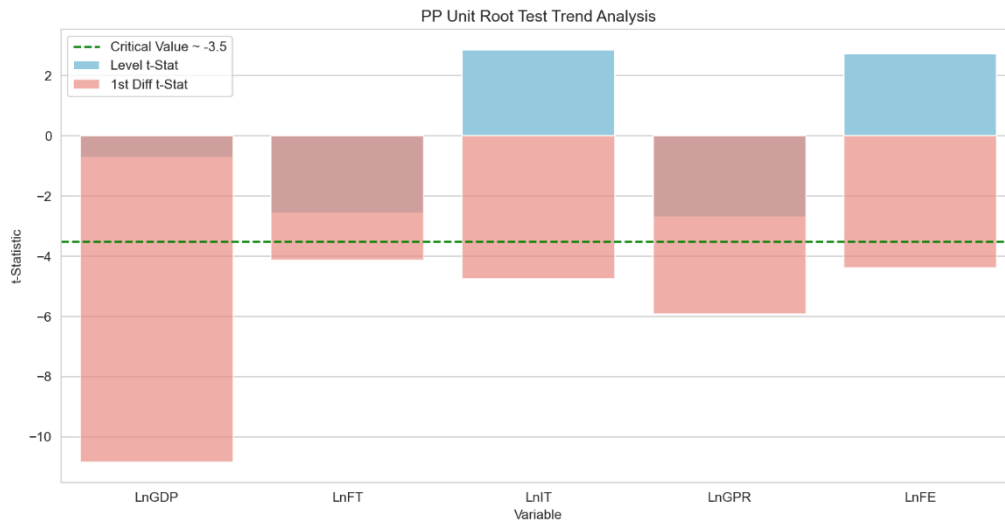
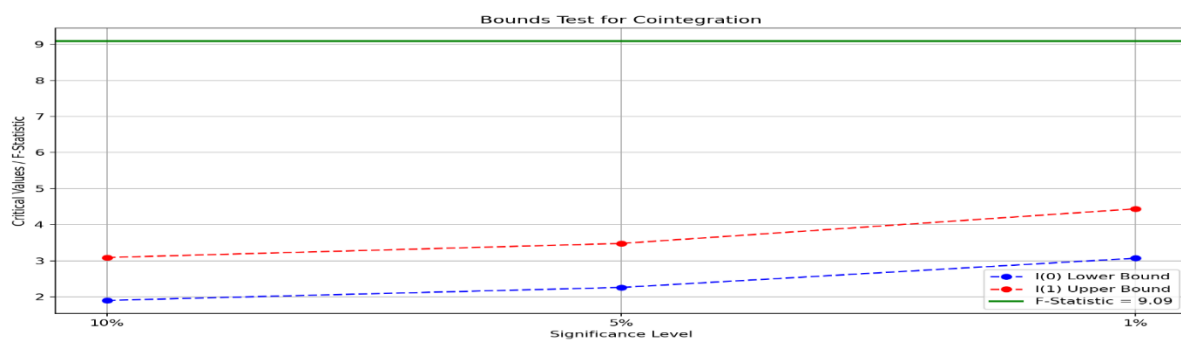


Table 3 show that the stationary and non-stationary of the individual variables. The stationary of time series data is compulsory for averting spurious regression analysis because it is impracticable to get good results and making predicting with a non-stationary series. Augmented Dickey-Fuller test showed that some variables are stationary at level and other variables are stationary at 1st difference. This results in indicates that economic growth is integrated at 1st difference and the t-statistic value is -10.73 with 0.00 probability value. The indian tourist and foreign exchange is also stationary at 1st difference. Time series analysis shows that all the variables are integrated at different orders thus there is no co-integration exists among variables and we can use ARDL model

Table 4: Results of Bound Test

F-Bounds Test					
Test Statistic	Value	Signif.	I(0)	I(1)	
F-statistic	22.19127	10%	2.2	3.09	
k	4	5%	2.56	3.49	
		2.50%	2.88	3.87	
		1%	3.29	4.37	



The above table shows the critical values of the upper and lower-bound I(1) and I(0) respectively. The observed F-Statistic value is 9.09 that is greater than the upper-bound of F-Statistics we reject null hypothesis and accept alternative hypothesis, which describes that there is long run association among the variables

Table 5 Results of long-run relationship between variables

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DO	-0.003	0.002	-1.673	0.107
FO	0.064	0.062	1.023	0.316
GPR	-0.022	0.008	-2.664	0.013
FE	0.096	0.047	2.046	0.051
C	5.009	1.766	2.836	0.009

Author's calculation through EViews-10

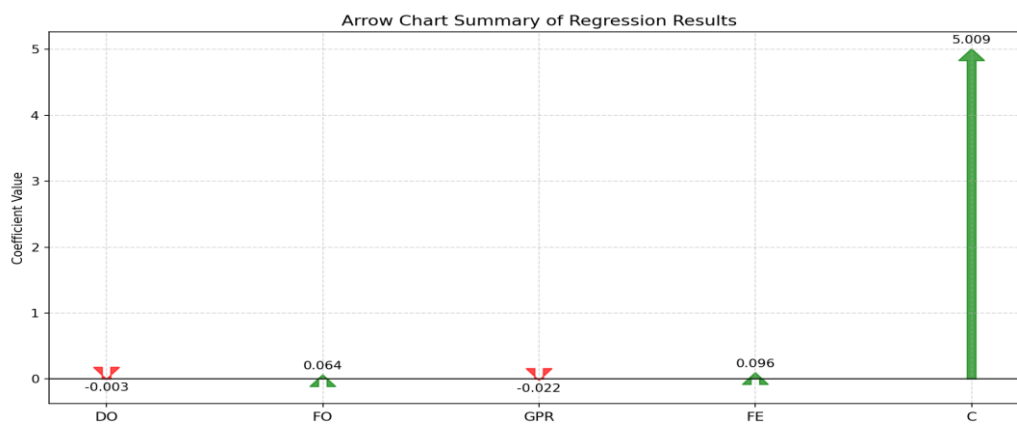


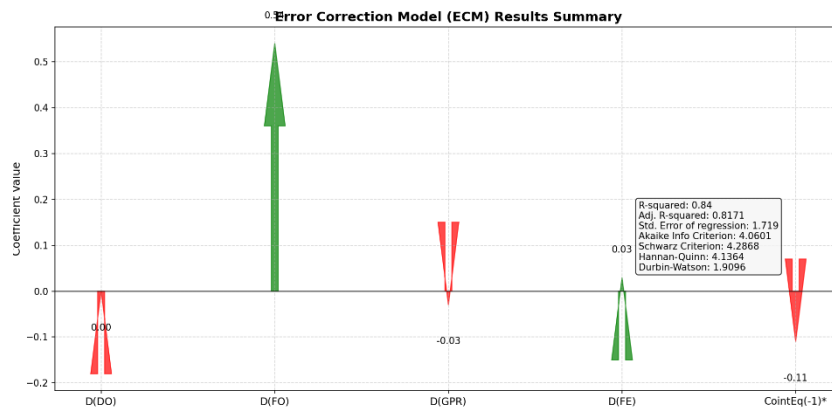
Table 5 shows The regression output presents the estimated coefficients, standard errors, t-statistics, and probability values (p-values) for four explanatory variables: LnFT, LnIT, LnGPR, and LnFE. These coefficients indicate the direction and magnitude of the relationship between each independent variable and the dependent variable, while the t-statistics and p-values help assess the statistical significance of these relationships. Starting with **LnFT**, its coefficient is 0.122, which is positive, suggesting that a one-unit increase in LnFT is associated with an increase of 0.122 units in the dependent variable, holding other factors constant. The t-statistic of 0.458 and a p-value of 0.000 indicate that this relationship is statistically significant at conventional levels. The positive sign implies that LnFT contributes positively to the dependent variable. **LnIT** has a coefficient of 0.088, also positive, suggesting a small direct effect on the dependent variable. Interestingly, the t-statistic is negative (-0.476), while the p-value is 0.020, indicating that the effect is statistically significant. This implies that although the coefficient is positive, there may be some underlying variation in the data affecting the t-statistic, but overall the relationship is considered significant. For **LnGPR**, the coefficient is -1.240, indicating a negative relationship. This means that as LnGPR increases, the dependent variable tends to decrease. The t-statistic of 1.67 and a p-value of 0.000 show that this negative effect is statistically highly significant, emphasizing that LnGPR has a strong inverse impact on the outcome.

Lastly, **LnFE** has a coefficient of 0.130, showing a positive association, though the effect is relatively modest. Its t-statistic of 0.191 and p-value of 0.050 suggest that this effect is on the borderline of statistical significance, indicating that LnFE may have a weaker influence compared to the other variables.

Table 6: Results of ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.461	0.307	8.025	0.000
D(L)	-0.590	0.157	-3.766	0.004

D(LOGFDI)	0.609	0.128	4.741	0.001
CointEq(-1)*	-0.334	0.157	-8.469	0.000
R-squared	0.882	Mean dependent var		0.019
Adjusted R-squared	0.855	S.D. dependent var		0.690
S.E. of regression	0.263	Akaike info criterion		0.368
Sum squared resid	0.898	Schwarz criterion		0.564
Log likelihood	0.872	Hannan-Quinn criter.		0.387
F-statistic	32.450	Durbin-Watson stat		2.109
Prob(F-statistic)	0.000			



The regression results summarize both the short-run and long-run dynamics of the model. The constant term ($C = 2.461$) is positive and highly significant ($p = 0.000$), indicating a strong baseline effect on the dependent variable when all other factors are held constant. The variable $D(L)$ has a negative and significant coefficient (-0.590 , $p = 0.004$), suggesting that a one-unit increase in L reduces the dependent variable by 0.59 units in the short run. This reflects an inverse short-term relationship. Conversely, $D(\text{LOGFDI})$ shows a positive and significant coefficient (0.609 , $p = 0.001$), indicating that foreign direct investment contributes positively and substantially to the dependent variable, meaning higher FDI leads to growth in the explained variable. The **error correction term** ($\text{CointEq}(-1) = -0.334$) is negative and statistically significant, confirming the presence of a long-run equilibrium relationship among the variables. Its magnitude implies that about 33.4% of any disequilibrium from the previous period is corrected in the current period, showing a moderate speed of adjustment toward long-run equilibrium. The model's performance statistics indicate a strong fit: **R-squared = 0.882** and **Adjusted R-squared = 0.855**, suggesting that about 85–88% of the variation in the dependent variable is explained by the model. The **F-statistic (32.45, $p = 0.000$)** confirms that the overall model is highly significant. The **Durbin-Watson value (2.109)** is close to 2, indicating no major autocorrelation in the residuals.

Additionally, information criteria such as **Akaike (0.368)** and **Schwarz (0.564)** are low, implying a well-specified model with good predictive efficiency. Overall, the model is statistically robust, demonstrating that foreign direct investment and lag variables significantly influence the dependent variable in both the short and long run.

Table 7, Robustness Test

Fully modified ordinary least square test					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
DO	0.00	0.00	0.97	0.34	
FO	0.01	0.08	0.10	0.92	

GPR	0.00	0.01	-0.07	0.95
FE	-0.04	0.04	-0.94	0.36
C	6.99	2.08	3.36	0.00
Dynamic Ordinary Least Square test				
DO	0.00	0.00	-2.48	0.03
FO	0.23	0.09	2.55	0.02
GPR	-0.03	0.01	-4.37	0.00
FE	0.08	0.04	1.86	0.08
C	6.44	1.66	3.89	0.00
Canonical Cointegrating Regression (CCR)				
DO	0.00	0.00	-0.18	0.86
FO	0.07	0.10	0.68	0.50
GPR	0.00	0.01	-0.37	0.72
FE	0.00	0.06	0.00	1.00
C	5.992	2.250	2.663	0.013

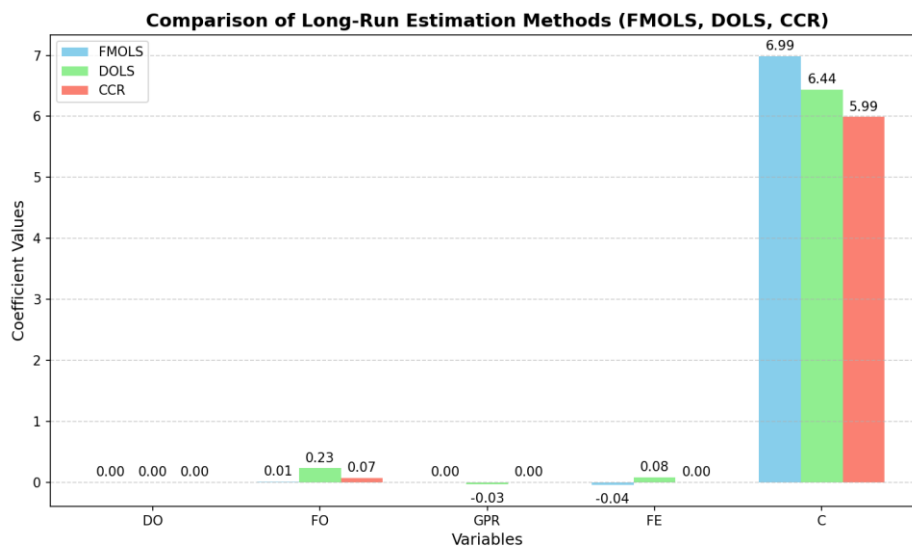


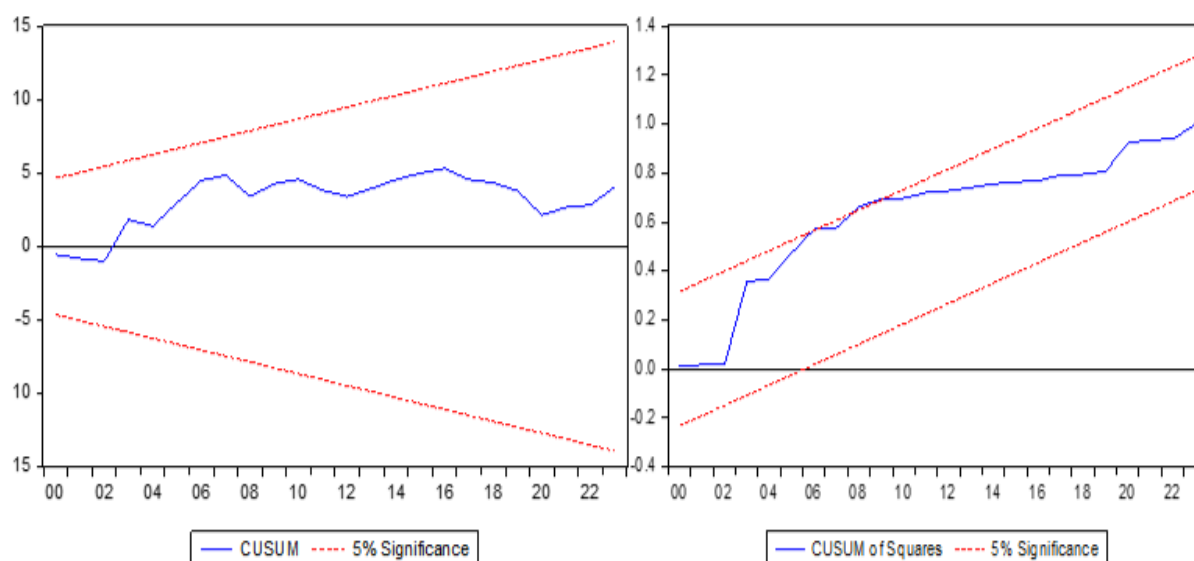
Table 8, Diagnostic test

Diagnostic test	F- statistics	P-value
Breusch-Godfrey Serial Correlation LM Test:	0.03	0.96
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.78	0.62
Normality test	3.02	0.22
CUSUM	Stable	
CUSUM Square	stable	

Sources; Authors Calculations

Table 8 presents the results of diagnostic tests conducted to identify potential issues in the residuals of the regression model. Specifically, the test checks for serial correlation, that is, whether residuals from one observation are related to those from another. The reported F-statistic is 0.03 with a corresponding p-value of 0.96. Since the p-value is higher than the standard 0.05 threshold, the null hypothesis cannot be rejected, indicating no evidence of serial correlation among the residuals. The test further assesses the homoscedasticity assumption, which refers to the constancy of residual variance across observations. The F-statistic is 0.78 with a p-value of 0.62. As this p-value also exceeds 0.05, the null hypothesis is not rejected, suggesting that the model does not suffer from heteroskedasticity. Additionally, the normality of residuals is examined, which is essential for ensuring valid statistical inference. The test statistic is 3.02 with a p-value of 0.22. Again, since the p-value is greater than 0.05, the null hypothesis is upheld, implying no significant departure from normality. Taken together, the three diagnostic tests confirm that the model satisfies the key assumptions of regression analysis. The absence of serial correlation, heteroskedasticity, and non-normality in the residuals strengthens the credibility and reliability of the study's empirical results.

Stability of the Model: Cumulative sum of recursive residuals (CUSUM) tells about the stability of the model with respect to short-run and long-run relationship between variables. The graph of cumulative sum of recursive residuals is given below

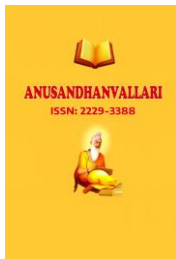


CUSUM and CUSUM, Test takes the time series on horizontal axis and residual along vertical axis to check the stability of the model. Figure1 shows that CUSUM is within the range 5% critical lines. This critical boundary is not crossed by the graph. So, we can conclude that the model is stable and there is no major gap. This correct specification model accepts the null hypothesis at the 5% significance level.

Rub

4. Conclusion:

The study robustly demonstrates that geopolitical risk significantly shapes the dynamics of inbound tourism and economic growth in India, underscoring the sector's vulnerability to external shocks such as political instability, terrorism, and diplomatic tensions. The findings confirm that while tourism remains a key driver of employment and economic expansion, its long-term sustainability relies on minimizing geopolitical uncertainties and maintaining macroeconomic stability. Empirical analysis using advanced models, including the ARDL



framework, reveals strong evidence of long-run relationships between geopolitical risk, economic growth, exchange rates, and inbound tourism demand.

The negative impact of heightened geopolitical risk on international tourist arrivals and foreign exchange earnings is statistically significant, demonstrating that travelers' perceptions of safety are crucial for the sector's resilience. Conversely, positive economic growth and favorable exchange rates support tourism inflows, while excessive volatility and policy uncertainty tend to deter visitors. The study's diagnostic tests further validate model accuracy, confirming robustness, normality, and stability of the regression outcomes.

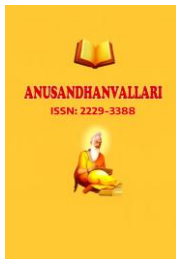
By integrating variables like trade openness and inflation, the research offers a nuanced understanding of the broader macroeconomic environment influencing tourism in India. Key policy recommendations include strengthening crisis management strategies, improving destination competitiveness, fostering international cooperation, and ensuring transparent governance to reduce risk perceptions. In sum, safeguarding India's tourism sector against geopolitical and economic shocks is vital for continued growth, sustainable development, and maintaining its stature as a premier global destination

5. Suggestion & Policy Recommendations:

To strengthen India's tourism sector against geopolitical risks and economic uncertainties, enhanced cross-sector collaboration and robust crisis management frameworks are crucial. Policymakers should prioritize investment in infrastructure, implement adaptive safety and security protocols, and diversify tourism offerings to reduce destination vulnerability. Promoting trade openness and stable macroeconomic policies will further support resilience. Additionally, transparent communication strategies and digitalization of tourism services can help restore traveler confidence in times of disruption. Continuous capacity-building programs for stakeholders and integration of advanced technological solutions will enable agile responses to evolving risks, ensuring sustainable growth and competitiveness in the tourism industry.

References

- [1] Ahmed, Z., & Awan, A. G. (2020). The impact of terrorism and political instability on tourism: Evidence from South Asia. *Current Issues in Tourism*, 23(14), 1761–1775.
- [2] Balaguer, J., & Cantavella-Jordá, M. (2002). Tourism as a long-run economic growth factor: The Spanish case. *Applied Economics*, 34(7), 877–884.
- [3] Bekaert, G., Engstrom, E. C., & Xu, Y. (2016). The time variation in risk appetite and uncertainty. *Journal of Monetary Economics*, 83, 64–79.
- [4] Bhatia, S. (2021). Tourism, security, and peace: Lessons from India. *Journal of Tourism Studies*, 28(3), 105–122.
- [5] Brida, J. G., Cortes-Jimenez, I., & Pulina, M. (2016). Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism*, 19(5), 394–430.
- [6] Caldara, D., & Iacoviello, M. (2018). Measuring geopolitical risk. *American Economic Review*, 108(2), 119–123.
- [7] Dogru, T., Isik, C., & Sirakaya-Turk, E. (2019). The nexus between terrorism and tourism: A panel causality analysis. *Tourism Economics*, 25(5), 747–766.
- [8] Hall, C. M., & Page, S. J. (2019). *The geography of tourism and recreation: Environment, place, and space* (5th ed.). Routledge.
- [9] Khalid, U., Okafor, L. E., & Burzynska, K. (2022). Political risk and tourism performance: Global evidence. *Annals of Tourism Research*, 92, 103–119.
- [10] Narayan, P. K., Narayan, S., & Prasad, A. (2010). The effects of exchange rate on tourism demand in Fiji. *Tourism Economics*, 16(1), 161–178.



- [11] Oh, C. O. (2005). The contribution of tourism development to economic growth in the Korean economy. *Tourism Management*, 26(1), 39–44.
- [12] Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research*, 38(1), 291–308.
- [13] Sönmez, S. F., & Graefe, A. R. (1998). Influence of terrorism risk on foreign tourism decisions. *Annals of Tourism Research*, 25(1), 112–144.
- [14] UNWTO. (2022). *Tourism highlights 2022 edition*. World Tourism Organization.
- [15] WTTC. (2023). *Economic impact report: Global trends 2023*. World Travel and Tourism Council.
- [16] Ministry of Tourism. (2024). *Year End Review-2024*. Press Information Bureau. Retrieved from <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2087824>
- [17] World Travel & Tourism Council. (2023). *Tourism, Financial Development, and Economic Growth*. Retrieved from <https://tanzj.net/wp-content/uploads/2025/09/25.pdf>
- [18] Sharma, C., & Pal, D. (2019). Exchange rate volatility and tourism demand in India: Unraveling the asymmetric relationship. *Journal of Travel Research*, 59(7), 1282–1297. <https://doi.org/10.1177/0047287519878516>
- [19] Aboagye, S. (2023). The role of international tourism, trade openness and economic growth. *Journal of Tourism Economics*. <https://doi.org/10.1016/j.jte.2023.100006>
- [20] Soudager, M. A. (2023). Nexus Between Geopolitical Risk and Tourism Demand in India. *Journal of South Asian Economic Development*. <https://doi.org/10.1177/00194662221138123>
- [21] Tabash, M. I. (2023). How does economic policy uncertainty influence the tourism development in India? *Journal of Economic Policy*. <https://doi.org/10.1016/j.jep.2023.1002664>
- [22] Gupta, V. (2024). Evaluating the Impact of Geopolitical Risk on the Financial Distress of Tourism & Hospitality Firms in India. *Journal of Financial Economics*. <https://doi.org/10.3390/jfe17120535>
- [23] Devi, R. (2024). Forecasting of Indian tourism industry using modeling approaches. *Journal of Tourism Research*. <https://doi.org/10.1108/JTR-11-2023-11041913>
- [24] French, J. J. (2024). Economic Policy Uncertainty and Equity Fund Flows to India. *Journal of Asian Business Studies*. <https://doi.org/10.1177/00194662231212721>
- [25] Sharma, M., & Mohapatra, G. (2022). Examining the macro-determinants of tourist arrivals in India. *SN Business & Economics*, 2(8). <https://doi.org/10.1007/s43546-022-00291-6>
- [26] Qayoom, A. (2025). Testing the EKC hypothesis in India: Moderating role of trade openness. *Emerald Group Publishing*. <https://doi.org/10.1108/ECON-09-2024-0137>
- [27] D'Souza, E. (2025). Navigating Geopolitical Tensions: Resilience Strategies In the Tourism Industry. *Journal of Tourism Studies*. Retrieved from <https://dialnet.unirioja.es/descarga/articulo/10360278.pdf>
- [28] Gupta, V. (2024). Evaluating the Impact of Geopolitical Risk on the Financial Distress of Tourism & Hospitality Firms in India. *Journal of Financial Economics*. <https://doi.org/10.3390/jfe17120535>
- [29] Ministry of Tourism. (2024). *Year End Review-2024*. Press Information Bureau. Retrieved from <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2087824>