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Modeling International Tourism Demand: Evidence from European Arrivals to Pakistan Using Panel Data Techniques

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Abstract
This study investigates the determinants of international tourism demand in Pakistan using annual panel data from ten European source countries — the United Kingdom, Belgium, Germany, Spain, the Netherlands, France, Sweden, Switzerland, Norway, and Turkey — spanning the period 1990 to 2019. The Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration is applied to each country individually to identify both long-run and short-run relationships between tourist arrivals to Pakistan and four key explanatory variables: real gross domestic product (RGDP), relative price of tourism (RPT), unemployment rate (UNR), and population growth rate (PGR). The Augmented Dickey-Fuller (ADF) unit root test confirms that the series are integrated at mixed orders — I(0) and I(1) — which justifies the use of the ARDL framework. The bound test results reveal statistically significant long-run cointegrating relationships for the United Kingdom, Belgium, Germany, Spain, the Netherlands, and Turkey, while France, Sweden, Switzerland, and Norway exhibit no such long-run associations. The long-run coefficients indicate that real income is the dominant and most consistent driver of tourist arrivals, with elasticities ranging from 5.70% for Spain to 13.21% for the United Kingdom. Relative tourism prices exert a negative influence on demand, reflecting the price sensitivity of European visitors, while population growth in the source country and unemployment rates produce mixed and country-specific effects. Error Correction Model (ECM) estimates confirm relatively rapid adjustment to equilibrium, with correction speeds ranging from 52.2% per annum for the UK to 214% for Germany. Structural stability of all estimated models is confirmed by CUSUM and CUSUMSQ tests. The findings carry important implications for Pakistan's tourism policy, suggesting that marketing efforts in high-income European markets, competitive pricing strategies, and improvements in

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destination infrastructure are essential for sustainable growth in inbound tourism.

Keywords: Tourism Demand, ARDL, Panel Data, Pakistan, European Countries, Cointegration

JEL Classification: L83, Z32, C23

INTRODUCTION

The tourist industry, which is the most important economic sector, has the fastest growth rates in the modern global economy. According to UNWTO data from 2023, international visitor arrivals have consistently risen over the previous thirty years, allowing the tourism sector to attain a 10 percent share of global GDP and to employ roughly 10 percent of the global workforce. Developing nations utilise tourism as their principal means of generating foreign currency, simultaneously creating employment and advancing their local economies, necessitating a departure from conventional export strategies to get success. The tourist sector in Pakistan presents both a lucrative financial prospect and a significant challenge for the country's advancement. Pakistan is regarded globally as one of the most appealing tourist destinations due to its natural beauty. The country encompasses five of the fourteen peaks that exceed eight thousand meters, including K2, the second-highest mountain on the planet. The northern areas of Gilgit-Baltistan and Khyber Pakhtunkhwa present landscapes of exceptional natural beauty, while the historical Silk Road heritage sites, Mughal architecture, and the remnants of the Indus Valley Civilisation at Mohenjo-daro and Harappa provide the country with unparalleled cultural richness. The coastal region bordering the Arabian Sea, the vast plains of Punjab, and the rich biodiversity of Sindh and Balochistan enhance Pakistan's tourism allure. The nation has not succeeded in transforming its natural resources and cultural heritage into a consistent influx of international tourists throughout time.

Pakistan became part of the United Nations World Tourism Organization (UNWTO) in 1949, becoming one of the initial representatives of developing countries. Yet the institutionalization process of tourism policy moved at the snail grinding level for the next many years. The tourism affairs came under the Ministry of Railways when jurisdiction was transferred to the Ministry of Commerce in 1955 on a secondary basis, but then went back to a secondary responsibility until the practical utilization went to the Pakistan Tourism Development Corporation (PTDC). The government of Pakistan, formed the very first Ministry, named Ministry of Tourism in 1972, symbolizing the beginning of major government involvement in infrastructure development. In 2007, Tourism Year was announced, while promotional advertising campaigns were set in motion with development works being started. The economic clout of the sector had grown so much over the past few years. Kumho, MTDC,and JFC. Within certain limits, the tourism industry got some governmental support. This varied from PKR 1,632.2 billion or 7.1% of GDP in 2013 to PKR 3,051.4 billion or 5.8% of GDP in 2019 (WTTC, 2020). The sector provided approximately 3.89 million direct management vacancies and had almost caused employment share by 6.1

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percent. The fresh documents show that the sum of tourism-consumed crates was 3.6 percent of total export proceeds amounting to roughly PKR 178.5 billion. In 2022, visitor expenditure in Pakistan reached US$ 16 billion, indicating not only post-pandemic recovery but also an illustrative source for the positive spillover effects of infrastructural investments in improving access to rural tourism via the China-Pakistan Economic Corridor (CPEC) (Pervaiz, Manzoor, and Awan, 2024). Tourism receipts in Pakistan are forecasted to reach around US$ 3.3 billion by 2028 with a regular annual expansion of roughly one percent (Reportlinker, 2024).

European source markets are displaying much potential for expansion in inbound tourism High-income European tourists, who comprise those from the UK, Germany, and France, Belgium, the Netherlands, Spain, Switzerland, Sweden, Norway, and Turkey, are highly mobile travelers and, while on their travels, are disposed to spending large amounts. In 2021, Eurostat (2024) mentioned approximately 1.1 billion tourism excursions by EU residents from the year of 2023, where 27.2 percent were international voyages. Belgium and the Netherlands high have an immense taste in international travel and so we see 75.4 percent of Belgian citizens and 53.0 percent of Dutch citizens spent their almighty long time abroad. Germany invested €106.8 billion in travel in the year 2023. There is every chance that these vast potential European source markets could be tapped upon for a lucrative business in Pakistan whatever legal requirements and good destination situations. Understanding the intentions of European travelers for Pakistan is not always an academic phenomenon; the information directly informs the making of tourism policy, allocation of marketing funds, exchange-rate management, and planning for infrastructure development. The empirical studies on tourism demand have shown that most foreign tourists' movings would generally fall to depend on economic conditions in the destinations, alongside the prices of certain components or costs of the interaction and the demographic profile. Based on that, any latest literature about the inbound tourism prospects in Pakistan indicates slight literature on generalist data or links between economic development and growth and tourism markets without advancing to the magnitude of affection of temporal dynamics and holistic well-being of concerned tourism markets.

To fill in this research gap, this work investigates panel data for the ten nations in Europe from 1990 to 2019 by ARDL bounds testing. The ARDL framework has an advantage for our purpose, with numerous orders of integration in the variables that promote meaningful economic interpretation in different countries. It serves longer-run elasticity states as well as short-run dynamics, which additionally enlightens the operation on how the intensity of tourist activities respond to changes in economies of the source and host countries.

LITERATURE REVIEW

The topic of international tourist demand research has produced significant studies demonstrating its methodological evolution over several decades. The gravity-augmented demand model, which elucidates tourist arrivals and expenditures via several parameters, was developed by Lim in 1997 and 1999, building upon the foundational study of Crouch from 1994 and 1995. The foundational research

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employed standard multivariate regression techniques to examine cross-sectional and short time-series data. The study established that income and price predominantly influence tourism demand; nevertheless, the results were limited due to reliance on statistical methods that assessed stationarity and structural stability until unit root and cointegration tests were conducted. The second generation of tourism demand studies, which began in the late 1990s and early 2000s, incorporated contemporary time series and cointegration methodologies into their study. Song, Romilly, and Liu significantly contributed to the field by demonstrating that tourism demand variables display non-stationary behaviour, necessitating cointegration analysis for long-run elasticity calculation. Dritsakis (2004) constructed long-run demand functions for Greece using the Johansen cointegration method, which revealed significant income elasticities and the impact of price relationships. The research established a novel direction in the discipline via error correction representations, allowing scholars to investigate rapid adjustment processes and analyse enduring operational patterns.

The current literature encompasses two active research domains that necessitate the concurrent examination of suitable research methodologies for analysing variables with varying order integration patterns. The ARDL limits testing method, established by Pesaran, Shin, and Smith in 2001, offers researchers a standardised approach to examine level correlations among variables that display I(0), I(1), and cointegrated characteristics. The limits test has emerged as the primary instrument in single-equation tourism demand estimation, particularly in studies utilising small samples or data from underdeveloped countries, where researchers have difficulties in establishing the order of integration. Research conducted by Narayan in Fiji, Habibi Rahim and Chin in Malaysia, and Asemota and Bala in Japan has demonstrated the practical advantages of the ARDL framework for estimating tourism demand functions with mixed-integration variables.

In the past two decades, there has been a significant rise in the utilisation of panel data methods in tourism demand research, as scholars have recognised that integrating data from several source countries enhances research efficacy and strengthens statistical analysis. Hsiao (2003) formally demonstrated that researchers utilising panel data estimates gain three advantages: less multicollinearity, enhanced degrees of freedom, and the capacity to address unobserved country-specific variations. Garin-Munoz (2006) employed a dynamic panel data model to analyse inbound tourism to the Canary Islands, revealing that income and lagged dependent factors were the principal predictors of arrivals. Massidda and Etzo (2012) established through their examination of regional bilateral domestic tourism in Italy that visitors' travel selections are influenced by their personal income and the relative costs associated with travel, including transportation and accommodation charges. Gormus and Gocer (2010) employed panel methodologies to examine Turkish tourism data and discovered that socioeconomic factors, including income and prices, significantly influence tourism patterns.

Recent research has enhanced the analysis by incorporating additional economic and non-economic variables into the evaluation. Researchers Surugiu, Leitao, and Surugiu (2011) conducted a Romanian study utilising panel data, revealing that GDP and trade

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openness served as significant positive determinants attracting tourists. Seetanah (2011) examined tiny island economies and identified infrastructure quality as a statistically significant additional factor. Researchers Krasniqi Dreshaj and Dreshaj (2023) conducted a study on eight Mediterranean and Middle Eastern countries utilising dynamic panel estimation via the System Generalised Method of Moments (GMM). They discovered that practically significant variables that affect an increase in tourist placeholders were income and trade space, while terrorist attacks and the COVID-19 pandemic decreased their wholesale price. Various factors from the traveler's country of origin and the targeted tourist destination are responsible for international tourist streams, but gravitation models seem too simplistic to fully capture these complexities. Extensive efforts have been made by academia to validate the existence of real price impacts on tourist trends. Lim (1997) finds that increased price index at the destination Country decreases tourist inflow from the originating country while the depreciating destination country currency decreases travel costs and profits are increased with an increase in tourist inflows. For a 20-year span from 2000 to 2020, Borrego-Dominguez et al. (2022) used the Variance Development Matrix to examine European tourism demand in Spain using panel data from fourteen EU source nations. The study discovered that GDP as well as accommodation capacity play significant and positive roles toward tourism growth in both the short and the long term, and the consumer price index works as a limiting factor for tourism growth. Thus, pricing effects between short-term and long-term ultimately make the result true.

Innumerable studies dedicated to relationships between income dynamics and tourism demand have found evidence that were applicable to Pakistan. Utilizing the ARDL bounds test, the study by Khan, Alim, Begum, Han, and Mohamed (2022) concluded that terrorism, tourism expenditures, and inflation were significant determinants of tourism revenues in both the short and long-run. The study indicated that any increase in foreign tourist arrivals in Pakistan resulted from peace and security enhancements complemented by stable inflation management. Iqbal, Khawer, Khan, and Irshad established, with their analysis from 1995-2022, that tourism development in Pakistan has a positive effect on GDP growth in a symbiotic way with the capital investment, while political instability and inflation cause begging effects. The study contemplates the existence of a system where tourism organization in Pakistan is a ploughback mechanism, as demand side factors act as important elements for the overall macroeconomic structure. Very few discussions have taken place in the existing corpus on how employment affects tourism, even with this relationship measured along with unemployment in this study. The research undertaken by Balcilar, Aghazadeh, and Ike (2021) on investigating outbound tourism demand for 32 OECD countries suggested that any increase in employment levels would be directly associated with total tourism expenditure in case domestic expenditure is taken as a benchmark, this will then allow any tourist to spend as much as they earn based on the factual income figure, and not on the sum of unemployment rates. This finding suggests that an expansion of outbound tourism demand could coincide with a rise in unemployment rates along with real wages, with structural unemployment creating

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more fall in household income than any clear consequences on travel behaviour.
The CUSUM and CUSUMSQ tests have been employed in many research to assess the stability of tourism demand estimating models. Ketenci (2009) validated the structural stability of estimated relationships by analysing ARDL demand models for Turkey, utilising data from thirteen European and other source countries, and discovered that CUSUM and CUSUMSQ statistics remained within the five percent critical bounds in nine out of thirteen instances. Brown and his associates developed a recursive residuals methodology that underpins CUSUM testing protocols. The stability shown by the critical bounds indicates that the regression coefficients were consistent, without any systematic or abrupt variations during the estimating period, as per Brown, Durbin, and Evans (1975). F1000Research has established that CUSUM stability under the five percent thresholds in an ARDL model has been validated by the 2025 research, which illustrates that both long-run and short-run coefficients of the model are applicable for policy analysis and forecasting. Segarra and his associates determined that foreign tourist influx to Spain is influenced by regional GDP, comparable pricing, hotel infrastructure, and destination attributes such as beaches and cultural assets, while civil turmoil poses a threat to tourism. The latest analysis indicates that supply-side characteristics at tourist sites have become almost as crucial as traditional income and price determinants in international travel markets contending with competition from other nations. This study's major finding indicates that the improvement of tourism infrastructure and improved destination appeal are crucial factors that generate sustained demand in Pakistan, alongside European economic conditions influencing demand from source markets. The principal economic factors influencing international visitor demand encompass three elements from the tourists' country of origin: their income, the comparative costs of tourism services across various destinations, and the demographic attributes of the tourists.

Data Sources and Sample

The study constructed an annual database spanning from 1990 to 2019. It consists of source data from 10 E. U.-based source countries: Sweden, Spain, Switzerland, the Netherlands, Norway, France, Germany, the United Kingdom, Belgium, and Turkey. Visitor arrival data and statistics were taken from various issues of the official publications of the Pakistan Government's Ministry of Tourism. Regarding the real GDP, CPI, unemployment rate, and population growth factors, the World Bank's World Development Indicators and the IMF's International Financial Statistics databases were also partially utilized. To assess the coefficient features, the research team used a natural logarithm transformation for each variable. The study chose to leave the population growth rate as such because of its unique formation properties-General Conference of American Slavic East European Studies.

METHODOLOGY AND MODEL SPECIFICATION

The theoretical foundation of this study draws on the standard economic demand model, in which tourism demand is treated as a function of income, prices, and a set of additional structural variables. In its general form, the tourism demand equation is

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written as:
TAjt = g(RGDPjt, RPTjt, UNRjt, PGRjt)
where j indexes the source country and t indexes time. In log-linear form, consistent with the standard practice in the tourism demand literature, the static specification becomes:
ln TAjt = α0 + γ1 ln RGDPjt + γ2 ln RPTjt + γ3 ln UNRjt + γ4 PGRjt + εjt (1)
where α0 is the intercept, γ1 to γ4 are the long-run elasticity coefficients, and εjt is a white-noise disturbance term. Because this specification does not account for the dynamic adjustment process, a dynamic extension incorporating lagged values of both the dependent variable and the regressors is adopted.

Unit Root Test
The Augmented Dickey-Fuller test, established by Dickey and Fuller in 1981, evaluates each time series prior to doing cointegration analysis to ascertain its integration order. The ADF test is preferred over alternatives due to its robust power characteristics in small samples and the utilisation of the Akaike Information Criterion (AIC) for lag length selection, which Lutkepohl (2005) demonstrates is advantageous for the sample size used in this investigation. The unit root results determine if the individual series are stationary at levels I(0), first differences I(1), or second differences I(2). The ARDL framework necessitates that no variable is integrated of order two, a criterion confirmed in this investigation.

ARDL Bounds Testing Approach
Given that the unit root tests confirm a mixture of I(0) and I(1) series across the variables and source countries, the ARDL bounds testing approach of Pesaran, Shin, and Smith (2001) is employed. The ARDL model is specified as:
ΔlnTAt = a + Σβ1ΔlnTAt-ij + Σδ2ΔlnRGDPt-ij + Σθ3ΔlnRPTt-ij + ΣΨ4ΔlnUNRt-ij + ΣΩ5ΔlnPGRt-ij + λ1lnTAt-1j + λ2lnRGDPt-1j + λ3RPTt-1j + λ4UNRt-1J + λ5PGRt-1 + εjt (3)
The first set of terms with coefficients β1, δ2, θ3, Ψ4, and Ω5 captures the short-run dynamics, while the coefficients λ1 through λ5 on the once-lagged level terms represent the long-run relationship. The null hypothesis of no cointegration is H0: λ1 = λ2 = λ3 = λ4 = λ5 = 0, tested using the F-statistic of Pesaran et al. (2001). This statistic is compared against two sets of critical values corresponding to the assumption that all variables are I(0) (the lower bound) and the assumption that all are I(1) (the upper bound). A computed F-statistic exceeding the upper bound leads to rejection of the null hypothesis of no cointegration. An F-statistic falling below the lower bound fails to reject the null. When the statistic falls between the bounds, the result is inconclusive.

Long-Run and Error Correction Models
Once the existence of a long-run relationship is confirmed for a particular source country, the long-run coefficients are estimated from:
TAt = α + Σβ1TAt-j + Σδ2RGDPt-j + Σθ3RPTt-j + Σψ4UNRt-j + ΣΩ5lnPGRt-ij + εt

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(4)

The Error Correction Model (ECM) is then estimated to recover the short-run dynamics and the speed of adjustment back to long-run equilibrium:

$$\Delta \ln TA_t = \alpha + \Sigma \Delta \beta 1 \ln TA_{t-j} + \Sigma \Delta \delta 2 \ln RGDP_{t-j} + \Sigma \Delta \theta 3 \ln RPT_{t-j} + \Sigma \Delta \Omega 5 \ln PGR_{t-j} + \lambda ECM_{t-1} + \varepsilon_t \quad (5)$$

The coefficient λ on the error correction term ECM_{t-1} should be negative and statistically significant if the system converges to the long-run equilibrium following short-run disturbances. Its magnitude indicates the proportion of the disequilibrium that is corrected within one year.

Diagnostic and Stability Tests

The researchers perform diagnostic assessments on each proposed model to ascertain its statistical validity. The Breusch-Godfrey (BG) Lagrange Multiplier test functions as a technique to evaluate serial autocorrelation. The White test serves as a technique to assess heteroscedasticity. The Jarque-Bera test is utilised to evaluate the normalcy of residuals. The Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests, proposed by Brown, Durbin, and Evans (1975), evaluate the structural stability of regression coefficients. Stability is achieved when both test statistics remain under five percent critical limits throughout the whole estimating time.

EMPIRICAL RESULTS AND DISCUSSION

Unit Root Test Results (Table 1)

Table 1 presents the results of the Augmented Dickey-Fuller unit root test for each variable across the ten source countries. The results confirm that no variable in the dataset is integrated of order two — a necessary precondition for the application of the ARDL bounds testing approach. The tourist arrivals variable (lnTA) is stationary at first difference, I(1), for all countries except Spain, where it is stationary at levels, I(0). The real GDP series (lnRGDP) exhibits I(0) behaviour for Belgium, Germany, Sweden, the Netherlands, and Norway, and is I(1) for the remaining countries. The unemployment rate series (lnUR) is I(1) for most countries, with exceptions for Sweden and Switzerland. The relative price of tourism (lnRPT) is universally integrated of order one across all ten source markets, reflecting the persistence of relative inflation and exchange rate differentials. The population growth rate (lnPGR) shows I(0) behaviour for Belgium and I(1) for all other countries.

The presence of a mixture of I(0) and I(1) variables across equations confirms that neither the standard Engle-Granger (1987) two-step procedure nor the Johansen (1991) maximum likelihood approach — both of which require all variables to be I(1) — would be appropriate for this dataset. The ARDL bounds testing approach of Pesaran et al. (2001) is therefore not merely a convenient methodological choice but the statistically correct one for this empirical context.

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Table 1: Unit Root Results

Variables	Belg	Ger	Fr	Swed	Spain	Switz	Nether	Norway	UK	Turkey
lnTA	I(1)	I(1)	I(1)	I(1)	I(0)	I(1)	I(1)	I(1)	I(1)	I(1)
lnRGDP	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)	I(0)	I(0)	I(1)	I(1)
lnUR	I(1)	I(1)	I(1)	I(0)	I(1)	I(0)	I(1)	I(1)	I(1)	I(1)
lnRPT	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)
lnPGR	I(0)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)

Source: Authors' Calculation. Note: Belg=Belgium, Ger=Germany, Fr=France, Swed=Sweden, Switz=Switzerland, Nether=Netherlands.

Bound Test Results and Long-Run Cointegration (Table 2)

Table 2 reports on the F-Statistics of the Bounds Test for ARDL, along with its corresponding critical limit values and diagnostic outcomes, for each source country. The analysis reveals that causal relationships have been built between tourist arrivals from Pakistan to source countries and the variables considered significant for arrivals in six out of the ten source countries. The UK, Belgium, Spain, and the Netherlands have F-statistics higher than the upper critical limit at a 5% level. For Germany and Turkey, the F-statistics exceed the upper bound only at a 10% level of significance. The study concludes that the long-term equilibrium relationships between Pakistan and the macroeconomic variables from six source markets on inbound tourism demand continue. The F-Statistics for France (0.89), Switzerland (1.18), Sweden (2.015), and Norway (1.43) lie below their respective lower critical bounds, providing definitive assurance that the null hypothesis of no cointegration cannot be discarded. The general lack of tourist demand from these markets up to Pakistan actually only strengthens this assertion; these nations clearly express that tourists from those countries make travel decisions only with respect to their certain personal factors, including adventure travel orientation, links to diaspora communities, and immediate interest in upcoming events. Any technical disruption during the research period has jeopardized the long-term relationship at the quantitative level because any changes from these bilateral tourism linkages could be potentially caused by varying levels of security conditions and the visa policies. According to diagnostic tests, all fitted models passed the Breusch-Godfrey serial autocorrelation test, the White heteroscedasticity test, and the Jarque-Bera normality test, because the learnt values are greater than 5%. This suggests residuals from all models show the correct behaviour conforming to the classical assumption of normality.

Table 2: F-Value Results of Bound Test

Origin Country	F-Statistic	Lower I(0)	Upper I(1)	K	Autocorr. (BG)	White Hetero.	Normality	Stability
UK	6.36**	2.86	4.01	4	0.153	0.633	0.854	Stable
Belgium	5.29**	2.86	4.01	4	0.866	0.844	0.721	Stable

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Origin Country	F-Statistic	Lower I(0)	Upper I(1)	K	Autocorr. (BG)	White Hetero.	Normality	Stability
Germany	3.82*	3.23	4.35	3	0.053	0.933	0.967	Stable
Spain	4.89**	2.86	4.01	2	0.922	0.432	0.811	Stable
Sweden	2.015	2.45	3.52	4	0.175	0.763	0.384	Stable
France	0.89	2.86	4.01	4	0.197	0.599	0.657	Stable
Switzerland	1.18	2.86	4.01	4	0.098	0.311	0.486	Stable
Netherlands	5.45**	2.86	4.01	4	0.062	0.635	0.505	Stable
Turkey	3.75*	3.23	4.35	3	0.047	0.827	0.449	Stable
Norway	1.43	2.45	3.52	4	0.995	0.601	0.992	Stable

*Source: Authors' Calculation. Note: ***, **, * indicate significance at 1%, 5%, and 10% respectively. Probability values greater than 0.05 indicate failure to reject H0.*

Long-Run Coefficient Estimates (Table 3)

Table 3 describes the long-run coefficients for the tourism demand model from six countries that showed evidence of cointegration. The study reveals that all source markets exhibit similar causal patterns with real income being the primary determinant for tourism in Pakistan, with cointegration evidence. The UK demonstrated a lag effect of 13.21 on real GDP in the tourism model-an effect that is significant at one percent. This implies that a 1 percent real income increase by British visitors over the previous year will raise UK tourist flow to Pakistan by 13.21 percent in the long run. UK tourism to Pakistan is found to be a luxury good, as its income elasticity is greater than one: thus, as indicated by Dritsakis (2004) for UK tourism to Greece and Lim (1997) for various studies, British tourists have a greater penchant for lower action costs for Pakistan compared to others that raise relative costs to the UK. A positive relationship between the level of UK unemployment and tourism may appear surprising; however, an alternative explanation is offered here. This relates to the substitution effect that is created by an unemployment rate: people can travel anywhere in the world and use up all their spare time, after the uncertainty of layoffs has come their way. The study professes that increasing unemployment actually provides a considerable motive for people to engage in international traveling, as they are increasingly freed of any professional obligations upon being released of service due to the company closing down, severance pay, and allotments from pensions or gratuity benefits.

The positive and highly significant lnTA(-1) coefficient pertaining to Belgian behaviour towards Pakistan lends powerful support to the argument for habit persistence in case of tourism of Belgium. The very definition of lagged and dependent variables suggests that earlier tourist arrivals somehow shape the future. These anticipatory variables are witness to tourists beyond the pattern of reasoning in the form of tourist flows antibody of sorts, either to word-of-mouth marketing and network effects or the development of an infrastructure catering to travel or tour operator businesses. The coefficient associated with income, lagged income

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(lnRGDP(-1) = 9.65) is also positive and highly significant at the 1% level, with the implication that as Belgian per capita income augments, international Tourist Arrivals in Pakistan also increase dramatically—a one percent increase in Belgian income results in an increase of 9.65 percent tourists.

From a long-run perspective, real GDP (lnRGDP = 8.93) is the dominant factor for Germany, significant at the one percent level, while the lagged unemployment rate has a statistically significant positive effect, and lagged population growth rate (lnPGR(-1) = -2.57) has a significant and a negative impact. The negative coefficient for population growth for Germany merits a very careful interpretation, in the light of the long-term demographic slowdown being experienced by Germany ¨C an ageing population and a declining working-age cohort. In such context, so on.redit might indeed be possible whereby slower population growth is one of the causes of the absolute decline in the number of prospective travelers in young, adventurous age group, that is, a supply-side constraint on outbound travel that clearly is distinct from income effects.

For Spain, real GDP (lnRGDP = 5.70) and the lagged relative price of tourism (lnRPT(-1) = 0.62) provide positive and significant readings at the one percent level, indicating that high-income levels and comparatively lower tourism costs in Pakistan would contribute to long-term tourist arrivals. An increase of one percent in Spanish per capita GDP would lead to a 5.70 percent increase in arrivals from Spain, while an increase of one percent in Pakistan's relative price competitiveness resulted in a 0.62 percent increase in tourism arrivals. The very high adjusted R-squared of Spain, reaching about 0.9147, lends support to this statement.

The Dutch real GDP (lnRGDP=7.43) is one more important variable, here significant at the 1% level. In the long term, when Dutch real income increases by 1% from the base value (7.43), the number of incoming Dutch tourists to Pakistan also improves by 7.43%. Relative price of tourism positively influences its influence on helping us understand that Dutch tourists are sensitive to the relative cost advantage Pakistan provides. Interestingly, the results replicate findings from Borrego-Dominguez et al. (2022) of the European demand for Spain, which proved that GDP and price competitiveness were the two most robust long-run predictors of tourist arrivals. In Turkey, the auto-correlative term (lnTA(-1) = 0.402) is positive and significant at the ten-percent level, thereby confirming the behavioral pattern to be possessed by the Belgian model again. While the income variable lagged by a year (lnRGDP(-1) = 7.60) positively and significantly affects the dependent variable, a one-percent increase in Turkish per capita income in the preceding years yields a 7.60-percent rise in the Pakistani arrival to Turkey in the long run. The current standing of unemployment in Turkey (lnUR = 3.097) is positively significant in the model and agrees with the description of leisure substitution arguments in the UK texts. The simplest model, as indicated by the adjusted R-squared (0.9476), by far the highest among the other models, is employed to fit cointegrating systems.

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Table 3: Long-Run Results of Tourism Demand from Tourist Generating Countries (Dependent Variable: lnTA)

Variable	UK	Belgium	Netherlands	Spain	Turkey	Germany
Constant	-145.67 (0.000)	1.543 (0.246)	12.77 (0.000)	-82.67 (0.004)	-38.42 (0.003)	-52.43 (0.000)
lnTA(-1)	—	0.858*** (0.000)	—	—	0.402** (0.055)	—
lnRGDP	—	—	7.43*** (4.48)	5.70*** (0.000)	—	8.93*** (0.004)
lnRGDP(-1)	13.21*** (0.000)	9.65*** (0.000)	—	—	7.60*** (0.003)	—
lnRPT	4.37 (0.001)	—	—	—	—	—
lnRPT(-1)	—	—	3.22 (1.20)	0.62*** (0.000)	—	—
lnPGR	—	—	—	—	—	—
lnPGR(-1)	-0.90** (0.026)	—	—	—	—	-2.57*** (0.007)
lnUR	3.60*** (0.002)	—	—	—	3.097*** (0.009)	-0.65** (0.012)
lnUR(-1)	—	—	—	—	—	—
Adj. R^2	0.9205	0.7862	0.6869	0.9147	0.9476	0.8659
Autocorr. (BG)	0.3756	0.4296	0.5027	0.9877	0.0657	0.0543
White Hetero.	0.6249	0.3504	0.7359	0.4667	0.7168	0.5731
Normality	0.1240	0.2615	0.8149	0.100	0.5317	0.5680
Stability	Stable	Stable	Stable	Stable	Stable	Stable

*Source: Authors' Calculation. Note: ***, **, * indicate significance at 1%, 5%, and 10% respectively.*

Short-Run and Error Correction Model Results (Table 4)

Table 4 presents the short-run coefficients along with the estimates of the Error Correction Term (ECT) from five countries which were noted to have a substantial ECM in their growth. We include in the study the Netherlands as an additional nation. As we know, the ECT coefficients for long-term equilibrium following short-term disruptions are negative and significant according to the theoretical premises. The significance of this error correction mode shows in Table 2 that it will reflect on the long-term cointegrating linkages with transitional equilibrium deviations leading to permanent outcomes. ECT for the United Kingdom is -0.522 with 10 percent significance level. This means that 52.2 percent of the long-term equilibrium deviations are gone within a year. Notable is the quick adjustment process between the UK and Pakistan through their significant travel infrastructure and huge tour operator networks. Belgium's ECT is -1.193 which implies that the model needs adjustments for not overshooting. It requires correction of 119.4 percent per year. Oscillation is evident in the above pattern due to ECT values greater than unity. The system over-corrects in one way and then stabilizes over a few time periods. From these insights, it is clear that tourism demand models are characterized somewhat by some form of overshooting, as documented by some extending academic research such as that of Narayan (2004) over small island economies. ECT for Spain is -0.718,

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showing a trickle-down of 71.8% per year. It is intended to show sufficient efficiency in agreement with the Spanish support market for the emergent tourism destinations. The ECT value for Turkey is -1.375 showing a constant rate of 137.5% over a single year. In the first case, the system has an overshooting property, while in the latter, the ECT value is -2.14, thus showing rapid convergence in Germany.

The present study surmises that British tourists exhibit short-term traveling behavior in response to pricing fluctuations in Pakistan during the continuous tourist season. The research project narrates that pricing works as an added factor directing the behavior of travelers during any kind of travel planning. There is a comparative study to be made between one's favorite type of destination. The German population growth rate fell by 4.05 percent, whereas the unemployment rate saw a 3.18 percent drop. Both of these demographic phenomena are substantial, with a 1 percent level of effect. The study demonstrates that German tourist arrivals in Pakistan appear to be excessively sensitive to some temporal intervals due to the demographic shift and rising unemployment rate prevailing in Germany. The study discusses that tourism economy has attracted foreign tourists, while Balcilar et al. (2021) research implies that the labor market conditions in the short run has a vital influence on factors associated with the tourist spending rate, where long elasticities bring in a more complex set of interactions. The study states that the population growth rate has a significant positive influence on Pakistani tourist arrivals, which basically happens post demographically.

Table 4: Short-Run Results of Tourism Demand (Dependent Variable: ΔlnTA)

Variable	UK	Belgium	Netherlands	Spain	Turkey	Germany
Constant	0.106 (0.520)	-0.129 (0.474)	-0.072** (0.021)	0.125 (0.359)	0.118 (0.369)	-0.083** (0.021)
ΔlnTA(-1)	—	0.302 (0.277)	—	—	1.402** (0.563)	—
ΔlnRGDP	—	—	0.615 (0.010)	4.367 (0.123)	—	—
ΔlnRGDP(-1)	3.981 (0.598)	-10.65** (-2.85)	—	—	17.636 (0.129)	—
ΔlnRTP	-1.984** (0.058)	—	—	—	—	—
ΔlnRTP(-1)	—	—	3.22 (1.20)	—	—	—
ΔlnPGR	—	—	—	0.956** (0.043)	—	-4.05*** (0.001)
ΔlnPGR(-1)	0.039 (0.615)	—	—	—	—	—
ΔlnUR	1.915 (0.142)	—	—	—	—	-3.18*** (0.003)
ΔlnUR(-1)	—	—	—	—	4.632 (0.136)	—
ECT(-1)	-0.522* (0.090)	-1.193* (0.090)	-1.265** (0.090)	-0.718** (0.024)	-1.375** (0.041)	-2.14*** (0.001)
Adj. R^2	0.632	0.722	0.601	0.873	0.952	0.935

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Variable	UK	Belgium	Netherlands	Spain	Turkey	Germany
Autocorr. (BG)	0.5433	0.7651	0.8635	0.6780	0.8113	0.9820
White Hetero.	0.4632	0.6718	0.3261	0.8945	0.99	0.7438
Normality	0.7724	0.7911	0.8541	0.6354	0.9702	0.8224
Stability	Stable	Stable	Stable	Stable	Stable	Stable

*Source: Authors' Calculation. Note: ***, **, * indicate significance at 1%, 5%, and 10% respectively.*

Structural Stability Analysis: CUSUM and CUSUMSQ (Figures 1 and 2)

The CUSUM (Cumulative Sum of Recursive Residuals) and CUSUMSQ (Cumulative Sum of Squares of Recursive Residuals) plots (presented in Figures 1 and 2) are standard diagnostic instruments of time-series econometrics for testing if the estimated regression coefficients remain stationary over the observation period, in which case there could be structural breaks, parameter drifts, and/or regime marking one way or another. Both tests were suggested by Brown, Durbin, and Evans (1975) and were made an integral part of the ARDL estimation process gradually.

Fig. 1

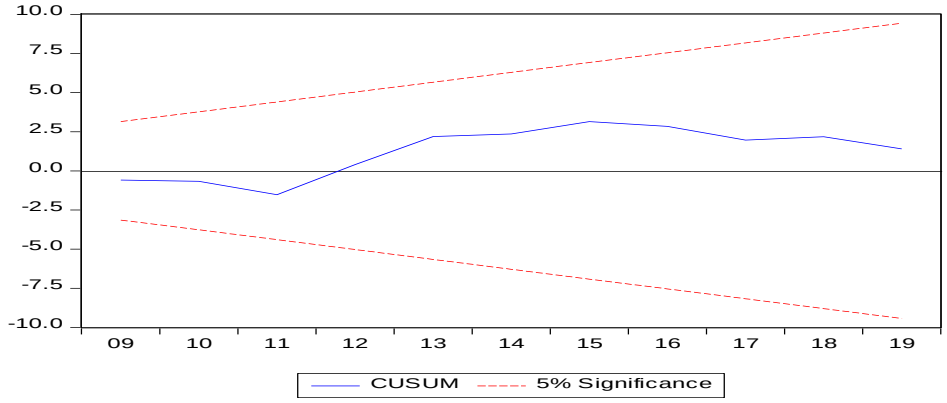
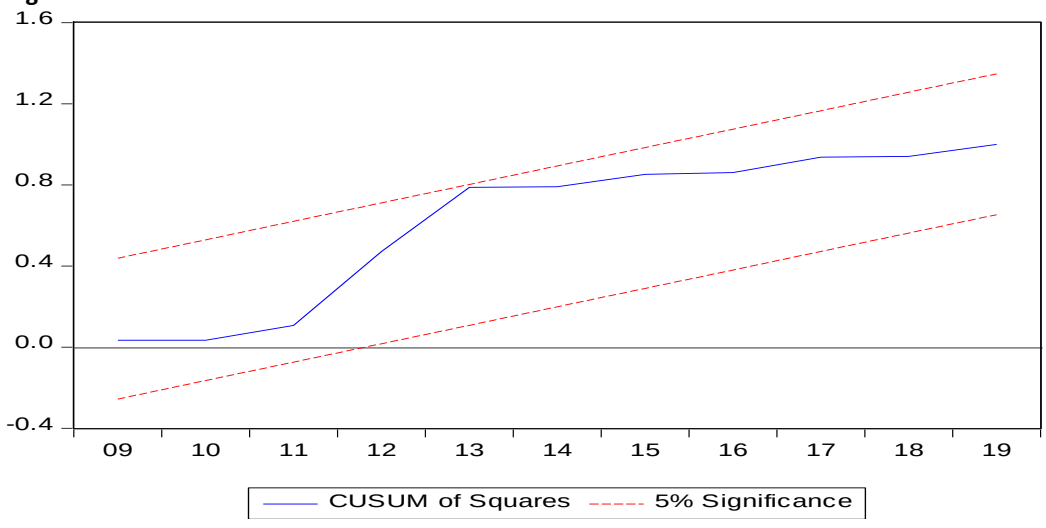


Fig. 2



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As illustrated in Figure 1, the CUSUM test is constructed from the sequence of cumulative sums of unit step ahead recursive residuals derived from recursively re-estimated versions of the model. Under the null hypothesis pertaining to parameter stability, the cumulative sum of the recursive residuals, within each subperiod, should oscillate randomly around zero, and the test statistic should remain within the triangular five percent critical bounds that expand symmetrically as the sample period changes. If the CUSUM statistical index breaches these critical bounds, this may imply systematic alteration in terms of regression coefficients: hence, the particular relationship between the dependent variable and its potential determinants has altered in a prolonged fashion. Therefore, transcending economic meaning, a crossing could possibly inform us, among myriad other things, that the income elasticity of tourism demand or the price sensitivity of travellers have changed fundamentally at some point in the 1990−2019 period — perhaps due to geopolitical shock, some major turn of events in Pakistan's visa permit policy, some terrorist occurrence, or new travel opportunities" commented on the author in plain text.

The CUSUM plots for six cointegrating models, encompassing the United Kingdom, Belgium, Germany, Spain, the Netherlands, and Turkey, persist throughout the estimating period, indicating results that remain below the five percent critical boundaries. The discovery has several significant implications that influence both econometric techniques and economic theories. The econometric analysis indicates that the coefficients in Table 3 and Table 4 represent the long-run and short-run correlations between tourist arrivals and their economic determinants. The models exhibit stability as their parameters remain constant, facilitating their application in policy research and forecasting; models with unstable parameters would yield inaccurate predictions when applied to new data.

Economically, the stability of the CUSUM plots suggests that the fundamental drivers of European tourist demand for Pakistan have remained broadly consistent over three decades. While individual events — such as the post-9/11 security concerns, the 2011 Abbottabad incident, or the periodic deterioration of law and order in specific regions — may have influenced the level of tourist arrivals in particular years, they do not appear to have fundamentally altered the structural relationship between income, prices, demographic conditions, and tourist flows. This is a meaningful finding because it suggests that Pakistan's tourism demand from Europe is governed by deep economic fundamentals rather than purely by perceptions of risk, which are themselves potentially amenable to policy intervention through effective communication, destination marketing, and safety guarantees.

The CUSUMSQ test, presented in Figure 2, statistics for all six models also remain within the five percent critical bounds throughout the estimation period. This result indicates that the variance of the residuals has been relatively stable over the full 1990-to-2019 sample, with no evidence of sudden volatility shifts that would undermine the reliability of the coefficient estimates. Taken together with the CUSUM findings, this dual confirmation of structural stability — consistent with the findings of Ketenci (2009) for tourism demand in Turkey and with F1000Research (2025) for India — provides strong grounds for confidence in the empirical results

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presented in this study. It also implies that the tourism demand models estimated here are suitable as a basis for forward-looking policy analysis and for short-run forecasting of European visitor arrivals to Pakistan, subject to the caveat that any future structural changes — such as a significant expansion of direct flight connectivity, a major shift in visa policy, or a geopolitical realignment — could alter these relationships.

CONCLUSION AND POLICY RECOMMENDATIONS

Concluding Remarks

The research examined determinants influencing international tourism demand to Pakistan from 10 European origin nations. The study employed annual panel data spanning from 1990 to 2019. The study employed the Autoregressive Distributed Lag (ARDL) bounds testing methodology to evaluate each country as an individual unit of analysis, leading to the detection of long-term cointegrating interactions and short-term dynamic modifications for each distinct bilateral relationship. The unit root analysis established that the variables are integrated at mixed orders — I(0) and I(1) — hence justifying the application of the ARDL framework in preference to other cointegration methods.

The bound test demonstrated robust, enduring linkages among six of the ten source nations, namely the UK, Belgium, Germany, Spain, the Netherlands, and TurkeyThe study shows that France, Sweden, Switzerland, and Norway do not have consistent ties with Pakistan, as tourist flows to Pakistan are driven by short-term phenomena rather than by pure economic considerations. An analysis performed in 2001 shows that income from the originating country is the principal determinant in attracting tourists to Pakistan, where income elasticity is 5.0864% for Spain and 13.21% for the UK. Prostrated Europeans regard Pakistan as a luxury destination, demanding almost perfectly elasticities in tourist patterns of travel. This influences Pakistan's position in European travel markets through periods of increased European incomes and variable visitor numbers (Borrego-Dominguez et al., 2018). It has shown that less expensive tourist prices at the destination, compared with those of the place of origin, attract travelers to the UK, Spain, and the Netherlands. This legitimizes the consensus in the tourist demand literature (Lim, 1997; Borrego-Dominguez et al., 2022). Tourists actually judge their holiday gigs on price competitivity, while their incomes are the most dominant determinant of their preferences. Concerns on employment status in the country of origin introduce critical barriers to any clarifications regarding nuances-theoretically considered via income, time constraints, and activities of leisure-that affect travel behavior. Tourism authorities of Pakistan have to study the impact of the population decline in Germany on future tourist arrivals, as this knowledge is basis to developing and working on outreach strategies for this market. An error correction model indicates that all six cointegrating economies naturally move to their long-term equilibria through swift adjustments ranging from 52.2% to 214% at annual rates; the UK leads in exceeding the German rate. The high ECT coefficient for Turkey, Belgium, and Germany basically signifies that these countries move towards oscillatory convergence, rising above their long-term equilibrium

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states, as their tourism systems behold irregular short-term oscillations.

Policy Recommendations

The study makes critical related suggestions that must find their way in legislation in Pakistan; targeting rich European market sections via focusing on visitor segments from a total of these six major source markets that determine tourist presence due to income levels. Pakistan should therefore start digital marketing exercises, collaborations with some luxury travel agencies, and be well represented in high-end international travel fairs to bring affluent middle-class-category tourists from markets in the United Kingdom, Germany, and the Netherlands. Rich travel money holders become inclined towards the Pakistani shores since these respective markets possess higher income elasticities. Therefore, service quality synonymous to superior extravaganza such as high-altitude treks, cultural trips, and small-scale eco-tourism experiences—appealing to the gained tourists owing to their extraordinary spending—is also one condition needed. In the comparison of the three markets above, the whole value for prices found by the UK, Spain, and lesser Netherlands helps in making Pakistan cost-competitive as a destination. Policies and institutions put in place in one direction or the other enhanced the tourism sector in Pakistan: those policies included macroeconomic policies that tightly managed local inflation, as well as some other policies that tended to keep the Pakistani rupee less valuable talking in the direction of strong European currencies. The tourism value chain in Pakistan is deficiently geared up to competitively address the European markets by bringing principal pillars such as lodging, travel, and food and beverage services to Pakistan's cost-ruling arsenal.

France, Sweden, Switzerland, and Norway, the four supplier countries, have poor long-lasting relationships with Pakistan, providing an excellent opportunity for market development. The absence of cointegration should serve as proof that these countries need structural components as traveling devices for tourists. Pakistani tourism authorities can set to build strong partnerships through targeted market development programs because of certain key countries with the support of the Pakistani diasporas in France and Switzerland. The demographic mutilation generated by the replacement of one with our fourth instance in the existing system may now establish a catalyst to spur the production of critical resources.

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