

Long-Run Relationship Between Tourism Receipts and Economic Development in Pakistan: Evidence from a VECM Framework

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Abstract

The present study investigates the long- and short-run relationship between tourism receipts and the inclusive growth dimension (measured as GDP per capita) in Pakistan, controlling for employment, trade openness, and inflation, using annual data for the period 2000-2025. It differs from the single-equation ARDL model prevalent in Pakistan-specific studies and uses a complete Vector Error Correction Model (VECM) to estimate the long-run equilibrium and system-wide short-run feedback simultaneously. All series are found to be 1st-order integrated by the unit root tests, a necessary condition for cointegration, and an Engle-Granger test and a Johansen test are used to confirm a significant long-run equilibrium relationship. Tourism receipts, employment, trade openness, and inflation have positive and negative long-run effects on the inclusive growth dimension, respectively, with a consistent negative impact from trade deficits and macroeconomic instability. The error-correction term is negative and highly significant, with disequilibrium corrected at around 77% per year. The short-run results demonstrate a positive tourism impact, which supports the Tourism-Led Growth Hypothesis, and a negative

employment impact, which may be associated with structural and/or disguised unemployment. The results suggest that tourism is a statistically sound development tool in and of itself and that it can be pursued with targeted investments in infrastructure and destination marketing, while the trade-liberalization policy, on the other hand, should be coupled with export-competitiveness measures. Inclusive growth is measured with GDP per capita, which reflects only the growth side of inclusive growth, and there is scope for future research to include distributional indicators.

Keywords: Tourism-led growth, Vector Error Correction Model, Co-integration, Inclusive growth, Pakistan, Trade openness, Error correction mechanism

1. Introduction

Travel and tourism has again become one of the world's fastest-growing industries. By 2025, it is projected to be the world's largest contributor to GDP, representing 9.8% of the world's GDP, or US\$11.6 trillion. The sector has grown by almost 50% over the last 35 years, compared with the rest of the world economy, and has directly and indirectly employed an estimated 366 million people globally (World Travel & Tourism Council (WTTC, 2026)). Tourism is considered a low-threshold industry for developing and emerging economies in particular. It helps countries convert natural and cultural resources that may not be tradable into economic value and potential, generating employment, foreign exchange, and investment in infrastructure (Brida et al., 2020; Eluwole et al., 2022).

Pakistan's tourism endowment is highly diverse, encompassing the high mountain ranges of the Karakoram and Himalayas, historic Mughal-era cities, religious heritage sites, and the coastal plains of Sindh and Balochistan. However, this potential is not reflected in the extent to which the sector is monetized compared with its peers in the region. Currently, the tourism sector contributes only about 1.9% to Pakistan's GDP and 1.7% to national employment. The country received fewer than one million foreign tourists in 2024, a far lower number than in destinations such as Vietnam and Jordan, and other countries in the Middle East group of economies that are experiencing high inflows of foreign tourists (Jahangir, 2025). The disparity between the tourism endowment and the sector's contribution to the Pakistani economy is a strong impetus for resuming empirical study of the relationship, if any, and the degree of linkage between tourism receipts and the country's long-run trajectory of economic development.

Tourism's importance in development economics has grown in recent years because it enables the monetization of natural and cultural resources that are not normally tradable, such as mountains, heritage sites, and coastlines, and their services, to generate foreign exchange without the high capital intensity usually required for manufacturing-led export strategies (Brida et al., 2020). It is important due to its size. Travel and tourism directly and indirectly provided 366 million jobs and accounted for 9.8% of global GDP in 2025 alone (WTTC, 2026), which is equivalent to, or in some instances even higher than, the number of jobs and GDP provided by other well-established industrial sectors.

Given the country's reliance on the coastal plains of Sindh and Balochistan, Mughal-era cities, and the Karakoram and Himalayan ranges as major assets for tourism, which contribute only around 1.9% of GDP and 1.7% of employment in Pakistan, the question of how much tourism receipts contribute to economic development is no simple academic curiosity. For a country like Pakistan, with only around 1.9% of GDP and 1.7% of employment from tourism, and with the Karakoram and Himalayan ranges, Mughal-era cities, and religious tourism sites as major assets, tourism receipts and economic development are no simple academic concern. It's a key policy question. To make tourism a legitimate factor in the country's development strategy, one should first determine whether this transmission is a valid, statistically stable long-run relationship or a short-run or spurious correlation.

The empirical work for Pakistan has followed the ARDL approach, using a single-equation bounds testing, as the majority of the literature on the tourism–growth relationship has done. In this approach, the impact of the tourism sector on growth is estimated, whereas the feedback effects of growth, employment, and trade on the tourism sector are treated as an outside factor (Azam et al., 2022; Hijazi et al., 2024; Iqbal et al., 2024). The one-equation model is insufficient to determine whether the observed relationship represents the true long-run equilibrium system and to capture possible short-run adjustment processes in which shocks to one variable trickle down to the other variables.

This is a key missing link, as policies aimed at the tourism value chain do not operate solely through tourism receipts but instead follow a complex macroeconomic pathway. A full Vector Error Correction Model (VECM) is thus required to test for the existence of a stable multivariate long-run equilibrium and to quantify the speed at which the system returns to that equilibrium after a shock.

This study is important for three major reasons. First, it adds to the empirical evidence base through 2024, reflecting the post-pandemic recovery and significant shifts in international travel patterns and Pakistan's tourism receipts (WTTC, 2026).

Second, the study's simultaneous estimation of a cointegrated system of tourism, employment, trade openness, and inflation enables policymakers to gain a fuller picture of how tourism-sector policies interact with labor-market and trade-policy outcomes. This is more informative than viewing tourism promotion as a stand-alone policy tool.

Third, the error-correction mechanism estimated in the study measures the actual annual rate of adjustment toward long-run equilibrium. This information is directly relevant to decisions about the timing, pacing, and sequencing of tourism-sector policies. The findings are of practical significance for the Ministry of Tourism Pakistan, provincial tourism boards, and those making investment decisions in the tourism sector for tourism development in Pakistan, based on evidence.

The overall aim of this study is to investigate the long-run and short-run relationship between tourism receipts and the growth dimension of inclusive growth in Pakistan for the period 2000–2025 using a Vector Error Correction Model (VECM). Specifically, to determine:

- (i) assess the long-run elasticities among tourism, employment, trade openness, and inflation, and their signs and magnitudes in light of theory;
- (ii) measure the short-run dynamics and what the speed of adjustment is to long-run equilibrium, using the error-correction term; and
- (iii) draw policy conclusions for the development of the tourism sector in Pakistan, based on long-run and short-run evidence.

It is important to clarify the conceptual scope of the outcome variable in this study. The concept of inclusive growth is widely accepted as growth in total output with deliberate attention to the distribution of that growth, encompassing dimensions such as poverty reduction, employment quality, and access. The UN Trade and Development's Inclusive Growth Index, which incorporates GDP and indicators of living conditions, equality, and environmental sustainability, illustrates this concept (United Nations Trade and Development (UNCTAD, 2025).

The dependent variable of this study, GDP per capita, does not capture distributional elements. Rather, it captures the inclusive growth dimension of growth. This is in line with single-indicator

empirical studies, in which per-capita output is considered the main growth indicator that affects other indicators of inclusiveness (Rusu & Oprean-Stan, 2023).

In more recent tourism-specific research, a distinction is made between tourism-led growth – which refers to growth in aggregate output – and tourism-led inclusive growth – which concerns how that growth is distributed across income groups, genders, and regions. Although the impact of tourism on economic growth is generally accepted in the literature, the theory of inclusive growth remains a subject of debate (Bhatt et al., 2024; Dossou et al., 2024).

For the growth dimension of inclusive growth, GDP per capita is used as a proxy in this study. This aligns with the single-indicator inclusive-growth literature (Rusu & Oprean-Stan, 2023) and the broader empirical literature on the Tourism-Led Growth Hypothesis (TLG) (Brida et al., 2020; Azam et al., 2022). However, the measure does not capture the distribution aspect of inclusive growth. This limitation is noted as a future research area in the Conclusion.

The study's contributions are twofold. This study's contribution is twofold.

This study makes three tangible contributions to the tourism–growth literature. First, from a methodological perspective, it uses a comprehensive multivariate VECM system, whereas most previous Pakistani studies have adopted the one-equation ARDL system. This enables estimation of the joint effects of tourism on employment, trade, and inflation in the short run, without being dominated by the long-run equilibrium relationship.

Second, on an empirical level, the study will extend the estimation sample through 2024, thereby capturing the dynamics of the post-COVID-19 recovery of international travel that were not captured in studies conducted prior to 2023 (WTTC, 2026).

Third, with respect to the policy's relevance, the study estimates the speed of error correction in the policy mechanism. This statistic is estimated in only a handful of current single-equation studies on Pakistan and gives policymakers a tangible number that reflects the speed at which tourism shocks or interventions are transmitted to measurable economic outcomes.

Altogether, the study is a methodological and empirical supplement to the existing literature on tourism growth–led Pakistan (Azam et al., 2022; Hijazi et al., 2024; Iqbal et al., 2024).

2. Literature Review

2.1 Theoretical Foundations

The Tourism-Led Growth Hypothesis (TLGH) holds that increases in tourist numbers can boost a country's economic growth through mechanisms such as foreign exchange earnings, job

creation, infrastructure investment, backward linkages with other sectors (such as transport, tourism and hospitality, and retail), and forward linkages (Balaguer & Cantavella-Jordá, 2002). This hypothesis is compatible with endogenous growth theory, which emphasizes the role of knowledge spillovers, capital deepening, and human-capital accumulation as key drivers of sustained economic growth, rather than exogenous technological change alone (Romer, 1990).

In this sense, tourism is a vital link which enables an economy to convert non-tradable natural and cultural resources into tradable services. This can bring about growth impacts akin to those found with export-led industrialization.

2.2 Global and Regional Empirical Evidence

Evidence from across the world is broadly positive for the Tourism-Led Growth Hypothesis, though findings differ across some economies. Brida et al. (2020) conducted a systematic literature review that confirms the hypothesis is supported in most country-level studies. The evidence is stronger in smaller economies with higher tourism dependence and weaker or mixed in larger, more diversified economies.

Similarly, Eluwole et al. (2022), based on a systematic literature network analysis, state that tourism has been increasingly recognized as a sustainable source of economic growth in developing countries due to its strong linkages with other sectors. However, Kostakis (2020) offers a crucial qualification. The study, based on panel cointegration and panel VAR analysis for Southern European countries, indicates that the growth effects of tourism are, to a certain extent, dependent on the tourism sector's export competitiveness and therefore cannot be regarded as automatic. The relevance of this qualification to the findings on trade openness is presented later in this study.

2.3 Pakistan-Specific Evidence

In Pakistan, recent studies of the relationship between tourism and economic growth indicate that the long-run relationship is positive. Some of the recent studies conducted in Pakistan using an ARDL model have found a positive long-run relationship between tourism and economic growth. The study by Azam et al. (2022) indicates that tourism receipts are highly significant in explaining variations in long-run economic growth in Pakistan. Hijazi et al. (2024) also validate the existence of the Tourism-Led Growth Hypothesis with the ARDL bounds-testing framework, whereas Iqbal et al. (2024) arrive at the same result with ARDL along with Granger causality testing.

Ahmed et al. (2024) build on this evidence by finding that tourism and employment together bring about economic growth in both productivity and income-generating ways. The studies, when put together, offer an acceptable one-equation case for tourism-induced growth in Pakistan. As mentioned before, however, they do not test for co-integration between the variables of tourism, employment, trade and inflation, nor do they estimate the short-run adjustment speeds for the system.

The inclusive-growth debate is short on specifics regarding tourism. Another, more recent, body of literature focuses on the 'fairness' of the economic gains that the tourism industry brings to society. The study by Dossou et al. (2024), based on data from 44 African countries, reveals that tourism does not necessarily lead to inclusive growth, but it can do so only if there is good governance. Likewise, Bhatt et al. (2024), in their systematic review of emerging and developing economies, find that there is a debate over the tourism-led inclusive growth hypothesis. They argue that more research at the country level is needed, including explicit measures of distributional outcomes.

The results of these investigations support the terminological distinction made in section 1.3. The present study focuses on the growth dimension of inclusive growth, in contrast with the more comprehensive 'inclusive' or 'distributional' dimension.

2.4 The Research Gap of the study and positioning of the study.

The literature leaves three broad areas of gaps. First, the research conducted in Pakistan is dominated by a single-equation ARDL approach. Consequently, the multi-variate equilibrium in the tourism, employment, trade and inflationary sectors, along with the speed of adjustment within the economy, remain relatively under-researched (Shrestha & Bhatta, 2018).

Second, most of the previous studies were carried out during pre-pandemic times. This hampers their ability to reflect the more recent dynamics of the tourism sector (WTTC, 2026).

Thirdly, there is a lack of focus on the inclusive growth aspect of Pakistan's tourism development. Once the relationship between tourism and growth has been determined, as is the focus of the present study, this is a natural path for future research.

The first two gaps are directly addressed by the VECM framework and the extended 2000–2024 sample used in the study presented here.

2.5 Hypothesis

With the theoretical and empirical literature reviewed above, this paper proposes to map the variables tourism receipts, employment, trade openness, and inflation as interrelated and endogenous to the inclusive growth dimension. The study does not assume that these variables act as input variables to economic growth, but sees them as variables which can influence each other and also be influenced by other variables. This is in line with the VECM framework, where all variables may be either explanatory or endogenous variables in a co-integrated system (Johansen, 1995).

In this context, five hypotheses are tested, which are related to the five objectives of the study:

H1: There is integration of order 1 between tourism receipts and employment, tourism receipts and openness of trade, and tourism receipts and inflation, which fulfills the necessary condition for co-integration.

H2: Tourism receipts, employment, trade opening, and inflation are co-integrated with the dimension of growth in inclusive growth in Pakistan.

H3: This implies that tourist receipts and employment have positive long-run effects on the Tourism-led growth dimension of inclusive growth, whereas the effects of trade openness and inflation are negative, in line with the Tourism-Led Growth Hypothesis (2022) by Eluwole et al. and the general macroeconomic theory (2021) by Mankiw.

H4: The error-correction term is negative and statistically significant, implying that adjustment toward long-run equilibrium occurs after short-run shocks.

H5: The growth link of tourism with the short run has a positive link, which strengthens the long-run link proposed in H3.

The hypotheses are tested in turn in Section 4.

3. Data and Methodology

3.1 Data Description

The aim of this study is to explore the effect of tourism on the growth dimension of inclusive growth in Pakistan on the basis of annual time-series data from 2000 to 2024. The growth dimension is captured in GDP per capita (GDPPC), which is in line with single-indicator approaches to inclusive growth (Rusu & Oprean-Stan, 2023) and with the scope clarification given in Section 1.3.

An international travel and tourism receipt (LNTTR) is the indicator used to measure tourism. To reduce omitted-variable bias and capture the companies' economy, employment (LNEMPILO15), trade openness (LNTRADEOPEN), and inflation (INFGDP, GDP deflator) are also included in the model as control variables. These decisions are in line with the recent literature on tourism growth (Brida et al., 2020; Azam et al., 2022; Eluwole et al., 2022).

The tourism receipts, employment and openness of trade are reported in natural log. This change can improve homoscedasticity and allow coefficients to be interpreted as elasticities. All information is from the World Bank's World Development Indicators (WDI) database.

Table 1. Description of Variables

Variable	Description	Measurement
GDPPC	Inclusive growth (growth dimension)	GDP per capita
LNTTR	Tourism receipts	Natural log of international travel and tourism receipts
LNEMPILO15	Employment	Natural log of employment-to-population ratio
LNTRADEOPEN	Trade openness	Natural log of exports plus imports as % of GDP
INFGDP	Inflation	GDP deflator, annual % growth

3.2 Model Specification

Following the Tourism-Led Growth Hypothesis, the long-run functional relationship is specified as:

$$GDPPC_j = f(LNTTR_j, LNEMPILO15_j, LNTRADEOPEN_j, INFGDP_j)$$

The relationship is estimated as:

$$GDPPC_j = \beta_0 + \beta_1 LNTTR_j + \beta_2 LNEMPILO15_j + \beta_3 LNTRADEOPEN_j + \beta_4 INFGDP_j + \varepsilon_j$$

Where β_0 represents the intercept, β_1 – β_4 are the long-run coefficients, and ε_j is the stochastic error term.

The coefficient for tourism is expected to be positive because tourism brings foreign exchange earnings to the country and provides investment opportunities, job opportunities, and infrastructure development (Eluwole et al., 2022; Azam et al., 2022).

3.3 Estimation Strategy

The empirical analysis is conducted in four key steps: unit-root test, residual-based cointegration test, Johansen cointegration test, and VECM estimation.

3.3.1 Unit Root Testing

The Augmented Dickey-Fuller (ADF) test is used to assess stationarity in regressions of non-stationary variables, which may yield spurious results. The ADF specification is:

$$Y_j = \alpha + \beta_t + \gamma Y_{j-1} + \sum \delta_i \Delta Y_{j-i} + \varepsilon_j$$

where the null hypothesis states that the series contains a unit root.

3.3.2 Residual-Based Co-integration Test

A Johansen model-based cointegration test is preceded by the Engle-Granger test. First, the long-run regression is estimated, and then the residuals are tested for stationarity using:

$$\Delta \hat{\varepsilon}_j = \rho \hat{\varepsilon}_{j-1} + \mu_j$$

When the residuals are stationary, the variables share a common stochastic trend and move together in the long run (Engle & Granger, 1987). 3.3.3 Johansen Cointegration Test. All variables are integrated of order one, and the Johansen method is used to estimate the number of cointegrating vectors. The analysis begins with the VAR representation as follows:

$$Y_j = A_1 Y_{j-1} + A_2 Y_{j-2} + \dots + A_k Y_{j-k} + \varepsilon_j$$

which is transformed into the VECM representation:

$$\Delta Y_j = \Pi Y_{j-1} + \sum \Gamma_i \Delta Y_{j-i} + \varepsilon_j$$

(Johansen, 1995).

3.3.4 Vector Error Correction Model (VECM)

After co-integration is confirmed, the VECM is estimated as:

$$\Delta \text{GDPPC}_j = \alpha + \sum \beta_i \Delta X_{j-i} + \lambda \text{ECT}_{j-1} + \varepsilon_j$$

Here, λ is the error-correction coefficient. To confirm convergence to long-run equilibrium, λ must be negative and statistically significant (Johansen, 1995).

3.4 Diagnostic and Robustness Assessment

Model adequacy is assessed using residual diagnostics and cointegration validation. The ADF unit root test, residual-based cointegration test, Johansen cointegration analysis, and VECM estimation can be used to examine the role of tourism in Pakistan's overall economic development and are well suited for this type of time-series macroeconomic analysis (Shrestha & Bhatta, 2018).

4. Results and Discussion

The empirical results of this study are presented in this section, which includes unit-root tests, cointegration tests, and estimation of the VECM to examine both short-run and long-run dynamics of tourism growth in relation to the growth dimension of inclusive growth in Pakistan, measured by GDP per capita, between 2000 and 2024.

4.1 Unit Root and Model Diagnostics

Table 2. Results of ADF Unit Root Test

Variable	ADF (Level)	Decision	ADF (1st Diff.)	Decision	Order
LNGDPPC	-1.694	Non-stationary	-3.592***	Stationary	I(1)
LNTRADEOPEN	-0.901	Non-stationary	-3.572***	Stationary	I(1)
LNTR	-2.535	Non-stationary	-3.728***	Stationary	I(1)
INFGDP	-0.956	Non-stationary	-5.141***	Stationary	I(1)
LNEMPILO15	-2.253	Non-stationary	-4.895***	Stationary	I(1)

All five series are non-stationary at levels but stationary at first differences at the 1% level. This indicates that both variables are integrated of order one, I(1), as required for Johansen cointegration analysis and Johansen VECM estimation.

Table 3. VECM Model Summary

Equation	Parameters	RMSE	R ²	Chi-square	p-value
Δ GDPPC	7	1.349	0.7329	30.1814	0.0001
Δ LNEMPILO15	7	0.007	0.6839	23.7943	0.0012
Δ LNTR	7	0.1538	0.5289	12.3474	0.0897
Δ LNTRADEOPEN	7	0.0958	0.4259	8.161	0.3186
Δ INFGDP	7	2.8066	0.5223	12.0272	0.0997

Sample period: 2003–2024 (18 effective observations); log-likelihood = 68.2676; AIC = -3.252; HQIC = -2.986; SBIC = -1.323; $\text{Det}(\Sigma_{ml}) = 3.49 \times 10^{-10}$.

The GDP-growth equation explains 73.3% of the variation in economic growth ($R^2 = 0.7329$), and the employment equation explains 68.4% ($R^2 = 0.6839$). Both exceed the 0.50 threshold typically considered "good" for macroeconomic time-series models, especially given the many unobservable factors that can affect economic growth (Wooldridge, 2020).

The high Chi-square values for the GDP-growth equation ($\chi^2 = 30.18$, $p < .01$) and the employment equation ($\chi^2 = 23.79$, $p < .01$) suggest that the growth dimension of Pakistan's inclusive growth is related to tourism, employment, openness to trade, and inflation. This aligns with the results presented by Azam et al. (2022). Near-zero values of the information criteria (AIC, HQIC, and SBIC) and the determinant of the residual covariance matrix also indicate that the system is well-fitting, parsimonious, and stable.

4.2 Long-Run Co-Integrating Relationship

The likelihood ratio statistic for the Johansen cointegrating vector is highly significant, with a value of $\chi^2 = 859.8258$ and a p-value less than .01. This confirms a stable long-run equilibrium relationship among GDP per capita, employment, tourism receipts, trade openness, and inflation. That is, these variables tend to move together over time rather than evolve independently (Johansen, 1995).

Table 4. Long-Run Co-Integrating Equation (Normalized on GDP per Capita)

Variable	Coefficient	Std. Error	z-stat	p-value
GDPPC	1	—	—	—
LNEMPILO15	-126.761	10.298	-12.31	0.000***
LNTTR	-10.018	0.549	-18.24	0.000***
LNTRADEOPEN	19.815	1.231	16.10	0.000***
INFGDP	0.354	0.025	14.29	0.000***
Constant	187.380	—	—	—

Co-integrating equation $\chi^2 = 859.8258$, $p < .001$ (1 equation, 4 restrictions).

Under Johansen normalization, the estimated long-run equation is:

$$\text{GDPPC} = 126.761 \cdot \text{LNEMPILO15} + 10.018 \cdot \text{LNTTR} - 19.815 \cdot \text{LNTRADEOPEN} - 0.354 \cdot \text{INFGDP} - 187.380.$$

Employment and Economic Development

The employment coefficient is statistically significant at the 1% level, and after normalization, it shows a positive long-run effect on economic development. This is in line with endogenous growth theory, which posits that labor force participation and human capital accumulation are significant contributors to economic growth (Romer, 1990).

As employment increases, household income rises, thereby increasing aggregate demand and investment. This pattern is also observed in Pakistan, as Ahmed et al. (2024) attribute employment growth to Pakistan's productivity and income-generating potential.

The emergence of the tourism industry and economic development.

The tourism coefficient is significant at $p < .01$, and after normalization, it shows a positive long-run relationship with economic growth. This supports the Tourism-Led Growth Hypothesis (Eluwole et al., 2022).

Tourism has a direct impact on GDP through spending on tourism, such as accommodation, transportation, food services, and retail activities. It also has indirect multiplier effects via supporting industries. The results are in line with Azam et al. (2022) and Hijazi et al. (2024), both of which consider tourism an important contributor to economic growth in Pakistan.

The impact of trade openness on economic development.

The trade-openness coefficient is significant at the 1% level, and when normalized, it shows a negative long-run relationship with economic development. This is especially so against the backdrop of the traditional expectation that trade liberalization will spur growth by fostering enhanced competition and technology transfer.

This could be due to Pakistan's persistent trade deficits, reliance on imports, and an export basket that was less diversified during the study period. This is in line with Kostakis (2020), who concludes that developing economies might not maximize the gains of trade liberalization if the GDP growth of imports continues to exceed GDP growth in exports.

The Linkage between Inflation and Economic Development

The coefficient of inflation is significant at the 1% level and has a negative long-run effect on economic development. This aligns with conventional macroeconomics, which holds that high inflation leads to less investment and misallocates resources due to uncertainty (Mankiw, 2021). The finding aligns with other developing countries, where inflation has been found to reduce sustainable growth due to increased production costs (Ahmed et al., 2024).

4.3 Error Correction Mechanism

Table 5. Error Correction Term (ECT) Coefficients

Dependent Var.	ECT Coeff.	Std. Error	z-stat	p-value	Interpretation
Δ GDPPC	-0.7695	0.1727	-4.45	0.000***	Converges

Dependent Var.	ECT Coeff.	Std. Error	z-stat	p-value	Interpretation
$\Delta \text{LNEMPILO15}$	0.0026	0.0009	2.93	0.003***	Diverges
ΔLNTTR	-0.0015	0.0197	-0.08	0.939	No adjustment
$\Delta \text{LNTRADEOPEN}$	0.0015	0.0123	0.12	0.902	No adjustment
ΔINFGDP	0.5455	0.3594	1.52	0.129	No adjustment

The ECT coefficient ($\phi = -0.7695$, $p < .01$) in the GDP-growth equation is negative and significantly different from zero within a 95% confidence interval. This supports the existence of a genuine long-run equilibrium and suggests that about 77% of the disequilibrium will be eliminated within one year, which is a relatively high speed of adjustment for macroeconomic purposes.

This type of negative and statistically significant error-correction coefficient is the norm for confirming the existence of cointegration (Engle & Granger, 1987). By contrast, the ECT coefficients for tourism, trade openness, and inflation are not statistically significant. This implies that the primary force driving the system toward re-equilibration is GDP per capita, not these other variables.

4.4 Short-Run Dynamics

Table 6. Summary of Short-Run VECM Dynamics

Dependent	Variable	Coeff.	Std. Error	z-stat	p-value	Sig.
ΔGDPPC	ECT(-1)	-0.7695	0.1727	-4.45	0.000	***
	$\Delta \text{Employment}$	-77.900	39.000	-2.00	0.046	**
	$\Delta \text{Trade Openness}$	9.421	5.642	1.67	0.095	*
$\Delta \text{Employment}$	ECT(-1)	0.0026	0.0009	2.93	0.003	***
	$\Delta \text{Trade Openness}$	-0.1036	0.0294	-3.52	0.000	***
	$\Delta \text{Inflation}$	-0.0028	0.0007	-3.75	0.000	***
$\Delta \text{Tourism}$	$\Delta \text{Trade Openness}$	1.1488	0.6434	1.79	0.074	*
$\Delta \text{Trade Openness}$	No significant var.	—	—	—	—	—
$\Delta \text{Inflation}$	$\Delta \text{Inflation}(-1)$	-0.6393	0.2946	-2.17	0.030	**

The GDP growth equation shows a significant negative short-run employment coefficient ($\beta = -77.90$; $p < .05$). This may reflect structural or disguised unemployment, or the creation of low-productivity jobs. This pattern may be observed in developing countries, where greater employment does not necessarily translate into higher productivity growth (Todaro & Smith, 2021).

The short-run effect of tourism on GDP growth is positive and statistically insignificant ($p < .10$, $\beta = 9.421$). This adds further evidence to the Tourism-Led Growth Hypothesis and aligns with the result of Hijazi et al. (2024).

The employment side of the equation shows that trade openness ($\beta = -0.1036$, $p < .01$) and inflation ($\beta = -0.0028$, $p < .01$) are both negatively significant in the short run. This suggests that increased import competition could put short-run pressure on domestic industries and create uncertainty about hiring decisions as prices rise, potentially resulting in job losses.

The effect of trade openness on tourism is positive and slightly significant, with $\beta = .1488$, $p < .10$. This is in line with the potential link between higher economic integration and easier cross-border mobility, which also helps to promote tourism.

4.5 Residual-Based Co-integration Test (Engle–Granger)

Table 7. ADF Test on Residual Series

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
-3.277	-2.66	-1.95	-1.60

The residual ADF (-3.277) is less than the critical values at all three conventional significance levels. Thus, the null hypothesis of a unit root in the residual series is rejected.

According to Engle and Granger (1987), stationary residuals imply that the variables share a common stochastic trend and are cointegrated. This provides further support for the long-run regression coefficients being economically meaningful rather than statistical artifacts.

Although the tourism sector is not the most important sector in all specifications, the cointegration results confirm that tourism is an integral component of Pakistan's stable long-run economic development system. This aligns with the long-run tourism–growth relationships found across the region, such as in Hijazi et al. (2024) and Iqbal et al. (2024).

5. Conclusion & Policy Implications

Overall, the VECM results indicate strong evidence of a long- run relationship between GDP per capita (the growth aspect of inclusive growth) and employment, tourism receipts, trade openness, and inflation in Pakistan for the period 2000–2024. The Johansen and Engle- Granger cointegration test results also show that these variables are cointegrated over time. The error- correction mechanism further suggests that GDP per capita is the key variable driving the system' s equilibrating process, with it adjusting around 77% of any GDP per capita deviation in one year.

The long- run estimates show that tourism and employment have positive long- run impacts, while the openness of trade and the inflation rate have negative long- run effects on this growth dimension. The short- run findings also indicate that tourism has a positive impact on growth, thus reinforcing the Tourism- Led Growth Hypothesis in Pakistan.

The results show that tourism has the potential to be a strategic sector that can contribute to foreign exchange earnings, employment, and infrastructure development, and has good backward and forward linkages with other sectors of the economy (Eluwole et al., 2022). Thus, policies focusing on the development of tourism infrastructure, destination marketing, security conditions, and investment facilitation are likely to positively impact Pakistan' s long- term economic growth.

Another negative long- run effect of trade openness is that liberalization policy should be paired with export competitiveness measures. Openness without an accompanying favorable export/import balance cannot ensure economic development (Kostakis, 2020).

As explained in Section 1. 1.3, GDP per capita is employed in this study to convey the growth aspect of inclusive growth. This aligns with the notion of single- indicator inclusive growth (Rusu & Oprean- Stan, 2023) and not with the broader concept of inclusive growth in a distribution- adjusted fashion, as with composite indices like that of UNCTAD (UNCTAD, 2025).

Future research should aim to re-estimate the system with explicit distributional outcome variables because the distributional aspect of tourism development is still not empirically resolved, even in contexts with a well- documented development effect of tourism (Bhatt et al., 2024; Dossou et al., 2024). These may be the poverty headcount ratio, the Gini coefficient of

income inequality, or the quality of jobs. This extension would help to see whether the growth of tourism is also equally distributed among various groups of the population in Pakistan.

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