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Economic Growth, Tourism, and Energy Consumption in a Resource-Dependent Economy: Evidence from Kazakhstan

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Abstract

Understanding the determinants of economic growth remains a central issue for resource-dependent economies seeking to achieve sustainable development and economic diversification. In this context, Kazakhstan represents a particularly relevant case due to its heavy reliance on energy resources and its increasing emphasis on tourism development as a potential diversification strategy. This study investigates the validity of the tourism-led growth hypothesis and the energy-led growth hypothesis in Kazakhstan using annual data covering the period 1995–2024. Economic growth is modeled as a function of tourism revenues, energy consumption, inflation, and the real effective exchange rate. To examine both short-run and long-run relationships among the variables, the Autoregressive Distributed Lag (ARDL) bounds testing approach is employed. In addition, structural breaks are identified using the Bai–Perron multiple breakpoint test and incorporated into the empirical framework. The empirical results reveal the existence of a long-run cointegration relationship among the variables. Long-run estimates indicate that energy consumption has a positive and statistically significant effect on economic growth, providing support for the energy-led growth hypothesis. In contrast, tourism revenues do not exert a statistically significant impact on economic growth, suggesting that the tourism-led growth hypothesis is not supported in the case of Kazakhstan. The real effective exchange rate exhibits a negative long-run relationship with economic growth, while inflation does not appear to be a significant determinant. Short-run results are broadly consistent with the long-run findings and indicate a gradual adjustment toward equilibrium. Furthermore, diagnostic and stability tests indicate the adequacy, robustness, and stability of the estimated model. The findings suggest that Kazakhstan's economic growth remains strongly associated with energy-related activities despite ongoing diversification efforts. While tourism may contribute to regional development and broader socioeconomic objectives, its contribution to macroeconomic growth appears to be limited relative to the dominant role of the energy sector. The study contributes to the literature by jointly evaluating the tourism-led growth and energy-led growth hypotheses within a unified framework and provides policy-relevant evidence regarding the challenges of economic diversification in resource-dependent economies.



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1. Introduction

Economic growth remains one of the primary objectives of national development strategies, particularly in emerging and resource-dependent economies seeking to enhance economic resilience, improve living standards, and achieve long-term sustainable development. Identifying the key drivers of economic growth is therefore of considerable importance for both policymakers and researchers. Among the factors frequently associated with economic expansion, tourism and energy consumption have attracted increasing attention in recent decades. Tourism is widely recognized as a source of foreign exchange earnings, employment generation, investment stimulation, and regional development, whereas energy consumption represents a fundamental production input that supports industrial activity, technological progress, and overall economic performance. Consequently, understanding the extent to which tourism and energy contribute to economic growth has become increasingly relevant in the context of sustainable and diversified development strategies.

The relationship between tourism and economic growth has been extensively investigated within the framework of the tourism-led growth hypothesis. According to this perspective, tourism contributes to economic growth by increasing export revenues, attracting domestic and foreign investment, generating employment opportunities, and stimulating productivity improvements. A comprehensive review conducted by [Brida et al. \(2016\)](#) concludes that tourism generally exerts a positive influence on economic growth across a wide range of countries and methodological approaches. More recently, [Alcalá-Ordóñez et al. \(2024\)](#), through an extensive review of recent empirical studies, confirm that tourism continues to be regarded as an important determinant of economic performance, although the magnitude and significance of its effects vary substantially across countries and regions. Similarly, [Tang and Tan \(2018\)](#), using a global sample of 167 countries, find that tourism contributes positively to economic growth, while emphasizing that the strength of this relationship depends on institutional quality and income levels. These findings suggest that tourism may serve as an important engine of economic development; however, its effectiveness appears to be highly context-specific.

Parallel to the tourism literature, the energy-led growth hypothesis argues that energy consumption constitutes a critical input in the production process and therefore plays a central role in supporting economic growth. Energy is essential for industrial production, transportation, infrastructure development, and technological advancement, all of which are fundamental components of economic activity. Nevertheless, empirical evidence concerning the energy–growth nexus remains inconclusive. While [Chang and Fang \(2022\)](#) report strong support for the positive contribution of energy consumption to economic growth in several emerging economies, other studies indicate that the nature and magnitude of this relationship depend on factors such as economic structure, energy composition, and development stages. As a result, both tourism and energy have been identified as important determinants of economic performance, yet their relative contributions remain an open empirical question in many countries.

Although tourism and energy consumption are frequently examined separately, strong theoretical and practical reasons justify analyzing them within a unified framework. Tourism can influence economic growth through several transmission channels, including the generation of foreign exchange earnings, employment creation, investment

in infrastructure, and the expansion of service-related sectors such as transportation and hospitality. These channels contribute to aggregate demand, productivity improvements, and overall economic performance.

Energy consumption, in turn, represents a fundamental input in the production process. It supports industrial activity, technological advancement, infrastructure development, and the functioning of key economic sectors, thereby directly contributing to economic output and growth. In resource-dependent economies, energy use is often closely associated with export-oriented production and large-scale industrial operations.

Moreover, tourism and energy consumption are inherently interconnected. The expansion of tourism increases demand for energy-intensive services such as transportation and accommodation, while the availability, cost, and efficiency of energy resources can influence the competitiveness and development potential of the tourism sector. Therefore, economic growth can be viewed as the outcome of interacting transmission mechanisms through which both tourism and energy consumption exert direct and indirect effects. This integrated perspective provides the conceptual foundation for the empirical model employed in this study.

This issue is particularly relevant for Kazakhstan. Since gaining independence, Kazakhstan has experienced significant economic growth largely supported by its abundant natural resource endowment, particularly oil, natural gas, and mineral resources. The energy sector has historically represented a major source of export earnings, fiscal revenues, foreign direct investment, and industrial development. However, as emphasized by [Azretbergenova and Syzdykova \(2020\)](#), heavy reliance on natural resources increases vulnerability to external shocks and limits the diversification of economic activities. Indeed, fluctuations in global commodity prices have repeatedly affected Kazakhstan's macroeconomic performance, exchange rate stability, and financial markets. Consequently, economic diversification has emerged as a strategic priority within the country's long-term development agenda.

Among the sectors identified as potential instruments of diversification, tourism occupies a prominent position. Kazakhstan possesses considerable tourism potential due to its unique natural landscapes, cultural heritage, historical attractions, and strategic geographical location connecting Europe and Asia. In recent years, policymakers have increasingly promoted tourism development as a mechanism for reducing dependence on extractive industries, stimulating regional development, creating employment opportunities, and enhancing economic resilience. Existing studies indicate that tourism may contribute to poverty reduction, regional development, and quality-of-life improvements in Kazakhstan ([Shah & ul Haq, 2022](#); [Salauatova et al., 2024](#); [Ibragimov et al., 2025](#)). Nevertheless, despite growing investments and policy initiatives aimed at supporting tourism, it remains unclear whether tourism has developed sufficiently to generate measurable effects on aggregate economic growth alongside the country's dominant energy sector.

Despite the growing body of research, several important gaps remain in the literature. First, studies focusing on Kazakhstan have generally examined tourism development, energy consumption, environmental sustainability, poverty reduction, or regional development separately rather than within a unified growth framework. Second, despite Kazakhstan's strong dependence on energy resources and its increasing emphasis on tourism-based diversification, empirical studies jointly testing the tourism-led growth and energy-led growth hypotheses remain extremely limited. Third, most existing studies focus on either tourism or energy individually and therefore provide only a partial explanation of the country's growth dynamics. Finally, recent discussions in the tourism literature emphasize the need to move beyond simple tourism–growth relationships and evaluate tourism's

role within broader processes of structural transformation and economic development, particularly in resource-dependent economies (Perles-Ribes & Moreno-Izquierdo, 2024).

Against this background, the present study investigates the validity of the tourism-led growth hypothesis and the energy-led growth hypothesis in Kazakhstan using annual data covering the period 1995–2024. Unlike previous studies that examine tourism and energy separately, this study evaluates their simultaneous effects on economic growth within a unified empirical framework while controlling for inflation and the real effective exchange rate. Methodologically, the study employs the Autoregressive Distributed Lag (ARDL) approach, which enables the examination of both short-run and long-run relationships among the variables. Furthermore, structural breaks are explicitly incorporated into the analysis in order to account for major economic disruptions experienced by Kazakhstan during the sample period.

This study makes several important contributions to the literature. First, it moves beyond the conventional approach of examining the tourism-led growth and energy-led growth hypotheses in isolation by conceptualizing them as competing drivers of economic growth within a resource-dependent economy. This perspective enables a more nuanced understanding of sectoral dominance and highlights how growth dynamics are shaped by the relative importance of different economic sectors.

Second, the study develops an integrated empirical framework that simultaneously incorporates tourism revenues, energy consumption, key macroeconomic control variables, and structural breaks within an Autoregressive Distributed Lag (ARDL) model. By explicitly accounting for major economic disruptions, the analysis captures the dynamic and shock-sensitive nature of growth processes in resource-dependent economies.

Third, the study provides new empirical evidence from Kazakhstan with broader implications for similar economies pursuing diversification strategies. The findings demonstrate that while energy consumption remains the dominant driver of economic growth, tourism does not yet exert a statistically significant macroeconomic effect. This result suggests that the effectiveness of tourism as a growth engine depends on its relative scale, structural linkages, and interaction with dominant sectors such as energy, thereby contributing to the broader debate on economic diversification and structural transformation.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the data, variables, and econometric methodology employed in the study. Section 4 presents the empirical results, while Section 5 discusses the findings within the context of the relevant theoretical and empirical literature. Finally, Section 6 concludes the study, outlines its policy implications, acknowledges its limitations, and suggests avenues for future research.

2. Literature Review

2.1. Conceptual Framework

This study is grounded in a conceptual framework that systematically integrates the transmission mechanisms linking tourism development and energy consumption to economic growth. Rather than treating these relationships as purely empirical associations, the framework emphasizes the underlying economic channels through which these variables interact within a resource-dependent economy.

Energy consumption influences economic growth primarily through supply-side mechanisms. As a fundamental input in the production process, energy directly supports industrial activity, infrastructure development, and overall production capacity. In energy-intensive economies such as Kazakhstan, increased energy use is closely associated with higher levels of output, greater capacity utilization, and export-oriented production dynamics.

In contrast, tourism development operates mainly through demand-side and structural channels. It generates foreign exchange earnings, promotes employment creation, stimulates both public and private investment, and supports the expansion of service-related sectors, including transportation, accommodation, and retail. However, the magnitude of these effects depends critically on the scale of the tourism sector and the extent of its integration with the broader economy.

The framework also highlights the interdependence between tourism and energy consumption. Tourism-related activities are inherently energy-intensive, particularly in transportation and hospitality services, while the availability, cost, and efficiency of energy resources influence the development and competitiveness of the tourism sector.

In addition, the framework allows for potential feedback mechanisms. Economic growth may, in turn, stimulate both energy consumption and tourism development, giving rise to dynamic and mutually reinforcing interactions over time.

The conceptual relationships and transmission mechanisms outlined above are visually summarized in Figure 1.

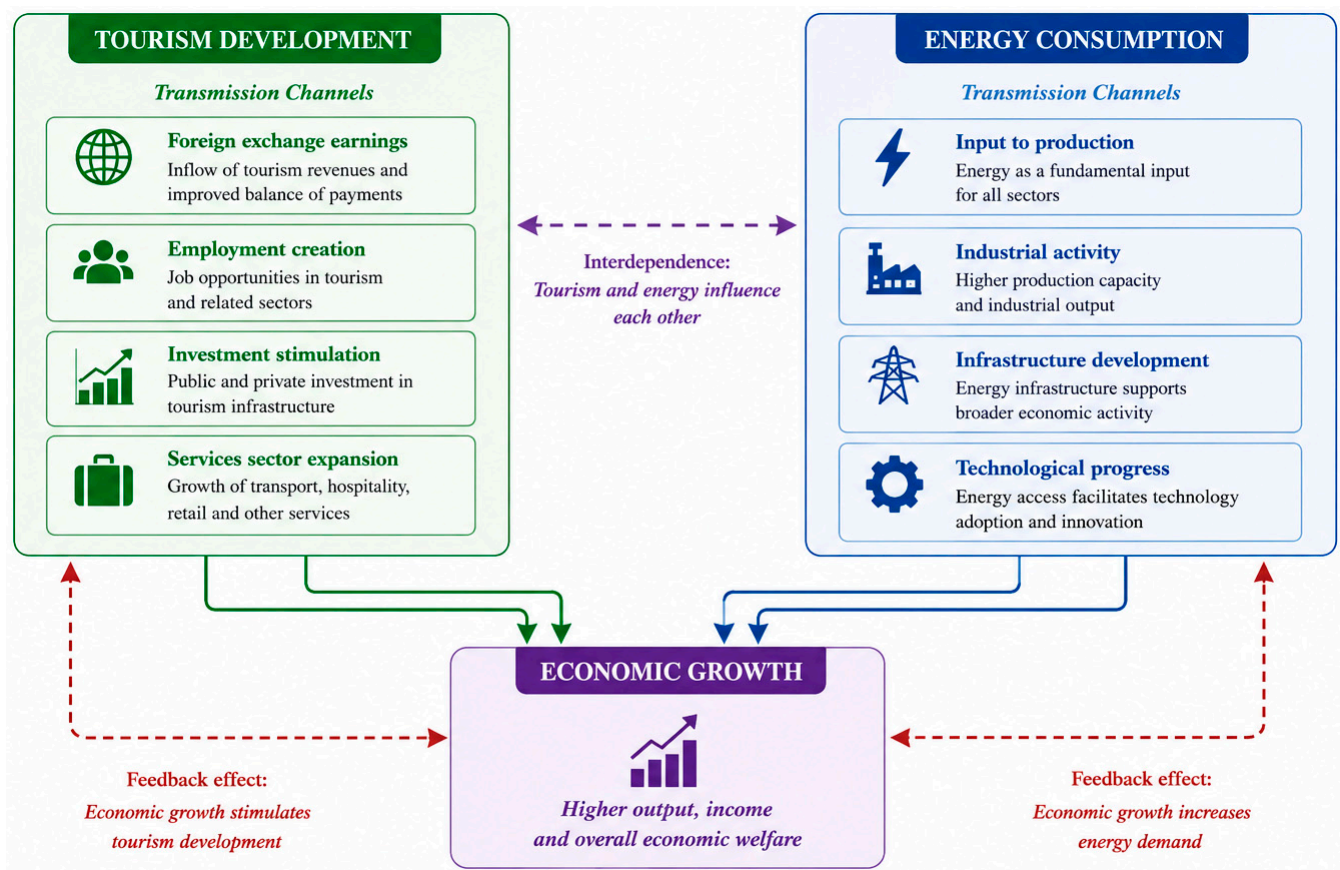


Figure 1. Conceptual Framework of the Transmission Channels between Tourism Development, Energy Consumption, and Economic Growth.

2.2. Empirical Literature

Building on the conceptual framework outlined above, the empirical literature provides extensive evidence on the relationship between tourism, energy consumption, and economic growth across different economic contexts. This relationship has become one of the most extensively debated topics in development economics, particularly in the context of economies seeking to balance growth, structural diversification, and long-term sustainability. Two dominant theoretical perspectives frame this debate. The tourism-led growth hypothesis posits that tourism functions as an export-oriented sector that generates

foreign exchange earnings, employment, and investment, thereby stimulating economic growth. In contrast, the energy-led growth hypothesis emphasizes the role of energy as a fundamental production input that supports industrialization, technological progress, and overall economic expansion. Despite extensive empirical investigation, the literature continues to report heterogeneous and often conflicting findings, suggesting that the growth effects of tourism and energy are highly context-dependent and shaped by structural and institutional conditions.

The tourism-led growth literature has expanded substantially over the past two decades. Comprehensive reviews such as [Brida et al. \(2016\)](#) and [Alcalá-Ordóñez et al. \(2024\)](#) indicate that tourism is generally associated with positive growth outcomes, although the magnitude and robustness of this relationship vary across countries and methodological approaches. Similarly, [Roy and Medhekar \(2026\)](#) highlight the increasing integration of tourism within broader sustainability and development agendas. Nevertheless, beyond this broad consensus, the empirical evidence remains far from uniform. Cross-country analyses ([Tang & Tan, 2018](#); [Mitra, 2019](#); [Odeleye et al., 2022](#)) demonstrate that the tourism–growth nexus is conditional on factors such as institutional quality, income levels, and regional characteristics, implying that tourism does not operate as a universal engine of growth.

Country-specific studies further reinforce this heterogeneity. While evidence from Pakistan ([Adnan Hye & Ali Khan, 2013](#)), Lebanon ([Tang & Abosedra, 2014](#)), Mediterranean economies ([Gao et al., 2021](#)), and European countries ([Xia et al., 2022](#)) generally supports the tourism-led growth hypothesis, other studies challenge its universality. For instance, [Bhattarai and Karmacharya \(2022\)](#) find no significant relationship between tourism and economic growth in Nepal, while [Kumar and Patel \(2024\)](#) show that structural breaks and nonlinearities can substantially alter empirical conclusions. These contrasting findings suggest that tourism’s contribution to growth depends not only on its scale but also on its structural integration, resilience to shocks, and interaction with broader economic dynamics.

Parallel to this debate, the energy–growth nexus has also produced mixed and inconclusive results. While the energy-led growth hypothesis is supported in several contexts ([Chang & Fang, 2022](#); [Zhai et al., 2024](#)), other studies emphasize nonlinear, asymmetric, or stage-dependent effects ([Nasir et al., 2025](#)). Moreover, recent research increasingly highlights that the growth implications of energy consumption depend not only on its quantity but also on its composition and sustainability characteristics. For example, [Raihan and Tuspekova \(2022\)](#) show that fossil fuel dependence exacerbates environmental pressures in Kazakhstan, whereas renewable energy use and technological innovation contribute positively to sustainability outcomes. This shift toward considering energy quality rather than quantity further complicates the interpretation of the energy–growth relationship.

An emerging strand of the literature adopts a more integrated perspective by jointly examining tourism, energy consumption, and environmental sustainability. Studies such as [Balsalobre-Lorente and Leitão \(2020\)](#), [Balsalobre-Lorente et al. \(2020\)](#), and [Bano et al. \(2021\)](#) demonstrate that interactions between tourism and energy can jointly influence economic growth, particularly when mediated by factors such as trade openness and renewable energy use. At the same time, environmentally oriented studies ([Rahman et al., 2022](#); [Pablo-Romero et al., 2023](#); [Osorio-Molina et al., 2023](#); [Rasool et al., 2023](#)) highlight the complex trade-offs between economic growth, energy consumption, and environmental sustainability. Taken together, these findings suggest that tourism and energy should not be analyzed in isolation but rather as interdependent components of broader development processes.

More recently, scholars have begun to question whether repeatedly testing the tourism-led growth hypothesis provides meaningful theoretical advancement. [Perles-Ribes and Moreno-Izquierdo \(2024\)](#) argue that the core relationship is already well established and call for a shift toward understanding tourism's role in structural transformation, economic diversification, and welfare improvement. This critique is particularly relevant for resource-dependent economies, where tourism is often promoted as a diversification strategy rather than a primary engine of growth.

In this context, evidence from Central Asia provides additional insights into the structural and policy dimensions of tourism development. Regional studies ([Azam et al., 2021](#); [Umurzakov et al., 2023](#)) indicate that tourism contributes to economic growth and sustainable development, although the strength and direction of this relationship vary across countries. At the same time, recent country-specific research on Uzbekistan ([Jeong et al., 2023](#); [Karimov, 2026](#); [Karimov et al., 2025](#)) emphasizes that tourism outcomes are strongly influenced by institutional quality, governance structures, infrastructure development, and sustainability-oriented policy frameworks. These findings highlight that tourism performance depends not only on demand-side expansion but also on structural conditions such as service quality, environmental management, and integration with local economies. Overall, this regional evidence underscores that tourism-led growth cannot be fully understood without accounting for country-specific structural characteristics.

Against this broader background, Kazakhstan represents a particularly distinct and analytically important case. The country's economy remains heavily dependent on energy resources, particularly oil and natural gas ([Azretbergenova & Syzdykova, 2020](#)), rendering it highly vulnerable to external shocks ([Syzdykova & Azretbergenova, 2024](#)). Although tourism has been increasingly promoted as a diversification strategy, its actual contribution to economic growth remains uncertain. Existing studies on Kazakhstan provide fragmented evidence. Some emphasize tourism's role in poverty reduction and regional development ([Shah & ul Haq, 2022](#); [Salauatova et al., 2024](#); [Shin et al., 2026](#)), while others highlight structural constraints such as volatility, infrastructure limitations, and weak sectoral linkages ([Toleubayeva & Mussina, 2025](#); [Serikbayeva et al., 2025](#)). Moreover, [Huseynli \(2022\)](#) reports a positive association between tourism revenues and economic growth, although based on a relatively simplified empirical framework.

Similarly, the energy–growth relationship in Kazakhstan remains inconclusive. While some studies report a positive relationship between energy consumption and economic growth ([Zhai et al., 2024](#)), others provide evidence consistent with the energy conservation hypothesis ([Wada et al., 2022](#)) or emphasize the growing role of renewable energy in industrial development ([Hasanov et al., 2025](#)). These mixed findings reflect the transitional nature of Kazakhstan's economy, which is gradually evolving toward a more diversified and service-oriented structure.

Despite this extensive body of research, several important gaps remain. First, the existing literature largely examines tourism, energy, and economic growth separately rather than within an integrated framework that captures their joint dynamics. Second, limited attention has been given to how sectoral dominance—particularly the role of energy in resource-dependent economies—shapes the effectiveness of tourism as a growth strategy. Third, empirical studies focusing on Kazakhstan rarely incorporate both tourism and energy variables simultaneously while controlling for key macroeconomic factors such as inflation and exchange rate dynamics. Finally, the broader question of whether tourism can function as a meaningful diversification mechanism in energy-dependent economies remains insufficiently explored.

Against this background, the present study contributes to the literature by jointly examining tourism revenues, energy consumption, inflation, and the real effective exchange

rate within a unified Autoregressive Distributed Lag framework for Kazakhstan over the period 1995–2024. By situating Kazakhstan within both the global tourism–growth debate and the regional context of Central Asia, the study provides new insights into how structural dependence on energy influences the role of tourism in economic growth and diversification processes.

3. Data and Methodology

3.1. Data and Model Specification

This study investigates the validity of the tourism-led growth hypothesis and the energy-led growth hypothesis in Kazakhstan using annual data covering the period 1995–2024. The sample period was determined by data availability and encompasses major economic transformations experienced by Kazakhstan following the transition to a market economy, including periods of rapid growth, external shocks, and diversification efforts. Economic growth is represented by gross domestic product (GDP), which serves as the dependent variable. Tourism activity is proxied by tourism revenues, while energy use is measured by per capita energy consumption (kg of oil equivalent). This measure reflects the extent to which energy is utilized within the domestic economy and serves as a key input in the production process. Unlike energy production, which primarily captures the supply-side capacity of the energy sector and may be largely export-oriented in resource-rich economies, energy consumption is more directly linked to domestic economic activity, including industrial output and infrastructure utilization. Therefore, per capita energy consumption is considered a more appropriate indicator for examining the relationship between energy utilization and economic growth. In addition, inflation and the real effective exchange rate are included as control variables to account for macroeconomic conditions that may influence economic growth. Inflation is measured using the annual consumer price index growth rate, whereas the real effective exchange rate is expressed as an index (2016 = 100).

All variables are transformed into their natural logarithmic forms. The logarithmic transformation provides several advantages, including reducing potential heteroscedasticity, mitigating scale differences among variables, and allowing estimated coefficients to be interpreted as elasticities. Data were obtained from the official database of the Kazakhstan Bureau of National Statistics and the World Bank's World Development Indicators database.

To examine the effects of tourism revenues and energy consumption on economic growth, the following baseline model is specified:

$$\ln gdp_t = \beta_0 + \beta_1 \ln tourism_t + \beta_2 \ln energy_t + \beta_3 \ln reer_t + \beta_4 \ln inf_t + \varepsilon_t \quad (1)$$

where *gdp* denotes economic growth, *tourism* represents tourism revenues, *energy* indicates per capita energy consumption, *reer* denotes the real effective exchange rate, *inf* represents inflation, and ε_t is the error term.

The inclusion of tourism and energy variables enables a simultaneous evaluation of the tourism-led growth and energy-led growth hypotheses. Moreover, inflation and exchange rate dynamics are incorporated to control for macroeconomic conditions that may affect economic activity in a resource-dependent economy such as Kazakhstan.

3.2. Unit Root and Structural Break Analysis

Prior to investigating the long-run relationship among the variables, their stationarity properties must be examined in order to avoid spurious regression results. Accordingly, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests are employed.

The unit root test results indicate that inflation is stationary at level, whereas economic growth, tourism revenues, energy consumption, and the real effective exchange rate become stationary after first differencing. Thus, the variables exhibit a mixed order of integration, consisting of both I(0) and I(1) processes. Since none of the variables is integrated of order two, the ARDL bounds testing framework can be appropriately applied.

In addition to stationarity analysis, potential structural changes are examined using the Bai and Perron (2003a) multiple structural break test. Accounting for structural breaks is particularly important in Kazakhstan, where economic performance has been influenced by major external shocks, including the global financial crisis, fluctuations in international oil prices, and exchange rate adjustments. Ignoring such structural changes may lead to biased coefficient estimates and misleading inferences regarding long-run relationships.

The Bai–Perron procedure identifies two statistically significant structural breaks occurring in 2009 and 2015. To capture the effects of these events, two dummy variables (dummy2009 and dummy2015) are incorporated into the ARDL framework. The inclusion of these variables allows the model to account for shifts in the economic environment and improves the reliability of the estimated long-run and short-run coefficients.

3.3. ARDL Bounds Testing Approach

To investigate the existence of a long-run relationship among the variables, the study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al. (2001). The ARDL methodology offers several advantages over conventional cointegration techniques. First, it can be applied when variables are integrated of different orders, provided that none is integrated of order two. Second, it performs well in relatively small samples, making it particularly suitable for studies based on annual macroeconomic data. Third, the ARDL framework simultaneously estimates both short-run and long-run dynamics within a single reduced-form equation, thereby providing comprehensive information regarding the adjustment process among variables. Finally, the ARDL approach helps mitigate potential endogeneity concerns by incorporating lagged values of both dependent and explanatory variables, thereby reducing simultaneity bias and capturing the dynamic adjustment process among the variables. Although a potential bidirectional relationship may exist between tourism development and economic growth, the ARDL framework provides a suitable empirical strategy for examining their long-run relationship in the presence of such concerns. While this approach does not fully eliminate endogeneity, it is widely employed in the literature, particularly in cases where suitable instrumental variables are not available.

The unrestricted error correction representation of the ARDL model can be expressed as follows:

$$\begin{aligned} \Delta \ln gdp_t = & \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta \ln gdp_{t-i} + \sum_{i=0}^m \beta_{2i} \Delta \ln inf_{t-i} + \sum_{i=0}^m \beta_{3i} \Delta \ln energy_{t-i} + \sum_{i=0}^m \beta_{4i} \Delta \ln reer_{t-i} + \sum_{i=0}^m \beta_{5i} \Delta tourism_{t-i} \\ & + \lambda_1 \ln gdp_{t-1} + \lambda_2 \ln inf_{t-1} + \lambda_3 \ln energy_{t-1} + \lambda_4 \ln reer_{t-1} + \lambda_5 tourism_{t-1} + \lambda_6 dummy_{2009} \\ & + \lambda_7 dummy_{2015} + \varepsilon_t \end{aligned}$$

where Δ denotes the first-difference operator, β represents short-run coefficients, and λ captures long-run relationships among the variables.

The existence of cointegration is tested through an F-statistic based on the following hypotheses:

Null Hypothesis (No Cointegration)

$$H_0 = \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$$

Alternative Hypothesis (Cointegration Exists)

$$H_0 \neq \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$$

If the calculated F-statistic exceeds the upper critical bound, the null hypothesis is rejected and a long-run equilibrium relationship among the variables is confirmed.

Following the identification of cointegration, long-run coefficients are estimated and short-run dynamics are examined through the Error Correction Model (ECM), which can be represented as:

$$\Delta \ln gdp_t = a_0 + \sum_{i=1}^m \alpha_i \Delta X_{t-i} + \phi ECT_{t-1} + u_t$$

where ECT_{t-1} denotes the lagged error correction term, ϕ represents the speed of adjustment coefficient, and u_t is the disturbance term. A negative and statistically significant error correction coefficient indicates convergence toward long-run equilibrium following short-run deviations.

Finally, the adequacy and reliability of the estimated ARDL model are evaluated through a series of post-estimation diagnostic tests, including the Breusch–Pagan–Godfrey heteroskedasticity test, the Breusch–Godfrey serial correlation test, the Jarque–Bera normality test, and the Ramsey RESET specification test. Furthermore, parameter stability is assessed using the CUSUM and CUSUMSQ tests.

4. Results

4.1. Preliminary Analysis

Table 1 reports the descriptive statistics of the variables used in the analysis. The results reveal several characteristics of Kazakhstan's economy during the study period. First, inflation exhibits considerably greater variability than the other variables, reflecting the macroeconomic adjustments, exchange rate realignments, and external shocks experienced during the country's transition and development process. In contrast, the real effective exchange rate displays relatively limited fluctuations, suggesting a comparatively stable pattern of external competitiveness over the sample period. The statistics further indicate that energy consumption follows a relatively stable trajectory. This finding is consistent with Kazakhstan's position as an energy-rich economy, where energy constitutes a fundamental input for production and economic activity. By comparison, tourism revenues exhibit greater variability, reflecting the sector's sensitivity to changing economic conditions, infrastructure development, and fluctuations in international tourism demand. Overall, the descriptive statistics suggest that while Kazakhstan's energy sector has maintained a relatively stable structure, the tourism sector has experienced more pronounced fluctuations, supporting the relevance of examining their respective contributions to economic growth.

Table 2 presents the correlation matrix among the variables. Economic growth is positively correlated with both energy consumption and tourism revenues, suggesting that increases in energy use and tourism activity are generally associated with higher economic performance in Kazakhstan. Tourism revenues and energy consumption also exhibit a positive relationship, indicating that tourism development is accompanied by greater energy demand. In contrast, inflation is negatively associated with economic growth, tourism revenues, and energy consumption, implying that macroeconomic instability may adversely affect economic activity. Furthermore, the correlation coefficients do not indicate the presence of severe multicollinearity among the explanatory variables.

Table 1. Descriptive Statistics.

	LNGDP	LNCPI	LNREER	LNENERGY	LNTOURISM
Mean	11.35489	2.284456	4.724003	8.110779	6.859989
Median	11.81559	2.055063	4.713115	8.147586	6.879407
Maximum	12.58273	5.171366	5.051585	8.443715	7.980024
Minimum	9.733341	1.647828	4.535820	7.704171	5.043425
Std. Dev.	1.000107	0.701355	0.132565	0.211869	0.771375
Skewness	−0.493685	2.644461	0.585900	−0.437637	−0.355541
Kurtosis	1.571365	10.91653	2.562616	2.126727	2.343122
Jarque–Bera	3.769870	113.3052	1.955525	1.910890	1.171410
Probability	0.151839	0.000000	0.376152	0.384641	0.556713
Sum	340.6466	68.53367	141.7201	243.3234	205.7997
Sum Sq. Dev.	29.00621	14.26508	0.509633	1.301769	17.25557

Table 2. Correlation matrix.

	LNGDP	LNCPI	LNREER	LNENERGY	LNTOURISM
LNGDP	1	−0.3592	0.0333	0.8498	0.8057
LNCPI	−0.3592	1	−0.0166	−0.1655	−0.6052
LNREER	0.03335	−0.0166	1	0.2621	0.0799
LNENERGY	0.8498	−0.1655	0.2621	1	0.6915
LNTOURISM	0.8057	−0.6052	0.0799	0.6915	1

4.2. Unit Root Analysis

In studies based on time series data, such as this one, the series must exhibit a stationary structure. Otherwise, estimations conducted with non-stationary, i.e., unit root-containing, series may be unreliable, producing spurious or misleading results (Gujarati, 2004, p. 792). A time series is considered stationary if its mean and variance do not change over time, and the covariance between two periods depends not on the specific time at which it is computed but only on the lag between the two periods. Therefore, before proceeding with the analyses, it is necessary to examine whether the series are stationary. The stationarity properties of the series were investigated using the Augmented Dickey–Fuller (ADF) unit root test and the Phillips–Perron (PP) unit root test. The maximum lag length was set to 8, and the optimal lag length was automatically determined based on the Schwarz Information Criterion (SIC) values. The unit root test results are presented in Table 3.

Table 3. ADF and PP Unit Root Test Results.

Variables	ADF (Level)	ADF (1st Difference)	PP (Level)	PP (1st Difference)	Result
lngdp	−0.988199 (0.7434)	−3.412591 (0.0190)	−0.837035 0.7933	−3.412591 0.0190	I(1)
lncpi	−6.491914 (0.0000)	-	−10.25461 0.0000		I(0)
lnreer	−2.858689 (0.0627)	−6.510534 (0.0000)	−2.909507 0.0565	−6.640784 0.0000	I(1)
lnenergy	−1.143178 (0.6846)	−4.711418 (0.0008)	−1.298028 0.6167	−4.698956 0.0008	I(1)
lntourism	−2.285236 (0.1831)	−5.154702 (0.0018)	−2.267254 0.1887	−3.926136 0.0057	I(1)

ADF and PP unit root test results indicate that LNGDP, LNREER, LNENERGY, and LNTOURISM are non-stationary at levels but become stationary after first differencing, implying that these variables are integrated of order one, $I(1)$. In contrast, LNCPI is stationary at level according to both tests and is therefore classified as an $I(0)$ variable. Overall, the ADF and PP test results provide consistent evidence regarding the order of integration of the variables. Since the model contains a combination of $I(0)$ and $I(1)$ variables and none of the series is integrated of order two, $I(2)$, the ARDL Bounds testing approach is appropriate for examining the long-run relationship among the variables.

4.3. Structural Break Analysis

While the unit root tests provide information regarding the stationarity properties of the variables, the relationships among economic growth, tourism revenues, energy consumption, inflation, and the real effective exchange rate may be influenced by major economic events, policy changes, and external shocks. Given Kazakhstan's dependence on energy exports and its exposure to fluctuations in global commodity markets, structural changes may alter the underlying relationships among the variables and lead to biased estimates if ignored. Therefore, the Bai–Perron multiple structural break test was employed to identify potential regime shifts before proceeding with the ARDL estimation. The results presented in Table 4 indicate the presence of two statistically significant structural breaks. The sequential F-statistics reject the null hypotheses of no break and one break at the 5% significance level, whereas the null hypothesis of two versus three breaks cannot be rejected. Accordingly, the Bai–Perron procedure identifies two structural break dates, namely 2009 and 2015. These break dates coincide with important developments in Kazakhstan's economy. The first break in 2009 is likely associated with the effects of the global financial crisis, which reduced external demand, weakened economic activity, and adversely affected commodity-exporting economies. The second break in 2015 corresponds to a period marked by a sharp decline in global oil prices and Kazakhstan's transition to a more flexible exchange rate regime, both of which generated significant macroeconomic adjustments and affected economic performance. To account for the potential effects of these structural changes, two dummy variables representing the break years of 2009 and 2015 were incorporated into the ARDL model. Controlling for these breaks improves the reliability of the estimated coefficients and ensures that the long-run and short-run relationships are not distorted by major structural shifts experienced during the sample period.

Table 4. Multiple breakpoint tests (Bai–Perron tests).

Sequential F-statistic determined breaks:			2
Break Test	F-statistic	Scaled F-statistic	Critical Value **
0 vs. 1 *	61.50356	307.5178	17.66
1 vs. 2 *	119.8497	599.2484	19.50
2 vs. 3	1.153089	5.765443	20.63
* Significant at the 0.05 level.			
** Bai and Perron (2003b) critical values.			
Break dates:			
	Sequential	Repartition	
1	2015	2009	
2	2009	2016	

4.4. ARDL Results

Following the identification of structural breaks and the inclusion of the corresponding dummy variables, the optimal lag structure of the ARDL model was determined prior to the cointegration analysis. Selecting an appropriate lag length is crucial for obtaining reliable estimates, as insufficient lags may lead to model misspecification, whereas excessive lags may reduce estimation efficiency, particularly in small samples. Therefore, the Akaike Information Criterion (AIC) was employed to identify the optimal model specification. Figure 2 presents the top twenty ARDL specifications ranked according to their AIC values. The results indicate that the ARDL(1, 2, 1, 2, 1, 2, 1) specification yields the lowest AIC value among all candidate models. Since the AIC selects the model that minimizes information loss while maintaining parsimony, the ARDL(1, 2, 1, 2, 1, 2, 1) model was chosen as the optimal specification. Accordingly, all subsequent Bounds testing, long-run coefficient estimation, and short-run error correction analyses are conducted based on this selected ARDL structure.

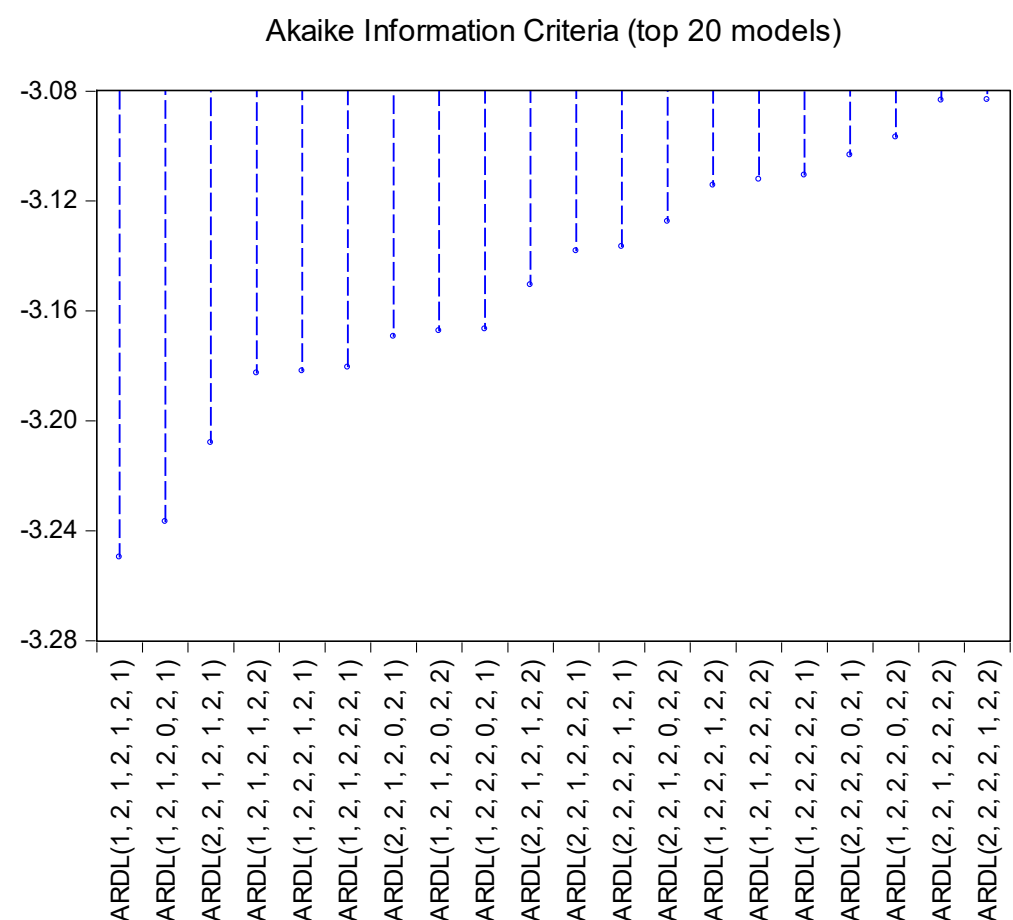


Figure 2. Selection of the ARDL Model.

After determining the optimal lag structure, the next step is to examine whether a long-run equilibrium relationship exists among economic growth, tourism revenues, energy consumption, inflation, and the real effective exchange rate. To this end, the ARDL Bounds testing procedure proposed by Pesaran et al. (2001) was employed. The results of the Bounds test are reported in Table 5. The calculated F-statistic is 9.804, which exceeds the upper critical bound value at all conventional significance levels. In particular, the estimated F-statistic is substantially higher than the 1% upper bound critical value of 4.43. Therefore, the null hypothesis of no cointegration is rejected, indicating the existence of a stable long-run relationship among the variables. This finding suggests that economic growth,

tourism revenues, energy consumption, inflation, and the real effective exchange rate move together over time despite short-run fluctuations. In the context of Kazakhstan, the result implies that the tourism sector, energy consumption, and key macroeconomic factors maintain a long-run equilibrium relationship with economic growth. Having established the presence of cointegration, the analysis proceeds to the estimation of long-run coefficients and short-run dynamics within the ARDL framework.

Table 5. ARDL Bounds Test Results.

Test Statistic	Value	k
F-statistic	9.804059	6
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Having established the existence of cointegration among the variables, the long-run coefficients were estimated using the selected ARDL specification. The results are reported in Table 6. The findings indicate that energy consumption exerts a positive and statistically significant effect on economic growth in Kazakhstan. Specifically, a 1% increase in per capita energy consumption leads to an approximately 4.88% increase in economic growth in the long run. This finding is consistent with the energy-led growth hypothesis and underscores the important role of energy in shaping economic activity within the examined framework. Given Kazakhstan's abundant energy resources and the substantial contribution of the energy sector to production, industrial activity, and export revenues, the positive impact of energy consumption on economic growth is consistent with the structural characteristics of the economy. In contrast, tourism revenues do not exhibit a statistically significant effect on economic growth. Although the estimated coefficient is positive, its lack of statistical significance suggests that tourism has not yet become a major driver of long-run economic growth in Kazakhstan during the study period. This finding implies that, despite ongoing efforts to diversify the economy and promote tourism development, the sector's contribution remains relatively limited compared to the dominant role of the energy sector. Therefore, the empirical results do not indicate a statistically significant association between tourism revenues and economic growth in the long run, and are not consistent with the tourism-led growth hypothesis.

Table 6. Long Run Coefficients.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCPI	0.877849	0.522451	1.680250	0.1211
LNENERGY	4.878205	1.784543	2.733587	0.0195
LNREER	−7.426184	3.897809	−1.905220	0.0832
LNTOURISM	0.014104	0.309483	0.045573	0.9645
D2009	0.596028	0.434970	1.370274	0.1979
D2016	−1.567104	1.023486	−1.531144	0.1540
C	5.983466	12.096277	0.494654	0.6306

Regarding the control variables, the real effective exchange rate is found to have a negative effect on economic growth at the 10% significance level. This result suggests that an appreciation of the domestic currency may adversely affect economic performance by weakening international competitiveness. For an economy characterized by a strong dependence on commodity exports, exchange rate movements can significantly influence production and external demand conditions. Inflation, on the other hand, exhibits a positive but statistically insignificant coefficient, indicating that long-run economic growth is not systematically associated with inflation dynamics during the sample period. The coefficients of the structural break dummy variables are statistically insignificant, implying that the identified break periods do not exert an independent long-run effect on economic growth once the effects of energy consumption, tourism revenues, inflation, and the real effective exchange rate are taken into account. Overall, the long-run estimates reveal that energy consumption remains a fundamental determinant of economic growth in Kazakhstan, whereas tourism revenues do not generate a statistically significant growth effect. These findings suggest that the Kazakh economy continues to be characterized by a strong dependence on energy-related activities, while the tourism sector has yet to develop sufficient scale and economic linkages to contribute significantly to long-run growth.

In addition to the statistical significance of the estimated coefficients, it is also informative to compare their magnitudes with those reported in the existing literature. The estimated long-run elasticity of energy consumption obtained in this study is relatively large, suggesting a strong dependence of economic growth on energy inputs in Kazakhstan. This finding is consistent with studies that emphasize the dominant role of energy in resource-dependent economies (e.g., [Zhai et al., 2024](#)), although the magnitude reported here appears higher, possibly reflecting the structural characteristics and energy-intensive nature of the economy.

By contrast, the estimated coefficient for tourism revenues is statistically insignificant, which contrasts with studies reporting positive tourism elasticities in other contexts (e.g., [Brida et al., 2016](#); [Gao et al., 2021](#)). This discrepancy suggests that, unlike in more tourism-oriented economies, the contribution of tourism to economic growth in Kazakhstan remains limited in magnitude. Overall, these comparisons indicate that both the size and significance of the estimated effects are closely linked to country-specific structural conditions.

Following the estimation of the long-run coefficients, the short-run dynamics were examined through the error correction representation of the ARDL model. The results are reported in Table 7. The findings indicate that energy consumption has a positive and statistically significant effect on economic growth in the short run. This result is consistent with the long-run estimates and suggests that increases in energy use contribute to economic activity in Kazakhstan. Given the strategic importance of the energy sector in the country's production structure and export earnings, this finding is consistent with the energy-led growth hypothesis within the context of Kazakhstan. In interpreting these results, it is important to note that, given the logarithmic specification of the model, the estimated long-run coefficients should be interpreted as elasticities rather than marginal effects. In this context, the coefficients reflect the percentage change in economic growth associated with a one percent change in the explanatory variables. Therefore, their magnitude captures the strength of the long-run relationship rather than short-run proportional responses. Accordingly, the relatively large coefficients obtained for energy consumption and the real effective exchange rate should be interpreted in light of Kazakhstan's structural characteristics as a resource-dependent and energy-intensive economy. Within the ARDL framework, long-run coefficients are derived from the underlying cointegration relationship and thus reflect persistent equilibrium co-movements among the variables. In such settings, strong and sustained linkages between energy use, external competitiveness, and economic

activity may result in relatively high elasticity estimates. These coefficients should therefore be viewed as indicators of structural dependence and long-run interactions rather than implausibly large marginal effects.

Table 7. Short-Run Estimation Results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCPI)	0.059415	0.049366	1.203560	0.2540
D(LNCPI(-1))	0.109272	0.021659	5.045119	0.0004
D(LNENERGY)	0.883761	0.130867	6.753128	0.0000
D(LNREER)	−0.061352	0.120445	−0.509377	0.6206
D(LNREER(-1))	0.263769	0.140445	1.878103	0.0871
D(LNTOURISM)	0.035297	0.032537	1.084847	0.3012
D(D2009)	−0.176677	0.088645	−1.993088	0.0716
D(D2009(-1))	0.137458	0.058005	2.369744	0.0372
D(D2016)	−0.504386	0.091400	−5.518439	0.0002
CointEq(-1)	−0.115011	0.055032	−2.089899	0.0407

By contrast, tourism revenues are not found to be significantly associated with economic growth in the short run. Consistent with the long-run results, the estimated coefficient remains statistically insignificant, suggesting that the findings are not consistent with the tourism-led growth hypothesis in the context of Kazakhstan. Although tourism has gained increasing policy attention as a tool for economic diversification, its contribution to economic growth appears to remain limited over the sample period. With respect to the control variables, the contemporaneous inflation coefficient is statistically insignificant, whereas its lagged value is positive and significant. This finding suggests that the effects of inflation on economic activity may emerge with a delay rather than instantaneously. The contemporaneous effect of the real effective exchange rate is insignificant, while its lagged coefficient is positive and weakly significant at the 10% level, implying that exchange rate movements may influence economic performance through delayed adjustment mechanisms. The coefficients associated with the structural break dummies reveal that the identified break periods generated notable short-run effects. The coefficient of the 2009 dummy is negative and weakly significant at the 10% level, reflecting the adverse economic conditions associated with the global financial crisis. However, the positive and significant lagged coefficient suggests that part of this negative impact was reversed in the subsequent period. Similarly, the negative and highly significant coefficient of the 2016 dummy is consistent with the macroeconomic adjustments experienced during the period of declining global oil prices and exchange rate reforms. The error correction term, ECT(-1), is negative and statistically significant at the 10% level, providing evidence of convergence toward the long-run equilibrium. The estimated coefficient of −0.115 indicates that approximately 11.5% of short-run disequilibrium is corrected within one year. Although the speed of adjustment is relatively moderate, the negative sign of the error correction term confirms the stability of the long-run relationship identified by the Bounds test. Overall, the short-run findings are broadly consistent with the long-run estimates. Energy consumption exerts a positive and statistically significant effect on economic growth, whereas tourism revenues do not exhibit a significant impact. Therefore, the results are consistent with the energy-led growth hypothesis but not with the tourism-led growth hypothesis in the context of Kazakhstan. Taken together, the findings suggest that energy-related activities

remain closely associated with Kazakhstan’s growth dynamics, while the contribution of tourism to economic growth appears to be limited during the study period.

To ensure the reliability of the estimated ARDL model, several post-estimation diagnostic tests were conducted. The results are reported in Table 8. The Ramsey RESET test fails to reject the null hypothesis of correct model specification, indicating that the estimated model does not suffer from functional form misspecification or omitted variable bias. In addition, the Breusch–Pagan–Godfrey test confirms the absence of heteroskedasticity, suggesting that the variance of the residuals remains constant throughout the sample period. The Breusch–Godfrey Serial Correlation LM test also indicates that the residuals are free from autocorrelation, implying that the model adequately captures the dynamic structure of the data. The normality test further reveals that the residuals are approximately normally distributed. The Jarque–Bera statistic is statistically insignificant, indicating that the null hypothesis of normality cannot be rejected. Moreover, the skewness and kurtosis values are close to those expected under a normal distribution, providing additional support for the adequacy of the model residuals. Overall, the diagnostic test results confirm that the estimated ARDL model is correctly specified and satisfies the key econometric assumptions regarding functional form, homoskedasticity, serial independence, and residual normality. Therefore, the estimated long-run and short-run coefficients can be considered statistically reliable and suitable for economic interpretation and policy evaluation.

Table 8. Diagnostic and Stability Tests.

Ramsey RESET Test			
F-statistic: 0.025752		<i>p</i> -value: 0.8757	
Heteroskedasticity Test: Breusch–Pagan–Godfrey			
F-statistic: 0.720473		<i>p</i> -value: 0.7324	
Serial Correlation LM			
F-statistic: 2.082907		<i>p</i> -value: 0.1805	
Normality			
Skewness: 0.135573	Kurtosis: 2.785846	Jarque–Bera: 0.139279	<i>p</i> -value: 0.932730

In addition to the diagnostic tests, the stability of the estimated ARDL model was examined using the CUSUM and CUSUMSQ tests (Figure 3). These tests evaluate whether the estimated coefficients remain stable over the sample period and provide additional evidence regarding the robustness of the estimated relationships. The results indicate that both test statistics remain within the 5% critical bounds throughout the sample period. Since neither the CUSUM nor the CUSUMSQ statistic crosses the corresponding critical boundaries, the null hypothesis of parameter stability cannot be rejected. The CUSUM results suggest that the estimated coefficients do not exhibit systematic structural instability over time. Similarly, the CUSUMSQ test confirms the absence of sudden parameter shifts arising from changes in the variance of the residuals. Although some fluctuations are observed toward the end of the sample period, particularly in the CUSUMSQ statistic, these movements remain within the critical bounds and therefore do not indicate model instability. Overall, the findings from the CUSUM and CUSUMSQ tests provide evidence that the estimated ARDL model is structurally stable over the sample period. Combined with the favorable diagnostic test results, these findings support the robustness of the estimated long-run and short-run coefficients and increase confidence in the validity of the empirical conclusions. Therefore, the evidence regarding the positive role of energy consumption in

economic growth and the absence of a statistically significant growth effect from tourism revenues can be considered stable and reliable within the estimated framework.

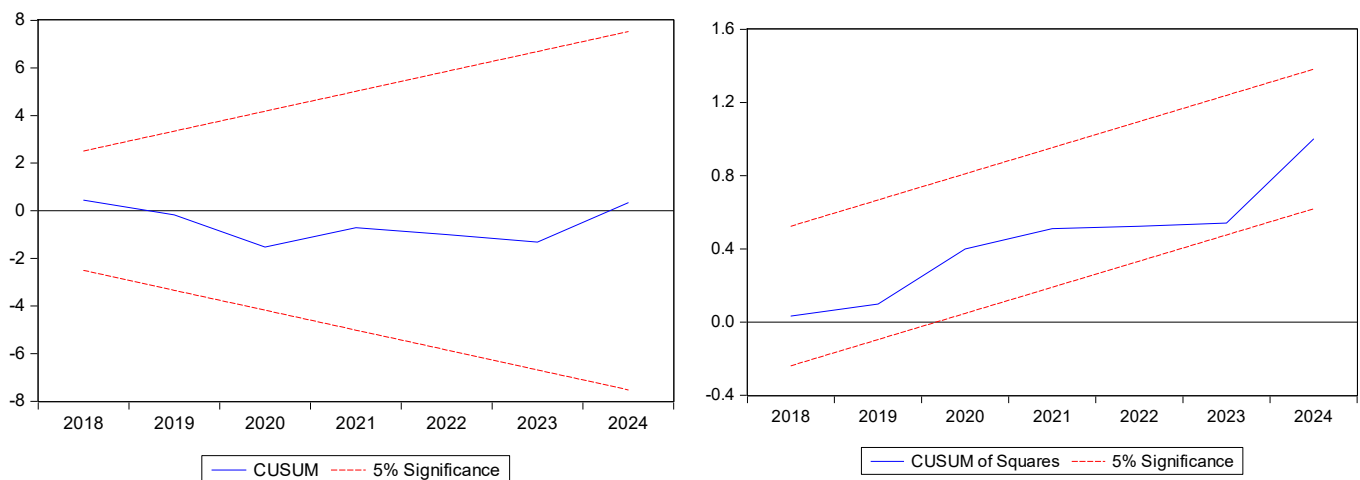


Figure 3. CUSUM and CUSUMSQ Graphs.

5. Discussion

The empirical findings provide important insights into the relative roles of tourism and energy consumption in Kazakhstan's economic growth process. The most notable result is that energy consumption exerts a positive and statistically significant impact on economic growth in both the short and long run, whereas tourism revenues do not exhibit a statistically significant growth effect. These findings suggest that Kazakhstan's growth dynamics remain more closely associated with energy-related activities than with tourism-driven expansion.

The positive relationship between energy consumption and economic growth is consistent with a substantial strand of the energy–growth literature that identifies energy as a fundamental input in the production process. In particular, the findings support the arguments of [Chang and Fang \(2022\)](#) and [Zhai et al. \(2024\)](#), who report positive associations between energy use and economic performance. The results also align with the structural characteristics of the Kazakh economy. As emphasized by [Azretbergenova and Syzdykova \(2020\)](#), Kazakhstan remains heavily dependent on natural resource exports, particularly oil and natural gas. Under such conditions, increases in energy consumption are likely to reflect higher levels of industrial activity, production capacity utilization, transportation demand, and export-oriented economic activity. Consequently, the significance of energy consumption in both the short and long run appears consistent with the country's resource-based growth model.

At the same time, the findings differ from those of [Wada et al. \(2022\)](#), who report evidence supporting the energy conservation hypothesis rather than the energy-led growth hypothesis in Kazakhstan. One possible explanation for this divergence relates to differences in sample periods, model specifications, and variable selection. The present study covers the period 1995–2024 and explicitly incorporates tourism revenues, inflation, exchange rate dynamics, and structural breaks within a unified framework. The results therefore suggest that when broader macroeconomic factors and structural shifts are taken into account, energy consumption continues to play an important role in explaining Kazakhstan's economic performance.

In contrast, the analysis does not provide empirical support for the tourism-led growth hypothesis. This finding differs from numerous international studies reporting a positive contribution of tourism to economic growth, including those of [Tang and Tan \(2018\)](#), [Mitra \(2019\)](#), [Odeleye et al. \(2022\)](#), [Tang and Abosedra \(2014\)](#), [Gao et al. \(2021\)](#), and [Xia et al. \(2022\)](#). While these studies generally conclude that tourism serves as an important source of economic expansion through foreign exchange earnings, investment generation, and employment creation, the results obtained for Kazakhstan suggest a more limited macroeconomic role for tourism.

However, the findings are not entirely inconsistent with the broader tourism literature. [Bhattarai and Karmacharya \(2022\)](#), for example, also fail to identify a significant tourism–growth relationship in Nepal. Similarly, [Kumar and Patel \(2024\)](#) argue that the tourism–growth nexus may be highly sensitive to structural conditions and economic disruptions. These studies suggest that tourism does not automatically generate growth effects in every economy and that country-specific characteristics play a decisive role in determining the economic contribution of the sector.

Several factors may explain why tourism revenues do not exert a statistically significant impact on growth in Kazakhstan. First, despite substantial tourism potential, the sector remains relatively small compared with the dominant energy industry. As a result, fluctuations in tourism revenues may be insufficient to generate detectable effects on aggregate economic performance. Second, the benefits generated by tourism often depend on strong linkages with transportation, hospitality, retail trade, and local supply chains. Although tourism development has accelerated in recent years, evidence provided by [Serikbayeva et al. \(2025\)](#) highlights continuing challenges related to infrastructure quality and transportation accessibility. These constraints may limit the extent to which tourism activity generates economy-wide multiplier effects.

The findings also contribute to the emerging debate regarding economic diversification in resource-dependent economies. Several recent studies emphasize tourism’s potential role in supporting diversification in Kazakhstan. [Shah and ul Haq \(2022\)](#) identify long-run links between tourism development and poverty reduction, while [Salauatova et al. \(2024\)](#) and [Salauatova et al. \(2025\)](#) argue that tourism can stimulate regional development and reduce dependence on extractive industries. The results of the present study do not necessarily contradict these findings. Rather, they suggest that positive tourism outcomes observed at regional, social, or sectoral levels may not yet be sufficiently large to produce statistically significant effects on aggregate national economic growth. In other words, tourism may contribute to regional development, employment creation, and welfare improvements without necessarily emerging as a major macroeconomic growth driver.

Another important implication concerns the structural characteristics of Kazakhstan’s development model. [Perles-Ribes and Moreno-Izquierdo \(2024\)](#) argue that the tourism literature should move beyond simply testing whether tourism increases economic growth and instead focus on broader issues of structural transformation and development. The results obtained in this study support this perspective. Although tourism does not appear to be a significant determinant of aggregate economic growth, this does not imply that the sector lacks economic relevance. Rather, it may indicate that the primary contribution of tourism in Kazakhstan currently lies in supporting diversification, regional development, and socioeconomic resilience rather than directly driving national output growth.

Finally, the identification of structural breaks in 2009 and 2015 reinforces the importance of accounting for external shocks when examining growth dynamics in resource-dependent economies. Both break dates correspond to periods of significant economic adjustment associated with the global financial crisis, declining oil prices, and exchange rate reforms. These findings are consistent with the observations of [Syzdykova and Azret-](#)

bergenova (2024), who emphasize the sensitivity of Kazakhstan's economy to external commodity market developments. The significance of these structural shifts further highlights the challenges faced by economies seeking to reduce dependence on natural resources while simultaneously developing alternative growth sectors such as tourism.

Overall, the findings indicate that Kazakhstan's economic growth remains closely linked to energy-related activities, providing empirical support for the energy-led growth hypothesis. In contrast, the study does not find sufficient evidence to support the tourism-led growth hypothesis. While tourism continues to possess considerable potential as a diversification instrument, its contribution to aggregate economic growth appears to remain limited relative to the dominant influence of the energy sector. These results suggest that the transition from a resource-dependent growth model toward a more diversified economic structure is still ongoing and that the economic effects of tourism may be more visible at regional and developmental levels than at the aggregate macroeconomic level.

6. Conclusions

This study examined the validity of the tourism-led growth and energy-led growth hypotheses in Kazakhstan over the period 1995–2024 using the ARDL bounds testing approach. In addition to tourism revenues and energy consumption, inflation and the real effective exchange rate were incorporated as control variables. Structural breaks were identified using the Bai–Perron procedure and included in the model to account for major economic disruptions during the sample period.

The empirical findings provide evidence of a long-run equilibrium relationship among economic growth, tourism revenues, energy consumption, inflation, and the real effective exchange rate. Both the long-run and short-run estimates consistently indicate a positive and statistically significant association between energy consumption and economic growth, with the findings being consistent with the energy-led growth hypothesis in the context of Kazakhstan. In contrast, tourism revenues do not exhibit a statistically significant impact on economic growth in either the short or long run, suggesting limited empirical support for the tourism-led growth hypothesis during the period under consideration.

These results contribute to the literature on resource-dependent economies by demonstrating that Kazakhstan's growth dynamics remain closely linked to energy-related activities, despite ongoing efforts toward economic diversification. While tourism has been increasingly promoted as a strategic sector, its contribution to aggregate economic growth remains limited relative to the dominant role of the energy sector. This finding does not imply that tourism lacks economic relevance; rather, its effects may operate through channels not fully captured by aggregate growth indicators, such as regional development, employment generation, income diversification, and improvements in living standards.

The policy implications derived from the findings should be interpreted with caution. The results reflect long-run associations within the specified empirical framework rather than definitive causal relationships. Therefore, the policy recommendations should be viewed as indicative and conditional upon the structural characteristics of the economy and the limitations of the model. From a policy perspective, the results highlight the importance of ensuring a reliable, efficient, and sustainable energy supply. Given the positive contribution of energy consumption to economic growth, policies aimed at strengthening energy infrastructure, improving energy efficiency, and expanding investment in energy technologies may contribute to long-term economic performance. At the same time, persistent reliance on energy-related activities may expose Kazakhstan to external vulnerabilities associated with fluctuations in global commodity markets, underscoring the importance of sustained diversification efforts.

The absence of a statistically significant relationship between tourism revenues and economic growth suggests that the tourism sector has not yet reached a scale or level of integration sufficient to function as a key driver of economic performance. This outcome may reflect structural constraints, including limited diversification within the tourism industry, inadequate infrastructure, and weak intersectoral linkages. These findings should be interpreted within the scope of the proxy used for tourism activity.

Accordingly, enhancing the contribution of tourism to economic growth requires a more comprehensive and strategically coordinated policy approach. Improving transportation connectivity, upgrading tourism infrastructure, enhancing service quality, and strengthening institutional and regulatory frameworks are essential steps toward increasing the sector's competitiveness. In addition, promoting higher value-added tourism activities and fostering stronger linkages between tourism and related sectors—such as transportation, manufacturing, and local services—may help generate broader economic spillovers.

Furthermore, increasing international competitiveness, encouraging investment in tourism-related industries, and integrating tourism more effectively with regional and cultural economies may enhance its long-term contribution to national development. In this context, the effectiveness of tourism as a diversification strategy depends not only on its expansion but also on its structural transformation and deeper integration within the broader economy.

The study also carries broader implications for Kazakhstan's development strategy. The findings suggest that the transition from a resource-dependent growth model toward a more diversified economic structure remains incomplete. While the energy sector continues to function as a primary engine of growth, long-term economic resilience will depend on the successful development of alternative sectors capable of reducing vulnerability to external shocks. In this regard, tourism should be viewed not only as a potential source of growth but also as an instrument for regional development, employment generation, and structural transformation.

Despite its contributions, the study has several limitations. First, the analysis relies on aggregate national-level data, which may mask significant regional disparities in tourism development and economic performance. Second, tourism activity is proxied by tourism revenues, which may not fully capture other important dimensions such as tourist arrivals, expenditure patterns, infrastructure development, or investment in the tourism sector. Third, the study does not explicitly incorporate factors such as environmental sustainability, institutional quality, or technological innovation, which may influence the relationships examined.

Future research could extend this analysis by employing regional-level data to explore spatial heterogeneity in the tourism–growth relationship. In addition, examining the interactions between tourism, renewable energy, environmental sustainability, and economic growth within an integrated framework would provide valuable insights. The application of nonlinear models, asymmetric approaches, and sector-specific analyses may further enhance understanding of the mechanisms through which tourism and energy consumption influence economic performance under different economic conditions.

Overall, the findings indicate that energy consumption remains a key determinant of economic growth in Kazakhstan, while tourism has not yet emerged as a statistically significant driver of aggregate economic performance. These results suggest that, although energy continues to underpin economic growth, the effectiveness of tourism as a diversification strategy depends on continued improvements in infrastructure, institutional capacity, and intersectoral linkages capable of translating tourism potential into broader economic gains.

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Conflicts of Interest: The authors declare no conflicts of interest.

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