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Does Tourism Development Improve the Quality of Life in Kazakhstan?

Abstract

This article examines whether tourism development improves the quality of life and boosts Kazakhstan's economy. To investigate this, we employed time series analysis, specifically cointegration and Granger non-causality tests, to variables representing Kazakhstan's quality of life, tourism development, and economic growth. The results show that quality of life and tourist development in Kazakhstan are cointegrated. Moreover, the analysis identifies unidirectional links extending from quality of life to tourism development, indicating a Granger causality from quality of life to tourism development, but not vice versa. Kazakhstan's economic expansion does not affect tourism or quality of life.

Keywords: quality of life, tourism receipts, economic growth, co-integration, Granger causality, error correction, Kazakhstan

1. Introduction

The tourism industry makes a significant contribution to the economic development of both developed and developing countries. Tourism fosters job opportunities enhances tourism infrastructure, advances technology, and helps alleviate poverty, leading to better health and social, environmental, and cultural well-being (Andereck & Nyaupane, 2011; Fu et al., 2020; Khan et al., 2020; Nopiyani & Wirawan, 2021; Rivera, 2016). Exploring the relationship between quality of life (QoL), tourism development (TD), and economic growth (EG) remains the central issue in academic research (Croes, 2012; Croes et al., 2018; Genç, 2012; Kim et al., 2013; Nopiyani & Wirawan, 2021; Uysal et al., 2012, 2016).

Governments prioritise tourism development to enhance the well-being of residents in a destination, evaluated not only by job opportunities and income but also by factors such as contentment, happiness, leisure, travel, and other aspects (Uysal et al., 2012). Subjective and objective quality of life (QoL) indicators influence the living standards of the population (Ridderstaat et al., 2016; Uysal et al., 2016). Although numerous studies have analysed the interaction between subjective quality of life (QoL) and tourism, relatively few have incorporated objective QoL indicators into their analysis (Croes et al., 2018, 2021; Fu et al., 2020; Ridderstaat et al., 2016; Rivera, 2016). However, researchers have found that tourism has a positive impact on quality of life (QoL) through the mediation of economic growth (Croes et al., 2021; Khan et al., 2020; Perles-Ribes et al., 2017; Ridderstaat et al., 2014, 2016).

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This study seeks to examine the relationships between i) quality of life and tourism development, ii) quality of life and economic growth, and iii) tourism development and economic growth employing time series analysis such as cointegration, Granger causality and error correction models. This study takes the first step in analysing precisely the unidirectional or bidirectional relationship between tourism development, quality of life, and economic growth in Kazakhstan. The findings will contribute to the tourism literature and update the implications of tourism policy in Kazakhstan.

2. Literature review

Tourism is a significant industry that contributes to sustainable development and has a substantial impact on various economic factors. Sustainable tourism considers the present and future economic, social, and environmental effects while addressing the needs of travellers, host communities, local economic activities, and ecological development (United Nations Environment Programme & World Tourism Organization [UNEP & UNWTO, 2005]). Supporting local communities is crucial in sustainable tourism, achieved through the provision of employment opportunities, poverty alleviation, and the preservation of cultural heritage and traditions.

2.1. Quality of life and tourism development

Tourism development (TD) impacts the community's quality of life through job creation, income growth, and improved goods and services (Fu et al., 2020; Khan et al., 2021; Nopiyani & Wirawan, 2021). Quality of life (QoL) encompasses objective and subjective aspects. Objective Quality of Life encompasses economic, environmental, social, health, and political well-being. Subjective Quality of Life (QoL) focuses on self-satisfaction with social life, family, job, community, and overall happiness (Kim et al., 2015; Khan et al., 2020; Fu et al., 2020).

Qualitative studies have investigated subjective indicators of the relationship between TD and QoL (Dolnicar et al., 2012; Kim et al., 2015; Obradović et al., 2021). However, few have examined objective quality of life (QoL) indicators, such as education, healthcare, income, employment, environment, safety, and security. Ridderstaat et al. (2016), Rivera (2016), and Croes (2012) have utilised regional-level objective quality of life (QoL) indicators, including human well-being, which encompasses education, health, and income.

The literature outlines three potential relationships between tourism development (TD) and quality of life (QoL). The first relationship suggests a unidirectional influence from quality of life (QoL) to tourism development (TD), indicating that improving human well-being could lead to growth in the tourism sector. Rivera (2016) provides empirical evidence of this relationship using cointegration techniques and Granger causality methods in Ecuador, revealing a long-run equilibrium relationship between human well-being, tourism, and economic growth.

In contrast, the second relationship suggests a unidirectional influence from tourism development to quality of life (TD→QoL), indicating that tourism development enhances the living standards of residents. Ridderstaat et al. (2016) find a nonlinear and reciprocal relationship between TD and QoL on the island of Aruba, suggesting that TD exerts a short-term impact on QoL.

The third relationship suggests a bidirectional influence between TD and QoL (TD ↔ QoL). Croes (2012) tests the bilateral relationship between TD and QoL in Nicaragua and Costa Rica. The outcome reveals that TD and QoL are directly and indirectly connected in the case of Nicaragua, as TD directly improves people's QoL through education, health, and material welfare, and QoL, in turn, contributes to the expansion of the tourism sector by enhancing the quality of services.

2.2. Tourism development and economic growth

Tourism is a potential economic driver of many developing and developed countries.

The significance of the tourism-led growth hypothesis (TLGH) aligns closely with the export-led growth hypothesis, which postulates that tourism development drives economic growth through the creation of jobs, human capital development, and tourism services exports (Perles-Ribes et al., 2017; Fonseca & Sánchez Rivero, 2020; Raifu, 2024).

Moreover, a growing body of literature has identified unidirectional (Gričar et al., 2021) and bidirectional (Cortes-Jimenez & Pulina, 2010; Gounder, 2021; Kim et al., 2006) causality running from technological development (TD) to economic growth. Specifically, applying the Granger causality approach for annual time series from 1989 to 2018, Kyara et al. (2021) analyze the TLGH in Tanzania, and their findings confirm the existence of unidirectional causality running from TD to economic growth. This suggests that Tanzania's economic growth is highly associated with TD for improving residents' livelihoods.

2.3. Conceptual framework

Based on the reviewed literature, the proposed conceptual framework of this empirical study is presented in Figure 1. Tourism Development (TD) is measured by tourism receipts, which represent the net revenue generated from tourism activities in Kazakhstan. Quality of life (QoL) is captured by the Human Development Index, which incorporates indicators such as per capita income, life expectancy, and education in Kazakhstan. Economic Growth (EG) is measured by Gross Domestic Product (GDP), which indicates the economic output of Kazakhstan.

Figure 1
Conceptual framework of TD, QoL and EG connections

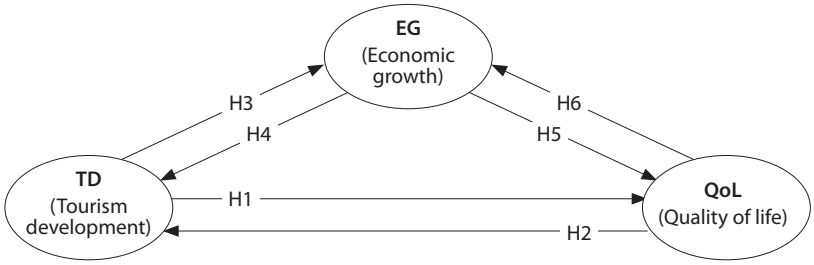


Figure 1 illustrates the potential direct and indirect relationships between TD, QoL, and EG. In total, six hypotheses (H1,.., H6) have been developed and are defined as follows:

H1 = Does tourism development drive the quality of life in Kazakhstan?

H2 = Does the quality of life drive tourism development in Kazakhstan?

H3 = Does tourism development drive economic growth in Kazakhstan?

H4 = Does economic growth drive tourism development in Kazakhstan?

H5 = Does economic growth drive the quality of life in Kazakhstan?

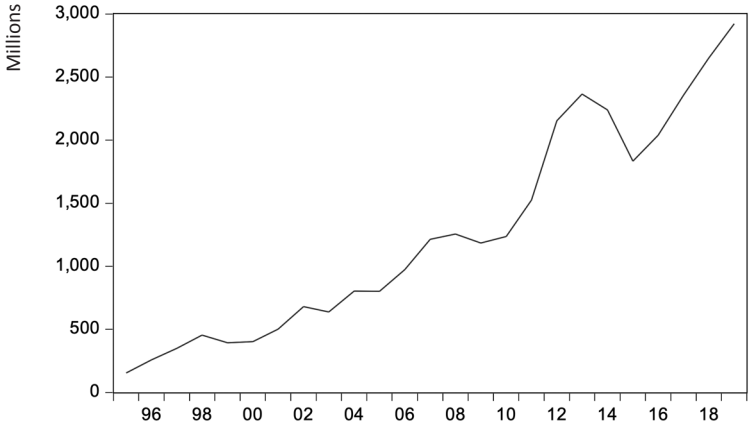
H6 = Does the quality of life drive economic growth in Kazakhstan?

2.4. The case of study of Kazakhstan

This study applies the proposed conceptual framework (Figure 1) to the case study of Kazakhstan. Kazakhstan, an emerging country in Central Asia, is ranked 80th in the Global Travel and Tourism Competitiveness Index

(World Economic Forum, 2019). According to the United Nations World Tourism Organisation (UNWTO, 2021), the number of international tourists visiting Kazakhstan increased dramatically from 202,000 in 1996 to over 8.5 million in 2019, resulting in substantial economic benefits. In 2019, Kazakhstan's inbound tourism receipts reached USD 2.922 million, accounting for 4.4% of total exports, a significant increase compared to USD 155 million in 1995 (see Figure 2).

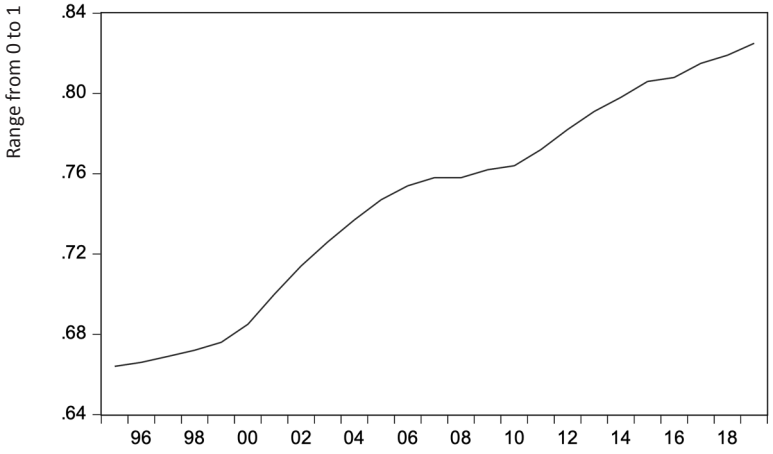
Figure 2
Tourism receipts in Kazakhstan (1995-2019)



Source: United Nations World Tourism Organisation (2021).

Figure 3 illustrates a notable improvement in human development in Kazakhstan over the past three decades, rising from 0.66 in 1995 to 0.82 in 2019, representing a significant 24% increase (United Nations Development Programme [UNDP], 2019).

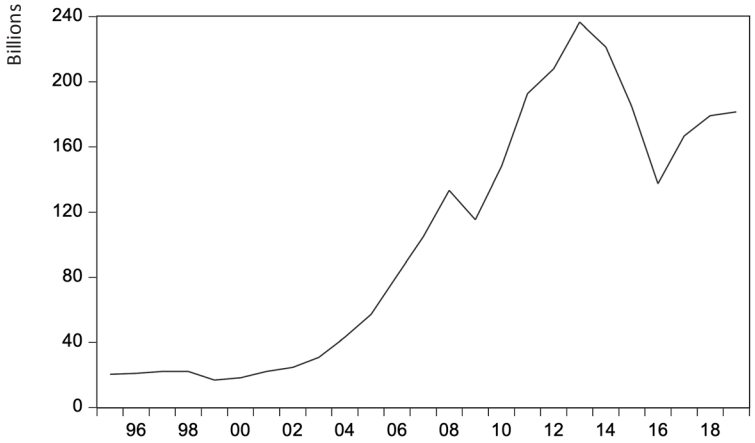
Figure 3
Human development index in Kazakhstan (1995-2019)



Source: United Nations Development Programme (2019, 2020).

Kazakhstan is the largest country in Central Asia in terms of its area and also the strongest in terms of its economic performance. The country's GDP recovered steadily after the downturn in 2015, reaching USD 181.7 billion in 2019 (see Figure 4). Kazakhstan has the most significant supply of crude oil and natural gas in Central Asia, ranking 15th globally in oil reserves and 12th in natural gas reserves, attracting international investors from the United States, Europe, the Russian Federation, and China.

Figure 4
Gross domestic product of Kazakhstan (1995-2019)



Source: World Bank (2020).

A summary of an extensive literature review reveals the gap, as no studies have yet explored the relationship between tourism development, quality of life and economic growth in Kazakhstan. Existing studies primarily focus on inbound tourism demand and economic factors influencing tourist arrivals in Central Asian countries, including Kazakhstan. For example, Kuralbayev et al. (2017) investigated the impact of exchange rates, transportation costs, and living expenses on international tourist arrivals in Kazakhstan. Ibragimov et al. (2021) explored the effect of economic factors on international tourist arrivals to Central Asian countries.

This study examines the causal relationship between tourism, quality of life, and economic growth in Kazakhstan, thereby contributing to the existing body of knowledge and the tourism literature.

3. Data description

This section examines the variables used to analyse the relationships between tourism development (TD), quality of life (QoL), and economic growth (EG) over the period from 1995 to 2019.

3.1. Tourism development (TD)

Tourism receipts serve as a proxy for tourism development (TD) and contribute to poverty reduction and economic well-being in a country (Croes, 2012; Croes et al., 2018; Khan et al., 2020; Ridderstaat et al., 2016). Studies show that tourism receipts are mainly used to reflect the TD in the analysis of TLGH and tourism-led quality of life (Kyara et al., 2021; Perles-Ribes et al., 2017; Kožić et al., 2024; Adeleye & Abdulkareem, 2023) The dataset was obtained from the World Tourism Organization statistics e-library (United Nations World Tourism Organization [UNWTO], 2021).

3.2. Quality of life (QoL)

In line with recent studies, we have utilised the Human Development Index (HDI) to represent quality of life (QoL) (Croes et al., 2021; Khan et al., 2021). HDI defines the achievements in a specific country across three main dimensions of human development: a long and healthy life, access to knowledge, and a decent standard of living (United Nations Development Programme [UNDP], 2019). HDI index ranges from 0 to 1, with values closer to 1 indicating higher levels of human well-being. The dataset is available from the United Nations Development Program dataset (United Nations Development Programme [UNDP], 2020).

3.3. Economic growth (EG)

The annual gross domestic product (GDP) is widely employed as a proxy for economic growth, capturing a country's economic development (Brida et al., 2016; Tang & Abosedra, 2012; Laiginhas Pina et al., 2023). GDP is measured in U.S. dollars and obtained from the World Bank Development Indicators database.

Table 1 summarises the descriptive statistics of each variable used in this study. The analysis shows each variable's average value, standard deviation, and minimum and maximum values (using their logs for TD and EG).

Table 1
Variable definition and descriptive statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
lnTD	Logarithm of tourism receipts	6.867	0.807	5.043	7.98
lnEG	Logarithm of real gross domestic product (2005=100)	24.97	0.983	23.54	26.19
HDI	Human Development Index	0.748	0.054	0.66	0.83

4. Methodology

In line with the study aims the methodology has four phases: i) testing the order of integration of the variables analyzed; ii) exploring cointegration between the variables to identify the existence of long-run equilibrium relationship among TD, QoL and EG; iii) estimating an error correction model (ECM) for integrating the short-run relationship between variables; iv) multivariate cointegration analysis using ARDL; v) testing for Granger non-causality between the three factors TD, QoL and EG.

4.1. Unit root tests

The initial step of the methodology involves testing the stationarity of the variables under analysis. Stationarity ensures the efficiency and consistency of cointegration estimation, reducing the risk of spurious regression (Song et al., 2008; Wooldridge, 2015). The Augmented Dickey-Fuller (ADF) tests (Dickey & Fuller, 1979, 1981), Phillips and Perron (PP) unit root tests (Phillips & Perron, 1988), and the KPSS-Kwiatkowski-Phillips-Schmidt-Shin unit root tests (Kwiatkowski et al., 1992) are employed to determine the stationarity of the series. Following the technical explanation by the authors (Perles-Ribes et al., 2017; Wooldridge, 2015), the augmented Dickey-Fuller (ADF) tests for a specific series consists in estimating the following equation:

$$\Delta Y_t = \beta_1 + \beta_2\, t + \gamma Y_{t-1} + \sum_{t-1}^{n} \alpha_i\, \Delta Y_{t-1} + \mu_t \quad (1)$$

where Δ indicates the first difference operator of the Y_t time series, and t is a time or stochastic trend. β_1 is a drift or constant, and n denotes the number of lags. ΔY_{t-1} is the lagged value of the Y_t time series, and μ_t represents a white noise error term. The ADF model is estimated using the Ordinary Least Squares (OLS) method. The optimal number of lag lengths (n) is identified using the Akaike Information Criterion (AIC) and the Schwarz Bayesian Information Criterion (SBIC) as the model selection criteria. The null hypothesis assumes that if $\gamma = 0$, the time series has a unit root or is non-stationary. The alternative hypothesis stipulates that if $\gamma < 0$, the time series has no unit root or is stationary (Dickey & Fuller, 1979; Gujarati, 2004; Perles-Ribes et al., 2016). Additionally, the Phillips-Perron (PP) unit root test has been applied to the series to determine whether it is stationary. The PP unit root test employs a nonparametric estimation technique to address potential serial correlation in the residuals and establish robust estimation (Phillips & Perron, 1988). KPSS, the abbreviated form for Kwiatkowski-Phillips-Schmidt-Shin, is considered another type of unit root test commonly used to check the null hypothesis of stationarity against the alternative of a unit root, as proposed by Kwiatkowski et al. (1992). The functional form of KPSS can be written as:

$$Y_t = \beta_t + r_t + \varepsilon_t$$

Where: $r_t = r_{t-1} + \mu_t$ indicates a random walk; μ_t is the independent identically distributed $(0,\sigma_u^2)$. t is a time indicator. ε_t shows the stationary process. The KPSS test formulates null and alternative hypotheses as follows. The null hypothesis of stationarity would not be rejected if the KPSS test statistic is smaller than the critical value.

In contrast, the alternative hypothesis of non-stationary is accepted if the KPSS test statistic is greater than the critical value calculated by Kwiatkowski et al. (1992). If the KPSS test statistic is less than the critical value, then the null hypothesis of stationarity is not rejected. In contrast, the non-stationary alternative hypothesis is accepted if the KPSS test statistic exceeds the critical value calculated by Kwiatkowski et al. (1992).

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4.2. Cointegration analysis

The second step in the methodology focuses on testing for cointegration between the variables. The Engle and Granger cointegration test, proposed by Engle and Granger (1987), is employed in this study to examine the existence of a long-run relationship between TD, QoL, and EG. The test involves conducting a unit root test on the residuals obtained from a regression model. If the residuals are stationary, the variables are considered cointegrated, indicating the presence of a long-run equilibrium relationship between them (Perles-Ribes et al., 2017).

Following the objective of the study, three long-run regression models are carried out as follows:

The first long-run regression equation for the relationship between QoL and TD is

$$QoL_t = \alpha_1 + \beta_1 lnTD_t + \mu_{1t} \quad (2)$$

The second long-run regression equation for the relationship between QoL and EG is

$$\mathrm{QoL}_t = \alpha_2 + \beta_2 \mathrm{lnEG}_t + \mu_{2t} \quad (3)$$

The third long-run regression equation for the relationship between EG and TD is

$$\mathrm{lnEG}_t = \alpha_3 + \beta_3 \mathrm{lnTD}_t + \mu_{3t} \quad (4)$$

where α_1, α_2, α_3 are constant intercepts, while β_1, β_2 and β_3 denote the long-run coefficients. μt is a well-behaved error term. The next procedure is to estimate the residuals (μ_t) for each of the above regressions and test them for unit root. If the residuals are stationary in I(0), then the residuals do not have a unit root, which is a stationary process. This indicates that the two variables are considered to be co-integrated, suggesting the existence of a long-run equilibrium relationship between them.

4.3. Error correction model (ECM)

The third step of the methodology involves estimating the Error Correction Model (ECM) to examine the short-run and long-run dynamics between TD, QoL, and EG, as well as to determine the speed of adjustment towards the long-run equilibrium, as proposed by Mukherjee et al. (2013) and Rivera (2016). Aligned with the study aims, three single ECM equations are estimated as follows:

$$\Delta QoL_t = \theta_1 + \gamma_1 \Delta lnTD_t + \delta_1 ect_{t-1} + \mu_{1t} \quad (5)$$

$$\Delta QoL_t = \theta_2 + \gamma_2 \Delta lnEG_t + \delta_2 ect_{t-1} + \mu_{2t} \quad (6)$$

$$\Delta lnEG_t = \theta_3 + \gamma_3 \Delta lnTD_t + \delta_3 ect_{t-1} + \mu_{3t} \quad (7)$$

Where ln represents the variable converted into its natural logarithm form. ΔQoL_t, $\Delta lnTD_t$, Δ and $lnEG_t$ correspond to quality of life, tourism development, and economic growth, as represented by the first difference operator. ect_{t-1} indicates the error correction term derived from the lagged residual of the cointegration equation. δ_1, δ_2, δ_3 refer to the estimated coefficient of error correction terms in equations (5), (6) and (7). These coefficients specify the speed of adjustment towards the long-run equilibrium. Equation (5) indicates the relationship between tourism development and quality of life. Equation (6) shows the relationship between quality of life and economic growth. Equation (7) represents the relationship between economic growth and tourism development.

4.4. Multivariate cointegration analysis ARDL and bounds testing

Pesaran et al. (2001) developed ARDL bounds testing approach that involves cointegration testing between variables. Additionally, this model is found to be appropriate for small sample sizes with variables in different integration orders, I(0), I(1), or both options. The ARDL model can be specified as follows:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-1} + \sum_{i=0}^{q} \beta_i \Delta X_{t-1} + \gamma_1 Y_{t-1} + \gamma_2 X_{t-1} + \epsilon_t$$

Where Y_t and X_{t-k} show the dependent and independent variables, respectively; Δ represents the first difference operator; p and q are considered to be lag lengths. The bounds testing is estimated based on the above equation. The null hypothesis states that there is no cointegration ($H0: \lambda 1 = \lambda 2 = 0$), and the alternative hypothesis ($H1: \lambda 1 \neq 0, \lambda 2 \neq 0$) is tested using the F-statistic.

4.5. Granger causality test

The final stage of the methodology involves the Granger causality test, which is used to determine the direction of causality between the variables. The Granger causality test determines whether one variable is causing another variable based on their past values. The test is conducted by estimating the Vector Autoregression (VAR) model, a standard approach for assessing the Granger causality among multiple variables (Granger, 1969, 1988) as follows:

$$Y_t = \beta 0 + \beta 1 Y_{t-1} + \ldots + \beta k Y_{t-k} + \alpha 1 X_{t-1} + \ldots + \alpha k X_{t-k} + \mu t \quad (8)$$

$$X_t = \delta 0 + \delta 1 X_{t-1} + \ldots + \delta k X_{t-k} + \gamma 1 Y_{t-1} + \ldots + \gamma k Y_{t-k} + \varepsilon t \quad (9)$$

In VAR equations (8) and (9), null and alternative hypotheses can be formulated as follows:

Acceptance of H0 = $\alpha_1 = \alpha_1 = \ldots = \alpha_k = 0$, indicate that X_t does not Granger-cause Y_t

Acceptance of Ha = $\alpha_1 = \alpha_1 = \ldots = \alpha_k \neq 0$, indicate that X_t does Granger-cause Y_t

Acceptance of H0 = $\gamma_1 = \gamma_1 = \ldots = \gamma_k = 0$, indicate that Y_t does not Granger-cause X_t

Acceptance of Ha = $\gamma_1 = \gamma_1 = \ldots = \gamma_k \neq 0$ indicates that Y_t does Granger-cause X_t

This study utilizes the augmented-lag VAR procedure proposed by Toda and Yamamoto (1995) to test the presence of Granger causality among the variables. The procedure involves determining the order of integration, selecting the optimal lag length, estimating the VAR model with p additional lags for each variable, and conducting a Wald test to examine the non-Granger causality hypothesis only on the first lags. The presence

of Granger causality is confirmed if the null hypothesis is rejected based on the Wald test result (Perles-Ribes et al., 2017; Mehmood et al., 2024).

5. Results

The results section outlines the findings and their interpretations. Starting with the outcomes of the unit root test, followed by the Engle and Granger two-step cointegration tests, the error correction model, and the Granger causality test. The estimated results were obtained using EViews 10 software, with the optimal lag length determined using AIC, SBIC, and HQ information criteria. The AIC criterion yielded the lowest critical value, indicating that lag two is the optimal lag. The results of the unit root tests (ADF, KPSS, and PP) are summarized in Table 2.

Table 2
Unit root test results

Variables		ADF	KPSS	PP	Integration
TD	Level	0.639(2)	0.927(2)***	-2.408(2)	
	First difference	-4.985(2)***	0.250(2)	-4.491(2)***	I(1)
EG	Level	-1.014(2)	0.839(2) ***	-0.864(2)	
	First difference	-3.392(2)**	0.173(2)	-3.012(2)**	I(1)
QoL	Level	-1.220(2)	0.909(2) ***	-0.522(2)	
	First difference	-3.154(2)**	0.096(2)	-2.388(2)	I(1)

The significant level at *** p<0.01, ** p<0.05, * p<0.1; ADF: Augmented Dickey-Fuller test; KPSS: Kwiatkowski-Phillips-Schmidt-Shin test; PP: Phillips–Perron. The optimal lag lengths are in the brackets and were obtained based on the SBIC and AIC information criteria for (ADF), Newey-West Bandwidth lag selection for KPSS and PP. I(1) denotes the integration of order 1. H0 for ADF & PP: the series has unit root; H0 for KPSS: the series has no unit root.

The ADF and KPSS results reveal that TD, EG, and QoL are all statistically significant at the 1% and 5% levels, indicating that these variables are stationary at the first difference and integrated of the same order, I(1). The study subsequently verified the presence of cointegration among the variables using the Engle-Granger cointegration test. Three equations were estimated using the OLS method (Table 3), and the residuals from OLS were subjected to unit root tests (Table 4) following the Engle and Granger test methodology (Engle & Granger, 1987).

Table 3
Two-step Engle and Granger cointegration test results

DV: QoL	Coefficient	Std. Error	t-Statistic
lnTD	0.064***	0.003	19.52
Contstant	0.306***	0.023	13.50
R-squared	0.94		
Durbin-Watson	0.77		
DV: QoL	**Coefficient**	**Std. Error**	**t-Statistic**
lnEG	0.051***	0.004	12.95
Contstant	-0.524***	0.098	-5.33
R-squared	0.879		
Durbin-Watson	0.232		
DV: lnEG	**Coefficient**	**Std. Error**	**t-Statistic**
lnTD	1.136***	0.091	12.44
Contstant	17.18***	0.631	27.21
R-squared	0.871		
Durbin-Watson	0.373		

Significant level at *** p<0.01, ** p<0.05, * p<0.1; DV: Dependent Variable.

As shown in Table 3, the three regressions represent the following relationships: QoL and lnTD ($QOL_t = \alpha_1 + \beta_1 lnTD_t + \mu_t$), QoL and lnEG ($QOL_t = \alpha_2 + \beta_2 lnEG_t + \mu_t$), lnEG and lnTD ($lnEG_t = \alpha_3 + \beta_3 lnTD_t + \mu_t$). Before interpreting these regression results, the stationarity of the OLS residuals must be tested.

The ADF unit root test is used to examine the residuals obtained from the three OLS regressions, with the outcomes reported in Table 4. Each residual is tested for a unit root at a level without incorporating a drift term. The ADF has confirmed that the residuals hold stationarity at level. These findings indicate that the residuals are stationary at I(0), thereby validating the existence of the long-run relationship among QoL and lnTD, QoL and lnEG, as well as lnEG and lnTD.

Table 4
Unit root test for OLS residuals

Cointegration	ADF test
QoL and TD	
Residual, No drift	-3.646***
QoL and EG	
Residual, No drift	-3.521(4)***
EG and TD	
Residual, No drift	-3.554(5)***

Significant level at *** p<0.01, ** p<0.05, * p<0.1;

After confirming the presence of cointegration among variables, the single error correction model (ECM) is estimated to determine the short-run and long-run dynamic relationships and the speed of the equilibrium effect. Table 5 reports the outcomes of the three single ECM estimations. The first model captures the short-run dynamic relationship between quality of life (QoL) and tourism development (TD). The $\delta_1 ect_{t-1}$ (the error correction term also called the speed of adjustment parameter) is statistically significant at the 10% level and has a negative expected sign. The error correction term coefficient equals -0.135, suggesting that long-run effects correct the previous period's disequilibrium at a speed of 13.5% per year. It also indicates the sizable speed of adjustment of disequilibrium correction toward reaching a long-run equilibrium steady-state. Moreover, tourism development ($\Delta lnTD_t$) is not statistically significant, implying that tourism development does not exert a short-term effect on the quality of life in Kazakhstan.

Table 5
ECM estimation results

DV: QoL model (1)	**Coefficient**	**Std. Error**	**t-Statistic**
θ_1	0.006***	0.001	5.485
ΔlnTDt	0.006	0.006	1.052
$\delta_1 ect_{t-1}$	-0.135*	0.075	-1.793
R-squared	0.133		
Durbin-Watson	0.721		
DV: QoL model (2)	**Coefficient**	**Std. Error**	**t-Statistic**
θ_2	0.006***	0.001	6.966
Δlight	0.005	0.005	1.129
$\delta_2 ect_{t-1}$	0.059	0.048	1.230
R-squared	0.161		
Durbin-Watson	0.814		
DV: EG model (3)	**Coefficient**	**Std. Error**	**t-Statistic**
θ_3	0.032	0.043	0.743
$\Delta lnTD_t$	0.501**	0.223	2.247
$\delta_3 ect_{t-1}$	-0.187*	0.105	-1.783
R-squared	0.227		
Durbin-Watson	1.219		

Significant level at *** p<0.01, ** p<0.05, * p<0.1; DV: Dependent Variable.

The second model examines the short-run dynamic relationship between quality of life and economic growth (EG). The error correction term is found to be statistically insignificant, and its coefficient value falls outside the acceptable range of -1 to 0. Similarly, economic growth ($\Delta lnEG_t$) is not statistically significant, indicating that economic growth has no short-term effect on the quality of life in Kazakhstan. The third model analyzes the relationship between economic growth and tourism development. The error correction term has a negative expected sign and is statistically significant at the 10% level. This finding indicates that the mechanism corrects its past period disequilibrium at a rate of 18.7% per year, demonstrating the speed of adjustment in correcting disequilibrium to achieve a long-run equilibrium steady state. Additionally, tourism development is statistically significant at the 5% level and has a positive short-term impact on economic growth in Kazakhstan. Tourism growth can stimulate economic progress in the short term by generating employment and attracting foreign currency inflows.

It is worth noting that cointegration tests provide evidence that variables move together in the long run. Furthermore, the error correction model establishes the short-run dynamics relationship between variables and measures the speed of adjustment parameters. However, this does not address the current research hypothesis (e.g., whether tourism development drives quality of life or vice versa). Therefore, the Granger causality tests have been conducted to evaluate the causal relationship among the variables in this study. The results of the Granger causality tests are presented in Table 6. The Granger causality result, based on an optimal lag of 2, reveals that the null hypothesis "Quality of life does not drive tourism development in Kazakhstan" is statistically significant at the 5% level and rejects H2. This implies that the quality of life Granger causes tourism development in Kazakhstan. In other words, a unidirectional relationship exists between the quality of life and tourism development in Kazakhstan, suggesting that tourism development does not necessarily lead to an improvement in the quality of life in Kazakhstan. This outcome can be attributed to the fact that the residents' economic welfare and living standards are strongly linked to other economic sectors (Kalyuzhnova & Belitski, 2019). As Kazakhstan is the world's largest supplier of crude oil and natural gas, trade, manufacturing, construction, and agriculture serve as the primary sources of income for its residents. While tourism generates employment and income, it accounts for only a small proportion of the country's total employment. Consequently, tourism growth is not the primary contributor to human development in Kazakhstan, as found in previous studies on Ecuador, Costa Rica, and Aruba. (Rivera, 2016; Croes, 2012; Vanegas et al., 2015; Ridderstaat et al., 2016). Furthermore, Telfer and Sharpley (2015) and Mihalič (2000) have revealed that improvements in quality of life through education, public health, and economic well-being encourage tourism competitiveness and development, suggesting a causal relationship running from quality of life to tourism development. Similarly, Chen et al. (2009) and Lanza et al. (2003) explored that the enhancement of social indicators and a peaceful political environment, which are primary components of quality of life, encourage tourism development.

Moreover, H1, H3, H4, H5, and H6 are not statistically significant, and therefore, they do not reject the null hypothesis of non-causality existing among the variables.

Table 6
Granger causality tests

Hypotheses	Chi-sq	P-value	Result
H1: Tourism development does not drive the quality of life in Kazakhstan	1.441	0.486	Accept
H2: Quality of life does not drive tourism development in Kazakhstan	7.453	0.024	Reject
H3: Tourism development does not drive economic growth in Kazakhstan	0.729	0.694	Accept
H4: Economic growth does not drive tourism development in Kazakhstan	3.071	0.215	Accept
H5: Economic growth does not drive the quality of life in Kazakhstan	0.745	0.688	Accept
H6: Quality of life does not drive economic growth in Kazakhstan	0.228	0.892	Accept

Lag 2 is found as optimal lag based on AIC/BIC information criteria.

6. Conclusions and policy recommendations

The quality of life of citizens has become one of the main objectives of tourism policy competitiveness. This study analyses three aspects: first, the relationship between tourism development, quality of life, and economic growth; second, the directions of these relationships; and third, the short- and long-run relationships between these variables. The results reveal the presence of cointegration between the variables used, indicating the existence of a long-run relationship among QoL and TD, QoL and EG, and EG and TD. The findings highlight interesting assumptions about the relationship between quality of life, tourism development and economic growth.

The study's findings reveal a unidirectional causal relationship between quality of life and tourism development in Kazakhstan. This implies that enhancing residents' quality of life could promote tourism expansion in the country.

The second objective is to determine the relationship between economic growth and tourism development (EG→TD). The findings suggest that tourism development has a positive short-term impact on economic growth, primarily through the influx of foreign currencies, job creation, and the export of tourism-related products. A 1% increase in tourism receipts tends to lead to a 0.5% increase in economic growth. However, tourism development does not Granger cause economic growth. The tourism sector accounts for only 5.2% of the GDP in Kazakhstan, which is a small contribution compared to the country's main economic activity (export of crude oil, natural gas, manufacturing, construction). Katircioglu (2009) reports similar outcomes, finding no causal relationship between tourism and economic growth in Turkey during the period 1960-2006.

The third objective of the study is to identify the relationship between quality of life and economic growth (QoL→EG). The error correction model shows a positive short-term effect between EG and QoL. Economic growth does not Granger cause the quality of life in Kazakhstan. This suggests that the main economic activities, such as the export of crude oil, natural gas, agriculture, and manufacturing, would improve the material well-being of the residents. However, they are not entirely responsible for improving educational well-being (e.g. literacy rate) or health welfare (e.g. life expectancy). Ridderstaat et al. (2016) and Rivera (2016) obtained similar results, indicating that the quality of life does not Granger-cause economic growth in the cases of Aruba and Ecuador, respectively.

Moreover, this study urges tourism leaders and government policymakers to improve and update existing tourism policies:

- Enhancing residents' quality of life to promote tourism development: policies aimed at improving the quality of life through a better standard of living (rise in income), improved education (literacy rate and accessibility to schools), and better healthcare services tend to encourage tourism development in Kazakhstan.
- Tourism has a short-term positive impact on economic growth; therefore, the government should upgrade its policies to increase investment in the tourism sector, thereby amplifying its effects on economic development in Kazakhstan.

Finally, the limitations of this study include a small sample size, a lack of consideration for social, cultural, and environmental factors, and the inability to generalize the results beyond Kazakhstan. Similar data constraints are typical in emerging countries (Perles-Ribes et al., 2017). Further research is needed to investigate the relationship between tourism development and quality of life in all Central Asian countries, including Tajikistan, Turkmenistan, Kyrgyzstan, and Uzbekistan. Additionally, including mediating determinants would provide more accurate results (Mukherjee et al., 2013).

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