NCCS Research Journal, Issue 2, October 2023, ISSN NO: 2822

Received Date: June 2023 Revised: August 2023 Accepted: October 2023

Tourism and Its Impact on The Growth of The Nepalese Gross Domestic Product

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Abstract

This article aims to show the impact of Real Tourism Earnings (RTER) on Real Gross Domestic Product (RGDP). A time-series economic analytical design was employed using secondary data covering the period 1990–2022 AD. All data were obtained from the Central Bank of Nepal, the Ministry of Finance, and the Central Bureau of Statistics to establish the impact of RTER on RGDP. In this respect, to capture short-run relationships among variables, the pairwise Engel Granger Test (PRGT), and Error Correction Mechanism (ECM)were developed, and co-integration analysis was introduced to capture long-run relationships among variables. In the paper, a 100 percent increase in RTER leads to a 90 percent positive change in RGDP in the short run; the coefficient is positive as well as significant at the 5 percent level in the short run. ECM has a unit root at the first difference in long-run relationships. The coefficient of ECM -0.96 and significance at 1 percent showed that it corrected all the disequilibrium at the convergent speed of 96 percent. All the stability and diagnostic tests of the model have no symbols of misspecification, and residuals are normally distributed, homoscedastic, and not serially correlated.

Key words: RGDP; RTER; ECM; Co-integration; Pairwise Engel Granger test;

Introduction

Tourism is one of the fast-growing labor-intensive industries, and people have been traveling for leisure time spending according to their destination choice. Nepal opened its doors to tourism after

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the first successful ascent of the world's highest mountain Mt. Everest on May 29, 1953AD by Edmund Hillary and Tenzing Norgey Sherpa, (Thapa. B, 2003) raised curiosity worldwide. The Himalayan Mountain nation chain mystified a charm among a large number of tourists. An increase in tourism inflow and economic growth are interrelated and vice versa. (Dogru, T,. Bulut, U 2018) Therefore government has been working very hard to advance the tourism sector. The infrastructure in Nepal is improving, with new tourist destinations, luxurious hotels and resorts, good roads, and brand-new international airports opening up, the tourism business is growing. People are becoming more and more involved in this sector. Institutions that teach and study about the tourism industry are also expanding. Since Nepal embraced federalism, local governments are now in charge of the tourism sector. To improve the local level of the tourism business, each province and state can put their ideas and plans into action.

Tourism is a contributor to sustainable economic growth in many countries. Sequeira TN Nunes PM looked at the relationship between tourism inflow and economic growth has found that tourism is a good driver of economic growth. It can be a tool for increasing export earnings, generating new employment opportunities, enlarging consumer markets, and promoting rapid diversification of the economy. Belloumi (2010), Furthermore, it also contributes to government revenue. It has a spin-off effect on all sectors of the economy. Saleh et al. (2015) Nepal is a developing nation with limited foreign sources; tourism receipts are one of the tools for high and sustainable economic growth. The increase in tourism arrivals resulted in an increase in tourism receipts. International tourism receipts have increased from Rs. 4459.7 million in 1990 AD to Rs. 75,374.1 million in 2018 AD. But after the unprecedented global pandemic COVID-19, Nepal's tourism went through a tumultuous period that restricted international travel movement. It decreased by 80 percent in 2020, followed by 35 percent in 2021 AD, reaching only Rs. 7874.4 million, but 2022 AD, the historic year for international tourist inflow as well as tourism receipts, increased by more than 306 percent, putting an end to the downward spiral, and reacted with 614,148 arrivals and Rs. 28620.6 million. Tourism spending increased by USD 48 every day, contributing thousands of jobs and a 2 percent share of Nepalese GDP despite the protracted COVID-19 pandemic and Ukraine-Russia war in the New Business Age (2023).

There are volumes of studies that have been done to show the relationship between tourism inflow and GDP growth. However limited research has been done to connect relationships the after COVID-19 outbreak. Further tourism inflow is not only the element that impacts GDP growth,

other factors such as foreign direct investment, remittance, domestic capital, export capacity, and import volume also have a considerable impact on the growth. In the previous works, there hasn't been more research conducted on the impact of tourism on the growth of Nepalese GDP. To cover this research gap, this paper examined the impact of real tourism earnings on the growth of the real gross domestic product of Nepal.

The findings of this research will have significant implications not only for the improvement of existing literature, but also for policymakers, stakeholders of the tourism industry, tourism investors, and other potential investors. It will provide insights into the current time series data which covered 32 years from 1990 -2022 AD. The goals of this research establish the impact of tourism and other factors like foreign direct investment, remittance, domestic capital, export capacity, and import volume, on the growth of Nepalese GDP and highlight the factors that contribute to its growth. Additionally, the research will help policymakers formulate policies that promote sustainable tourism development and ensure that the benefits of tourism are evenly distributed across the country. Therefore, this study aims to establish the relationship and explain the impact of tourism and other variables on real gross domestic product by addressing the potential gap in the literature.

Literature Review

There have been volumes of empirical studies examining the effect of tourism receipts on economic growth. Some literature shows that the effect of tourism on economic growth in the short and long run differs depending on the destination and nature of the tourism industry. Short-run positive effects were economic growth, infrastructure development, new jobs, and foreign exchange (Bouzahzah and Menyari 2013), Srinivasan et al. 2012, Pan and Dossou (2019), Lanza, A., & Pigliaru, F. (2000), Brida, J. G., & Zapata-Aguirre, S. (2010). On the other hand, some authors showed short-run negative effects, including inflation, pollution, and environmental degradation. Sinha, R. K. (2008), Brida Brida, J. G., & Risso, W. A. (2012); Gössling, S.; Scott, D.; & Hall, C. M. (2013). There are several authors and studies that have shown the positive effects of tourism receipts on economic growth in the long run, including diversification of the economy, infrastructure development, stimulating entrepreneurship and innovation, and regional development.

Overall, the positive effects of tourism on economic growth in the long run can be significant and far-reaching. However, it is important to manage and regulate the industry to ensure that the benefits are maximized and the negative impacts are minimized. Mowforth, M., and Munt, I. (2009) highlighted the potential long-term benefits of tourism in developing countries, including employment opportunities, infrastructure development, and regional development. Balaguer, J., and Cantavella-Jordá, M. (2002) found that tourism had a positive and statistically significant impact on economic growth in the long run in Spain. (Dritsakis, N. 2004) found that tourism had a positive and statistically significant impact on economic growth in the long run in Greece. (Lanza, A., & Pigliaru, F. 2000) conducted a meta-analysis of various studies and found that tourism had a positive and statistically significant impact on economic growth in the long run in several countries.

Objective of the Study

The general objective of the paper is to identify the relationship between and among the real gross domestic product (RGDP), real tourism receipts (RTER), real foreign direct investment (RFDI), remittance inflow, export, import, and domestic capital. The specific objective is to examine the contribution of RTER to RGDP in Nepal.

Hypothesis of the Study

Null Hypothesis (Ho): RTER has no significant contribution to the RGDP growth of the Nepalese economy.

Alternative Hypothesis (H1): RTER has made a significant contribution to the RGDP growth of Nepal.

Methodology

This entire research design followed a quantitative research nature. This study employs annual time series data covering 33 years, from 1990 AD to 2022 AD. The model is developed based on the variables selected as real gross domestic product (RGDP), real tourism receipts (RTER), real foreign direct investment (RFDI), remittance inflow, export, import, and domestic capital of Nepal, guided by the functional relation between growth and RTER receipts. All the data are based on secondary sources published by the Nepal Tourism Board, Ministry of Finance,

Ministry of Tourism, Culture, and Aviation, Nepal Rashtra Bank, World Bank, and others. Different econometric and statistical tools and models, such as regression analysis and error correction models, will be used to analyze the data using Excel, E-views-10, and Microfit software.

Measures of FDI Impact on RGDP (Model -1)

RGDP = f (RTER)……(1)

To show a functional relationship, the stochastic model becomes

$RGDP = \beta_0 + \beta_1(RTER)$……(2)

Workings of the model tested in its natural logarithm form,

$LNRGDP = \beta_0 + \beta_1 LN(RTER) + \mu$…….(3).

Measure of RTER On Others Variables (Model 2)

GDP = f(RTER, RFDI, RREM, RDK, REXP, RIMP)……(1)

The functional relationships, stochastic model become

$RGDP = \beta_0 + \beta 1(RTER) + \beta_2(RFDI) + \beta_3 (RREM) + \beta_4(RDK) + \beta_5(REXP) + \beta_6(RIMP) + \mu$……(2)

Workings of model tested in its natural logarithm form

$LNRGDP = \beta o + LN\beta 1(RTER) - \beta_2 LN (RFDI) + \beta_3 LN (RREM) + \beta_4 LN (RDK) + \beta_5 LN (REXP) + \beta_6 LN (RIMP) + \mu$……(3)

Unit Root Test

The augmented Dickey-Fuller test as suggested by Dickey and Fuller (1979) has been applied to test the presence of a unit root in time series data. There are three versions of the ADF test.

$\Delta Y_t = \beta_1 + ZY_{t-1} + \alpha_i + e_t$…….1 (Intercept only)

$\Delta Y_t = \beta_1 + \beta_{2t} + ZY_{t-1} + \alpha_i + e_t$ …….2 (Trend and Intercept only)

$\Delta Y_t = ZY_{t-1} + \alpha_i + e_t$ …….3 (no trend, no Intercept)

The basic objective of this test is to examine the null hypothesis and alternative hypothesis.

Null hypothesis (Ho): Variables are not stationary or have unit roots,

Alternative hypothesis (H1): Variables are stationary.

Engle-Granger Co-integration

If the regression model with non-stationary variables is run the regression model may be spurious or nonsense like model 1.1

LNRGDP = βo + LNβ1(RTER) - β_2LN (RFDI) + β_3LN (RREM) + β_4LN (RDK) + β_5LN (REXP) + β_6LN (RIMP) + μ……(1.1)

The symptom of a spurious regression of R-squared value would be greater than Durbin Watson Statistics. So Engle-Granger Model (ECM) is to be used as given below.

DLNRGDP = βo + β1D(LNRTER) - β2D(LNRFDI) + β3D(LNRREM) + β4D(LNRDK) + β5D(LNREXP) + β6(LNRIMP) + μ……(1.2)

The standard Granger Causality Test seeks to determine whether the past value of a variable helps to predict change in another variable. The definition states that in the conditional distribution, the lag value of Y_t adds no information to the explanation of the movement of X_t beyond the provided by the lag value itself.

Empirical Analysis

To examine the impact of LNRTER, LNRGDP is assumed as a function of LNRTFR. The regression model has been employed to examine the impact of the variables. It was hypothesized that all the independent variables in the model have a significant positive impact on the Nepalese economy which is a proxy by LNRGDP growth and actually following results are obtained. Following the Augmented Dickey-Fuller (ADF) test, all series are non-stationary at level but stationary at first difference. However, ADF tests are often affected by the choice of the lag length (p) and lose power while estimating a large sample.

Unit Root Results at Log Level and First Difference

Variables	Log Level Form		First Difference	
	t-statistics	p-value	t-statistics	p-value
LNRGDP	-2.3826	0.1548	-7.2107	0.0000
LNRT_ER	-1.7414	0.4010	5.5653	0.0000
LNRFDI	-2.3090	0.1754	-7.7925	0.0000
LNRREM	-2.1970	0.2113	-7.2692	0.0000
LNRDK	-1.3638	0.5873	-6.4356	0.0000
LNREXP	-2.6435	0.0951	-7.7946	0.0000
LNRIMP	-2.7728	0.0742	-6.8554	0.0000

Source: Author's estimation results using Eviews-10, 2023

Since all the variables are stationary at the first difference using Schwarz info Criterion at maximum lag 2. So we should use the OLS technique. The results show that LNRTER is significant at 5 percent meaning the positive impact of LNRTER meaning a 100 percent increase in LNRTER leads to about 90 percent change in LNRGDP. If we drop all other variables there is positive relation between LNRGDP and LNRTER.

LNRGDP = 2.84 + 0.90LNRT_ER

P- value = 0.0816, 0.0000

t-value = (1.7819) (5.5322)

R^2 = 0.4967, F – test 3060, SD = 1.14, DW = 0.81 (See Appendix)

In the second model, the coefficient of LNRTER, LNRREM, LNRDK, LNREXP LNRIMP are positive as well as significant at a 5% level but LNRFDI is not significant at 5 percent as well as negative. It may be due to a larger portion of spending driven out towards consumption of foreign produce goods from import.

LNRGDP = 3.2335 + 0.1016*LNRTER – 0.0046*LNRFDI + 0.0616*LNRREM + 0.0822*LNRDK + 0.1390*LNREXP + 0.6527*LNRIMP

P- value = 0.0000, 0.0106, 0.8295, 0.0317, 0.0296, 0.0036, 0.0000

t-value = (6.1852) (-2.7537) (0.2175), (2.2698) (1.2865) (3.1975) (6.9449)

R^2 = 0.9935, F – test 662.51, SD = 1.44, DW = 1.6973 (See Appendix)

To observe the long-run relation between the variables we approach Engle Granger which shows the residual term for stationary. The P-value is less than 1% and the absolute value of t-statistics is greater than the critical value of 10 percent, 5 percent even 1 percent. We reject the null hypothesis and accept the alternative hypothesis. So there is co-integration in order zero I(0). Thus, the residual term being stationary at the level we can say there was the existence of co-integration in the long run. Therefore, we converted to the first difference for error correction.

Augmented Dickey-Fuller Unit Root test on ECM

Null Hypothesis: ECM has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.341301	0.0001
Test critical values:	1% level		-3.653730	

	5% level		-2.957110	
	10% level		-2.617434	
*MacKinnon (1996) one-sided p-values.				

In the third model, we see the ECMt-1 is known as equilibrium error its coefficient tells us the rate that corrects the disequilibrium of the previous period. The ECM coefficient must be negative for convergent equilibrium which is fulfilled in the model. Other coefficients of LNRDK LNRREM, and LNREXP are positive but not significant at the 5 percent level but LNRFDI is negative and insignificant at a given level. LNRIMP is positive and significant at 5 percent, which is shown in the following table.

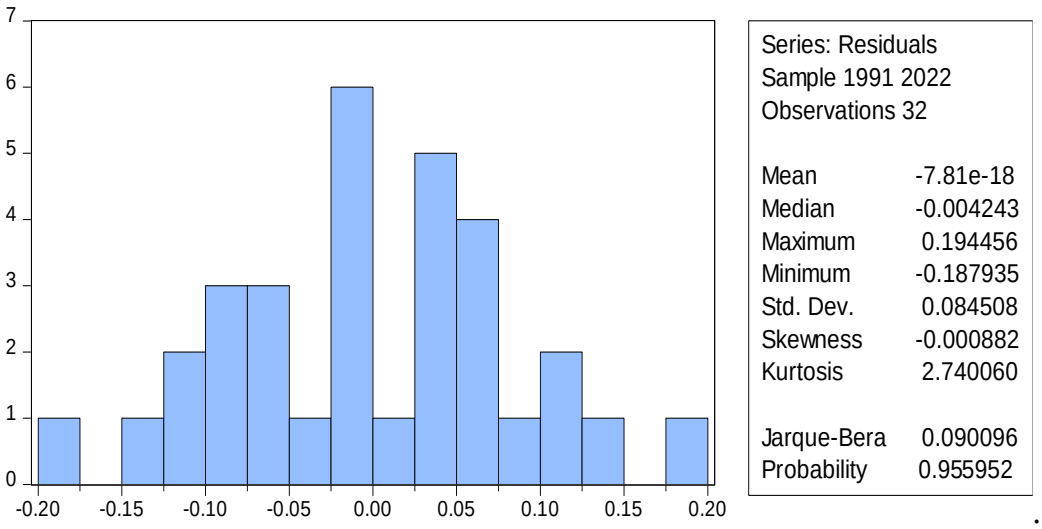
Table: The ECM Model

Dependent Variable: DLNRGDP				
Method: Least Squares				
Date: 04/29/23 Time: 19:32				
Sample (adjusted): 1991 2022				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0077	0.0184	-0.4188	0.6791
DLNRT_ER	0.0781	0.0400	-1.9532	0.0625
DLNRFDI	-0.0132	0.0148	-0.8909	0.3818
DLNRREM	0.0347	0.0333	1.0408	0.3083
DLNRDK	0.1681	0.1070	1.5701	0.1295
DLNREXP	0.0449	0.0942	0.4772	0.6375
DLNRIMP	0.6851	0.0902	7.5886	0.0000
ECM(-1)	-0.9672	0.2228	-4.3407	0.0002
R-squared	0.9758	Mean dependent var		0.1106
Adjusted R-squared	0.9687	S.D. dependent var		0.5432
S.E. of regression	0.0960	Akaike info criterion		-1.6356
Sum squared resid	0.2213	Schwarz criterion		-1.2692
Log likelihood	34.171	Hannan-Quinn criter.		-1.5142
F-statistic	138.26	Durbin-Watson stat		1.9046
Prob(F-statistic)	0.0000			

Source: Author's estimation results using Eviews-10, 2023

All the variables included in the model show the existence of regression. The R^2 of the model estimation is obtained at 0.97 which indicates that 97 percent of the variation in RGDP can be explained by the variation of independent variables. The computed F test is 138 is higher than the table value. The value of D-W is greater than R^2 indicating the model is free from the auto-correlation; Augmented Dickey-Fuller test has revealed non-stationary at the level and stationary when the variables are converted into the first difference. Similarly, the Angle Granger approach shows the long-run relation, the residual term is stationary at the level and the p-value is less than 5 percent. Similarly, the Error Correction Term (ECM) has a negative sign after estimation and is significant at the 5 percent level. If the P-value is less than 5 percent it corrects the error at the speed of 97 percent annually.

Model stability is checked by normal distribution, by observing R^2 and corresponding and corresponding P-values which are all greater than 5 percent. The result of Jarque-Bera statistics showed that J-B is 0.09 having a probability value of 90 percent. As the probability value is reasonably high, the residuals are normally distributed so the null hypothesis cannot be rejected following figure conforms to the normal distribution.

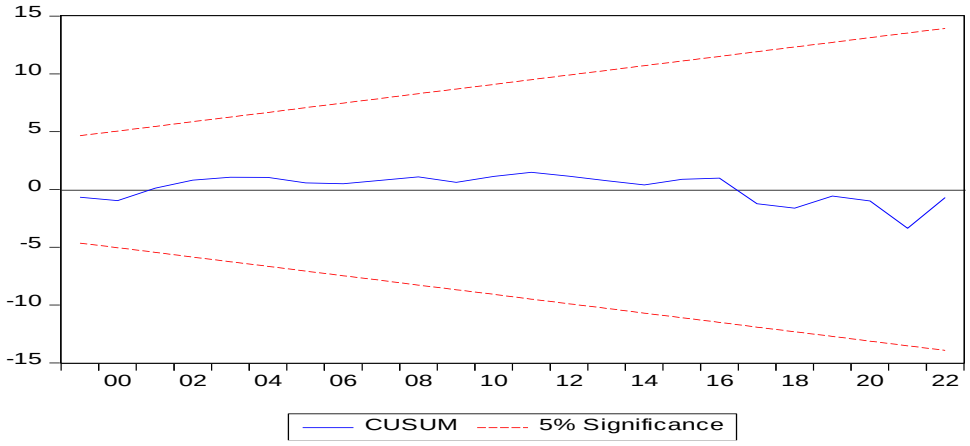


Source: Author's estimation results using Eviews-10, 2023

Similarly, the CUSUM test has no structural break limiting within the 5 percent boundary shown in the following figures.

Figure Residual Stability Test

CUSUM



Source: Author's estimation results using Eviews-10, 2023

Conclusion

This paper analyzes the impact of tourism receipts on real GDP growth in Nepal. Real GDP is the outcome variable, tourism income is the interest variable, and other variables like real foreign direct investment, remittance inflow, real domestic income, export earnings, import outflow, etc. are control variables. The Engle-Granger-Granger (ECM) with time series data starting from 1990 AD to 2022 AD was used. The findings of the paper show that there is a positive and significant relationship between tourism income and economic growth in the short run as well as the long run. The short-run result was shown by the OLS that the tourism receipts are positive as well as significant at 5 percent; in the paper, a 100 percent increase in LNRTER leads to about a 90 percent change in LNRGDP if all the variables are dropped. The unit root test of the ECM residual term being stationary at level proved that there is co-integration in the long run since $ECM_{(t-1)}$ was negative with a coefficient of 0.96 and significant at 10 percent, which showed that it corrected all the disequilibrium at convergent speed of 96 percent. However, the study shows that foreign direct investment and remittances had no significant relationship with RGDP. Statistically, FDI was not significant or negative. Both FDI and remittances are directed toward capital transfer and service duplication in the long run, rather than creating value for societies. FDI priorities have shifted from productive to non-productive sectors. This may be due to consumption from national sources. It shows cases of production from imported raw materials. Meanwhile, exports show a positive but insignificant relationship with RGDP, which implies that increasing export production from imported raw materials

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APPENDIX-I

Pairwise Granger Causality

Pairwise Granger Causality Tests
Date: 04/29/23 Time: 20:03
Sample: 1990 2022
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLNRT_ER does not Granger Cause DLNRGDP	30	0.01847	0.9817
DLNRGDP does not Granger Cause DLNRT_ER		0.20037	0.8197
DLNRDK does not Granger Cause DLNRGDP	30	0.01178	0.9883
DLNRGDP does not Granger Cause DLNRDK		1.24286	0.3058
DLNRFDI does not Granger Cause DLNRT_ER	30	1.39249	0.2671
DLNRT_ER does not Granger Cause DLNRFDI		1.19187	0.3203
DLNRREM does not Granger Cause DLNRT_ER	30	0.32535	0.7253
DLNRT_ER does not Granger Cause DLNRREM		0.32514	0.7254
DLNRDK does not Granger Cause DLNRT_ER	30	0.91937	0.4118
DLNRT_ER does not Granger Cause DLNRDK		0.41186	0.6668
DLNREXP does not Granger Cause DLNRT_ER	30	0.20355	0.8172
DLNRT_ER does not Granger Cause DLNREXP		0.10716	0.8988
DLNRIMP does not Granger Cause DLNRT_ER	30	0.43427	0.6525
DLNRT_ER does not Granger Cause DLNRIMP		0.21927	0.8046

Source: Author's estimation results using Eviews-10, 2023

APPENDIX-II

Lag order selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LNRGDP LNRT_ER LNRFDI LNRDK LNRREM LNREXP LNRIMP
Exogenous variables: C
Date: 04/29/23 Time: 20:10
Sample: 1990 2022
Included observations: 31

Lag	LogL	LR	FPE	AIC	SC	HQ

0	-134.8346	NA	2.22e-05	9.150618	9.474421	9.256170
1	-20.54341	169.5933*	3.58e-07*	4.938284	7.528713*	5.782699*
2	30.50668	52.69687	5.35e-07	4.806020*	9.663074	6.389299

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's estimation results using Eviews-10, 2023

APPENDIX-III

Unit Root Error Correction

Null Hypothesis: ECM has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.341301	0.0001
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Source: Author's estimation results using Eviews-10, 2023

APPENDIX-IV

Measure of LNRTER Impact on LNRGDP

Dependent Variable: LNRGDP
Method: Least Squares
Date: 04/29/23 Time: 18:22
Sample: 1990 2022
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.842377	1.595084	1.781961	0.0846
LNRT_ER	0.908807	0.164276	5.532214	0.0000

R-squared	0.496797	Mean dependent var	11.63070
Adjusted R-squared	0.480565	S.D. dependent var	1.147579
S.E. of regression	0.827081	Akaike info criterion	2.516864
Sum squared resid	21.20595	Schwarz criterion	2.607561
Log-likelihood	-39.52825	Hannan-Quinn criteria.	2.547381
F-statistic	30.60540	Durbin-Watson stat	0.804504
Prob(F-statistic)	0.000005		

Source: Author's estimation results using Eviews-10, 2023

Appendix V

Measure of LNRTER and Other Variables

Dependent Variable: LNRGDP
Method: Least Squares
Date: 04/29/23 Time: 18:38
Sample: 1990 2022
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.233570	0.522785	6.185282	0.0000
LNRT_ER	0.101659	0.036916	-2.753768	0.0106
LNRFDI	-0.004694	0.021576	-0.217564	0.8295
LNRREM	0.061660	0.027165	2.269827	0.0317
LNRDK	0.082209	0.063899	1.286544	0.0296
LNREXP	0.139045	0.043485	3.197529	0.0036
LNRIMP	0.652779	0.093994	6.944902	0.0000

R-squared	0.993502	Mean dependent var	11.63070
Adjusted R-squared	0.992002	S.D. dependent var	1.147579
S.E. of regression	0.102629	Akaike info criterion	-1.529567
Sum squared resid	0.273849	Schwarz criterion	-1.212126
Log-likelihood	32.23786	Hannan-Quinn criteria.	-1.422758
F-statistic	662.5137	Durbin-Watson stat	1.697306
Prob(F-statistic)	0.000000		

Source: Author's estimation results using Eviews-10, 2023