Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 4): pp.4518-4529
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.04.764856

Aggregated and Disaggregated Market Approach to Tourism Led Growth Hypothesis in Pakistan

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Abstract- The study investigates the relationship between tourism and economic growth for the economy of Pakistan. Tourism led growth hypothesis has been tested for annual data at the aggregate and the disaggregated market approach. Tourism led growth hypothesis has been tested at the aggregate level for the period of 1969-2016 through a combined co-integration test, vector error correction mechanism bi-directional causality, and uni-directional causality. The results show that tourism and economic growth have a long-run relationship, bi-directional causality in the long run, and unidirectional causality runs from tourism to economic growth in the short run. At the disaggregated level, the results show that out of 10 tourism markets only 2 markets i.e Canada and Germany support Tourism led growth hypothesis in the short run. However, 7 out of 10 tourism markets in the long run. In conclusion, the tourism-led growth hypothesis is valid in Pakistan in both cases; aggregated and disaggregated markets approach.

Keywords: Tourism, Growth, Combined Cointegration, VECM, Tourism-led growth hypothesis

I. INTRODUCTION

Tourism is considered an invisible export that increases foreign reserves and causes technology transfer, knowledge, and skills which implies a positive relationship between tourism and socio-economic development. This study analyzes the association between tourism and economic growth in Pakistan using the aggregated and disaggregated market approach. In the aggregated market approach, all tourists arriving in a destination country from all over the world are taken a single variable i.e in the case of Pakistan, the total number of tourists arriving from all over the world to Pakistan. In the disaggregated market approach, the whole tourism market is segregated into individual tourism markets where we take into account tourist arrival from an individual market i.e international tourist arrival to Pakistan from Germany or Canada, etc. The nexus between tourism and economic growth is called the tourism-led growth hypothesis. The research question of the study, 'Is the Tourism-led Growth Hypothesis valid at the aggregated and disaggregated level in Pakistan?'

Pakistan offers picturesque beauty such as mountains, lakes, and oceans to international and local tourists. The elevated mountains range over 7 thousand meters of Himalayas and Hindukush compel foreign tourists from around the world to visit Pakistan. The old and ancient cultural and traditional Indus valley and Gandara civilization, Mohenjo Daro and Harappa ruin also attract foreign tourists to visit and study the diverse cultural heritage. All these naturally bestowed and diverse demography, culture, and tradition open the way for investment in the tourism sector of Pakistan that would generate employment opportunities and enhance economic growth. The recent data of the Pakistan Tourism Development Corporation show that the arrival of foreign tourists to Pakistan has been increasing since 2013. The recent statistics reported by the world travel and Tourism Corporation, tourism in Pakistan employed 1.5 million people which is 2.4% of total employment, and is expected to grow by 3 percent in 2020. It is forecasted that 4.8 million people would be employed by 2027 (WTTC). Tourism contribution to Pakistan's economy was 5.9% of GDP in 2019. It is estimated to increase its share of GDP and reach 7.2% in 2027. Therefore, the tourism sector in Pakistan is growing and it has the potential of generating employment opportunities and thus enhances economic growth.

II. LITERATURE REVIEW

A review of the literature shows that several authors have made attempts to test the tourism-led growth hypothesis such as (Ghali 1976) investigated the empirical relationship between tourism and economic growth. The results support the tourism-led growth hypothesis. (Archer 1984) concluded that the tourism-led growth hypothesis was valid in Barbados. (Cantavella-Jordá, 2002) found that tourism in Spain has a multiplier effect and the tourism and economic growth nexus is valid. While (Durbarry, 2004) and (Dritsakis, 2004) found the same for Mauritius and Greece's economy. (Dritsakis 2004) applied a multivariate VAR model, cointegration, and causality on quarterly data from 1960: Q1 to 2000: Q4 for Greece's economy and found a positive relationship between tourism and economic growth. Similarly, (Ongan, 2005), (Khalil 2007), (Hatemi and Gunduz, 2005), (Katircioglu 2009) conducted similar studies for Turkey, Pakistan, and Malta respectively and found the tourism-led growth hypothesis valid for the countries. On the other hand, (Oh 2005) used a VAR technique to investigate the tourism-led growth hypothesis for the Korean economy. Results of the bivariate model were different from the previous studies because the outcomes showed that there is no long-run relationship between economic growth and tourism expansion in Korea. Secondly, the outcomes of the causality test reveal one-way causality from growth to tourism. The author concluded that in Korea tourism is heavily dependent on economic growth. (Malik et al 2010) analyzed the importance of the Tourism sector in the economic growth of Pakistan. They incorporated the current account deficit variable in their study because tourism helps in capital formation due to the inflow of foreign exchange that can be used to import capital goods. The findings of the study confirmed the presence of a stable long-run and short-run association between the variables. Similarly, (Brida and Risso 2010), (Kreishan 2010) results confirmed the presence of the TLG hypothesis in these regions. (Hye and Khan 2013) investigated the TLG hypothesis in Pakistan because of its importance and contribution to economic development like creating job opportunities, human and physical capital. The results support the TLG hypothesis in the case of Pakistan. Likewise, (Jalil et al 2013) conducted a similar study for Pakistan by using physical capital, trade openness and inflation as a variable along with tourism and economic growth. The outcome of the paper showed that causality runs from international tourism economic growth which indicates the significant positive impact of international tourism on the economic growth of Pakistan. Hence, both studies confirmed the presence of the TLG hypothesis in the case of Pakistan. International tourism is considered a key promoter of growth and development in both developed and developing countries. In this regard, (Jayathilake 2013) studied the Srilankan economy to check the importance of tourism's contribution to economic growth. He came up with the conclusion that international tourism plays a significant role in promoting economic growth and development in developing countries like Sri Lanka. All international tourists coming to a destination country may not be genuine tourists and might not contribute to the economic growth of the destination country. Therefore, to avoid this aggregation bias (Tang & Tan 2013) conducted a study in Malaysia to check the stability of the TLG hypothesis at the disaggregated level by using 12 different tourism markets. The results of the study showed that for 8 out of 12 tourism markets TLG hypothesis was valid and stable. Hence, they suggested that not all the international tourists coming to Malaysia contribute to economic growth. Similarly, (Lean et al 2014) for Singapore and Malaysia, (Aleemi & Qureshi 2015) for Pakistan, (Banday & M. Kocoglu 2015) for India drawn similar conclusion and accepted that tourism leads to economic growth and TLG hypothesis is valid.

III. EMPIRICAL MODEL AGGREGATED MARKET APPROACH

This study used an empirical model which is derived from (Cortez-Jimenez and Pulina 2010), (Phiri et al 2015) and (Fayissa et al 2007), The production function for the study is as follows: $Y = f(K, HC, EX, TX, IF)$ ....(1), taking log of the production function we get $lnY_t = \alpha_0 + \alpha lnK_t + \beta lnHC_t + YlnEX_t + ln\delta TX_t + \theta lnIF_t + v$ .... (2) In equation (2) $lnYt$ shows the real GDP, lnK_t and $lnHc_t$ represents the traditional source of economic growth like physical and human capital. Similarly, $lnEX_t$ represents exports and $lnTX_t$ tourism export and $lnIF_t$ shows the institutional factor.

3.2 Empirical Model for Disaggregated Market Approach

Numerous studies used the Growth accounting framework to calculate the engines of growth. However, for the validation of tourism-led growth hypothesis various model specifications have been utilized by the researchers. Among them, the most popular model utilized by the researchers to analyze the tourism-led growth hypothesis is (Balaguer and Cantavella-Jordá 2002) model. They suggested including the real exchange rate in the model to check the external competitiveness. They proposed that the real exchange

rate affects both economic growth and international tourism. Later, (Katircioğlu 2010) in his study confirmed the postulation made by (Balaguer and Cantavella-Jordá 2002). Therefore, considering all these recommendations we used a tri-variant model to examine the validity of the tourism-led growth hypothesis in Pakistan. $\boldsymbol{Y_t = f\ (VA_t,\ REER_t)}$ the specific form of the function under linearity assumption in log for is $\boldsymbol{lnY_t = \alpha_0 + \alpha_1\ lnVA_t\ + \alpha_2\ lnREER_t + e_t}$ where Y_t is gross domestic product, VA_t indicates the international tourist arrivals from different tourist markets. Similarly, *REERt* shows the real exchange rate (2010=100). $\boldsymbol{e_t}$ represents the residual term which is assumed to be normally distributed and white noise.

IV. Econometric Methodology

To accomplish the first objective this study employed yearly data from 1969-2016. We used real GDP *(Y)* as a proxy for measuring economic growth, *K* and *HC* are the traditional sources of economic growth like physical and human capital. The proxy used for the measurement of physical and human capital is the gross fixed capital formation and secondary school enrollment. Similarly, *XG* represents exports and *TX* represents tourism export which is measured through tourism receipt. While *IF* shows the institutional factor measured using a proxy of economic freedom index. The data have been collected from the Statistical Bureau of Pakistan (50 years volume I-IV), world development indicator (WDI) and Academy of Educational Planning and Management (AEPAM) data. Similarly, to accomplish the second objective this study utilized yearly data from 1979 to 2016 for real GDP, real effective exchange rate (2010=100) and tourist arrivals. The sample of 37 years has been selected on the availability of international tourist arrival data from the Statistical Bureau of Pakistan. The disaggregated market consists of the *United Kingdom, USA, India, Afghanistan, Iran, Malaysia, China, Bangladesh, Canada, and Germany*. The data have been collected from the Statistical Bureau of Pakistan (50 years Volume I-IV) and the World Development Indicators (WDI).

4.1 Combined Co-integration

Bayers and Hanck (2013) developed a combined co-integration test to enhance the power of co-integration. The distinctiveness of this test that it combines different individual tests (Engle and Granger, Johansen, Peter Boswijk, and Banerjee) to get conclusive results. Fisher's formula was employed to calculate and to combine the p-values of a different individual co-integration test. Fisher's formula for calculating combined cointegration test is as follows: $\boldsymbol{EG - JOH = -2\ [\ln (P_{EG}) + (P_{JOH})]}$**…….(3)** and $\boldsymbol{EG - JOH - BO - BDM = -2[\ln (P_{EG}) + (P_{JOH}) + (P_{BO}) + (P_{BDM})]}$ **… (4)** Where EG = Engle and Granger (1987), JOH = Johansen (1991), BO = Boswijk (1994), BDM = Banerjee et.al (1998) similarly, P_{EG}, P_{JOH}, $P_{BO,}$ and P_{BDM} are the *p*-values of the different individual tests. The null hypothesis of no co-integration can be rejected if the calculated Fisher statistics exceeds the critical value of Bayers and Hanck (2010) tabulated value and vice versa.

4.2 Vector Error Correction Method Granger Causality (VECM)

It is a method to estimate the short-run and long-run causality between the variables in a series. VECM method is estimated after the confirmation of co-integration between the variables. The estimated VECM model is as follows:

$$1-£\begin{bmatrix} lngdp_t \\ lnhc_t \\ lnpc_t \\ lntr_t \\ lnifi_t \\ lnex_t \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \\ a_5 \\ a_6 \end{bmatrix} + \begin{bmatrix} b_{11t} & b_{12t} & b_{13t} & b_{14t} & b_{15t} & b_{16t} \\ b_{21t} & b_{22t} & b_{23t} & b_{24t} & b_{25t} & b_{26t} \\ b_{31t} & b_{32t} & b_{33t} & b_{34t} & b_{35t} & b_{36t} \\ b_{41t} & b_{42t} & b_{43t} & b_{44t} & b_{45t} & b_{46t} \\ b_{51t} & b_{52t} & b_{53t} & b_{54t} & b_{55t} & b_{56t} \\ b_{61t} & b_{62t} & b_{63t} & b_{64\,t} & b_{65t} & b_{66t} \end{bmatrix} \times \begin{bmatrix} lngdp_{t-1} \\ lnhc_{t-1} \\ lnpc_{t-1} \\ lntr_{t-1} \\ lnifi_{t-1} \\ lnex_{t-1} \end{bmatrix} + \ldots\ldots\ldots +$$

$$\begin{bmatrix} b_{11t} & b_{12t} & b_{13t} & b_{14t} & b_{15t} & b_{16t} \\ b_{21t} & b_{22t} & b_{23t} & b_{24t} & b_{25t} & b_{26t} \\ b_{31t} & b_{32t} & b_{33t} & b_{34t} & b_{35t} & b_{36t} \\ b_{41t} & b_{42t} & b_{43t} & b_{44t} & b_{45t} & b_{46t} \\ b_{51t} & b_{52t} & b_{53t} & b_{54t} & b_{55t} & b_{56t} \\ b_{61t} & b_{62t} & b_{63t} & b_{64\,t} & b_{65t} & b_{66t} \end{bmatrix} \times \begin{bmatrix} lngdp_{t-1} \\ lnhc_{t-1} \\ lnpc_{t-1} \\ lntr_{t-1} \\ lnifi_{t-1} \\ lnex_{t-1} \end{bmatrix} + \begin{bmatrix} \alpha \\ \beta \\ \gamma \\ \delta \\ \varphi \\ \psi \end{bmatrix} ECT_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix} \ldots\ldots\ldots\ldots (5)$$

The above equation (1-£) shows the difference operator and ECT_{t-1} show the lagged error correction term. If the value of error correction is negative and significant then it indicates the long-run causality between the variables in the series. Similarly, if the 1st differences of the variables become significant then there exists a short-run causality between the variables in the series.

4.3 Unit Root Test

Clemente-Montanes-Reyes (1998) proposed a test that accommodates two unknown structural breaks stemming in the series. The null and alternative hypothesis of the proposed study is as follows. Null Hypothesis $\boldsymbol{H_0 ; \ yi = y_{t-1} + n_1 DTB_{1t} + n_2 DTB_{2t} + \varepsilon_t \ ...(6)}$ and alternative $\boldsymbol{H_1 ; y_t = \upsilon + m_1 DU_{1t} + m_2 DTB_{2t} + \varepsilon_t \ ... \ (7)}$ DTB_{1t} being a pulsed variable is set to 1 when $t=TBi+1$ and set to zero otherwise. Similarly $TBi < 1 \ (i=1, 2)$ then DU_{1t} is set to 1 otherwise it is equal to zero. According to (Clemente et al 1998) TB_1 and TB_2 represent the breakpoints. For two structural breakpoints the unit roots equation become as follows: $\boldsymbol{y_t = \upsilon + \gamma y_{t-1} + \alpha_1 DTB1t + \beta 2 \ DTB_{2t} + \delta_3 DU_{1t} + DU_{2t} \sum_{i=1}^{k} c_j \Delta y_{t-1} + \upsilon_t ...(8)}$ In the above equation, k shows the optimal lag and Δ is the difference operator. The t-statistic of y_{t-1} can be used to test the null hypothesis against the alternative. Whereas $\boldsymbol{\upsilon_t}$ being the residual term assumed to be white noise and normally distributed.

4.4 Granger Causality Test

The Granger Causality test is used to check the causality between the variables. If the variables in the model are co-integrated, then it is essential to estimate the Granger causality test under the error correction model (ECM). In doing so, it will capture the long run and short run unorthodoxy of series by adding one period lagged error- correction term (Narayan and Smyth 2004). However, if the variables are not co-integrated then we should run a VAR model to perform the Granger Causality test. The Granger Causality test will be conducted by estimating the following error-correction models assuming that the variables used in the model are co-integrated. $\boldsymbol{\Delta \ lnY_t = \upsilon_1 + \sum_{i=1}^{p} \alpha_i \Delta lnY_{t-i} + \sum_{i=1}^{q} \beta_i \ \Delta lnVA_{i,t-i} + \sum_{i=1}^{r} \gamma_i \Delta lnREER_{t-i} + \psi_1 ECT_{t-1} + \varepsilon_{1t} ....9}$ and $\boldsymbol{\Delta \ lnVA_{i,t} = \upsilon_2 + \sum_{i=1}^{p} \beta_i \Delta lnVA_{i,t-i} + \sum_{i=1}^{q} \alpha_i \Delta lnY_{t-i} + \sum_{i=1}^{r} \gamma_i \Delta lnREER_{t-i-i} + \psi_2 ECT_{t-1} + \varepsilon_{2t} \ ...10}$ Where $ECTt_{-1}$ shows one period lagged error correction term which is derived from the long-run relationship. The term $VA_{i,t}$ shows arrivals of tourists from *ith* tourism markets. Whereas, $\boldsymbol{\varepsilon_{1t}}$ and $\boldsymbol{\varepsilon_{2t}}$ show the residual term which is assumed to be having zero mean and constant variance.

V. Results of Aggregated Markets Approach

Clemente-Montanes-Reyes structural break unit root test has been applied to identify the two unknown structural breaks stemming in the series.

Table 5.1

Clemente-Montanes-Reyes Structural Break Unit Root Test

Variables	Innovative outliers			Additive outlier		
	Test statistics	DU1	DU2	Test statistics	DU1	DU2
ln Y	-2.462	1988	2001	-6.917*	1987	2008
ln HC	-4.060	1989	2001	-5.373**	1995	2003
ln K	-4.189	1986	2003	-5.981*	1975	1978
ln TR	-5.083	1998	2007	-5.785*	2001	2003
ln IFI	-5.264	1977	2003	-6.532*	2003	2011
ln EX	-2.556	1978	1991	-6.245*	1978	1992

* and **shows the significance level at 1 % and 5%

Table 5.1 results show that all the variables have a unit root problem at level but they are stationary at first difference at 5% level of significance. we used a combined co-integration test which is more robust as compared to individual co-integration tests the results of the combined co-integration test are more conclusive.

Table 5.2
Combined Co-integration Results

	Fisher's Statistics	Critical Values		
		1 percent	5 percent	10 percent
EG-JOH	55.26*	15.701	10.419	8.242
EG-JOH-BO-BDM	83.15*	29.85	19.888	15.804

* shows the significance level at 1 percent

Table 5.2 shows two types of tests i.e EG-JOH and EG-JOH-BO-BDM. The results of combined co-integration tests showed that as the Fisher's statistics value is greater than the critical value for economic growth, human capital, physical capital, economic freedom, exports, and tourism receipt, therefore, we reject the null hypothesis of no co-integrated at 1 percent level of significance. The results of the tests showed that there is a long-run association between the variables.

Table 5.3
Long-run Analysis

Dependent variable ln Y_t			
Variables	Coefficient	Standard error	T-statistics
ln K_t	1.3218*	0.1670	7.9131
Ln HC_t	0.7652**	0.3485	2.1954
Ln IFI_t	0.2736**	0.0939	2.9116
Ln TR_t	0.2841*	0.0412	6.8844
Ln Ex_t	0.4342***	0.2098	2.0695
R square	0.9934		
Durban Watson	1.9283		
F-statistics	4619.865		
Probability	0.0000		
Note: *,** and *** shows 1 percent, 5 percent and 10 percent level of significance			

The results of cointegration between the variables confirmed the presence of a long-run relationship between tourism and economic growth in Pakistan. Therefore, it is necessary to estimate the long-run impact of independent variables on the dependent variable. The results in Table 5.3 show the long-run analysis between the dependent variable and independent variables. The results clearly show that there is a positive and significant impact of tourism receipt on economic growth. The results indicate that keeping all other things constant a 1 percent increase in tourism receipt will increase economic growth by 0.2841 percent. The results of the study are consistent with Balaguer and Cantavella (2002), Brida et al (2009), (Belloumi 2010). The economic freedom index the proxy for institutional factor has a positive relationship with economic growth such that a 1% increase in economic freedom index increases the GDP by 0.27%. These finding of the study corresponds to the study of (Phiri et al 2015), (Durbarry 2004). Moreover, the diagnostic tests were also performed to check the problem of autocorrelation, heteroscedasticity and the normality of the series. Furthermore, to check the stability of the parameters we used the CUSUM and CUSUM square test. The results of both tests are presented in figure 1 and figure 2. Both tests indicate that the parameters are stable at a 5 percent level of significance as the CUSUM line is between the 5 percent level of significance.

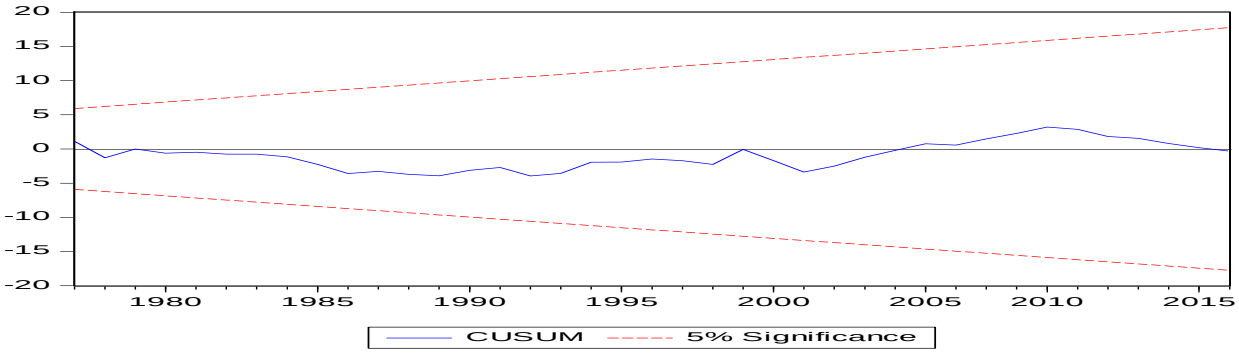

Fig. 1. Cumulative Sum of Recursive Residuals

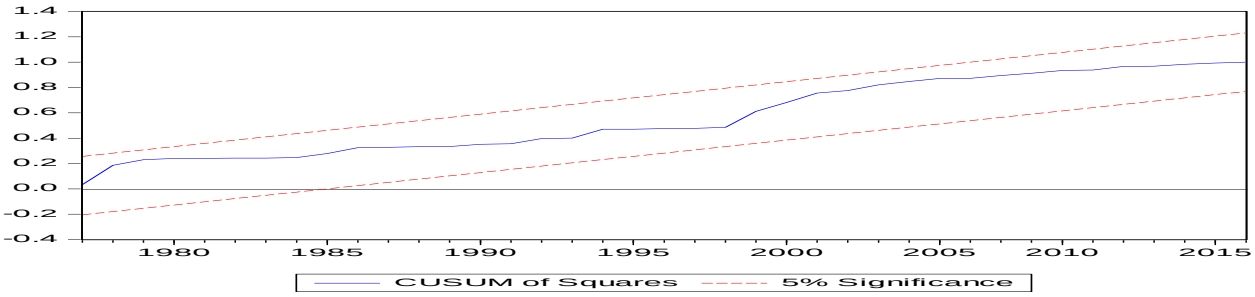

Fig. 2. Cumulative Sum of Squares of Recursive Residuals

Table 5.4
Short-Run Analysis

Dependent variable ln Y_t			
Variables	Coefficient	Standard error	T-statistics
ln PC_t	0.03096	0.024593	1.258967
Ln HC_t	1.07699*	0.390092	2.760865
Ln IFI_t	0.03559**	0.016248	2.190692
Ln TR_t	0.02703***	0.013367	2.022604
Ln EX_t	0.01017	0.051173	0.198730
ECM_{t-1}	-0.9473	0.4322	-2.19152
R square	0.7234		
Durban Watson	1.8813		
F-statistics	5.865		
Probability	0.0001		

Note: *, ** and *** shows 1 percent, 5 percent and 10 percent level of significance

The results in Table 5.4 explain the short-run phenomenon. We noticed that in the short-run, there is a significant and positive impact of tourism receipt on economic growth. The results suggested that a 1% increase in tourism receipt would increase economic growth by 0.027% in the short run. It has been observed institutional factors have a significant and positive impact on economic growth. An increase of 1 percent in institutional factors will increase economic growth by 0.03% respectively. The value of the error correction term (ECM_{t-1}) is negative and significant which is desirable for a long-term relationship. The lagged term of ECM_{t-1} shows the speed of adjustment from short-run to long-run in the system. The ECM_{t-1} value shows that any disequilibrium in economics from short-run to long-run is corrected by 0.94 percent in a year. We perform different sensitivity tests and the short-run model passed all the sensitivity tests like LM test, Ramsey-Reset test, heteroscedasticity test, ARCH test, and normality test. Furthermore, we applied the CUSUM and CUSUM square tests to check the stability of parameters. The results are significant at a 5 percent level of significance showing that the parameters of the model are stable in the short run.

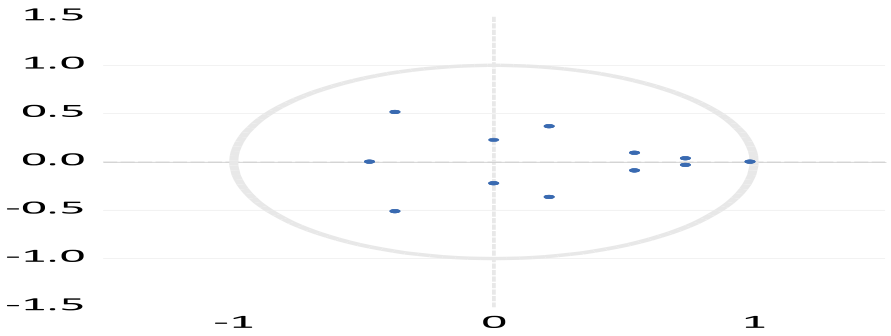

Fig. 3. Inverse roots of AR characteristics Polynomial

(Tang and Abosedra 2015c) stated that it is important to check the inverse root of AR to get reliable and robust results of Granger causality. The results will be robust and reliable if the inverse root of AR (autoregressive) lies within the circle. The results of the AR root are presented in Figure 3 which shows that all the roots are within the circle. Hence it confirms that the results are robust and reliable. The results of the vector error correction Granger causality test are presented in Table 5.5. The results of the VECM Granger causality showed a negative and significant value of the lagged value of error correction term for all the variables in the model which depicts the long-run association between the underlying variables. In long-run, there is two-way causality between economic growth and tourism growth. While in a short-run uni-directional causality runs from tourism receipt to economic growth. All the diagnostic tests were performed to check the properties of time-series. The results of the diagnostic test showed that our results are robust, reliable and consistent.

Table 5.5

VECM Granger Causality Analysis

Variables	***ln Y_t***	***ln TR_t***	***ln HC_t***	***ln K_t***	***ln IFI_t***	***ln EX_t***	***ECM t-1***	***Diagnostic tests***			
								χ^2 *Normal*	χ^2 *ARCH*	χ^2 *REMSAY*	χ^2 *LM test*
ln Y_t	-----	*0.03454*** *(0.0487)*	*0.2436**** *(0.0821)*	*0.0353 (0.2427)*	*0.0114 (0.5457)*	*0.0594 (0.3736)*	*-1.3723* (0.006)*	*1.2435 (0.6512)*	*0.0423[1] (0.8380)*	*0.1482[1] (0.7032)*	*0.3226[1] (0.7271)*
ln TR_t	*2.5871 (0.1875)*	------	*0.3179 (0.7590)*	*0.5197** *(0.0233)*	*0.2438**** *(0.0958)*	*1.1143* (0.002)*	*-0.9276* (0.0019)*	*1.3250 (0.5153)*	*1.5216[1] (0.2174)*	*0.1350[1] (0.7154)*	*0.1446[1] (0.6704)*
ln HC_t	*0.021 (0.9734)*	*0.0598 (0.6523)*	------	*0.0317 (0.4019)*	*0.0195 (0.9243)*	*0.1131 (0.1073)*	*-0.5123* (0.005)*	*1.8241 (0.7123)*	*7.1419[1] (0.1153)*	*0.5142[1] (0.8123)*	*0.9531[2] (0.3289)*
ln K_t	*0.8694 (0.2443)*	*0.0128 (0.8444)*	*0.2479 (0.6276)*	------	*0.1735** *(0.0125)*	*0.3519 (0.1522)*	*-1.8563* (0.0000)*	*1.5423 (0.6123)*	*0.0162[1] (0.8985)*	*1.1716[1] (0.2862)*	*1.8693[1] (0.17151)*
ln IFI_t	*0.2242**** *(0.0641)*	*0.0181 (0.8760)*	*1.1925 (0.1743)*	*0.6848** *(0.0020)*	------	*0.6377 (0.1145)*	*-0.8393* (0.0000)*	*0.5326 (0.7661)*	*0.0162[1] (0.8985)*	*1.1716[1] (0.2862)*	*1.8693[1] (0.1715)*
ln EX_t	*0.8655** *(0.0386)*	*0.1181* 0.0028)*	*1.11428* (0.0004)*	*0.0812 (0.2457)*	*0.0747**** *(0.0606)*	-----	*-0.5393* (0.0039)*	*0.9078 (0.6351)*	*2.5888[1] (0.1076)*	*0.1325[1] (0.6524)*	*0.0757[1] (0.9311)*

Note: *, ** and *** shows 1 percent, 5 percent, 10 percent of the level of significance respectively

5.2 Results of Disaggregated Market Approach

The results of Clemente-Montanes-Reyes structural break unit root test are presented in Table 5.6 which shows that at 5 percent level of significance, the test statistics of Clemente-Montanes-Reyes structural break unit root test failed to reject the null hypothesis of a unit root in the series including the arrivals of international tourist from Germany. Therefore, it can be inferred from the following results of the unit root test that all the variables in the series are integrated of the same order *I(1)*

Table 5.6
Clemente-Montanes-Reyes Structural Break Unit Root Test

Variables	Innovative outliers			Additive outlier		
	Test statistics	DU1	DU2	Test statistics	DU1	DU2
ln Y	-3.694	1986	2002	-3.889	1992	2005
ln REER	-2.809	1984	1997	-3.090	1987	1998
UK	-4.461	1996	2010	-4.413	2001	2012
USA	-0.931	1998	2010	-2.512	1997	2011
Afghanistan	-4.686	1990	1999	-3.326	1996	2011
Iran	-3.128	1994	2006	-4.605	2005	2009
India	-0.209	1990	2001	-2.154	1989	2000
Canada	-4.398	2003	2011	-3.322	2001	2003
China	-5.183	1985	2000	-4.413	1984	2003
Malaysia	-5.189	1989	2003	-4.992	1992	2002
Germany	-3.095	2000	2010	-0.895	1999	2011
Bangladesh	-2.283	1990	1999	-0.227	1991	1997

*Note: The minimum t-statistic at 5 percent critical value is -5.940**

After affirming the integrating order, the next step is to estimate the Co-integration relationship between the variables in a series. all variables have the same order of integration *I(1)* order so we applied the combined Co-integration test proposed by Bayer and Hanck (2013) to determine the long-run relationship between tourism, exchange rate and economic growth in Pakistan. Table 5.7 shows the result of the Bayer and Hanck combined Co-integration test.

Table 5.7
Results of the Combined Cointegration Tests

Tourism Markets	Fisher's Statistics		
	EG-JOH	EG-JOH-BO-BDM	Conclusion
United Kingdom	8.623*	22.762**	Co-integrated
USA	11.536**	22.096**	Co-integrated
Afghanistan	12.145**	23.551**	Co- integrated
Iran	14.946**	23.616**	Co-integrated
India	17.213***	34.236***	Co-integrated
China	11.924**	25.537**	Co-integrated
Canada	14.283**	29.130**	Co-integrated
Bangladesh	12.451**	28.631**	Co-integrated
Malaysia	17.234***	32.604***	Co-integrated
Germany	13.472**	22.938**	Co-integrated
Significance Level	Critical Values		
1 percent	16.679	32.077	
5 percent	10.895	21.106	
10 percent	8.479	16.444	

Note: *** and ** denote statistical significance at the 1 and 5 percent levels respectively.

The combined co-integration test consists of two forms i.e EG-JOH and EG-JOH-BO-BDM. These two forms of combined cointegration are obtained from Fisher's statistics. The results of EG-JOH in the above table show that all the tourism markets are co-integrated at 1% and 5% level of significance except for the

United Kingdom which gives an insignificant result at a 5% level of significance. However, it rejects the null hypothesis of no cointegration at a 10 percent level of significance. Hence, the results of EG-JOH infer Pakistan's economic growth is cointegrated with tourist arrival from 10 major tourism markets. While on the other hand, the results of EG-JOH-BO-BDM shows significant results for all major tourism markets at 1 percent and 5 percent level of significance. From the above results, we can conclude that there exists a cointegration between exchange rate, economic growth, and tourism, indicating a long-run association between the variables. The findings of the study are in line with the conclusions of (Balaguer and Cantavella-Jordá and Brida 2002), (Katircioğlu 2010), and (Tang 2015).

After the confirmation of cointegration between the variables, the next phase is to estimate long-run coefficients. This study utilized the Fully Modified Ordinary Least Square Method (FMLOS) to estimate the long-run coefficients. The results of FMLOS are presented in Table 5.8.

Table 5.8
Long-Run Coefficients (FMOLS)

Tourism markets	Constant	$lnVA_t$	$lnREER_t$
United Kingdom	41.249***	0.4282**	-0.368***
USA	22.334***	0.623**	-0.854**
Afghanistan	30.106***	0.362***	-0.803***
Iran	24.491***	0.811***	-0.455***
India	33.46***	0.407***	-0.816**
China	11.314**	0.912***	-0.172**
Canada	17.484***	0.147***	-0.628**
Bangladesh	22.798***	0.829**	-0.972**
Malaysia	25.482***	0.564**	-0.321**
Germany	35.484***	0.133**	-0.834**

Note: *** and ** denote statistical significance at the 1 and 5 percent levels respectively.

The results of the test indicate a positive and significant coefficient for the tourist arrivals from the ten tourism markets at 1 percent and 5 percent level of significance. The findings of this study suggest a positive impact of tourism on the economic growth of Pakistan. Moreover, the coefficients of the long-run estimates of tourist arrivals range from 0.13 to 0.91. Thus indicating, keeping all other things constant 1 percent increase in tourist arrivals will increase economic growth from 0.13 to 0.91 percent. Similarly, the real exchange rate harms economic growth in Pakistan and the coefficients are statistically significant at 1 percent and 5 percent level of significance except for Germany. The results of long-run coefficients for real exchange rate ranges from -0.3 to -0.8 indicating that holding all other things constant a 1 percent increase in real exchange rate i.e appreciation of the Pakistani Rupee decreases the economic growth plausibly within 0.3 to 0.8 percent.

When the variables are cointegrated then to explain the long-run equilibrium there must be at least on Granger causality direction in a series. The results of short-run and long-run causalities are presented in Table 5.9. Both short-run and long-run causality relationships are estimated by using an error correction framework[1]. The results of the tourism-led growth hypothesis for the ten international tourist markets show that only 2 tourist markets Granger cause economic growth in the short run namely, Canada and Germany.

Table 5.9
Granger Causality Results

Tourism Markets	Tourism-led Growth Hypothesis	
	Short-run	Long run
United Kingdom	0.050 (0.3229)	1.437 (0.0051) ***
USA	0.087 (0.154)	1.479 (0.0014) ***
Afghanistan	0.072 (0.321)	0.914 (0.721)
Iran	0.087	1.247**

	(0.165)	0.016)
India	0.042 (0.914)	0.898 (0.490)
China	0.074 (0.167)	1.157 (0.021) **
Canada	0.087 (0.026) **	1.835 (0.000) ***
Malaysia	0.085 (0.382)	0.996 (0.026) ***
Bangladesh	0.093 (0.229)	0.882 (0.342)
Germany	0.027 (0.081) *	1.213 (0.005) **

Note: The asterisks ***, ** and *shows significance level at the 1 percent, 5 percent, and 10 percent respectively.

On the other hand, in the long run, 7 out of 10 tourism markets Granger cause economic growth at 1percent and 5 percent of the level of significance. The Granger causality results further show that 3 out of 10 tourist markets namely Afghanistan, Bangladesh, and India did not contribute to economic growth both in the long run and short run.

Table 5.10
Diagnostic Test on Δ ln Y_t

Δ ln Yt	$\chi 2^{Normal}$	$\chi 2^{ARCH}$	$\chi 2^{REMSAY}$	$\chi 2^{LM\ test}$
UK	*4.234*	*0.1459[1]*	*0.670[1]*	*0.126[2]*
USA	*2.563*	*0.541[1]*	*0.333[1]*	*0.887[1]*
Afghanistan	*3.412*	*0.396[1]*	*0.472[1]*	*0.892[1]*
Iran	*1.523*	*0.140[1]*	*0.241[1]*	*0.831[1]*
India	*2.142*	*0.474[1]*	*0.152[1]*	*0.793[1]*
China	*3.261*	*0.286[1]*	*0.413[1]*	*0.799[1]*
Canada	*1.405*	*0.138[1]*	*0.346[1]*	*0.316[1]*
Malaysia	*2.361*	*0.425[1]*	*0.221[1]*	*0.995[1]*
Bangladesh	*1.642*	*0.625[1]*	*0.674[1]*	*0.166[1]*
Germany	*3.263*	*0.257[1]*	*0.138[1]*	*0.595[1]*

Several diagnostic tests were performed on the ECM equations. The results show that the ECM equations for Granger causality test has no serial correlation and ARCH problems. The residuals are normally distributed and the results of Ramsey RESET test showed no misspecification error in the model. The sensitivity tests results are reported in Table 5.10.

VI. CONCLUSIONS

The combined co-integration confirms the presence of a long-run association between economic growth, tourism receipt, physical capital, human capital, institutional factors and exports in the case of Pakistan. The results further suggested a positive and significant effect of physical capital, tourism receipt, human capital, exports and institutional factor on economic growth. Tourism stimulates economic growth both in the short run and long run. In the long run, all the variables in the system granger cause economic growth. While in the short run there is a one-way causality running from human capital, physical capital, exports, institutional factor and tourism receipt to economic growth and thus tourism led growth hypothesis is valid in Pakistan. The combined cointegration test shows that all the tourist arrival from 10 tourism markets is cointegrated with the economic growth of Pakistan. The short-run causality results show that only two countries i.e Germany and Canada stimulate economic growth in the short run. Similarly, in the long run, 7 out of 10 tourism markets Granger cause economic growth of Pakistan. Hence the results of

this study showed that the tourism-led growth hypothesis is valid in the case of a disaggregated market approach in Pakistan.

VII. POLICY RECOMMENDATIONS:

1. The government should prioritize the tourism sector and declare tourism as an important sector in terms of its contribution to socio-economic development and economic growth.
2. As compared to other countries, to establish coordination between stockholders and private sectors in Pakistan, there is a need for establishing tourism councils at the national level, provincial level and district level.
3. The government should formulate tourism policies that target those international markets that contribute to the economic growth of Pakistan.
4. To attract more tourist from the targets international markets government should provide competitive tour packages to target countries

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