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THE CONTRIBUTION OF TOURISM DEVELOPMENT TO ECONOMIC GROWTH IN PAKISTAN

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This study, empirically examines the aggregate tourism demand function for Pakistan using time series data for the period 1960-2006. The total tourism receipts in Pakistan are related to the world income, relative prices and transportation cost. This study employs bounds testing cointegration procedure proposed by Pesaran et al. (2001) to compute the short and long-run elasticities of income, prices, and transportation cost variables. Also the CUSUM and CUSUMSQ stability tests are implemented on the aggregate tourism demand function. The empirical results indicate that income is the most significant variable in explaining the aggregate tourism receipts to Pakistan and there exists a stable tourism demand function.

I. Introduction

The tourism industry is an important revenue earner in many countries due to the income generated by tourist expenses on goods and services, and taxes levied on businesses besides creating an opportunity for employment and economic advancement. This situation has encouraged the tourism industry; to be one of the sources of economic growth, especially when there will be an increase of international tourist arrivals in future as forecasted by the World Tourism Organisation [WTO (2006)].

Since international tourism is increasing at a very high rate, this has fetched new highlights for Pakistan. Because the arrivals of foreign visitors had tremendously increased by hosting 6,48,000 tourists during 2004, as compared to 500900 tourists over the previous year 2003, we earned $135.6 million. It is an increase of 29.4 per cent as we earned $185.6 million during 2004. In the year 2005, Pakistan achieved a record growth in arrivals of 7,98,260 tourists from all tourist generating markets except the South Asia, which is 23.3 per cent increase from the previous year. The Ministry of Tourism, Government of Pakistan, predicted the tourist arrivals target of 7, 20,000 for the year 2010 set by the WTO/UNDP in Tourism

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Development Master Plan. The excess in tourist arrivals over the year 2004 was not beneficial for Pakistan because the earnings from foreign tourism declined from $185.6 million to $185.3 million in 2005, registering 0.2 per cent decrease over the previous year. During 2003-04 the GNP of the country was Rs.4534 billion equivalents to $78.7 billion, during the same period, foreign earning is Rs.9.8 billion or $0.17 billion, which is 0.2 per cent of GNP. While GNP of Pakistan during 2004-05 was 4886 billion rupees, equivalents to $82.3 billion and foreign exchange earnings from tourism was Rs.10.8 billion equivalents to $0.18 billion which is the same per centage of GNP (0.2%) as was in 2003-04. According to the WTO estimates, 808 million tourists traveled worldwide in 2005, reflecting an increase of 5.5 per cent over the previous year The South Asian region, received 8 million tourists in 2005 recording an increase of 3.9 per cent over the year 2004. Pakistan's share in the region increased from 8.6 per cent in 2004 to10.1 per cent in 2005. In the world tourist arrivals, Pakistan's share is 0.10 per cent compared to the South Asian region share of 10.1 per cent in 2005. Tourism in Pakistan is not weak. About 42 million domestic visitors traveled within the country in 2005. Nearly 90 per cent tourists traveled by road, 8.5 per cent by rail and only 1.8 per cent traveled by air. The average spending per foreign tourist, $286.4 in 2004 declined to $232.1 in 2005.i.e., 1.9 per cent. Similarly spending per tourist per day also decreased by 19 per cent from $11.5 in 2004 to $9.3 in 2005.(tourism year book 2005-06) Tourism industry has played a significant role in the socio-economic development, and has promising future and growth potential in the country.

In contrast with the important role of the tourist industry in Pakistan's economy, little attention has been paid to its quantitative analysis. Existing empirical research is based on traditional econometric techniques and without examining stability situation of the estimated regression equations, The aim of this study is to perform a recent cointegration technique on the international inward tourism receipts to Pakistan in order to explore major factors which influence the level of those flows and to reveal importance of a stable tourism demand equation for economic policy evaluations.

This study also employs a very recently developed Single Cointegration Technique, Auto Regressive Distributed Lag (ARDL) approach as proposed by Pesaran and Smith (2001) in addition to performing the stability tests on the Selected Regression Equation.

The organization of rest of this paper is as follows: Section II discusses the variables, and data sources which are used in empirical studies of international demand along with explaining the data used for this study. Section III outlines the econometric methodology which is employed in this research. Section IV deals with the econometric results and concluding remarks are given in last section.

II. Data and Variable Selection

The data set is based on the gross domestic product (GDP), world income, relative tourism prices, transportation cost and the dummy variables. All series are in the natural log form except the dummy variables. In this study, to see whether the tourism demand is affected by factors such as the world income, relative tourism prices, transportation cost and the dummy variable. The dependent variable is Tourism Receipts (TR) and all others the explanatory variables.

The annual data used in the analysis for the period 1960 to 2006, has been taken from the following sources. The data of GDP, world income, tourism price, relative prices are obtained from the International Financial Statistics (IFS) by IMF. The data of tourism receipts is taken from 50 years book of Pakistan and the tourism year book, Ministry of Tourism, Government of Pakistan. The transportation cost is not available, the crude oil prices are used as proxy for Transportation cost which is obtained from www.forecasts.org and ENR Pakistan limited. The selected variables used in this study are as follows:

1. Dependent Variable

In the literature different measures are used for tourism demand. These studies have used tourist arrivals, tourism expenditure and tourism receipts as proxies for tourism demand. However, most of the studies show the tourism receipts as a common measure for tourism demand such as Lim and McAleer, (2002). Therefore, in this study the tourism receipts as dependent variable is used.

2. Independent Variables

In order to test the hypothesis, this study focus on the relationship between tourism receipts and other explanatory variables which determine the tourism demand in Pakistan. The tourism literature suggests that demand for international tourism increases with an increase in world income and improvement in law and order situation and decreases with relative prices and transportation cost. To capture these effects we use three economic factors i.e., world income, relative prices, transportation cost and one dummy variable to restrain the effect of political stability.

The World income is the sum of GNP of top ten tourist generating countries and Relative prices by exchange rate adjusted consumer price index of the destination country as well as the origin countries as used by Halicioglu (2004). It is expected that there is negative relationship between tourism demand and relative prices.

Transportation or traveling cost can be measured by (1) representative air fares between the visited destination and the country of origin [Bechdolt (1973), Gray (1966); Kliman, (2001), Kulendran and Witt (2000), Lim and McAleer (2002), and Dritsakis (2004)], (2) representative ferry fares and/or petrol costs for surface travel [Quayson and Var (1982), and Witt and Martin (1987)] and (3) price of crude oil [Halicioglu, (2004), and Munoz (2006)], In this study, the price of crude oil has been used. It is expected that the higher price of oil will reduce the tourism demand.

In this study, the dummies are the political unrest of 1999 and earthquake 2005. These dummies are included in the tourism demand model.

III. The Methodology

Autoregressive Distributed Lag (ARDL) Model

Presently, dynamic analysis has started to be explored in the tourism field especially cointegration analysis such as the works by Sieddighi and Shearing (1997), Kulendran and Witt (2001), Lim and McAleer (2002), Dritsakis (2004), Divisekera (2003), Halicioglu (2004), Narayan (2004), Han, Durbarry, Sinclair (2006), Muñoz (2006), Song and Witt (2003, 2006); and Croes and Vanegas (2006). For this study, the ARDL bound test approach has been selected, since it can also be applied for a small sample size. Furthermore, it can estimate the long-run and short-run relationships in tourism demand model simultaneously. It can also distinguish dependent and explanatory variables and allow to test for the existence of relationship between variables in level irrespective of whether the underlying regressors are purely I(0), I(1) or mutually cointegrated.

We form the following aggregate tourism demand model for Pakistan which assumes that total tourist flows into Pakistan demand is determined by the level of world income, relative prices, and the transportation cost:

$$ln\,TR_t = \alpha_o + \alpha_1 \,ln\,WY_t + \alpha_2 \,ln\,RP_t + \alpha_3 \,ln\,TC_t + \varepsilon_t \qquad (1)$$

Here, TR is the total tourist arrivals, WY is the real world income, RP is the exchange rate adjusted relative prices between Pakistan and the rest of the world and TC is the transportation cost index. All series are in natural logarithmic form (Ln). The expected signs for parameters are as follows:

$$\alpha_1 > 0 \; \alpha_2, \alpha_3 < 0$$

The autoregressive distributed lag (ARDL) deals with single cointegration and is introduced originally by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). This method has certain econometric advantages in comparison to other single cointegration procedures. Firstly, endogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger method are avoided. Secondly, the long and short-run parameters of the model are estimated simultaneously. Thirdly, all variables are assumed to be endogenous. Fourthly, the econometric methodology is relieved of the burden of establishing the order of integration amongst the variables and of pre-testing for unit roots. In fact, whereas all other methods require that variables in a time-series regression equation are integrated of order one, i.e., the variables are I(1), only that of Pesaran et al. (2001) could be implemented regardless of whether the underlying regressors are purely I(0), I(1) or mutually cointegrated.

$$\Delta ln\,TR_t = \alpha + \sum_{i=1}^{m} \beta_i \Delta ln\,TR_{t-i} + \sum_{i=0}^{m} \gamma_i \Delta ln\,WY_{t-i} + \sum_{i=0}^{m} \delta_i \Delta ln\,RP_{t-i} + \sum_{i=0}^{m} \pi i \Delta ln\,TC_{t-i}$$
$$+ \lambda_1 ln\,TA_{t-1} + \lambda_2 ln\,WY_{t-1} + \lambda_3 ln\,RP_{t-1} + \lambda_4 ln\,TC_{t-1} + \lambda_5 Dum + \varepsilon_t \qquad (2)$$

The first part of the equation with β_i, γ_i, δ_i and π_i represents the short run dynamics of the model, whereas the parameters λ_1, λ_2, λ_3 and λ_4 represent the long run relationship, the null hypothesis of the model is,

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0 \quad \text{There exist no long run relationship}$$
$$H_1: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 \neq 0$$

The ARDL model testing procedure starts with conducting the bound test for the null hypothesis of no cointegration. The calculated F-statistic is compared with the critical value tabulated by Pesaran et al. (2001). If the test statistics exceed the upper critical value, the null hypothesis of no long-run relationship can be rejected regardless of whether the underlying order of integration of the variables is zero or one. Similarly, if the test statistic falls below a lower critical value, the null hypothesis is not rejected. However, if the test statistic falls between these two bounds, the result is inconclusive. When the order of integration of the variables is known and all variables are I(1), the decision is made on the upper bound. Similarly, if all variables are I(0), then the decision is made on the lower bound.

In the second step, if there is evidence of long-run relationship of the variables, the following long-run model [equation (3)] will be estimated as:

$$TR_t = \alpha + \sum_{j=1}^{m} \beta_j TR_{t-j} + \sum_{j=0}^{m} \gamma_j WY_{t-j} + \sum_{j=0}^{m} \delta_j RP_{t-j} + \sum_{j=0}^{m} \pi_j TC_{t-j} + \lambda_1 Dum_t + \varepsilon_t \qquad (3)$$

If we find the evidences of long run relation, then in the third step the error correction model will be estimated. The error correction model results indicate the speed of adjustment back to the long run equilibrium after a short run disturbance. The standard error correction model (ECM) involves estimation of the following equation.

$$\Delta ln\,TR_t = \alpha + \sum_{j=1}^{m} \beta_j \Delta ln\,TR_{t-j} + \sum_{j=0}^{m} \gamma_j \Delta ln\,WY_{t-j} + \sum_{j=0}^{m} \delta_j RP_{t-j} \qquad (4)$$
$$+ \sum_{j=0}^{m} \pi_j \Delta ln\,TC_{t-j} + \mu Dum_t + \lambda ECM_{t-1} + \varepsilon_t$$

where λ is the speed of adjustment parameter and ECM is the residual that is obtained from the estimated cointegration model of equation (3).

To ascertain the goodness of fit of the ARDL model, the diagnostic test and the stability test will be conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticity associated with the model.

Furthermore, the stability of regression coefficient is tested by cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests popularized by Brown et al. (1975). The Brown et al. (1975)[1] stability testing technique is based on

[1] The stability of coefficients of regression equations are, by and large, tested by means of Chow (1960), Hansen (1992), and Hansen and Johansen (1993). The Chow stability test requires a priori knowledge of structural breaks in the estimation period and its shortcomings are well documented. In Hansen (1992) and Hansen and Johansen (1993) procedures, stability tests require I(1) variables and they check the long-run parameter consistency without incorporating the short-run dynamics of a model into the testing procedure - as discussed in Bahmani-Oskooee and Chomsisengphet (2002). However, it is possible to overcome these shortcomings by employing the Brown et al. () procedure if we follow Pesaran et al. (2001).

the recursive regression residuals. The CUSUM and CUSUMSQ statistics will be estimated recursively and plotted against the break points of the model. If the plots of these statistics fall inside the critical bounds of 5 per cent level of significance, then we assume that the coefficients of a given regression are stable.

IV. Results and Interpretation

Unit Root Tests

The ARDL modeling approach, popularized by Pesaran and Shin (1999) and Pesaran et al. (2001), has numerous advantages. The main advantage of this procedure is that it can be applied regardless of the stationary properties of the variables in the sample and the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modeling framework (Laurenceson and Chai 2003). Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation, which allows for inferences on long run estimates, which is not possible under alternative cointegration procedures.

The ARDL yields consistent estimates of the long run parameters which are asymptotically normal irrespective of whether the variables are I(0), I(1) or mutually integrated, since there is no need for unit root pre-testing but we think it is still important to complement the estimation process with unit root test in order to ensure that none of the variables is integrated of higher order i.e. I(2) as it will violate the assumption of bound testing procedure. As long as the ARDL model is free of residual correlation problem [Pesaran and Shin, (1999)]. The important advantage of ARDL against the single equation analysis is that the latter suffers from problems of endogeniety, while the ARDL method can distinguish between dependent and explanatory variables. Indeed, one of the important advantages of ARDL procedure is that the estimation is possible even when the explanatory variables are endogenous. Hence, ARDL provides robust and efficient results, even in small and finite sample data sizes.

Prior to the testing of cointegration, a test of order of integration was conducted for each variable, using the Augmented Dickey-Fuller (ADF-1981) and Phillips Perron (PP-1986). The PP procedures, which compute a residual variance which is robust to autocorrelation, are applied to test for unit roots as an alternative to ADF unit root test.

The underlying assumption of ARDL procedure is that each variable in equation (1) is I(1) or I(0). If any variable is integrated of higher order then the procedure is not applicable. Thus, it is still important to perform unit root tests to ensure that none of the variable in equation (1) is I (2) or higher order.

The results in Table 1 show that all variables are integrated of order one I(1) and therefore, the ARDL testing could be proceeded.

TABLE 1
Unit Root Test Estimation

Variable	ADF Test Statistic (with trend and intercept)		PP Test Statistic (with trend and intercept)	
	Level	First Difference	Level	First Difference
Tourism Receipts [lnTR]	-1.684	-6.683***	-1.714	-6.686***
Transportation Cost [ln TC]	-1.572	-7.739***	-1.767	-4.978**
Relative Prices [ln RP]	-2.503	-8.03***	-2.503	-7.952***
World Income [ln WY]	0.947	-4.023**	1.616	-4.874***

Source: Author Calculations
Note: *** (**) and * at 1%, 5% and 10% level of Significance respectively

Both the test results (ADF and PP) indicate that all variables under consideration viz; Tourism Receipts (TR), World Income (WY), Relative Prices (RP) and Transportation Cost (TC) are not stationary at level but are integrated of order one I(1) i.e., stationary at first difference. Therefore, the ARDL testing could be deployed to determine whether there exists a stable long run relationship among these variables or not.

Lag Selection Results

The ARDL is considered for long run relationships as mentioned earlier. The main assumption of ARDL is to include variables in model having cointegrated order I(0) or I(1) or mixture of both. This leads to support for implementation of bounds testing, which is a three steps procedure, in the first step we selected lag order on the basis of Schwarz criterion (SBC) because computation of F-statistics for cointegration is very much sensitive with lag length.

Therefore, the lag order of 2 is selected on lowest value of SBC (Table 2) for the overall model. Given the maximum lag order, the individual lag order through unrestricted vector auto regression (VAR) determined at which the corresponding SBC is minimum.

TABLE 2
VAR maximum Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SBC	HQ
0	-234.012	NA	0.046305	11.11683	11.32162	11.19235
1	-46.5525	322.6046	2.44E-05	3.560581	5.427408	4.013704
2	-13.2563	49.55716	1.74E-05	3.174711	4.789325*	4.005436*
3	19.66557	41.34371*	1.37E-05*	2.806253	6.082904	4.01458
4	48.54392	29.54994	1.50E-05	2.625864*	6.926469	4.211794

Notes: * indicates minimum Schwarz SBC at the corresponding lag.

The results in Table 3 indicate that the lag order for the estimation of ARDL equation (2) is (1,1,2,0,0).

TABLE 3
Variance Decomposition of Prices

Variables	Lag 0	Lag 1	Lag 2	Lag 3	Lag 4	Selected Lag
TR	2.891109	0.386969*	0.513633	0.403496	0.700730	1
WY	4.129756	0.985847*	1.151968	1.58525	1.705999	1
RP	1.871421	-0.281510	-0.693230*	0.080851	0.271747	2
TC	0.317438*	0.563898	0.797521	0.771118	0.951375	0
TP	1.846702*	4.351564	3.705384	3.908732	4.038112	0

Notes: * indicates minimum Schwarz SIC. At minimum SIC the corresponding AIC is minimum too..

3. *Bound Test Results*

Given the existence of a long run relationship, in the next step the ARDL cointegration method is used to estimate the parameters of equation (2) and R-square for computing F-statistics with a maximum order of lag set to one in order to minimize the loss of degrees of freedom [as suggested by Pesaran and Shin (1999) and Narayan (2004)]. The calculated F-statistics for the cointegration test is displayed in Table 4. Given a relatively small sample size in this study of 47 observations, the critical values are based on small sample size between 30 and 80.[2]

TABLE 4
F-Statistic of Cointegration Relationship

Test statistic	Value	lag	Significance level	Bound Critical Values* (unrestricted intercept and no trend)		Bound Critical Values* (unrestricted intercept and trend)	
F-statistic	4.688	1	-	I(0)	I(1)	I(0)	I(1)
			1%	4.306	5.874	5.184	6.684
			5%	3.136	4.416	3.834	5.064
			10%	2.614	3.746	3.240	4. 350

Source: Author Calculation
Note: * base on Narayan (2005)

[2] Pesaran and Pesaran (1997) and Pesaran and Smith (2001), however, generated critical values based on 500 and 1000 observations and 20,000 and 40, 0000 replications, respectively, which are suitable for large sample size.

The calculated F-statistic (F-statistic = 4.688) is higher than the upper bound critical value at 5 per cent level of significance (4.416), using unrestricted intercept and no trend. But the F-statistic is only higher than the upper bound critical value at 10 per cent level of significance (4.350), using unrestricted intercept and trend. This implies that the null hypothesis of no cointegration cannot be accepted at 5 per cent and 10 per cent level of significance and therefore, there is a cointegration relationship among the variables.

4. *Long Run Estimation Results*

Having found a long run relationship, the tourism demand model is estimated using the ARDL estimation approach. The empirical results of long run tourism demand elasticities are tabulated in Table 5.

TABLE 5
ARDL (1,1,2,0,0) Model Selected on the
Based of Schwarz Bayesian Criterion

	Dependent Variable: lnTR	
Variables	Coefficient	t-Statistics
Intercept	-1.998	-2.191**
lnTR,t-1	0.025	4.245***
lnTR,t-2	0.190	1.274
lnWY t	0.739	5.449***
lnWY t-1	0.036	2.792**
lnRP t	-0.089	-2.237***
lnRP t-1	-0.996	-0.369
lnTC t	-0.110	-2.771**
lnTC t-1	-0.041	-1.973**
Dummy	-0.019	-0.442
R-squared	0.829	
Adjusted R-squared	0.807	
F-statistic	19.930	
AIC Criterion	-0.072944	
SBC Criterion	0.413653	
D- Watson stat	1.865	
Durbin- h- stat	0.025	

Source: Author Calculation
Note: *** (**) and * at 1%, 5% and 10% level of significance respectively

The above results convey very important information. They indicate the existence of a stable long run relationship between dependent variables and the set of explanatory variables. All variables appear with the correct sign which indicate that world income, relative prices and traveling costs have an significant explanatory power in determining the tourism demand for Pakistan. Empirical results predict mostly positive relationship between tourism demand and income of the origin country. World income has a very strong highly significant positive effect (0.739) upon the tourism receipts. Every 1 % increase in the current world income will lead on average to a 0.739 % increase in tourism receipts in Pakistan, other things being equal. The previous year income has also significant positive impact of 0.036 on the tourism demand. The magnitude of coefficient is some what smaller than the current income, however it is statistically significant. The empirical results show that relative prices indicating relative competitiveness of the destination country to the origin country, has a statistically significant negative relationship with tourism demand. However, the lag effect of relative price is statistically insignificant. The result is consistent with the economic theory and shows that with an increase of every 1% in the current relative price, tourism receipts fall by 0.089%. The result suggests that tourists are much careful about the relative cost of tourism in Pakistan. Previous study of Munoz (2006), suggests that transportation cost measured as the price of crude oil has a negative relationship with tourism receipts. Similarly in this study the estimated coefficient of transportation cost has a highly significant (at one per cent) impact on all tourism receipts, consistent with the demand theory. The current level of transportation cost has 0.110 statistically significant negative impact on tourism receipts with a lag effect of -0.014. The dummy variable, which represents the differential slope coefficient, appears with negative sign as expected. However, it is statistically insignificant at 5% level of significance. The result might reflect an interesting fact that the political situation of the region does not have any significant impact on the tourism receipts in Pakistan.

According to the value of coefficient of determination R-squared and adjusted R-squared, the explanatory power of the tourism demand are quite reasonable, which are 0.82 and 0.80, respectively. The explanatory power of this model, in general, is equal to that of similar studies. F-statistics is highly significant. The value of Durban-h statistics indicates that there is no first order correlation in the models.

5. *Error Correction Model Results (ECM)*

After establishing the long run relationship, Table 6 reports the short-run coefficient estimates obtained from the ECM version of ARDL model. The ECM coefficient shows how quickly/slowly variables return to equilibrium. The error correction term ECMt-1, which measures the speed of adjustment to restore equilibrium in the dynamics model, appears with negative sign and is statistically significant at one per cent level of significance, ensuring that long run equilibrium can be attained.

3 "If a regression model contains lagged value(s) of the regressand, the Durbin-Watson statistics value in such cases is often around 2, which would suggest that there is no first order autocorrelation in such models. Thus, there is a built-in bias against discovering first order autocorrelation in such models. As a matter of fact, Durbin has developed the so-called Durbin –h test to test serial correlation in autoregressive models." [Gujrati (2003)], "Autocorrelation: What happens if the Error Term are Correlated", Chapter 12 in Basic Econometrics 4th Edition, Mc-Graw Hill/Irwin, New York, USA. pp 471.].

TABLE 6
Error Correction Representation for the Selected ARDL Model
ARDL (1,1,2,0,0) selected based on Schwarz Bayesian Criterion

	Dependent Variable: Δ Tourism Receipts	
Variables	Coefficient	t-Statistics
Constant	2.032	1.962*
$\Delta \ln TR_{t-1}$	0.180029	4.433436***
$\Delta \ln TR_{t-2}$	0.091971	2.640282**
$\Delta \ln WY_{t}$	0.078692	3.328637***
$\Delta \ln WY_{t-1}$	0.842960	7.283378***
$\Delta \ln RP_{t}$	-0.015309	-0.364097
$\Delta \ln RP_{t-1}$	-0.866163	-20.90574***
$\Delta \ln TC_{t}$	-0.129487	-4.530783***
$\Delta \ln TC_{t-1}$	-0.277815	-8.695555***
Dummy	-0.036522	-4.165023***
ECM_{t-1}	-0.073589	-26.62699***
Goodness of Fit Statistics		
R-squared		0.794
Adjusted R^2		0.793
F-statistic		1129.570*
Durbin-h stat		1.846
Short run Diagnostic Tests		
Ser. Corr. LM Test		6.162 (0.858)
ARCH Test		0.196 (0.823)
W-Hetero. Test		2.224 (0.274)
Ramsey RESET		2.109(0.126)
Jarque-Bera Test		0.140 (0.936)

Source: Author Calculation
Note: *** (**) and * at 1%, 5% and 10% level of significance respectively.

The coefficient of ECM_{t-1} is equal to (-0.074) in the short run model, which imply that deviation from the long-term equilibrium is corrected by 7 per cent over each year at zero per cent level . The lag length of short run model is selected on basis of Schwartz Bayesian Criteria (SBC). The error correction model (ECM) coefficients have the same signs as in the long run ARDL model and are mostly significant. However, there is marked difference in the magnitude.

In the short run the current income effect is much smaller than that of in the long run, but the lag effect of short run is stronger. Every 1% increase in the current income in the origin countries leads to an increase of 0.078% in the tourism receipts. However, the previous level of income increases the tourism receipts by 0.843%.

The current year relative price does not have any significant effect on the tourism demand as the coefficient is statistically insignificant in the short run model. However, its lag effect is negative and statistically significant. The results reflect an interesting fact that current year relative price of tourism is statistically significant in the long run and insignificant in the short run model, but the lag effect of relative price is insignificant in long run and significant in short run. It shows that those tourists are much sensitive to the current level of relative price in the long run and to the previous level of relative price in short run.

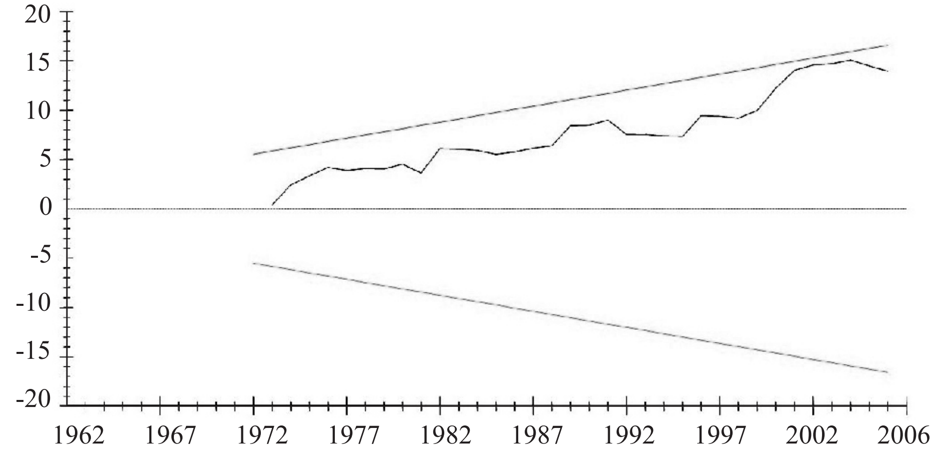
Empirically, the negative relationship between transportation cost and tourism demand is found. Accordingly, the co-efficient estimated with ARDL based approach for transportation cost (TC) is negative and statistically significant. However the effect of transportation cost is stronger in the short run than in the long run.

Interestingly, the dummy variable, which captures the effect of political instability and law & order situation, is statistically significant as opposed to the long run. It appears with negative sign and strikingly significant at zero per cent of significance, reflecting that political instability and worse law and order situation in the region has an unenthusiastic effect on tourism demand in Pakistan.

The ECM model passes all short run diagnostic tests for no serial correlation, no conditional autoregressive serial correlation, no heteroscedasticity and no specification error in functional form and the error term is normally distributed. The regression for the underlying ARDL equation fits very well at R^2 =0.794 and also passes the diagnostic tests.

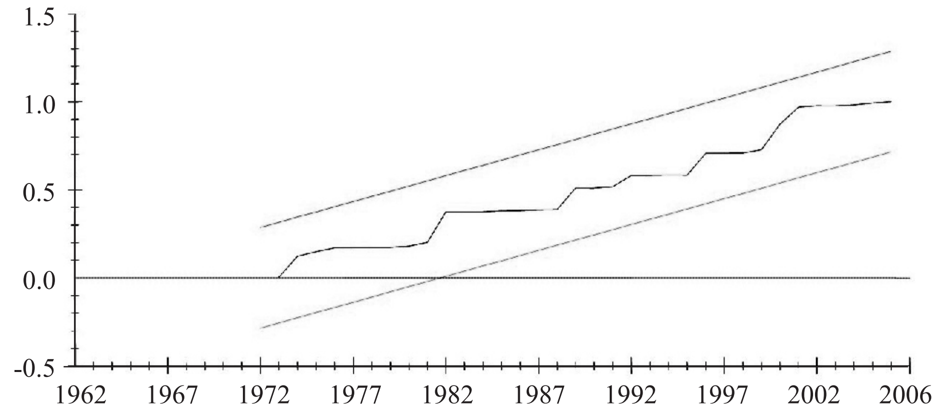
Furthermore, the stability of the regression coefficients is evaluated using the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) of the recursive residual as suggested by Brown et al, (1975) and Pesaran and Smith (2001). The regression coefficients appear stable, given that neither the CUSUM nor the CUSUMSQ test statistics exceed the bounds of 5% level of significance (Results are presented in figure 1 and 2).

FIGURE 1
Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

FIGURE 2
Plot of Cumulative Sum of Square Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

V. Conclusion and Policy Implications

Present study attempted to estimate an aggregate tourism demand function for Pakistan using a recent single cointegration technique, i.e., ARDL approach. The results from this estimation suggest that the most significant factor in determining the level of tourism receipts into Pakistan is real world income level, which is followed by the relative prices and transportation cost. It is empirically presented that the estimated tourism demand function reveals a stable long-run relationship between its dependent and independent variables. To this end, the CUSUM and CUSUMSQ stability tests utilized and they indicate that there exists a stable tourism demand function. These results indicate that it is possible to use the estimated aggregate tourism demand function as a policy tool in implementing tourism policy in Pakistan. As far as the Pakistan tourism policy is concerned, we assume that stability of a tourism demand function will reduce the uncertainty associated with the world economic environment and will increase the credibility of its commitment to pursue a sustainable tourism policy.

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