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TOURISM, TERRORISM AND ECONOMIC GROWTH IN CASE OF PAKISTAN: AN ECONOMETRIC MODEL APPROACH

Abstract

This empirical study attempts to indicate the impacts of tourism and terrorism on economic growth in Pakistan with augmentation of expenses and inflation variables to Tourism-led Growth (TLG) hypotheses. An abundance of literature has demonstrated the FDI and export nexus with economic growth, but this study focuses on the abovementioned variables. The stationarity of the data has been checked through ADF tests and is stationary at first differences, while stability, serial correlation and problems of heteroscedasticity have also been detected through various techniques in order to ensure the robustness and consistency of our model. The Johansen's co-integration test revealed that there is long-run co-integration among variables; the test results show a significant positive impact of tourism on economic growth. Terrorism and inflation have statistically negative significant impacts on growth, and expenses have negative insignificant impacts on economic growth. In addition, the Granger causality test shows the existence of long-run one-way Granger causation running from tourism to economic growth. This study suggests that policy makers should take appropriate steps to attract more international tourists in order to attain long-run economic growth in Pakistan.

JEL CLASSIFICATION: F43, Z30, EOO.
KEYWORDS: TOURISM; TERRORISM; EXPENSES; INFLATION; JOHANSEN'S COINTEGRATION TEST; PAKISTAN.

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1. Introduction

Economic growth means a sustainable increase in real output. To attain sustainable economic growth is the ultimate goal of every nation. Many countries of the developed world and some Asian nations are enjoying sustainable growth, including Thailand, Korea, Japan, Indonesia, Singapore, and especially India and China. Pakistan is also an important Asian and developing economy that has been striving to accomplish sustainable long-term economic growth since its independence but has failed. What is the reason? There are many factors that hinder economic growth, such as limited government understanding of the real factors or poor policy implementations towards economic growth. However, it is difficult to answer this question so easily (Iqbal et al. 2013). Economic growth can be affected by different factors because of its complex nature. Economists identify several factors that contribute to economic growth, positively or negatively. The present study tries to present an empirical analysis of an essential research question: 'Do tourism, government expenditure, terrorism and inflation influence the economic growth progression of Pakistan?' The following is a detailed discussion of the factors and their impact on gross domestic product (GDP) growth in Pakistan, which is important to this study.

Tourism has a key economic importance for a nation; it creates a substantial amount of foreign exchange income that contributes to the economic growth of a nation. The revenue from international tourism is a valuable source of earning for all nations; it alleviates the pressures on the balance of payments. Tourism in Pakistan has increased with decreases in terrorism recently. In 2016, the number of international tourists to Pakistan tripled compared to 3 years before.[1] According to a Pakistan Tourism Development Corporation (PTDC) report, foreign tourists have increased since 2013 to 1.75 million, though domestic travellers have increased 30 percent and number 38.3 million.[2]

According to a WTTC report, it is expected that domestic travel expenditures will jump 5.6 pc (Rs 2.13 tr) in 2027 from (Rs 1.24 tr) 5.3 pc per annum in 2017. In 2016, total spending by foreign tourists was Rs 93.8

[1] *Bloomberg* reported.
[2] Dawn.com Updated September 30, 2017 4478

billion and is expected to jump to Rs 96.7 billion in 2017; it is forecast to rise to Rs 204 billion by the end of 2027. In 2016, Pakistan ranked 47th among 185 countries in tourism direct and absolute contributions and 136th in terms of relative contribution to GDP; it is expected the industry will employ up to 4.8 million people by 2027. Pakistan's scenic exquisiteness has historically fascinated overseas and home tourists and travellers equally, but the country's image as a tourist destination was marred due to terrorism and militancy, mainly in the northern parts of the country.[3]

Pakistan has improved its ranking in the tourism industry. Less than a million international tourists came to Pakistan in 2017, currently ranking 124 out of 136 countries as noted in the Travel and Tourism Competitiveness Index 2017 released by the World Economic Forum.[4] The worst attribute for Pakistan, as noted by the report, was visa attainment, where the ranking was 135 out of 136 countries. Amongst the 136 countries, the government's prioritization of travel and tourism industry was ranked at 132, while the sustainability of travel and tourism industry development ranked 128. Effectiveness of marketing and branding to attract tourists ranked 125. The quality of tourism infrastructure ranked 123, while hotel rooms ranked 129. Pakistan has a total of 36 world heritage cultural sites, and the attractiveness of natural assets scored 127.

In 2017, the travel and tourism industry continues to make a real difference in the lives of millions of people by driving growth, creating jobs, decreasing poverty and nurturing development. Travel and tourism directly produced 1,337,500 jobs in 2016 (2.3% of total employment), and this was forecast to grow by 2.3% in 2017 to 1,368,000. This mainly replicates the economic activity produced by related industries, such as hotels, travel agents, airlines and other passenger transportation. Travel and tourism's

[3] A World Travel and Tourism Council (WTTC) report titled "Travel and Tourism Economic Impact 2017" cited by *Bloomberg* estimated tourism's contribution to the economy at Rs 2.03 trillion ($19.4 billion) ─ 6.9 pc of the Gross Domestic Products (GDP). The WTTC forecasted this contribution to rise 6pc this year, and to exhibit a 5.8 pc per annum increase, reaching Rs 3.8 tr ($36.1 bn) ─ 7.2pc of GDP ─ in 2027.

[4] Pakistan improved its ranking in the 2017 Travel and Tourism Competitiveness Index released earlier this year by the World Economic Forum. Local reports also suggest tourism is on the rise in the country.

share of total national investment will rise from 9.2% in 2017 to 11.4% in 2027[5].

The causal association between tourism and economic growth is well presented in various studies focused on multiple nations, sample periods, variables and econometric methods and deliver mixed findings. The results of the various studies consist of four main hypotheses: tourism-led growth; growth-led tourism; feedback hypothesis, indicating there is bidirectional causality between inbound tourism and economic growth; and the neutrality hypothesis, when no causality exists between international tourism and economic growth.

Ohlan (2017), in his study of the newly developed Bayer and Hanck combined test specification, found that tourism, economic growth and financial development were co-integrated in the period of 1960-2014. He also revealed that inbound tourism increases economic growth, both in the long run and short run, and his findings further indicate long-run one-way Granger causation from tourism to economic growth. Although tourism nexus growth empirically has been investigated intensively, the direction of causality is still under debate in developing economies. Kostakis and Theodoropoulou (2017) used spatial data analysis to suggest a connection between tourism and economic growth while using data from 2000-2014 for Southern Europe's regions. The empirical findings divulge the existence of the significant conditional convergence hypothesis that is associated with the endogenous growth theory. Their findings also show that tourism and human capital supply seem to have positive influences on regional income. Dogru and Bulut (2017) investigate the causal relations between tourism development and economic growth. Their research outcomes indicate that there is bidirectional causality between growth in tourism receipts and economic growth, proposing that economic growth and tourism development are interdependent and that tourism development fuels economic growth, and vice versa. Barahona (2017), used co-integration and Granger causality tests to check the hypothesis of tourism-led economic growth in Thailand. His results showed that tourists from South Asia and Oceania led or increased Thailand's economic growth. Ribeiro et al. (2016) examine the economic influences of expenditure on tourism in Brazil, which shows that tourist expenditure in the Northeast was responsible for a 3.9% increase in

[5] Travel and Tourism Economic Impact 2017 Pakistan, World travel and tourism Council

the Northeast's GDP. Furthermore, the sectorial analysis showed significant spill-over effects to the rest of Brazil, especially from manufacturing industries. Tugcu (2014), in his research using panel data for the period 1998-2011, applied panel Granger causality to specify that causality between tourism and economic growth depends on the country group and tourism indicator. Furthermore, European countries are better able to generate growth from tourism compared to Mediterranean countries.

The tourism industry, especially in the previous few decades, is a crucial source of income generation for developing economies (Atan and Arslanturk, 2012). The impact of tourism on economic development and growth is replicated in exports. This study will apply the so-called tourism-led growth (TLG) hypothesis, using time series data, from this perspective, which is a simple reflection of the export-led growth hypothesis. The growth hypothesis refers to a situation in which tourism plays a vital role in the economic growth process either directly and/or as a complement to other production factors. Upon examination of the literature, it is noted that tourism growth studies are classified under two strands. The first strand includes studies that investigate the causal association between tourism and economic growth by employing the Granger causality test with time series data. The second strand of the literature is composed of studies that analyse the association between tourism and economic growth by using cross-section or panel data and indicate that there can be mixed results on the association between tourism and economic growth that are sensitive to the specific country group being examined.

The relationship between economic growth and tourism development has been broadly examined in tourism economics literature. A number of studies reported evidence of a relationship between economic growth and tourism development that supports unidirectional causality from tourism development to economic growth, and others showed support from economic growth to tourism development. There is also support for bidirectional causality, and some studies have found no causality between economic growth and tourism development, while a variety of empirical techniques have been applied to investigate the causal relationship between tourism and economic growth (Tugcu 2014).

Terrorism hinders economic growth. There is no single definition of the term terrorism. In general, terrorism means any activities or actions that increase fear and anxiety in the world, a region or a country. Historically, many researchers and academicians have given much more attention to the

cause and consequences of war and internal conflicts; however, existing economic literature has not significantly utilized and analysed the interruption of terrorism on economic growth (Shahbaz et al. 2013). Recently, Pakistan is facing the menace of terrorism, facing the costs of Afghan War after the Soviet invasion in 1979 and the US occupation. Pakistan is also influenced by numerous ethnic, political, religious and linguistic clashes, which have enhanced terrorist activities in the country. According to Pakistan official estimation, the economy has been impacted to the extent of more than US$ 51.3 billion between 2001 and 2010, which has caused a huge reduction to GDP growth and FDI, damage to infrastructure and the tourism industry, capital and human flight, and much more. [6]

Survila et al. (2017) examined the impact of terrorism on the tourism sector of Lithuania by using secondary data and carried out (qualitative) surveys. Since the possibility of a terrorist attack in Lithuania is trivial, their study emphases the Lithuanian outbound tourism sector. It is worth emphasizing that tourists become the victims of not only pre-planned but also of individual terrorist attacks. The purpose of their study was to identify how Lithuanian tourists and experts perceive dangers and whether this affects their choice of trips and what measures can reduce the impact of terrorist attacks on tourism. Basu and Marg (2010) examine the impact of political instability and terrorist activities on tourism industry in three Middle East countries: Egypt, Jordan and Lebanon. This industry is an important and key factor to their development. They found that The Sharm-el-Sheikh event triggered a loss of 8% of international tourism earnings in 2004 and a loss of 0.56% of GDP of 2005. Likewise, Dahab incidents affected 8% of international tourism incomes of 2005 and 0.53% of GDP of 2006. Incidents in Jordan in November 2005 affected 7% of international tourism revenues of 2004 and 1% of GDP of 2005. In the case of Lebanon, two major incidents, the war of 2006 and a terror occurrence in May 2008, caused a 17.3% and 7.2% reduction in international tourism revenues compared with 2005 and 2007, respectively. Iqbal et al. (2013) examined the influence of important determinants, including similar FDI, exports, and exchange rate as well as terrorism and political instability on the economic growth in Pakistan from 1973 to 2010. The empirical results showed that exports, FDI and exchange rate positively impact economic growth in Pakistan, while terrorism and political instability negatively impact

[6] Pakistan Embassy, Economic division FY (2011).

economic growth. Shahbaz et al. (2013) studied the causal relations between terrorism and economic growth in Pakistan by incorporating capital and trade openness in a production function. The study was conducted from the period 1973 to 2010. The ARDL test showed that there is a long-run association between terrorism and economic growth. The Granger causality test shows that terrorism affects economic growth. Gaibulloev and Sandler (2008) compute the influence of terrorism and conflicts on income per capita growth in Asia from 1970-2004. Their panel estimations indicate that transnational terrorist attacks have significantly negative consequences. An additional terrorist incident per million persons reduces GDP per capita growth by approximately 1.5 percent. Transnational terrorism decreases growth by crowding in government expenditures. An internal conflict has the greatest growth concern, more than twice that of transnational terrorism. However, in our study, we did not find any causation from terrorism to tourism, although terrorism has a significant negative impact on economic growth in this study.

Like other developing countries, one of the utmost essential objectives of macroeconomic policies in Pakistan is to sustain high economic growth together with low inflation. However, there has been substantial debate on the nature of the inflation and growth association. Therefore, this study will also attempt to address the effect of inflation on growth. To achieve sustainable economic growth joined with price stability is the vital goal of macroeconomic policies for the majority of nations in the world (Umaru and Zubairu 2012). Madurapperuma (2016) observed the impact of inflation on economic growth in Sri Lanka during the period 1988 to 2015 by applying a Johansen co-integration test and an Error Correction model and found that there is a long-run negative and significant association between economic growth and inflation. Kasidi and Mwakanemela (2015) observed the influence of inflation on economic growth and found a relation between inflation and growth. Time-series data for the period 1990-2011 was employed, and there was a negative relation between the variables. Their results show no evidence of co-integration between inflation and economic growth in Tanzania. Shuaib et al. (2015) studied the effect of inflation on the economic growth in Nigeria from 1960 to 2012. The empirical result revealed that there is no co-integrating association between inflation and economic growth for Nigeria. Additionally, they observed a causality association between the two variables by employing pair-wise Granger

causality. We can see from the observations of the above studies that there are mixed findings by various researchers for different economies.

In the past few years in the economic history of Pakistan, the pace of economic growth is gradually decreasing, but the size of government expenditure is gradually increasing. This study will also examine the expenses of percent of GDP on economic growth. Increments in government expenditures above this minimum level have a decreasing effect on economic growth. At several levels of expenses, the effect of government expenses on the production of goods and services is negative. Unnecessary government spending makes everyone poorer.[7] According to various academic research studies, unnecessary government spending damages economic growth. There is substantial debate over the impacts of corruption and government spending on growth. This study will provide a contribution to the debate, starting with a tourism-led growth model and extending it to account for the effects of government spending, namely, expense to GDP. Many studies have just addressed military spending and functional spending.

There are numerous indiscretions in the nation leading to public turmoil, and there is growing fraud in government actions caused from an unsuitable public financial arrangement and execution commonly seen in some developing nations. Terrorism also leads to increased military expenditure, and private resources were then used to counter terrorism as the USA increased their military expenditure to 100 billion dollars from 2001 to 2005 for the war on terror in Afghanistan and Iraq and spent 5 billion dollars on transportation and airport security annually. However, firms have also paid additional money annually because of the risk and threat of terrorism (Anwar et al. 2017). However, in some terrorist-affected countries and developing countries, most of the government expenditure goes to military expenditure rather than to investment or functional expenditure. The importance of the question comes from the fact that the military sector uses a large portion of the limited resources of any society. Those scarce resources have alternative uses in the productive sectors of the economy. In the case of Pakistan,

[7] Currently, the United States and most developed countries' governments spend excessively, which reduces economic growth. In other words, as governments divert resources away from private entrepreneurs, jobs, investment, and productivity decline, which ultimately slows down the economy (Joint Economic Committee Republicans Monday, March 27, 1995 report).

productive and functional expenditure on infrastructure, health, human capital and education is less than 4% total GDP. B.C. Olopade and D.O. Olopade (2013) tried to measure how fiscal and monetary policies (government expenditures) affect economic growth and development in Nigeria. Their result showed insignificant relations amongst the majority of the components, including expenditure, economic growth and development.

There are many studies that have addressed tourism and economic growth in developed and European countries while using panel data; however, this study will bridge the gap for developing countries like Pakistan. The major objective of the article is to examine empirically the long-run and short-run impacts of tourism, terrorism, inflation, and government expenses on the economic growth of Pakistan to understand the importance of those variables in the process of economic growth and to propose policy measures and recommendations to attain a high and sustainable GDP growth level. This objective is carried out by using tourism-led growth hypotheses (TLG) with an augmentation of other variables in the function. The hypotheses formulated for the testing are that increasing international tourism inflow will positively influence economic growth, as an increase in tourism will promote growth of Pakistan, and that terrorism, expenses and inflation will have negative impacts on economic growth. The study contributes to existing growth and tourism economics literature in the following ways: ADF tests are used to test the order of integration of the variables, and the Johansen's co-integration and Vector Error Correction Model (VECM) are applied to examine both short-run and long-run associations. Direction of causal relation is investigated by a Granger causality approach.

2. Speciation of the Model and Methodology

2.1. The development of the model

Various models have been used by different studies, like the growth-led tourism hypothesis, the feedback hypothesis and the neutrality hypothesis, but the current study will apply the so-called tourism-led growth (TLG) hypothesis using time series data, which is a simple reflection of the export-led growth hypothesis.

$$Gr_t = f(Tour_t, Terr_t, Inf_t, Exps_t) \quad (1)$$

The econometric analysis is based on a simple regression frame work derived from the Tourism-led Growth (TLG) hypotheses. A simple log-linear form of the above equation is:

$$logGR_t = \beta_0 + \beta_1 logTour_t + \beta_2 logTerr_t + \beta_3 logInf_t + \beta_4 logExps_t + \mu_i \quad (2)$$

While:
'Gr', Gross domestic product growth,
'Tour', Tourism Receipts,
'Terr', Terrorism incidents regardless of doubts,
'Inf', Inflation rate,
'Exps', Expenses,
'μ', Error Term
't', time period annually.

All the variables are taken in the logarithmic form; β_0 is constant, while β_1,β_2,β_3 and β_4, indicate coefficients. Coefficients of elasticity are measures of the degree of responsiveness.

2.2. Data Collection

Time series secondary data over the period 1995-2015 have been used for analysis. Based on data availability, the explanatory variables included in the empirical model—GDP growth, tourism (% export), inflation, consumer prices (annual %) and expenses (% GDP)—are collected from the World Development Indicators (WDI, 2017 www.worldbank.org), while data for terrorism is taken from the Global Terrorism Database (www.start.umd.edu/gtd) for all terrorist incidents regardless of doubt.

2.3. Estimation Procedures

For time series data analysis, there are different methods that can be employed on the basis of the nature of the data. Such techniques include the ARDL model, VAR and Johnson Co-Integration techniques; the first step in time series data is to check the stationarity of the data through PP and ADF tests. For the current study, we have used the VAR-based Johnson Co-Integration test to check the long-run relation between the variables and Vector Error Correction Model (VECM) to measure short-run and long-run

relationships between them. If all of the variables of interest were found of nature I (1), then the Johnson co-integration can be utilized. However, there are a few steps to be done before proceeding.

2.3.1. Unit root test

First, we will check the stationary of the data; it is essential to check first for possible non-stationary problems (unit root). Ignoring unit root problems would lead to spurious regression. We have used the Augmented Dickey and Fuller (ADF) test to check the stationarity of the data. The general form of various test is:

$$\Delta Y_t = \delta Y_{t-1} + \mu_t \quad \text{(i)}$$

The equation for intercept and no trend can be written as follows:

$$\Delta Y_t = \alpha + \delta Y_{t-1} + \sum_{i=1}^{p} \alpha_t \, \Delta y_{t-i} + €_t \quad \text{(ii)}$$

OLS can be used in a condition if all the variables of interest found stationarity at level. If it is higher than level, then a different test be used.

2.3.2. Optimal lag Length

The second necessary step is to find optimal lags in time series data. The Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) have been used to decide the optimal lag length on the basis of minimum values of these both criteria. To attain proper empirical results, the selection of the optimal lag length is an essential task.

2.3.3. Johnson Co-integration Test

The third necessary step in this study is to utilize the VAR-based Johnson co-integration estimation method developed by Juselius and Johansen (1990) to compute the empirical long-term association between dependent and independent variables. If no stationary but I (1) time series are co-integrated, we can run the Vector Error Correction Model (VECM) to examine both the short-run and long-run dynamics of the series.

2.3.4. Error Correction Model

When there are long-run relations between the variables, i.e., the variables are co-integrated, there is an error correction sign. A conventional ECM for co-integration series can be shown as follows:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_i \Delta Y_{t-i} + \sum_{i=0}^{n} \delta_i \Delta X_{t-i} + \Phi z_{t-i} + \mu_t \quad \text{(iii)}$$

A co-integration equation is thus:

$$z_{t-i} = ect_{t-i} = Y_{t-i} - \beta_0 - \beta_i X_{t-i} \quad \text{(iv)}$$

Z and ECT are the OLS residuals from the above long-run co-integrated regression; error correction relates to the fact that the last period deviation from log-run equilibrium (error) influences the short-run dynamics of the dependent variables. Thus, the coefficient of ECT 'Φ' is the speed of adjustment because it measures the speed at which the dependent variable returns to equilibrium after a change in independent variables.

$$\Delta loggr_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta(loggr)_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta(logExpens)_{t-i} + \sum_{i=1}^{n} \beta_3 \Delta(logInf)_{t-i} + \sum_{i=1}^{n} \beta_4 \Delta(logTerr)_{t-i} + \sum_{i=1}^{n} \beta_5 \Delta(logTourm)_{t-i} + \Phi ect_{t-i} + \mu_t \quad (3)$$

3. Results and Discussion

This section elaborates the empirical association among economic growth, tourism, terrorism, inflation and expenses on the basis of an econometric estimation method of Johansen co-integration. ADF unit root analysis signifies that some variables are non-stationary at level. However, to achieve stationarity at first differences. The Johnson test is compulsory in this situation to check if any long-run relationship exists among them. The unit root ADF test result is reported in table 3.1.

Table 3.1. Unit Root Analysis.

ADF Test Statistic					
	Level		First Differences		
Variables	Constant	Intercept and no trend	Constant	Intercept and no trend	Conclusion
$logGr_t$	-3.8085	-2.9350	-3.8315***	-5.3604***	I(1)
$logExpens_t$	-3.8315	-1.6831	-3.8573***	-4.9138***	I(1)
$logInf_t$	-3.8085	-1.4375	-3.0299**	-3.7559**	I(1)
$logTerr_t$	-3.8085	-0.7290	-3.8315***	-4.3181***	I(1)
$logTourm_t$	-3.8085	-0.9902	-3.8315***	-5.3260***	I(1)

Where (***), (**) and (*) represent 1%, 5% and 10% levels of significance level.

Through unrestricted VAR estimation we found that one lag is appropriate for our model estimation; the AIC and SC values are the lowest. Table 3.2 shows the results of lag selection criteria, which is reported below.

Table 3.2. Lag Selection Criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	67.24186	NA	6.83e-10	-6.915762	-6.668437	-6.881659
1	120.4881	70.99493*	3.38e-11*	-10.05423*	-8.570275*	-9.849611*
2	141.2818	16.17288	1.28e-10	-9.586861	-6.866281	-9.211730

*indicates lag order selected by the criterion

LR: Sequential modified LR test statistics (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

3.2. Johnson co-integration test

The VAR-based Johnson co-integration estimation method developed by Juselius and Johansen (1990) was used to compute the empirical long-term association between dependent and independent variables. Table 3.2 shows the unrestricted co-integration rank test (Trace); the null hypothesis of no co-integration is rejected. From the finding of trace statistics, we reject the null hypothesis while accepting the alternative hypothesis of existence of co-

integrations. The estimation table of the Johnson co-integration test is available at appendix table no. (I).

Table 3.2. Unrestricted Co-integration Rank Test (Trace).

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.912916	91.02960	69.81889	0.0004
At most 1	0.794370	47.09378	47.85613	0.0589
At most 2	0.474474	18.62360	29.79707	0.5202
At most 3	0.323431	7.043190	15.49471	0.5726
At most 4	0.000568	0.010219	3.841466	0.9192

**MacKinnon-Haug-Michelis (1999) p-values

* denotes rejection of the hypothesis at the 0.05 level, while alternative is excepted; trace statistic indicates 1 co-integrating eqn(s) at the 0.05 level.

3.3. The Empirical Results

From our analysis, we have found there is co-integration, which means a long-run relationship exists between variables, so we use VAR to estimate the VECM model: See table no. (II) For VECM model complete estimation. The result of the Estimated VECM with GDP growth is the target variables:

$$\Delta loggr_t = 0.0621 - 0.674ect_{t-1} - 0.364\Delta(loggr)_{t-1} - 2.906\Delta(logExpens)_{t-1} + 0.892\Delta(logInf)_{t-1} - 0.547\Delta(logTerr)_{t-1} - 3.514\Delta(logTourm)_{t-1}$$

Co-integrated (Long Run) Equation;

$$ect_{t-1} = 1.000(loggr)_{t-1} + 1.531(logExpens)_{t-1} + 1.310(logInf)_{t-1} + 0.54(logTerr)_{t-1} - 6.84(logTourm)_{t-1} + 14.743$$

Table 4.3. the long-run normalized coefficient

Normalized long-run Coefficient			
Variables	coefficients	Standard Error	t-statistic
logExpens	-1.5313	(0.9991)	[1.5326]
logInf	-1.3107	(0.234)	[5.6013]
logterr	-0.5491	(0.1276)	[4.3015]
logtourm	6.846	(1.0206)	[-6.7086]
C	14.74331		

Note: T0.01=2.72, T0.05=2.02, T0.10=1.68

The long-run coefficient has been calculated from the unrestricted equation by dividing the coefficient of each independent variable by the first lag values of the dependent variable and multiplying by the minus sign (Shahbaz et al. 2013).

D(LOGGR) = C(1)*(LOGGR(-1) -1.5313*LOGEXPENS(-1) - 1.3107*LOGINF(-1) -0.5491*LOGTERR(-1) + 6.846*LOGTOURM(-1) + (14.74331) + C(2)*D(LOGGR(-1)) + C(3)*D(LOGEXPENS(-1)) + C(4)*D(LOGTERR(-1)) + C(6)*D(LOGTOURM(-1)) + C(7)

Table 4.4. the short-run normalized coefficient from vector error correction estimate

Short- Run Normalized coefficient and ECM	
Variables	coefficients
D(logExpens)	-7.7921
D(logInf)	-0.3036
D(logterr)	-0.1855
D(logtourm)	1.1878*
ect	-0.6604***
C	0.05541

(*), (**), (***) represent 10% and 5% and 1%, respectively

In the short run, tourism is significant at the 10% level, while other variables are insignificant. It can be seen from Table 6 that the error correction term (C (1)) in the equation is statistically significant at the 1%

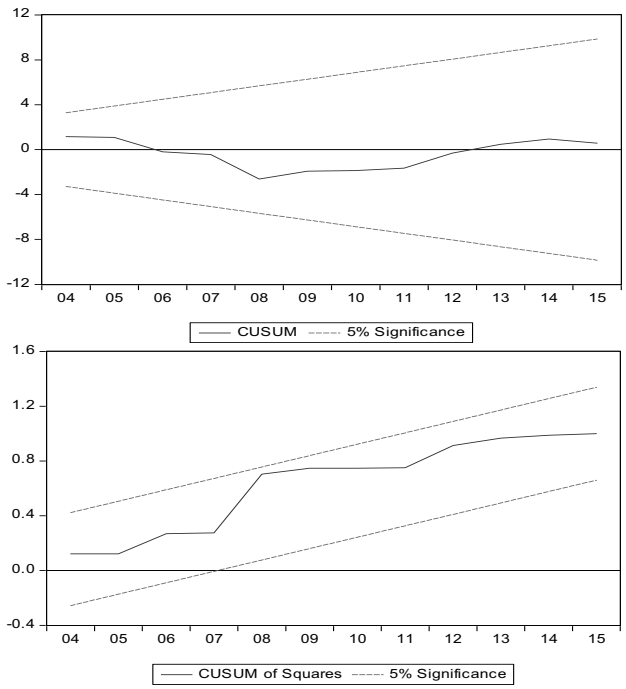
level and bears a negative coefficient. Therefore, the model is reliable. Further, the short run coefficients are calculated with the help of a Wald coefficient restrictions test. In the short run, expenses and inflation influence economic growth negatively but insignificantly. The ECM results indicate the convergence of the model and implies that approximately 66% of adjustments take place every year. This analsis will help decision makers in developing strategies and policies to accelerate economic growth through tourism and other variables.

The results of the long-run and short-run estimations are presented in table (4.3) and table (4.4); other different diagnostic tests, shown in the appendix table (4.5(A),(B),(C)), present the LM serial correlation test, which indicates that model is free from any serial correlation problems. There is also no problem of heteroscedasticity; the result is presented in table (4.6) and table (4.6(A)); the White Test is also significant at 5 percent, which is presented in table (4.7). Further, the Jarque–Bera test in Figure 3 shows that the functional form is correct and the distribution is normal. Table (4.8) shows the Granger causality test, and table (4.9) shows the Wald-coefficients test. While Figures 4 and 5 show impulse response functions and residual graphs, Figures 6 and 7 show correlogram and variance decomposition combined graphs, respectively.

3.3. Stability Checking

The stability of the model is checked through the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests.

Figure 1-2. Stability of the model.



Figures 1 and 2 show that the estimated line is well within critical limits at a 5% level. The estimated models are thus reliable and stable. This entails that all the coefficients in the error correction model are constant.

4. Discussion of Findings

The estimated coefficients of all of variables were explained in terms of elasticities with respect to the dependent variable (Growth) during the given time period. Statistically, the estimated coefficients of tourism are significant at 1 percent and have a positive impact on growth in the long run and the short run. This outcome was also favoured by Ohlan (2017), Kostakis and Theodoropoulou (2017), Dogru and Bulut (2017) and Ribeiro et al. (2016).

The estimated coefficient of terrorism is also significant in the long run. The negative effect of terrorism on growth is a consequence of different internal and external factors concerning politics, economy, and social network. This result is also consistent with the results of Iqbal et al. (2013) and Shahbaz et al. (2013). The coefficient of terrorism is -0.5491, which shows that, on average, a 1 percent rise in terrorist incidents causes growth to decrease by 0.5491% in the long run. The coefficient of inflation is also found to be statistically significant. The estimated coefficient of inflation is -1.3107, which shows that a 1% increase in inflation rate can cause growth to decline by 1.3107% in the long run. This result is also consistent with Shuaib et al. (2015) and Kasidi and Mwakanemela (2015). The negative estimated coefficient of the expenses showed that on average, a 1% increase in expenses will decrease growth by 1.5313% in the long run. This estimated coefficient, however, is not found to be statistically significant. This result is consistent with the findings of B.C. Olopade and D.O. Olopade (2008) and Attari and Javed (2013). Also in the short run, tourism has a positive impact, while terrorism, inflation and expenses have negative impacts on economic growth in Pakistan. The Granger causality tests in table 4.8 in the appendix also show that there is one-way Granger causality running from tourism to economic growth in the long run. Our result is supported by the findings of Ohlan (2017) and Dogru and Bulut (2017).

5. Conclusion and suggestions

This study sets out to examine the tourism and economic growth nexus with augmentation of other variables of terrorism, expenses and inflation from the evidence of the tourism-led economic growth (TLG) hypothesis in Pakistan. Observing the significance of the impact of important determinants, which is less realized and demonstrated for tourism, terrorism, expenses and inflation on the economic growth in Pakistan, was empirically verified by using time series annual data over the period 1995 to 2015, which are available from different sources. The VAR-based Johansson's co-integration test was used to check the long-run association among variables. The results show that tourism has a positive and significant impact on economic growth. This means this industry has the potential to improve growth in Pakistan. Expenses have a negative but insignificant impact, while inflation and terrorism have negative and statically significant impacts on economic growth in this study. The government should cope with terrorism

and maintain stable inflation rates. It is generally assumed that modest and stable inflation rates stimulate the economic growth of a country. Unnecessary spending can be recovered through tax revenue, which will be a burden on the public in the future, ultimately impacting production and growth.

This study suggests new perceptions and insights for new policies in Pakistan for sustainable economic growth. The study suggests that policy makers should take appropriate steps to cope with severe terrorist incidents and keep and provide better security and peace in the country to attract more international tourists in order to achieve long-run economic growth. The government should also cut unnecessary spending and should incrementally add productive expenditures. Spending on infrastructure and archaeological sites should be promoted to improve access to archaeological and scenic tourist spots in the country. The government should also ease visa processes for foreign tourists. However, there is some limitation to this study, as there are several tourism growth hypotheses available to evaluate the economic impact of tourism. All tourism growth hypotheses are different in terms of nature, structure, the results driven, demands of the data and complexity. There are 4 tourism-growth hypotheses, but this study only uses TLG hypotheses. There are also many factors affecting Pakistan's growth, but current studies only incorporate the abovementioned variables to the TLG function. However, the purpose of this paper is to check the TLG hypotheses for developing economies like Pakistan. This can be followed by many developing economies to study the effectiveness of tourism on growth.

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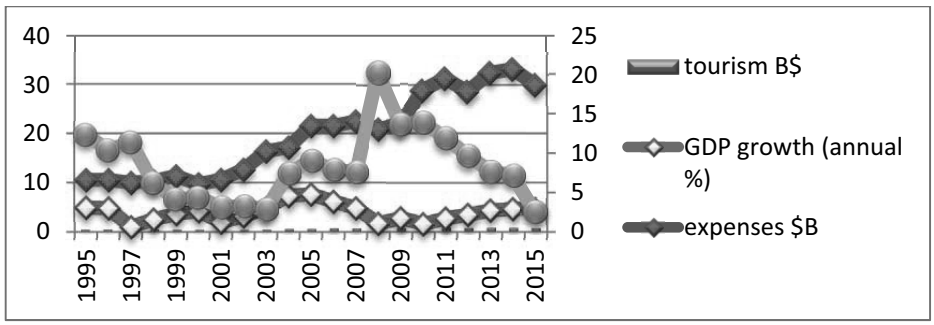
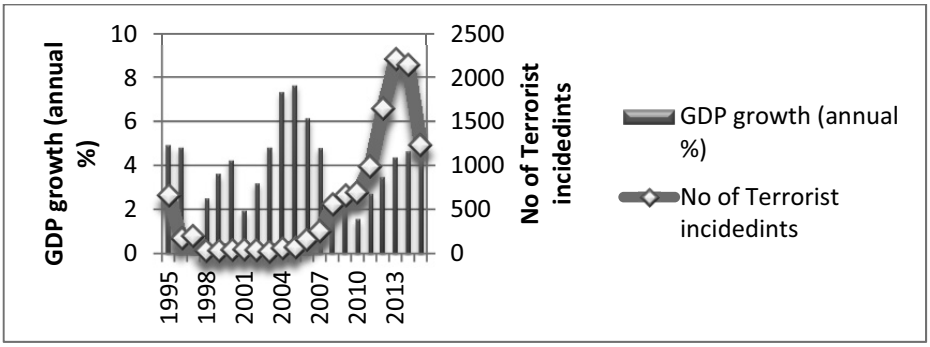
Appendix

Figure 1. Total No. of Tourism receipts; GDP growth and Annual Expenses.



Source: www.worldbank.org

Figure 2. Total No. of Incidents that occurred annually.



Source: www.globalterrorisimdatabase.com

Table 4.5(A). VEC Serial Correlation LM Test

Null Hypothesis: No Serial Correlation at lag order h

Lags	LM-Stat	Prob
1	25.38919	0.4407

Probs from chi-square with 25 df.

Table 4.5(B). Breusch-Godfrey Serial Correlation LM Test.

F-statistic	0.0156	Prob. F(1,11)	0.9029
Obs*R-squared	0.026908	Prob. Chi-Square(1)	0.8697

Table 4.5(C). VAR Residual Serial Correlation LM Test

Lags	LM-Stat	Prob
1	21.63535	0.6567

Table 4.6. Heteroscedasticity Test: Breusch-Godfrey

F-statistic	0.212668	Prob. F(10,8)	0.9871
Obs*R-squared	3.990148	Prob. Chi-Square(10)	0.9478
Scaled explained SS	2.699023	Prob. Chi-Square(10)	0.9876

Table 4.6(A). VAR Residual Heteroscedasticity Tests: No Cross Terms (only levels and squares).

Joint test:		
Chi-sq	df	Prob.
157.1023	150	0.3292

Table 4.7. White Test: VEC Residual Heteroscedasticity tests, No Cross Terms (only levels and squared joint test).

Joint Test		
Chi-sq	df	Prob.
197.4838	180	0.1767

Table 4.8. Granger Causality Test
VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(LOGGR)			
Excluded	Chi-sq	df	Prob.
D(LOGEXPENS)	1.516514	1	0.2181
D(LOGINF)	2.646934	1	0.1037
D(LOGTERR)	2.499282	1	0.1139
D(LOGTOURM)	3.428572	1	0.0641
All	4.316135	4	0.3649

Table 4.9. Wald-Coefficient Test
c(3)=c(4)=c(5)=c(6)=0

Test Statistic	Value	df	Probability
F-statistic	1.128018	(4, 12)	0.3889
Chi-square	4.512070	4	0.3411

Figure 3. Jarque-Bera Test.

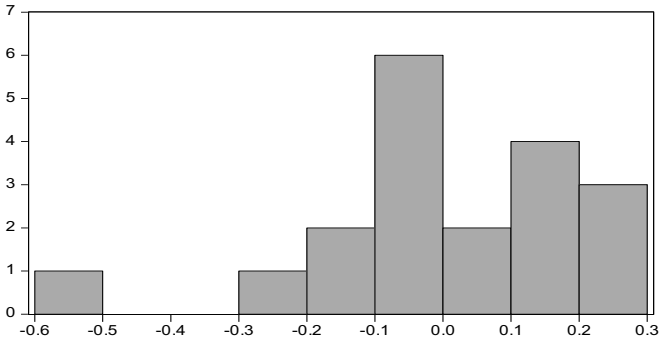


Figure 4. Impulse Response Functions.

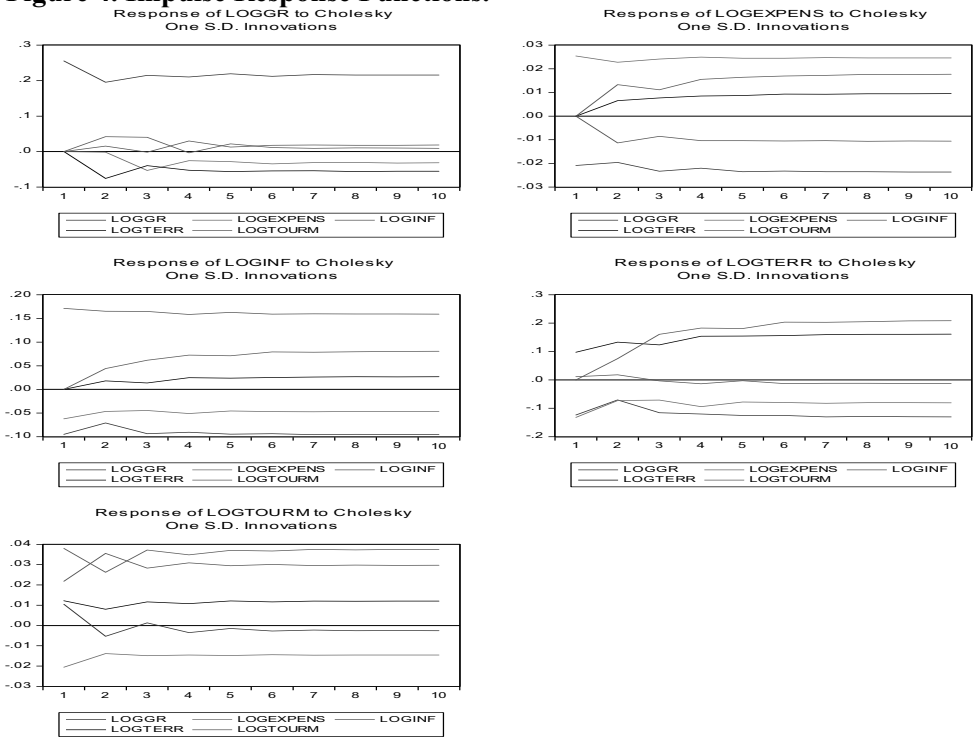


Figure 5. Residuals Graphs.

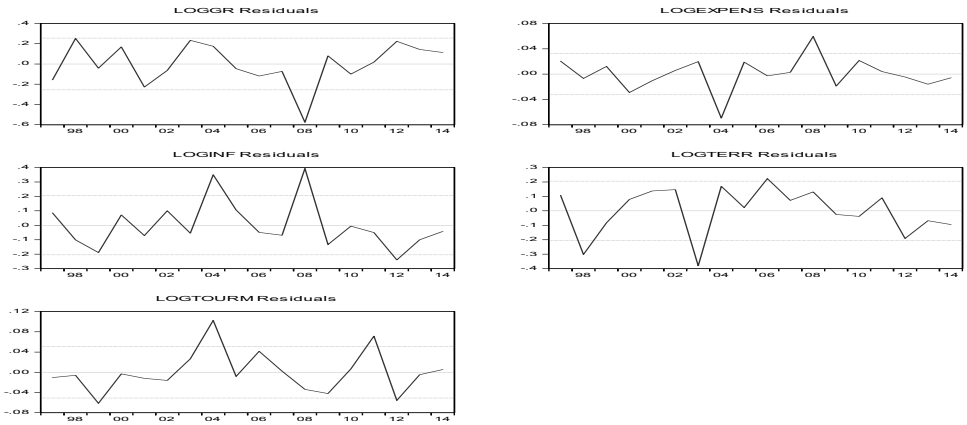


Figure 6. Correlogram Graphs.

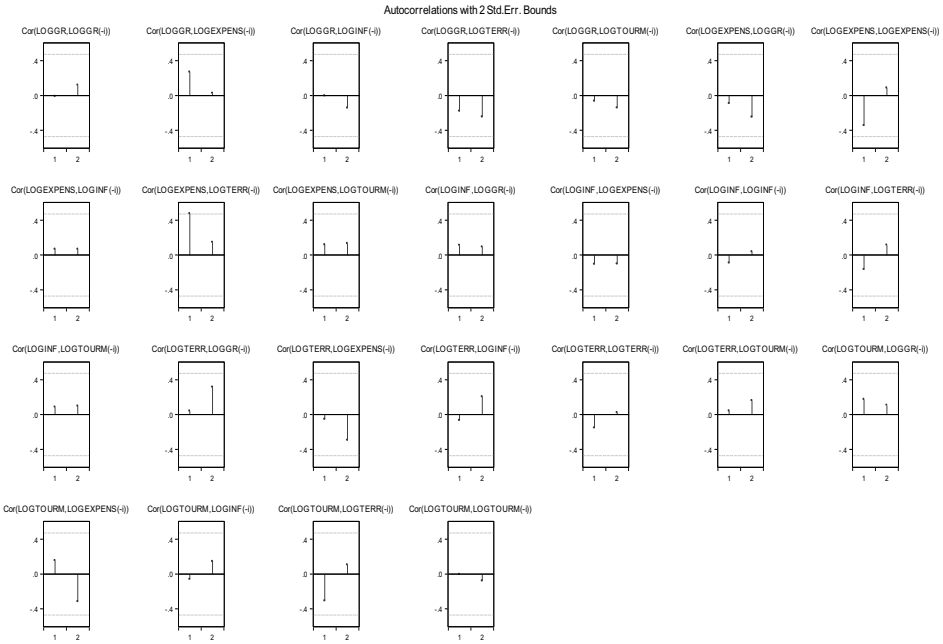


Figure 7. Variance decomposition combined graphs.

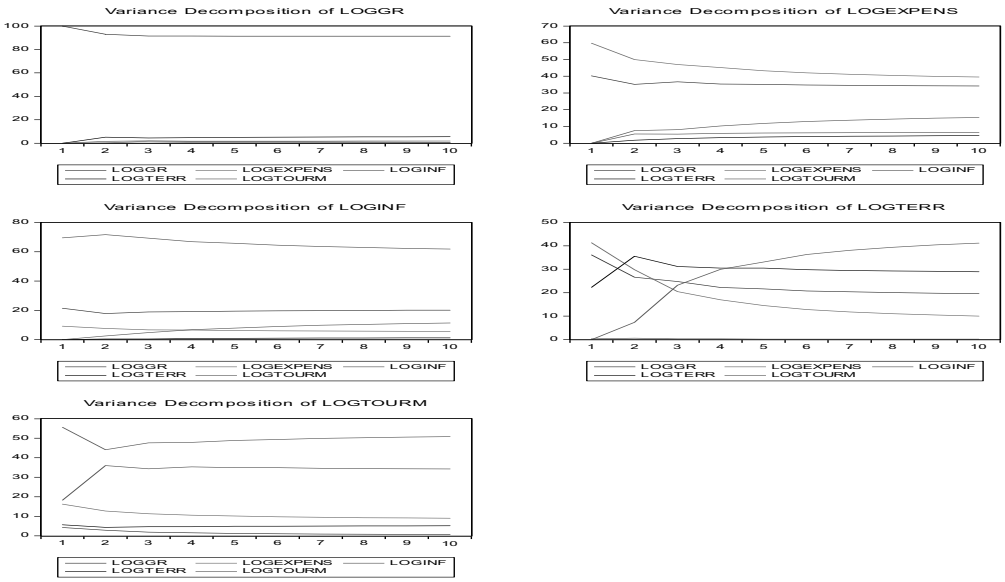


Table (I). Johnson co-integration test.

1 Cointegrating Equation(s): Log likelihood	117.7349			
Normalized cointegrating coefficients (standard error in parentheses)				
LOGGR	LOGEXPENS	LOGINF	LOGTERR	LOGTOURM
1.000000	1.531342	1.310725	0.549144	-6.84685
	(0.99912)	(0.23400)	(0.12766)	(1.02065)
Adjustment coefficients (standard error in parentheses)				
D(LOGGR)	-0.67476			
	(0.25687)			
D(LOGEXPENS)	-0.02449			
	(0.03313)			
D(LOGINF)	-0.05625			
	(0.20668)			
D(LOGTERR)	-0.14698			
	(0.20700)			
D(LOGTOURM)	0.008390			
	(0.05137)			

Table (II). Vector Error Correction Estimates.

Vector Error Correction Estimates					
Standard errors in ( ) & t-statistics in [ ]					
Cointegrating Eq:	CointEq1				
LOGGR(-1)	1.000000				
LOGEXPENS(-1)	1.531342				
	(0.99912)				
	[1.53269]				
LOGINF(-1)	1.310725				
	(0.23400)				
	[5.60139]				
LOGTERR(-1)	0.549144				
	(0.12766)				
	[4.30159]				
LOGTOURM(-1)	-6.84685				
	(1.02065)				
	[-6.70836]				
C	14.74331				
Error Correction:	D (LOGGR)	D (LOGEXPENS)	D (LOGINF)	D (LOGTERR)	D (LOGTOURM)
CointEq1	-0.67476	-0.02449	-0.05625	-0.14698	0.008390
	(0.25687)	(0.03313)	(0.20668)	(0.20700)	(0.05137)
	[-2.62687]	[-0.73932]	[-0.27216]	[-0.71004]	[0.16333]
D (LOGGR(-1))	-0.36844	-0.01297	0.160265	0.577494	0.008670
	(0.26406)	(0.03405)	(0.21247)	(0.21280)	(0.05281)

	[-1.39526]	[-0.38091]	[0.75430]	[2.71385]	[0.16418]
D(LOGEXPENS(-1))	-2.90601	0.063317	1.389313	4.243051	0.273882
	(2.35979)	(0.30433)	(1.89872)	(1.90163)	(0.47191)
	[-1.23147]	[0.20805]	[0.73171]	[2.23127]	[0.58037]
D(LOGINF(-1))	0.892895	-0.08007	-0.11106	-0.02768	0.109332
	(0.54882)	(0.07078)	(0.44159)	(0.44226)	(0.10975)
	[1.62694]	[-1.13133]	[-0.25151]	[-0.06259]	[0.99616]
D(LOGTERR(-1))	-0.54775	0.037303	0.070654	0.202848	-0.00852
	(0.34648)	(0.04468)	(0.27878)	(0.27921)	(0.06929)
	[-1.58091]	[0.83483]	[0.25344]	[0.72651]	[-0.12295]
D(LOGTOURM(-1))	-3.51437	0.180324	0.772349	0.967444	-0.25256
	(1.89798)	(0.24477)	(1.52714)	(1.52948)	(0.37956)
	[-1.85164]	[0.73670]	[0.50575]	[0.63253]	[-0.66541]
C	0.062140	-0.00753	-0.01876	0.050710	0.016143
	(0.06777)	(0.00874)	(0.05453)	(0.05461)	(0.01355)
	[0.91693]	[-0.86178]	[-0.34407]	[0.92855]	[1.19115]
R-squared	0.441229	0.347843	0.134744	0.551928	0.275752
Adj. R-squared	0.136444	-0.00788	-0.33721	0.307525	-0.11929
Sum sq. resids	0.716052	0.011909	0.463574	0.464997	0.028637
S.E. equation	0.255138	0.032904	0.205288	0.205603	0.051023
F-statistic	1.447674	0.977853	0.285501	2.258269	0.698029
Log likelihood	3.478479	40.34646	7.391562	7.363970	32.45010
Akaike AIC	0.391280	-3.70516	-0.04351	-0.04044	-2.82779

Schwarz SC	0.737536	-3.35891	0.302749	0.305815	-2.48153
Mean dependent	-0.00087	-0.0034	-0.00884	0.059809	0.011067
S.D. dependent	0.274556	0.032775	0.177526	0.247074	0.048227

Determinant resid covariance (dof adj.)	1.68E-11
Determinant resid covariance	1.43E-12
Log likelihood	117.7349
Akaike information criterion	-8.63721
Schwarz criterion	-6.6586