# Impact of Oil Prices on Economic Growth and Exports Earning: In the Case of Pakistan and India

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*The impact of oil prices on exports earnings and economic growth is investigated in the case of Pakistan and India by using the data from 1971 to 2009. The JJ cointegration and FMOLS methods are employed. The empirical findings indicate that the long run relationship exist among the variables in both countries cases. The oil prices (also squared term) is impeded the exports earning, and human capital, physical capital and economic growth are enhanced the exports earning, and in the second economic growth model, the human capital, physical capita and oil prices are economic growth enhancing factors in the case of Pakistan. On the other hand in the case of India human capital, physical capital and oil prices positively related to exports earnings whereas economic growth negatively related to exports earnings. The results of economic growth model indicate that only human capital and physical capital are positively related to economic growth.*

Keywords: *Economic Growth, Exports, Oil prices*
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## Introduction

The 1970's shock of oil price took attention of many economists to consider oil price as an important macroeconomic factor that influence the overall economic activity. Unfortunately in literature, centre of attention were the developed countries trying to capture "impact of oil prices upset to the output growth" either by focusing oil exporting countries that affect the supply side or oil importing countries that affect the demand of oil in international market

The relationship between oil prices and economic indicators has started to investigate with the Pioneer work of Hamilton (1983). He studied the outcomes of the drastic changes in the petroleum prices to the U.S economic activity over the period of 1948-1973 and found a negative linkage between oil price shocks and real economic variables. Chichinisky et al. (1985) examined the effect of oil price shocks on macroeconomic conditions in the case few oil importing developing countries. They found the lowest real price level in developing economies in the decade of 1980s that adversely influences the balance of payment especially on exports dependent countries.

Berument and ceylan (2003) adopted structural VAR to examine the outcomes of the oil shocks on the economic growth in the case of 16 MENA (Middle East and North African) countries. They used two variables; net oil imports over GDP and net oil exports over GDP to differentiate between oil importing and oil exporting countries respectively. Corresponding to the existing literature they found that the oil price shocks cause significant and positive effects on output growth for most of the MENA countries, no evidence is supported for significant and negative impact of an oil price shock.

Rodriguez and Sanchez (2004) used multivariate VAR methodology to analyze the outcomes of high oil prices on economic growth for oil exporting as well as importing OEDC countries (individual G-7 countries, the euro area and Norway). By using both linear and non-linear (scaled) models they found that the increase in the oil prices

affects the GDP growth rate with the greater magnitude. They examined causality on at least one direction for all countries and in both directions in most countries by using granger causality test.

Guo and Kliesen (2005) analyzed that the volatile behavior of the oil prices increases the real cost of doing business which affects the U.S macroeconomic activity asymmetrically in short run. They concluded that the GDP growth rate is negatively affected by the volatility of daily crude oil prices over the period of 1982-2004. However the outcomes of oil shocks are symmetric as well as asymmetric on aggregate economic activity.

Cologni and Manera (2005) adopted structural VAR methodology to study the short run and long run impact of oil prices changes to the output level along with other macroeconomic variables (i.e. interest rate, inflation, unemployment and exchange rate) of the G7 countries for the period of 1985-2005. They proposed a tight monetary policy for the countries taken under observation to control the inflation in reaction of unanticipated change of oil prices which leads to affect the real economic activity adversely by increasing the real cost of doing business.

Malik (2007) examined the effect of high oil prices on economic growth with other macroeconomic variables like deficit spending, public debt, expected inflation and investment spending for economy of Pakistan. The major finding of her study is about the nonlinear relationship among the oil prices and economic growth; that the increase in oil prices is essential for economic growth but after threshold level it tends to affect the economy adversely.

Parinda and Sahoo (2007) used panel Pedroni's cointegration methodology to test export led hypothesis for four south Asian countries (India, Sri lanka, Pakistan and Bangladesh) over the period of 1980-2002. They tested this hypothesis by focusing on manufacturing exports along with other variables like human capital and capital formation. The findings of the study supported the export

led growth by finding the long run relationship among the variables of interest and GDP (and non export GDP).

Zhang et al (2007) used a new approach Ensemble Empirical Mode Decomposition to raise some complex features of oil prices. The EEDM analyze the behavior of crude oil in following way; by crumbling the series into a number of fundamental modes on the basis of their rate of occurrence which indicate the short term shock in the market, the modes are made of unpredictable methods and their trends used to capture oil prices in long run as well.

Regardless of the fact that china is net oil importing country, over last two decades it is observed a direct relationship between Chinese exports and international oil prices. To explain this fact, Faria et al (2009) established a theoretical model of export competitiveness of China using monthly data over the period of 1992-2005. The model purposes the dramatic growth of the Chinese economy brought out an increase in the international oil prices that gives a tough challenge to its exports competitors, whereas its large labor force is also a competitive edge for China. Estimates of a reduced form model explain that positive link between oil prices and export competitiveness whereas elasticity exchange rate on exports is negative.

This study aims to determine the effect of oil prices on exports earning and economic growth in the case of Pakistan and India. The JJ cointegration and Fully Modify Ordinary Least Square (FMOLS) method are employed. The remaining paper is structured as follows: after introduction the methodology is presented in the section-B. Section-C explains the empirical results. The final section gives conclusion.

## Methodology

This study evaluates the impact of oil prices on the economic growth and export earnings in the case of India and Pakistan. For estimation evidence, this study estimates the following models. Where suppose that economic growth (Y) is determined by the physical capital (K), human capital (HC), exports earnings (X) and oil prices (OILP), whereas export earnings are determined by the economic growth, physical capital, human capital and oil prices. Purpose of introducing the square term of oil prices in model-2 and model-4 is to check the nonlinear behavior of the oil prices as malik (2007), Guo and Kliesen (2005) and Rodriguez and Sanchez (2004) found.

**Model-1**

$$Y = \alpha_0 + \alpha_1 K + \alpha_2 HC + \alpha_3 X + \alpha_4 OILP + \mu_i$$

**Model-2**

$$Y = \gamma_0 + \gamma_1 K + \gamma_2 HC + \gamma_3 X + \gamma_4 (OILP)^2 + \mu_i$$

**Model-3**

$$X = \varphi_0 + \varphi_1 Y + \varphi_2 K + \varphi_3 HC + \varphi_4 OILP + \mu_i$$

**Model-4**

$$X = \delta_0 + \delta_1 Y + \delta_2 K + \delta_3 HC + \delta_4 (OILP)^2 + \mu_i$$

Where $\alpha_s, \gamma_s, \varphi_s$ and $\delta_s$ represent the slope coefficients, and $\mu_i$ is the error correction term. The data of all variables have been taken from State Bank of Pakistan and Asian development Bank. The Real GDP, real gross fixed capital formation and real exports[1] are used for economic growth, physical capital and exports respectively. The secondary school enrolment (% gross) is used for human capital and oil prices employ US dollars per barrel. Oil prices are supposed to have a positive relation with economic growth and negative relationship with exports earning of both oil importing countries.

[1] All measure at constant prices of 2000.

This study uses the Augmented Dickey Fuller, JJ cointegration and Fully Modified Ordinary Least Square (FMOLS) methods for estimation evidence. The ADF is a standard unit root test. This unit root is based on the following regression model.

$$\Delta Y_t = \beta_0 + \beta_1 T + \alpha Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \quad ----- (1)$$

Where $Y_t$ , T and $\Delta$ respectively confers a time series, a linear time trend and first difference operator, $\beta_0$ is a constant, k is respecting the optimum number of lags on the dependent variable, and $\varepsilon_t$ is random error term. The null hypothesis for testing nonstationarity is $H_0$: $\alpha = 0$ meaning economic series are non-stationary[1]. If the hypothesis of non-stationary is established for the underlying variables, it is desirable and important that the time series data are examined for co integration. Engle & Granger's (1987) approach for co integration is simple and popular for its certain agreeable attributes. However, it suffers from certain drawbacks that discourage its use (See Enders, 1995).We use the maximum likelihood procedure of Johansen (1991, 1995) because this is based on the well-established likelihood ratio principle. The advantage of the Johansen's procedure is that several co-integration relationships can be estimated and it fully captures the underlying time series properties of the data. Johansen's method tests the restrictions imposed by co-integration on the unrestricted VAR involving the series. Consider a VAR of order p.

$$y_t = A_1 y_{t-1} + \cdots\cdots + A_\rho y_{t-\rho} + Bx_t + \varepsilon_t \quad -------(3)$$

Where $y_t$ is a k-vector of non-stationary I(1) variables, $x_t$ is a d-vector of deterministic variables, and $\epsilon_t$ is a vector of innovations. We can write the VAR as

[1] If the t- Statistic associated with estimated coefficient, where α, is less than the critical value for the test, the null hypothesis of non-stationary cannot be rejected at 1 or 5 or 10 % level of Significance.

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_t - 1 + Bx_t + \varepsilon_t \quad (4)$$

Where $\Pi = \sum_i A_i - I, i = 1, \cdots\cdots, \rho$

$$\Gamma_i = - \sum_{j=r+1} A_i \quad (5)$$

Granger's representation theorem asserts that if the coefficient matrix Π has reduce rank

r < k, then there exist $k \times r$ matrices α and β each with rank r such that Π = α and $y_t$ is stationary is the number of co integrating relations (the co integrating rank) and each column of β is the co integrating vector. The elements of α are known as the adjustment parameters in the vector error correction model. Johansen's method is to estimate the Π-matrix in an unrestricted from, and then test whether we can reject the restrictions implied by the reduced rank of Π. Johansen's method uses two test statistics for the number of co integrating vectors: the trace test and maximum eigenvalue ($\lambda_{\max}$) test. The ($\lambda_{trace}$) statistic tests $H_0$, that the number of distinct co integrating vectors is less than or equal to r against a general alternative. The second statistic tests $H_0$ that the number of co integrating vectors is r against the alternative of r+1 co integrating vectors. In next step we estimate the long run coefficients by using the Fully Modified Ordinary Least Square (FMOLS). This method appears to employ Kernel estimators of the Nuisance parameters for numerical analysis. For the achievement of asymptotic effectiveness, this advance modifies least squares to test serial correlation impacts and endogeniety in the independent variables which results from verification of a cointegrating link (Philip and Hansen (1990)). For the inquiry of long run association through Fully Modified Ordinary Least Squares (FMOLS), it is essential condition that all variables are stationary at integrated order one.

## Empirical Results

The table-1 indicates the result of Augmented Dickey Fuller unit root test. The results shows that all variables are integrated of order one.

**Table 1**

**Results of Augmented Dickey Fuller**

| Variables | Pakistan | | India | |
|---|---|---|---|---|
| | I(0) | I(1) | I(0) | I(1) |
| $Ln(Y)$ | -0.678 | -5.524* | -0.897 | -5.457* |
| $Ln(K)$ | -1.609 | -4.503* | -0.756 | -5.357* |
| $Ln(H)$ | -2.446 | -4.781* | -2.819 | -5.095* |
| $Ln(X)$ | -2.889 | -6.488* | -0.914 | -3.619*** |
| $Ln(OIL)$ | -2.639 | -5.597* | -3.051 | -4.093** |

*Note: *:**:*** respectively the 1%:5% and 10% Level of Significance*

Table-2 indicates the results of JJ cointegration for long run relationship. The panel-A represents the results in the case of Pakistan. The results confirm the long run relationship in all four models. There are three cointegrated vectors in model-1, five cointegrated vectors are in model-2, two and three cointegrated vectors in model-3 and model-4 respectivly.

**Table-2**

**Results of JJ Cointegration**

| *Panel A-Pakistan* | | | | | |
|---|---|---|---|---|---|
| Null Hypothesis | Alternative Hypothesis | Model -1 | Model-2 | Model-3 | Model-4 |
| r = 0 | r >= 1 | 120.725[a] | 225.671[a] | 108.121[a] | 103.587[a] |
| r <= 1 | r >= 2 | 78.841[a] | 98.866[a] | 67.191[a] | 67.558a |
| r <= 2 | r >= 3 | 47.464[a] | 51.778[a] | 42.348[b] | 39.436[a] |
| r <= 3 | r >= 4 | 25.426 | 30.061[a] | 22.669 | 16.976 |
| r <= 4 | r = 5 | 7.695 | 11.638[b] | 8.827 | 7.298 |
| *Panel B-India* | | | | | |
| r = 0 | r >= 1 | 112.023[a] | 104.694[a] | 85.167[a] | 110.154[a] |
| r <= 1 | r >= 2 | 62.781[b] | 60.561[a] | 42.882 | 48.861 |
| r <= 2 | r >= 3 | 36.144 | 32.925[b] | 23.571 | 28.863 |
| r <= 3 | r >= 4 | 18.387 | 18.701[b] | 10.731 | 15.196 |
| r <= 4 | r = 5 | 7.513 | 6.729 | 1.501 | 5.044 |

*Note: a and b respectively indicate that trace statistic above the 5% and 10 % level of significance.*

The panel-B represents the results in case of India. There are two cointegrating vectors in model l, four cointegrating vectors in model-2 and one cointegration vector is found in model-3 and model-4 both. These results confirm the long run relationship among the variables. After establishing the long run relationship in next step we estimate the long run coefficient by using Fully Modify Ordinary Least Square

(FMOLS). The table-3 represents the long run coefficients in the case of Pakistan. The panel-A (table-3) shows that human capital, physical capital and economic growth are positively associated to export earnings and on the other hand the oil prices and square term of oil prices are negatively related to export earnings. In panel-B the results indicate that the human capital, physical capital, export earnings and oil prices are positively related to economic growth as Berument and ceylan (2003) estimated for MENA countries.

**Table-3**

**Long Run Coefficients of Pakistan**

| **Panel-A** | | |
|---|---|---|
| Dependent Variable: Exports | | |
| | Coefficients[prob.] | Coefficients[prob.] |
| HC | 0.381[0.091] | 0.366[0.098] |
| K | 0.644[0.019] | 0.626[0.021] |
| Y | 0.769[0.003] | 0.791[0.002] |
| Oil | -0.127[0.002] | - |
| (Oil)*2 | - | -0.063[0.002] |
| Constant | -11.8911[0.000] | -11.939[0.000] |
| **Panel-B** | | |
| Dependent Variable: GDP | | |
| H | 0.237[0.065] | 0.237[0.065] |
| K | 0.388[0.002] | 0.388[0.002] |
| X | 0.382[0.000] | 0.382[0.000] |
| Oil | 0.114[0.000] | - |

| | | |
|---|---|---|
| (Oil)*2 | - | 0.057[0.000] |
| Constant | 5.966[0.000] | 5.9664[0.000] |

Table-4 shows the result in the case of India. The results (panel-A) indicate that human capital, physical capital, oil prices and square term of oil prices are positively related to exports earnings similar as Faria et al (2009) found for the Oil importing country of China. But the economic growth is negatively related to exports earnings in the case of India.

The panel-B shows that human capital and physical capital are positively linked to economic growth in accordance with previous studies like Parida and Sahoo (2007). In contrast the oil prices and exports earning are statistically insignificant in the case of India in order to enhance the economic growth.

**Table-4**

**Long Run Coefficients of Indian**

| **Panel-A** | | |
|---|---|---|
| Dependent Variable: X | | |
| | Coefficients[prob.] | Coefficients[prob.] |
| H | 0.426[0.021] | 0.426[0.021] |
| K | 1.397[0.000] | 1.397[0.000] |
| Y | -0.237[0.595] | -0.237[0.595] |
| Oil | 0.128[0.001] | - |
| (Oil)*2 | - | 0.064[0.001] |
| Constant | -6.431[0.063] | -6.431[0.063] |
| | | |
| Panel-B | | |

| Dependent Variable: Y | | |
|---|---|---|
| H | 0.121[0.039] | 0.121[0.039] |
| K | 0.839[0.000] | 0.839[0.000] |
| X | -0.058[0.234] | -0.058[0.234] |
| Oil | -0.015[0.176] | - |
| (Oil)*2 | - | -0.007[0.176] |
| Constant | 6.508[0.000] | 6.508[0.000] |

## Conclusion

The aim of this study is to investigate the impact of oil prices on export earnings and economic growth in the case of Pakistan and India. The results confirm the long run relationship among the variables in both countries. The results demonstrate that oil prices (also squared term) is impeded the exports earning, and human capital, physical capital and economic growth are enhanced the exports earning. In the second economic growth model, the human capital, physical capital and oil prices are growth enhancing factors in the case of Pakistan. The study examined a linear relationship among the oil prices and economic growth which entails that: with strong human capital and physical capital, higher oil price leads to the high economic growth as by switching to the alternative sources of energy to meet the demand side pressure.

In the case of India the human capital, physical capital and oil prices positively related to exports earnings and economic growth negatively related to exports earnings. The results of economic growth model indicate that only human capital and physical capital are positive related to economic growth.

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# Tourism, Exports and FDI as a Means of Growth: Evidence from four Asian Countries

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*This study examines the impact of tourism receipts, exports and foreign direct investment on economic growth on four ASIAN countries namely India, China, Pakistan and Russia. By employing Panel ordinary least squares estimation technique in log linear model, study finds that the tourism has positive impact and FDI has negative impact on economic growth in four ASIAN while impact of exports of goods and services on economic growth is inconclusive. In addition to that, we find that human capital and physical capital have positive impact on economic growth of these countries.*

Key words: *Tourism, FDI, Exports, Economic Growth, ASIAN countries.*
JEL classification: *C33, L83, O150, O49.*

## 1. Introduction

In recent years, there has been an upsurge of interest of researchers as well as policy makers in the role of tourism for the economic growth (normally measured by Gross Domestic Product (GDP) and its variants). Policy makers of developing countries focus on economic

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policies to promote international tourism as a potential source of economic growth and development as well. Recently, tourism sector has witnessed the prominent increase all over the world. For example, the tourism receipts in 2009 reached to 852 billion US dollar vis-à-vis 2 billion US dollar in 1950 and international tourist arrivals increased to 880 million in 2009 vis-à-vis 25 million in 1950 (UNWTO 2010). Further, tourism is responsible for 300 million direct and indirect jobs and represents 13% of the world's GDP (UNWTO 2009). In the Asia and the Pacific region, the tourist arrival is reached to 181.2 million in 2009 vis-à-vis 55.8 million in 1990. Interestingly, these figures do not include domestic tourism and if it is included, these figures will increase remarkably. There are important multiplier effects of tourism sector in the other economic sectors. Similar to the Export-Led Growth (ELG) hypothesis, a Tourism-Led Growth (TLG) hypothesis postulates the existence of various arguments for which tourism would become a main determinant of overall long-run economic growth.[1] For instance, tourism brings in foreign exchange, which can be used to import capital goods in order to produce goods and services leading in turn to economic growth (Mckinnon, 1964). On the other hand, international tourism would contribute to an increase in the income as the EGL hypothesis postulates, by enhancing efficiency through competition between local firms with the ones corresponding to the

[1] As an export activity, international tourism is a source of long-run growth through several channels. Firstly, small open economies benefit from tourism specialisation, enhancing faster growth with respect to other types of economies (Lanza and Pigliaru 1994). This implies a higher level of income generated by the existence of comparative advantage. Secondly, an increase of tourism receipts will relieve foreign exchange constraints. These extra resources can be employed to increase imports of capital goods that might further boost domestic investment and consumption (Nowak, Sahli, and Cortés-Jiménez, 2007). The increase in competition at an international level, given by the unique supply of certain characteristics of a destination (e.g. natural amenities, art and history, climatic conditions) will enhance economic growth via better management, higher levels of accumulation and efficiency of tourism resources as well as higher levels of investment and human capital accumulation in tourism activities. In fact, multiplier effects are likely to be produced both in export and non-export sectors. Many developing countries have thus started to regard tourism as an integral part of their economic growth and development strategies since it serves as a source of scarce financial resources, job creation, foreign exchange earnings, and technical assistance (Sinclair, 1998).

other international tourist destinations (Bhagwati and Srinivasan, 1979; Krueger, 1980) and facilitating the exploitation of scale economies in local level (Helpman and Krugman, 1985). Balaguer and Cantavella-Jorda (2002) argued that, foreign exchange brought by international tourism could well be used to import capital goods in order to produce other goods and services, leading in turn to economic growth. Further, they argued that, "if those imports are capital goods or basic inputs for producing goods in any area of the economy, then, it can be said that earnings from tourism are playing a fundamental role in economic development" (p. 878). Taking into account that a large proportion of tourist expenditures are spent on the consumption of non-traded goods and services in the host country, there exist factors, which can have either a positive role or an unfavorable impact on economic growth as their price is not determined in the international market, but in the local market (Balaguer and Cantavella-Jorda, 2002). Further, Hazari and Ng (1993) by examining the relationship between tourism and welfare showed that tourism may be welfare reducing, while Hazari and Kaur (1995) argued that tourism is always welfare improving using a Komiya (1967) type first-best model. The role of tourism to the economic growth and to the progress of modern societies has become a common awareness in political authorities worldwide. For this reason, many attempts are being made in order to develop tourism, being amongst the most important sectors of economic activity, to the benefit of their economies as quickly and as effectively as possible.

However, there is still debate on whether or not countries should promote their tourism sector to achieve long-run economic growth and development is a novel issue. The TLG hypothesis postulates that international tourism is considered as a potential strategic factor for economic growth. There are several empirical studies analyzing the tourism industry's contribution to a country's economic growth. Some of the most remarkable works on this topic are Balaguer and Cantavella Jordà (2002) for Spain, Dritsakis (2004) for Greece,

Gunduz and Hatemi-J (2005) for Turkey, Louca (2006), Noriko and Motosugu (2007), Oh (2005) for Korea, Kim, Chen and Jan (2006) for Taiwan, Proença and Soukiazis (2008) for Portuguese regions and Gani (1998) for small islands. Most of them have found that in the long-run economic growth is determined by tourism sector thereby they suggested that tourism sector should be promoted. Considering the great contribution of the tourism industry to the world economy, the research in this field may be of significant importance. In particular, the investigation of the relationship between tourism and economic growth can provide crucial information for policy formulations and strategic planning by the government, as well as tourism businesses.

Therefore, the main objective of this study is to consider the role of exports, FDI and tourism on economic growth. India, China, Pakistan, and Russia have been taken as a case study. These are the countries focusing on rapid development of tourism sector and in these countries the expenditure on the international tourism has increased considerably in recent years. In this study we have preferred panel data analysis technique as it has an advantage of containing "the information necessary to deal with both the intertemporal dynamics and the individuality of the entities being investigated" (Dielman, 1989). Additionally, this paper extends the existing literature by building on a production function derived theoretically from Feder (1982) and applied in the economics literature by Ukpolo (1994) and Ghatak, Milner and Utkulu (1997) but by adding tourism and FDI as additional sources of growth. Further, we use two-way error component model contrast to one-way error component model as used by most of studies in this are in the panel framework.

The reminder of the paper is organized as follows. Section 2 discusses brief review of literature followed by econometric methodology, data source, and variables description in the section 3. Section 4 reports the data analysis and the empirical findings. Concluding remarks are provided in the fifth section.

## 2. A brief literature review

There are number of studies examining the potential link between exports and economic growth however, their findings are rather mixed (Giles and Williams' 2000). Nevertheless, it can be argued on the basis of theory that exports contribute positively to the economic growth by relieving the foreign exchange constraint (McKinnon 1964) or by enhancing efficiency through increased competition (Krueger 1980), among others. Importantly, the argument concerning the role of exports as one of the main deterministic factors of economic growth is not new. It goes back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth, and that there are economic gains from specialization. It was also recognized that exports provide the economy with foreign exchange needed for imports that cannot be produced domestically. The basic idea regarding ELG paradigm is that exports increase total factor productivity because of their impact on economics of scale and other externalities such as technology transfer, improving skills of workers, improving managerial skills, and increasing productive capacity of the economy. Another advantage of ELG is that it allows for a better utilization of resources, which reflects the true opportunity cost of limited resources and does not discriminate against the domestic market. There are many studies in the context of developing countries which have conclude that there is a positive relationship between exports and economic growth for example, Balassa (1978, 1985), Jung and Marshall (1985), Ram (1985, 1987), Bahmani-Oskoee, Mohtadi and Shabsigh (1991), Bahmani-Oskoee and Alse (1993), Levin and Raut (1997), and Khalifa Al-Youssif (1997). However, most of these studies are either country specific or in the framework of cross-country.

As for as FDI is concerned, Gorg and Greenaway (2004) have pointed out that foreign direct investment has negative rather than positive spillovers in transition economies. In similar line Findlay (1978) also postulates that FDI increases the rate of technological progress in the

host country through a "contagion" effect from the more advanced technology, management practices etc. used by the foreign firms. UNCTD (1999) finds that the FDI has either a positive or a negative impact on output depending on the variables that are entered alongside it in the test equation. Anwara and Nguyen (2010) identify several determinants of the link between FDI and economic growth. Some of these determinants are, for example, human capital, learning by doing, exports, macroeconomic stability, and level of financial development, public investment. Neuhause (2006), based on these determinants, shows that there are three main channels through which FDI can influence the technological change, improve the capital stocks and generate economic growth: (a) direct transmission (through "Greenfield Investments"), (b) indirect transmission (through "Ownership Participation"), and (c) second-round transmission (through "Technology Spillover"). In a recent study Tiwari and Mihai (2011) by comparing the growth performance of exports and FDI for Asian countries for the period 1986-2008 show that both foreign direct investment and exports enhance the growth process. However, they suggest to follow an export-led growth path particularly at the initial stage of growth and in the later period, dependence on FDI might be a feasible option.

Recently interest of researchers is growing on the link between tourism and economic growth currently known as the TLG hypothesis however, the extensive literature to test for TLG hypothesis is still scarce (Cortés-Jiménez and Pulina 2009). Balaguer and Cantavella-Jordá's (2002) tested this hypothesis for the first time on the context of Spain within a bivariate framework. If we consider the case of developing countries, the contributions of tourism as TLG hypothesis have recently been documented in the empirical literature. For instance, the Dritsakis (2004) find that tourism has had a long-run economic growth effect in Greece and hence confirming the TLG hypothesis. Balaguer and Cantavella-Jorda (2002) also confirm the validity of the TLG hypothesis for long-run economic performance of

Span. Oh (2005) for Korea, Tosun (1999), and Guduz and Hatemi (2005) for Turkey have also found empirical support for the TLG hypothesis. Similarly, following Barro and Sala-i-Martin (1992), Proenca and Soukiazis (2008) examine the impact of tourism on the per capita income growth of Portuguese regions and concluded that tourism can be considered as an alternative solution for enhancing regional growth in Portugal provided supply characteristics of this sector are improved over years. Comparing the relative growth performance of 14 "tourism countries" within a sample of 143 countries, Brau, Lanza, and Pigliaru (2003) and Lee and Chang (2008) document that, on the average, tourism enhances the economic growth process; i.e., tourism countries tend to grow faster than all the other sub-groups (OECD, Oil Exporting, LDC, Small). On the other hand, Chen and Devereux (1999) argue that tourism may actually reduce welfare for trade regimes dominated by export taxes, or import subsidies. Using a theoretical framework, Chen and Devereux (1999) demonstrated that FDI in the form of tourism is, for the most part, beneficial while tourist immiserization is also possible in Sub-Saharan Africa. Therefore, we cannot not, *a priori*, forecast the magnitude or direction of the impact of tourism receipts on the economic growth performance economies.

To this respect, in the tourism literature, there are two main streams of thought stemming from the so-called E-LG hypothesis. On the one side, Nowak, Sahli, and Cortés-Jiménez (2007) argue that economic growth can be achieved via increases in the volume of imports of inputs. This economic relationship is known as Tourism Capital Imports to Growth (T-CIG). The T-CIG hypothesis has been empirically supported for the case of Spain (Nowak Sahli, and Cortés-Jiménez, 2007) which confirms that economic development and industrialization in Spain were achieved since the early Sixties through imports of capital goods mainly financed by tourism receipts (Sinclair and Bote Gómez, 1996). On the other side, the TLG hypothesis postulates that the economic growth of countries can be generated by

expanding international tourism as a non-traditional export. Interestingly, despite the fact that the TLG hypothesis is directly derived from the ELG hypothesis, the existing literature on this topic is still scarce. Cortés-Jiménez and Pulina (2006) claim the narrow relationship between the TLG and ELG hypotheses and empirically test them separately for the case study of Spain and Italy. Nevertheless, Durbarry (2004) for the case of Mauritius attempts to evaluate the impact of different types of exports including international tourism on economic growth.

## 3. Econometric analysis of tourism, exports and fdi as a means of growth

### 3.1 Economic model, Data source and Variables definition

For the analysis, we have adopted Cobb-Douglas production function within the neoclassical framework,

$$Y_t = K_t^{\alpha} H_t^{\beta} A_t \qquad (1)$$

where the quantity of output ($Y$) is a function of physical capital ($K$), human capital ($H$), and production technology ($A$) and $t$ denotes a time/year. This production function is expanded according to the new growth theory by following Barro and Sala-i-Martin (1995).[1] To this respect, international trade affects economic growth and can indeed be regarded as a type of technology in that it converts non-specialized production into specialized production (Mankiw, 2004). Hence, according to the new growth theory, export expansion improves economy-wide efficiency in the allocation of inputs and leads to total factor productivity growth. From a demand-side point of view, an inward-oriented policy is not sustainable since domestic demand is

[1] There are several channels for promoting economic growth such as encouraging domestic saving and investment, foreign investment, education, R&D and free trade.

limited and domestic resources may remain idle; hence, domestic economic growth cannot be enhanced. In an outward-oriented country with free trade, exports are the engine of growth through the expansion of external demand, as a component of the aggregate demand function (Agosin, 1999; Boriss and Herzer, 2006). On the supply-side, exports can positively contribute to economic growth through different means, such as facilitating the exploitation of economies of scale, or promoting the diffusion of technical knowledge (Grossman and Helpman, 1991). Therefore, the Cobb-Douglas production function can be expanded by adding exports as an extra variable:

$$Y_t = K_t^{\alpha} H_t^{\beta} X_t^{\gamma} A_t \qquad (2)$$

Following Durbarry's (2004) exports (*X*) can be further decomposed into two separate components, namely *XGS* (exports of goods and services) and *XT* (tourism exports). Additionally, we have added FDI also in the production function to analysis its impact on economic growth. Therefore, the Cobb-Douglas production function adopted in this study is:

$$Y_t = K_t^{\alpha} H_t^{\beta} XGS_t^{\gamma} XT_t^{\delta} XF_t^{\theta} A_t \qquad (3)$$

The equation (3) in a linear logarithmic form can be written as

$$Y_t = \pi + \alpha K_t + \beta H_t + \gamma XGS_t + \delta XT_t + \theta XF_t + \varepsilon_t \qquad (4)$$

where $\varepsilon$ is a disturbance term with zero mean and constant variance. The equation (4) in the representation form of panel can be written as follows:

$$Y_{it} = \pi + \alpha K_{it} + \beta H_{it} + \gamma XGS_{it} + \delta XT_{it} + \theta XF_{it} + \varepsilon_{it} \qquad (5)$$

where *i* represents country.

This study focuses on economic growth among four ASIAN countries for the period 1995-2008. $Y_{it}$ is measure of economic growth

(measured by log of the PPP-adjusted real (at constant 2005 international $) GDP, $K_{it}$ is measured by gross fixed capital formation (at constant prices of 2000), $H_{it}$ is measured by the percentage of the population having age between 15 to 65, $XGS_{it}$ is measured by exports of goods and services as percentage of gross domestic product, $XT_{it}$ is measured by international tourism receipts, $XF_{it}$ measured by net inflow of foreign direct investment as a percentage of investment and $\pi$ is an overall constant. Data of all these variables has been accessed from the official websites of World Bank on March 12th, 2010. This study utilizes the panel data estimation technique for analysis. There are three types of panel-data models namely, a pooled Ordinary Least Squire (OLS) regression, panel model with random effects and panel model with fixed effects. However, while using a pooled OLS regression, countries' unobservable individual effects are therefore not controlled. According to Bevan and Danbolt (2004), heterogeneity of the countries under consideration for analysis can influence measurements of the estimated parameters. Further, using a panel-data model with incorporation of individual effects, has a number of benefits, for example, among others, it allows us to account for individual heterogeneity. Indeed, Serrasqueiro and Nunes (2008) and Tiwari and Kalita (2011) mentioned that developing countries differ in terms of their colonial history, their political regimes, their ideologies and religious affiliations, their geographical locations and climatic conditions, not to mention a wide range of other country-specific variables. And, if this heterogeneity is not taken into account, it will inevitably bias the results, no matter how large the sample is. Therefore, by incorporating countries' unobservable individual effects in equation (3) the model to be estimated is as follows:

$$Y_{it} = \pi + \alpha K_{it} + \beta H_{it} + \gamma XGS_{it} + \delta XT_{it} + \theta XF_{it} + w_{it} \quad (6)$$

where $w_{it} = \mu_i + \varepsilon_{it}$, with $\mu_i$ being countries' unobservable individual effects. The difference between a polled OLS regression and a model considering unobservable individual effects, lies precisely in $\mu_i$. When

we consider the random-effect model, equation (6) will be same. However, in that case, $\mu_i$ is presumed have the property of zero mean, independent of individual observation error term $\varepsilon_{it}$, has constant variances $\sigma_\varepsilon^2$, and is independent of the explanatory variables.

However, there may be a correlation between countries' unobservable individual effects and growth determinants. If there is no correlation between countries' unobservable individual effects and growth determinants, the most appropriate way of carrying out the analysis is using a panel model of random effects. On the contrary, if there is a correlation between countries' individual effects and growth determinants, the most appropriate way of carrying out the analysis is to use a panel model of fixed effects.

To test for the possible existence of a correlation we use the Hausman test. This test tests the null hypothesis of non-existence of a correlation between unobservable individual effects and the growth determinants, against the alternative hypothesis of an existence of a correlation. Further, unlike previous studies which have analyzed the impact of tourism, exports and FDI on economic growth by using only the one-way error component model (i.e., either fixed effect or random effect is present in the model), we have analyzed the model in which two-way error components are present. Therefore, by expanding equation (4) to incorporate the two-way error component model, the equation becomes as follows:

$$Y_{it} = \pi + \alpha K_{it} + \beta H_{it} + \gamma XGS_{it} + \delta XT_{it} + \theta XF_{it} + u_{it} \quad (7)$$

where $u_{it} = w_{it} + \lambda_t = \mu_i + \lambda_t + \varepsilon_{it}$, $\mu_i$ denotes the unobservable individual effect, $\lambda_t$ denotes the unobservable time effect, and $\varepsilon_{it}$ is the remainder stochastic disturbance term. Note that $\lambda_t$ is individual-invariant and it accounts for any time-specific effect that is not included in the regression. If $\mu_i$ and $\lambda_t$ are assumed to be fixed

parameters to be estimated, and the reminder disturbance is stochastic with $\varepsilon_{it} \sim IID(0, \sigma_{\varepsilon}^2)$, then equation (6) represents a two-way fixed effect error component model.[1]

## 4. Data analysis and results interpretation

Regression results of estimated equations (6) and (7) have been presented in table 1. We have carried out regression analysis in three different cases. In first case, we have analyzed the model by taking into account cross-country fixed effects, in the second model we have analyzed the case of cross-country random effect and in the third case we have analyzed the model by taking into account cross-country random effect and cross-country fixed effects. To decide upon which model is better i.e., random effect or fixed effect we have performed Hausman test. Finally, normality check analysis of model 1, model 2 and model 3 has been carried out by using Jarque-Bera (JB) test as if residuals do not fallow normality assumptions; this will imply misspecification of the model.

[1] In the case of a time-fixed effect model, $\lambda_t$ is a time-varying intercept that captures all of the variables that affect the dependent variable and vary over time but are constant cross-sectionally, and the opposite holds in case of a time random-effect model.

**Table 1**

**Regression Results**

| Panel data Models: Dependent variable GDP (in parenthesis standard errors) | | | |
|---|---|---|---|
| Independent variables | Model 1 | Model 2 | Model 3 |
| | FE-CS | RE-CS [Swamy and Arora estimator of component variances] | RE-CS & CS- FE [Swamy and Arora estimator of component variances] |
| EGS | 0.060772*<br>(0.031069) | -0.240832***<br>(0.074162) | 0.060772*<br>(0.032369) |
| FDI | -0.054634***<br>(0.010923) | -0.157121***<br>(0.025266) | -0.054634***<br>(0.011380) |
| POPULATION | 4.126278***<br>(0.308188) | 3.206509***<br>(0.573293) | 4.126278 ***<br>(0.321083) |
| GFCF | 0.394711***<br>(0.043034) | 0.503961***<br>(0.049272) | 0.394711***<br>(0.044834) |
| TOURISM RECEI | 0.091310***<br>(0.028945) | 0.138560*<br>(0.075810) | 0.091310***<br>(0.030157) |
| C | -1.332536<br>(1.015398) | -0.340461<br>(1.735738) | -1.332536<br>(1.057886) |
| Model summary | | | |
| Adjusted R-squared | 0.998776 | 0.987234 | 0.998776 |
| S.E. of regression | 0.035007 | 0.113067 | 0.035007 |
| Breusch and Pagan LM test for | --------- | $chi^2(1) = 59.62$*** | ---------- |

| | | | |
|---|---|---|---|
| random effects | | | |
| Hausman test | -------- | $chi^2(5)= 5.79$ | ---------- |
| Fixed effect(F-test) | $F_{(3,47)}= 158.20***$ | ---------- | ---------- |
| Jarque-Bera (J-B) | 1.380411 | 1.656740 | 1.380411 |
| Cross-sections included | 4 | 4 | 4 |
| Total panel observations | 56 | 56 | 56 |
| Note: (1) ***, **, and *denote significance at 1, 5 and 10 % level of significance. (2) EF, CS, LM, SD denotes fixed-effect, cross-section, Lagrange multiplier, and standard deviation respectively. (3) [----] denotes results are not computed. | | | |

It is evident from the table that Hausman test is not significant implying that it does not reject the null hypothesis of "difference in the coefficients of fixed effect and random effect is not systematic". Thus, Hausman test says that random effect model is better for analysis. If we compare the results obtained from the model 1 (fixed effect model) and model 2 (random effect model) we will find that both results are same except the case of Exports of Goods and services (EGS). In this case, when we use fixed-effect model we find that impact of EGS is positive on economic growth i.e., GDP and when we use random-effect model, we find that impact of EGS on GDP is negative. Further, F-test of fixed effect is highly significant implying that country specific factors are also playing crucial role. Therefore, in the model 3 we have estimated a model that takes in to account the role of country specific effects while estimating under the

framework of random effect. Results reported by the model 3 are similar to the results of model 1. Additionally, results of J-B test reviles that residuals of all model follow property of the normal distribution. Model 1, 2 and 3 reviles that effect of FDI on economic growth is negative, tourism, population and Gross Fixed capital Formation (GFCG) is positive. While for exports sector, model 1 and model 3 says that it has positive impact on the economic growth and model 2 says that it has negative impact on the economic growth; this leads us in inconclusive zone.

## 5. Conclusions

This study has focused to examine the impact of tourism, exports and foreign direct investment on economic growth that to test E-LG, T-LG and FDI-LG hypothesis on four ASIAN countries namely India, China, Pakistan and Russia. Study period of the analysis is 1995 to 2008. For the analysis, we have panel ordinary least squares estimation technique in log linear model for estimation in the framework of fixed and random effect. For the empirical analysis we have used production function that is derived from Feder (1982) and Durbarry (2004) and was modified by inclusion of FDI and then the relationship amongst traditional exports of goods and services, tourism receipts, FDI and economic growth is tested by considering physical and human capital as other relevant factors.

We find that, as expected, physical capital and human capital are also key factors in the long-run growth in four ASIAN countries. Additionally, economic growth in four ASIAN countries is positively impacted by tourism receipts and FDI has shown negative impact on economic growth while impact of exports of goods and services on economic growth is inconclusive. Therefore, we can say that tourism sector is working as a complementary sector and so its role should be taken into account in the strategic and promotional policies adopted by governments and policy makers.

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