Asian Development Policy Review
ISSN(e): 2313-8343
ISSN(p): 2518-2544
DOI: 10.18488/journal.107.2019.74.307.317
Vol. 7, No. 4, 307-317.

URL: www.aessweb.com

IMPACT OF INFLATION, CO_2 EMISSIONS AND FOREIGN INVESTMENT ON ECONOMIC GROWTH: A CASE OF PAKISTAN

Sadam Hussain[1+]
Waqar Ahmad[2]
Yasmeen Qamar[3]
Muhammad Shahid Akram[4]

[1]*Center for Industrial and Business Organization, Dongbei University of Finance and Economics, Dalian, Liaoning Province, China.*
Email: sadam_2iqbal@yahoo.com Tel: +8613795124091
[2]*HZAU Wuhan Hubei, China.*
[3]*Department of Economics, The University of Lahore, Lahore, Pakistan.*
[4]*The School of Economics, Bahauddin Zakariya University Multan, Punjab, Pakistan.*

(+ Corresponding author)

Article History
Received: 9 September 2019
Revised: 11 October 2019
Accepted: 15 November 2019
Published: 23 December 2019

Keywords
Inflation
Labor
Capital
Co_2 emission
Foreign investment
Economic growth
Pakistan.

JEL Classification:
C10; F18; F41; Q50.

ABSTRACT

In this article, an endeavor has been made to break down the connection and the impact of foreign investment together with CO_2 emission, labor, capital and inflation on economic growth of Pakistan by utilizing time series data from 1971-2015. Since it's alluring to test the effect of foreign investment inflow utilizing the ongoing actualities and figure, the examination utilizes GDP as needy variable while FDI, CO_2, and inflation are utilized as free variables. The examination adopts ARDL to Co-integration techniques for the experimental investigation. The exact estimations demonstrate that foreign investment has positive and huge relationship with economic growth which infers that foreign investment and capital support economic growth both in short and long run. The CO_2 discharges have negative and critical connection with economic growth in long run however hold insignificant in short runs. Increment in inflation impedes the economic growth in long run on account of the negative connection among GDP and inflation. These experimental bits of knowledge give policy-makers essential strategy recommendations.

Contribution/ Originality: This study is one of very few studies which have investigated the impact of environmental changes on the economic growth of Pakistan.

1. INTRODUCTION

In the previous few decades, economic development and its components have been a noteworthy focal point of financial economists, particularly for the creating economies. The investment go about as a power for financial economic growth and is the main peak point for an economy, and it tends to be either residential reserve funds or through foreign investment. The foreign investment gives coordinate capital financing that deliver positive externalities, along these lines animate economic growth by means of exchange of technology, overflow impacts, establishment of new techniques and methods, and improved administrative abilities (Lee, 2013). To be sure foreign investment adds to the host nation in three different direction, (I) foreign investment fortify accordingly economic growth process in the host nation (Alfaro *et al.*, 2010) (II) foreign investment is the wellspring of outer financing (Bustos, 2007) and (III) foreign investment abbreviates the connection between local reserve funds and aim investment (Ndikumana and Verick, 2007).

The impact of foreign investment on economic growth of host country is dependent of number of elements, for example, economic stability, investment and tax assessment arrangement, Technology headway of host nation, human capital, exchange transparency, and so on Pegkas (2015). Foreign investment helps in market advancement of host economy which additionally upgrades the work open doors for gifted and also non-talented labor. All the more particularly, foreign investment grades to be centered around those sectors and framework that appreciate and have space for promote near favorable position. Regularly foreign investment benefits the financial development of the host country; it increment add up to level of investment by assembling the more elevated amount of household speculation, and by the mix of trend setting innovation together with the host's nation human capital, foreign investment can be more effective and profitable when contrasted with residential speculation (Lim, 2001).

Foreign investment does contribute and advance economic growth however it has its natural cost too. The advancement and development of the modern increment the request of vitality which is the significant reason for CO_2 (Carbon dioxide) outflows (Shahbaz *et al.*, 2015). Since creating economies have loosened up strategies concerning natural issues, multinational enterprises are urged to make interests in such nations to build their generation alongside alternate advantages. Both ecological relaxation and diminished production cost are principle explanations for environmental hardship in have country. There are distinctive hypotheses in regards to the impacts of vitality utilization as CO_2 emissions. As per contamination asylum hypothesis, developing country experience environmental decay in view of debilitate environmental security laws as a greater amount of multinational partnerships are pulled in towards the advantages related with these developing nations (Cole and Elliott, 2003).

Then again, some economic specialist contend that foreign investment gives progressed and effective frameworks and organize through better administration framework that give enhanced condition quality in have economy (pollution halo theory). For developing nations to support economic growth, foreign investment empower industrialization which thusly may advance emission of CO_2 everywhere (Pao and Tsai, 2011). Decisively, it tends to be contended that CO_2 emission can have huge connection with economic growth of country due to the vitality utilization related with the industrialization procedure particularly for the developing nations yet in addition has its cost.

Main points for macroeconomic arrangement (Fontaine, 1996) of any nation are to maintain high level of growth ratio and low inflation rate. Value stability is the fundamental segment (McDonald and Gibson, 1998) in deciding the development ratio of country. Both higher and low expansion rate have awful outcomes for the economy. For instance, Aiyagari (1990) suggest that cost of bringing down the inflation rate beneath certain level i.e. towards zero, is more than the advantages.

Growth and inflation are exceedingly compelling in deciding the financial stability and in accomplishing the present and future focuses for the country. In the ongoing couple of decades, number of studies has explored the relationship between inflation and economic growth. The consequences of these researches and observational proof have additionally been mixed. Vinayagathasan (2013) ordered the inflation/growth trade off in four distinctive ways. The primary view proposed no impact of inflation on growth ratio (Cameron *et al.*, 1996). The second view suggested that inflation has negative impact on economic growth (Saaed, 2007). The third view bolster that there exist a positive connection among inflation and economic growth (Mallik and Chowdhury, 2001).

Likewise, Feldstein (1996) aim shifting the harmony rate of inflation from two percent to zero would cause an interminable welfare increase equivalent to around one percent of (GDP) annually." These days, a large portion of the investigations proposed negative impact of expansion on financial development over the long haul (Aydın *et al.*, 2016) be that as it may, what is the ideal level, if or not there is any limit specific to every economy gathering, and to what extent it takes to accomplish stable development after the general level costs is lessened to wanted level is dependably the inquiry for economists.

Among the different sectors of economies, mechanical division in Pakistan fills in as a fundamental supporter of the economy (Shah *et al*., 2011) i.e. around 25% of GDP. Rising businesses requires expanded preparation of both domestic and foreigner resources, being the most vital determinant of advancement in mechanical sector (Khan and Kim, 1999) so Pakistan is stepping up with regards to sound macroeconomic strategies to assemble trust and grab the eye of nonnative speculators. An expanding pattern has been developing to discover the nexus between financial development, foreign investment, CO_2 emission, and so forth yet the experimental confirmations are vague with questionable result. Less develop economies regularly confront the issue of macroeconomic security and ward upon global offices and associations to balance out their economies, so inflation needs to complete a great deal with the economic growth of the nation. Like other low develop economies, next to no is thought about the commitment of these variables to the economic growth which gives the inspiration to distinguish the connection of these components to the development trade off. The motivation behind the examination is to explore the connection and impact of foreign investment, CO_2 outflow and inflation towards economic growth of Pakistan. Whatever is left of the investigation is sorted out as take after. Area 2 gives the short audit about writing. Segment 3 is about information determination and strategy. Segment 4 covers exact outcomes and examination, and Section 5 finishes up the investigation.

2. REVIEW OF LITERATURE

To manage economic growth, most of the developing countries intentionally downgrade the ecological standers to draw in foreign investment. For this reason, out of country investors move their tasks to low develop economies and to get different favorable circumstances related with these economies. The majority of the investigations, both on develop and developing economies showed the constructive outcome of foreign investment towards economic growth, which is subject to number of variables, for example, human capital, foundation, innovation, environmental issues, exchange transparency, and so on. Lipsey and Zegan (1994) perform the investigation on both develop (23 countries) and creating (78 countries) and found that FDI has noteworthy positive effect on financial development. Borensztein *et al.* (1998) demonstrate that FDI is a vital mean in exchanging cutting edge innovation and contribute towards economic growth and its effect is more prominent in have countries with the larger amount of human capital. Campos and Kinoshita (2002) analyze the impact of foreign investment on economic growth of Central and Eastern European and Soviet Union progress economies and give confirm that foreign investment has significant constructive outcome on economic growth of each choose economy.

Pegkas (2015) perform the examinations on Euro zone countries to ponder the relationship and impact of FDI on economic growth for the year 2002 to 12. Their exact result showed the positive long runs co-integration between foreign investment stocks and economic growth and furthermore the stock of foreign investment is a critical variable that positive influences the economic growth of Euro zone countries. Kivyiro and Arminen (2014) find that for Sub-Sahara African nations, CO_2 emission, financial advancement, FDI, and energy utilization move a similar way in long run. Omri *et al.* (2014) indicate bi-directional causality between economic growth and FDI streams and CO_2 outflow and FDI. The outcomes for every one of the examinations are not same as a few specialists give distinctive connection between financial development, FDI and CO_2 emanation, for instance (Al-Mulali and Tang, 2013; Chandran and Tang, 2013) thinks about on ASEAN countries and Gulf Cooperating Council give confirm that monetary development and vitality utilization are the wellspring of CO_2 outflows, however foreign investment does not have any job in CO_2 discharges. Cole and Elliott (2003) discover U-formed relationship between per capita modern outflow and pay in China, where economic growth likewise prompt increment in population.

Kemal (1976a) utilized the unadjusted CMI a data on the estimation of settled assets and made no push to modify the data for underestimation of the capital stock. It may be the case that the proportion of working cash-flow to labor in various enterprises may shift generally and will every now and again have a tendency to be higher for moderately less automated procedures (Sen, 1975).

Zhu *et al.* (2016) explored the relationship of foreign investment, economic growth, and inflation utilization on CO_2 emission on ASEAN countries and discovered heterogeneous impact of the above factors on CO_2 emission crosswise over quantiles with more elevated amount of exchange receptiveness can consolidate the expansion in CO_2 discharge especially in high and low discharge countries. Omri *et al.* (2014) examine the causality relationship between FDI, CO_2 emission and economic growth for 54 countries for the year 1990 to2011 and give the experimental proof of "bi-directional causality between FDI inflows and monetary development for every one of the boards and among FDI and CO_2 for every one of the boards, with the exception of Europe and North Asia." For Pakistan, Bakhsh *et al.* (2017) made an endeavor to discover the impact of FDI on industrial pollution and financial development for the period 1980 to 2014 and found that expansion in financial development leads toward increment in industrial pollution and financial development drops as industrial pollution crosses a specific level. Thus, FDI is likewise observed to be decidedly related with CO_2 emission.

Despite the fact that a considerable measure of studies have analyzed the relationship between monetary economic growth and inflation, no particular pattern is observed to be related between the inflation and economic growth. The greater parts of the most recent research indicate inflation as requirement to monetary advancement and have negative effect on economic growth. Regularly inflation helps economic growth when it is underneath a specific limit level however negative impact has when expansion is over that edge esteem. Sarel (1996) proposes the presence of purpose of level which is right around 8%. Ghosh and Phillips (1998) exhibit a significantly bring down swelling edge level i.e. 2.5% a year. Khan and Ssnhadji (2001) decided the distinctive limit level for industrialized (1-3%) and creating (11-12%) nations and uncovered that swelling prevents monetary development extensively past this level. For Asian economies, Vinayagathasan (2013) discover inflation contrarily influence growth when it surpass 5.43% yet don’t have impact below this level.

Lee (2009) looks at the connection between economic growth, foreign investment, and modern contamination and found that variables are interrelated in long kept running if there should be an occurrence of Malaysia. The impacts of foreign investment inflows and CO_2 emission on the host economy have dependably been an issue on account of the dubious results, and furthermore there is additionally little think about Pakistan's economy coefficient.

3. DATA, MODEL SPECIFICATION AND ECONOMETRIC METHODOLOGY

3.1. Data

The center object of this article is impact of foreign investment together with CO2 emission, labor, capital and inflation on economic growth of Pakistan in Million US $ by utilizing time series data from 1971-2015. Data has been taken from World Bank, State Bank of Pakistan (SBP), Statistic Hands Book of Pakistan, and International Financial statistic (IFS) and Pakistan Economic Survey (different issues).

3.2. Model Specification

$$\boldsymbol{Y = f(L, K)} \tag{1}$$

The component of human capital (H) in to the output, or, in other words Equation 1, the output appears as Equation 2.

$$\boldsymbol{Y = f(l, k, co2, fdi, inf)} \tag{2}$$

There,

l = labor

k = capital

co2 = cardon dioxide

fdi = foriegn direct investment

inf = inflation

3.3. Econometric Tools and Methodology

$$Y = \beta_0 + \beta_1 FDI + \beta_2 L + \beta_3 CO_2 + \beta_4 INF + \beta_5 K + \varepsilon \quad (3)$$

The econometric model for the study is given in the Equation 3. Where, FDI is foreign Direct Investment, CO2 is carbon Dioxide, Inf is Inflation rate, L is Labor force, K is capital and e is error term. The coefficient of each variables is discussed in detail in Table 1.

Table-1. Representation of parameters.

β_1	β_2	β_3	β_4	β_5
Coefficient of Foreign Direct investment	Coefficient of CO_2	Coefficient of Inflation	Coefficient of Labor	Coefficient of Capital

3.4. ARDL

ARDL (Autoregressive Distributed Lag) approach (Pesaran and Shin, 1998; Pesaran *et al.*, 2001) is a co-mix procedure for deciding long-run and short-run (Jalil and Mahmud, 2009) connections among variables. The multiple regression technique (Glahn, 1968; Hermiston and Faulkner, 1971; Goodman, 1976; Asiltürk and Çunkaş, 2011) will be evaluated for this examination. We have in excess of one autonomous variable. The ARDL form of Equation 3 is given in the Equation 4:

$$\Delta(Y)_t = \alpha_0 + \beta_1(CO_2)_{t-1} + \beta_2(L)_{t-1} + \beta_3(FDI)_{t-1} + \beta_3(INF)_{t-1} + \beta_3(K)_{t-1} + \sum_{i=1}^{p}\gamma_i\, \Delta(Y)_{t-1}$$
$$+ \sum_{i=1}^{p}\varpi_i\, \Delta(CO_2)_{t-1} + \sum_{i=1}^{p}\beta_i\, \Delta(L)_{t-1} + \sum_{i=1}^{p}\theta_i\, \Delta(INF)_{t-1} + \sum_{i=1}^{p}\varpi_i\, \Delta(K)_{t-1} + \sum_{i=1}^{p}\beta_i\, \Delta(K)_{t-1}$$
$$+ \mu_t \quad (4)$$

4. OBSERVATIONAL RESULTS AND ANALYSIS

Table 2 shows the consequences of the stationary test for ADF (Augmented Dickey-Fuller test) and PP test (Phillip-Perron) for the instance of Pakistan. Two tests i.e. ADF and PP demonstrate that GDP is critical at level. The various variables are observed to be significant at first level, accordingly, uncovers that the variables are I (1). As the outcomes figure out that the factors are I (0) or I (1), therefore recommending that we can without a doubt apply the ARDL test way to deal with above model as utilizing ARDL test requires the data to be stationary at the level I (0) and at first level I (1) and is as indicated by the definitions from Narayan (2005).

Table-2. ADF (Augmented Dickey-Fuller) and PP (Phillip-Perron) unit root test outcomes.

Test	ADF (Augmented Dickey-Fuller)		Phillips-Perron		Conclusion
Variable					
GDP	0.000***	0.000***	0.000***	0.000***	*At level*
FDI	0.08*	0.001***	0.341	0.689	
L	0.7	0.025	0.560	0.45	
CO_2	0.90	0.01**	0.898	0.232	
K	0.501	0.005	0.671	0.53	
INF	0.026**	0.07*	0.016**	0.232	
GDP	0.000***	0.000***	0.000***	0.000***	*At first difference*
FDI	0.000***	0.001***	0.001***	0.007***	
L	0.000***	0.000***	0.000***	0.000***	
CO_2	0.000***	0.000***	0.000***	0.000***	
K	0.000***	0000***	0.002***	0.000***	
INF	0.000***	0.000***	0.000***	0.000***	

Note: p<0.01***, p<0.05**, p<0.1*.

Table-3. ARDL Bounds Test for Co-integration.

Lag structure	1,1,0,2					
F-statistics	1 % Critical value		5 % Critical value		10% Critical value	
11.91753	1 (0)	1 (1)	1 (0)	1 (1)	1 (0)	1 (1)
K=3, N=43	4.29	5.61	3.23	5.35	2.72	3.77

Table 3 displays the co-integration test analysis, and the existence of a long-run relationship has been established among the models variables. Results demonstrate that the computed F-statistics are 3.77 values. The significant critical value bounds at ten percent level (with unrestricted intercept and no trend) are 5.61 and for the lower and upper bounds respectively. Subsequently, the computed F-statistics is higher than the critical value of the upper bound, which implies that there exist a long run co-integration relationship between dependent and independent variables.

4.1. Lag Selection Criteria AIC

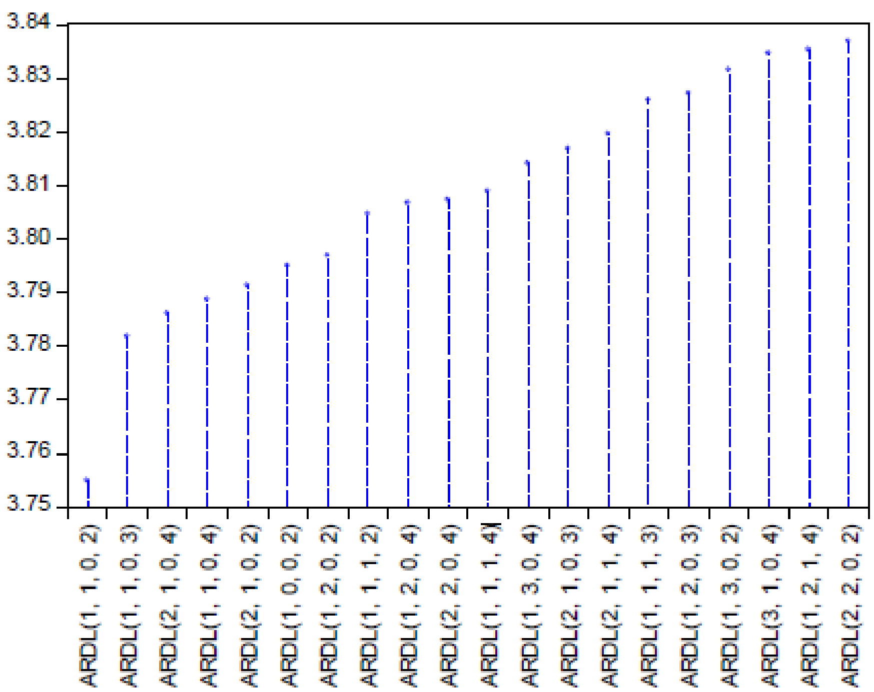

Figure-1. Akaike data criteria (top 20 models).

Table-4. Estimation results for long run relation.

Lag structure		1,1,0,2
Dependent variable: Gross Domestic Product (GDP)		
Regressors	**Coefficient**	**T-ratio (Prob)**
Constant	2.715	4.341(0.000)
D(FDI)	1.125	2.046(0.048)
K	1.671	3.092(0.032)
LN(CO_2)	-1.200	-1.727(0.0929)
INF	-0.142	-2.298(0.0276)
L	-0.320	-1.952(0.0874)
Diagnostic test		
T-statistics	LM version	F version
Jarque-Bera(normality)	1.223(0.542)	Not Applicable
LM test (1) correlation	2.624(0.269)	1.072(0.353)
Heteroskedasticity test	8.079(0.325)	1.156(0.351)
CUSUM test	Stable	Stable
CUSUMQ test	Stable	Stable

The Table 4 demonstrates the coefficients esteems for the long run estimations; the table showed that D (FDI) is huge and positive relationship at five percent level and it demonstrates that one percent expansion in FDI increases GDP by 1.12 percent. This suggests foreign investment or FDI help up economic growth in long run. Also capital shows the positive impact on increasing economic growth in long run. The LN (CO_2) has negative and huge relationship with GDP at 10 percent level and once percent expansion in LN (CO_2) diminishes GDP by 1.20 percent, which implies that increment in environmental contamination lessens GDP in long run. Inflation likewise influences fundamentally and has negative relationship with economic growth in long keep running at 5 percent level; one percent expansion in expansion lessens GDP by 0.14 percent. Also labor and economic growth negative relation at -1.9 percent on the behalf of long run time period. All the diagnostics tests demonstrate that our information is free from ordinariness, Heteroskedasticity and Serial Correlation issues. In addition, CUSUM and CUSUMQ tests are additionally stable which uncovers that model is stable for long run.

Table-5. Estimation results for short-run relation.

Lag structure:		
Dependent variable: Gross Domestic Product (GDP)		
Regressors	**Coefficient**	**T-ratio (Prob)**
D(LNCO2)	8.536	1.119(0.270)
D(FDI, 2)	1.235	1.912(0.0640)
D(K)	3.437	1.459(0.043)
D(INF)	-0.070	-1.17(0.247)
D(INF-1)	0.147	2.378(0.023)
D(L)	0.32	1.431(0.003)
CointEq(-1)	-1.097	-7.682(0.000)
Cointeq = GDP - (-1.2006*LNCO2 + 1.1251*D(FDI) -0.1421*INF + 2.7155).		

The Table 5 shows the short-run relationship among GDP and other logical variables; The D ($LNCO_2$) holds positive but inconsequential relationship with economic growth. D (FDI) has positive and noteworthy relationship with GDP at 10 percent level, and one percent expansion in D (FDI) increases GDP by 1.2 percent. Capital holds the positive impact on GDP, three percent expansion D(K) increment GDP by 1.4 percent. The inflation has negative but unimportant relation-ship with GDP. Anyway, the slack estimation of inflation, D (INF-1) demonstrated the slack estimation of inflation for economic growth and each past esteem reduces GDP by 0.14 percent. The labor shows the positive relationship with GDP of country in short run time period, 0.32 percent impacted on GDP increase 1.43 percent. Error redress term which demonstrates short run dynamics, the coefficient value is - 1.09 and noteworthy which suggests the model will merge to the balance by - 1.097 percent each and hence show holds the intermingling property.

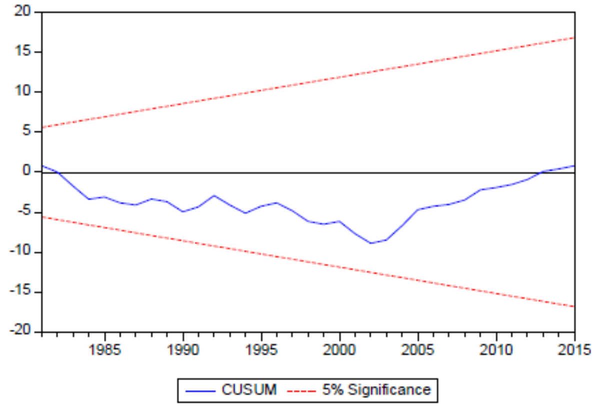

Figure-2. Plot of cumulative sum of recursive residuals.

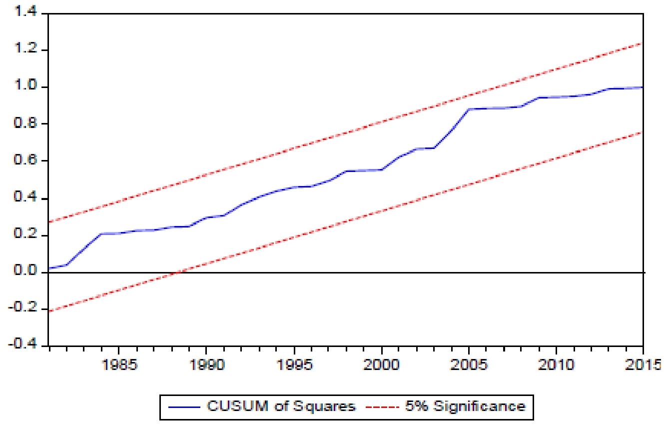

Figure-3. Plot of cumulative sum of squares of recursive residuals.

Figure 2 and Figure 3 display the CUSUM and CUSUM of Squares individually. Both the figures demonstrate that our model is stable 5 % at critical level.

5. CONCLUSION

The reason for this thesis is to two creases, to break down the impacts and relationship of labor, capital, inflation, CO_2 emission and foreign investment on the economic growth of Pakistan as estimated by GDP for the period 1971 to 2015. Foreign investment assumes vital role in boosting up financial growth and monstrous literature has just examined this issue, anyway it attractive to test the effect of FDI inflow on GDP if there should arise an occurrence of Pakistan utilizing the present and ongoing figures and information. Since gigantic declination has been seen after 2008 and huge vitality deficiency that prompts low level of foreign investment (FDI) inflow in case of Pakistan. Along these lines this model is especially focus foreign investment and economic growth utilizing the recent information.

The examination utilizes data for the period 1971 to 2015; data for the applicable variables are gotten from the World Bank Indicators. The model contains GDP as reliant inflation CO_2 (Carbon dioxide) outflows and foreign investment, as illustrative variables. For data analysis we applied ARDL model to co-integration; the results demonstrates a significant relationship among GDP and foreign investment (Campos and Kinoshita, 2002) and that foreign investment help up GDP in long run, however short run foreign investment doesn't have any relationship. This shows because of modification process, foreign investment set aside long opportunity to add to economic growth in Pakistan. While Inflation holds long run and negative affiliation this demonstrates expansion obstructs economic growth in long run (Vinayagathasan, 2013). The environmental contamination is appeared through CO_2 and it demonstrates that in long run CO_2 holds negative association with economic growth, which uncovers that environmental contamination impedes economic growth and is in agreeing with Bakhsh *et al.* (2017) for Pakistan Environmental contamination causes a decrease in economic development for long-run. By and large the heightening in capital force shows that the general future business prospects in the division are distressing.

Since foreign investment positive impacted on economic growth in long run, there is need of appropriate arrangement execution to increase the foreign investment in the nation; First government needs to cover the vitality lack in the country that will draw in more foreign investment in country. There is additionally need to enhance the lawfulness circumstance as poor peace conditions adversely influences the investment openings. The inflation is big financial problem of Pakistan country; there may be a few purposes behind the inflation both money related and non-fiscal. Hence first need to decide the underlying foundations of expansion; if financial variables are the in charge of higher costs in economy government should control cash supply in the economy; on the off chance that if the inflation are expected to non-factors then government ought to be control non-money related elements. Since environmental debasement is the obstacle in the method for long-run economic growth, hence activities are expected to keep the contamination underneath certain level. Also, appropriate enactment is required to control the level of CO_2 emanations.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
Acknowledgement: All authors contributed equally to the conception and design of the study.

REFERENCES

Aiyagari, S.R., 1990. Deflating the case for zero inflation. Federal Reserve Bank of Minneapolis Quarterly Review, 14(3): 2-11.

Al-Mulali, U. and C.F. Tang, 2013. Investigating the validity of pollution haven hypothesis in the gulf cooperation council (gcc) countries. Energy Policy, 60: 813-819.Available at: https://doi.org/10.1016/j.enpol.2013.05.055.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan and S. Sayek, 2010. Does foreign direct investment promote growth? Exploring the role of financial markets on linkages. Journal of Development Economics, 91(2): 242-256.Available at: https://doi.org/10.1016/j.jdeveco.2009.09.004.

Asiltürk, I. and M. Çunkaş, 2011. Modeling and prediction of surface roughness in turning operations using artificial neural network and multiple regression method. Expert Systems with Applications, 38(5): 5826-5832.Available at: https://doi.org/10.1016/j.eswa.2010.11.041.

Aydın, C., Ö. Esen and M. Bayrak, 2016. Inflation and economic growth: A dynamic panel threshold analysis for Turkish Republics in transition process. Procedia-Social and Behavioral Sciences, 229: 196-205.Available at: https://doi.org/10.1016/j.sbspro.2016.07.129.

Bakhsh, K., S. Rose, M.F. Ali, N. Ahmad and M. Shahbaz, 2017. Economic growth, CO2 emissions, renewable waste and FDI relation in Pakistan: New evidences from 3SLS. Journal of Environmental Management, 196: 627-632.Available at: https://doi.org/10.1016/j.jenvman.2017.03.029.

Borensztein, E., J. De Gregorio and J.-W. Lee, 1998. How does foreign direct investment affect economic growth? Journal of International Economics, 45(1): 115-135.

Bustos, P., 2007. FDI as a source of finance in imperfect capital markets: Firm-level evidence from Argentina. Pompeu Fabra University-CREI Mimeo.

Cameron, N., D. Hum and W. Simpson, 1996. Stylized facts and stylized illusions: Inflation and productivity revisited. Canadian Journal of Economics, 29(1): 152-162.Available at: https://doi.org/10.2307/136156.

Campos, N. and Y. Kinoshita, 2002. . Foreign direct investment as technology transferred:some panel evidence from the transition economies, CEPR Discussion Paper 3417, London. London: Centre for Economic Policy Research (CEPR).

Chandran, V. and C.F. Tang, 2013. The impacts of transport energy consumption, foreign direct investment and income on CO2 emissions in ASEAN-5 economies. Renewable and Sustainable Energy Reviews, 24: 445-453.Available at: https://doi.org/10.1016/j.rser.2013.03.054.

Cole, M.A. and R.J. Elliott, 2003. Determining the trade–environment composition effect: The role of capital, labor and environmental regulations. Journal of Environmental Economics and Management, 46(3): 363-383.Available at: https://doi.org/10.1016/s0095-0696(03)00021-4.

Feldstein, M., 1996. The costs and benefits of going from low inflation to price stability. NBER Working Paper, No. 5469.

Fontaine, J.A., 1996. Are there (good) macroeconomic reasons for limiting external investments by pension funds? The Chilean experience. The Economics of Pensions: Principles, Policies and International Experience.

Ghosh, A. and S. Phillips, 1998. Warning: Inflation may be harmful to your growth. Staff Papers, 45(4): 672-710.Available at: https://doi.org/10.2307/3867589.

Glahn, H.R., 1968. Canonical correlation and its relationship to discriminant analysis and multiple regression. Journal of the atmospheric sciences, 25(1): 23-31.Available at: https://doi.org/10.1175/1520-0469(1968)025<0023:ccairt>2.0.co;2.

Goodman, L.A., 1976. The relationship between modified and usual multiple-regression approaches to the analysis of dichotomous variables. Sociological Methodology, 7: 83-110.Available at: https://doi.org/10.2307/270705.

Hermiston, R. and J. Faulkner, 1971. Prediction of maximal oxygen uptake by a stepwise regression technique. Journal of Applied Physiology, 30(6): 833-837.Available at: https://doi.org/10.1152/jappl.1971.30.6.833.

Jalil, A. and S.F. Mahmud, 2009. Environment Kuznets curve for CO2 emissions: A cointegration analysis for China. Energy Policy, 37(12): 5167-5172.Available at: https://doi.org/10.1016/j.enpol.2009.07.044.

Kemal, A.R., 1976a. Sectoral growth rates and efficiency of factor use in large-scale manufacturing sector in West Pakistan. The Pakistan Development Review, 15(4): 349-381.

Khan, A. and Y.-H. Kim, 1999. Foreign direct investment in Pakistan: Policy issues and operational implications.

Khan, M.S. and A.S. Ssnhadji, 2001. Threshold effects in the relationship between inflation and growth. IMF Staff papers, 48(1): 1-21.

Kivyiro, P. and H. Arminen, 2014. Carbon dioxide emissions, energy consumption, economic growth, and foreign direct investment: Causality analysis for Sub-Saharan Africa. Energy, 74: 595-606.Available at: https://doi.org/10.1016/j.energy.2014.07.025.

Lee, C.G., 2009. Foreign direct investment, pollution and economic growth: Evidence from Malaysia. Applied Economics, 41(13): 1709-1716.Available at: https://doi.org/10.1080/00036840701564376.

Lee, J.W., 2013. The contribution of foreign direct investment to clean energy use, carbon emissions and economic growth. Energy Policy, 55: 483-489.Available at: https://doi.org/10.1016/j.enpol.2012.12.039.

Lim, M.E.-G., 2001. Determinants of, and the relation between, foreign direct investment and growth: A summary of the recent literature (No. 1-175). International Monetary Fund.

Lipsey, B.M. and M. Zegan, 1994. What explains developing country growth. NBER Working Paper. National Bureau for Economic Research, Cambridge, Massachusetts, 4132.

Mallik, G. and A. Chowdhury, 2001. Inflation and economic growth: Evidence from four south Asian countries. Asia-Pacific Development Journal, 8(1): 123-135.

McDonald, J. and C.C. Gibson, 1998. Interpersonal dynamics and group development in computer conferencing. American Journal of Distance Education, 12(1): 7-25.Available at: https://doi.org/10.1080/08923649809526980.

Narayan, P.K., 2005. The saving and investment nexus for China: Evidence from cointegration tests. Applied Economics, 37(17): 1979-1990.Available at: https://doi.org/10.1080/00036840500278103.

Ndikumana, L. and S. Verick, 2007. The linkages between FDI and domestic investment: Unravelling the developmental impact of foreign investment (No. 2007-13). Working Paper.

Omri, A., D.K. Nguyen and C. Rault, 2014. Causal interactions between CO2 emissions, FDI, and economic growth: Evidence from dynamic simultaneous-equation models. Economic Modelling, 42: 382-389. Available at: https://doi.org/10.1016/j.econmod.2014.07.026.

Pao, H.-T. and C.-M. Tsai, 2011. Multivariate granger causality between CO2 emissions, energy consumption, FDI (foreign direct investment) and GDP (gross domestic product): Evidence from a panel of BRIC (Brazil, Russian Federation, India, and China) countries. Energy, 36(1): 685-693.Available at: https://doi.org/10.1016/j.energy.2010.09.041.

Pegkas, P., 2015. The impact of FDI on economic growth in Eurozone countries. The Journal of Economic Asymmetries, 12(2): 124-132.Available at: https://doi.org/10.1016/j.jeca.2015.05.001.

Pesaran, M.H. and Y. Shin, 1998. An autoregressive distributed-lag modelling approach to cointegration analysis. Econometric Society Monographs, 31: 371-413.Available at: https://doi.org/10.1017/cbo9781139052221.011.

Pesaran, M.H., Y. Shin and R.J. Smith, 2001. Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3): 289-326.Available at: https://doi.org/10.1002/jae.616.

Saaed, A.A., 2007. Inflation and economic growth in Kuwait: 1985-2005-evidence from co-integration and error correction model. Applied Econometrics and International Development, 7(1).

Sarel, M., 1996. Nonlinear effects of inflation on economic growth. Staff Papers, 43(1): 199-215.Available at: https://doi.org/10.2307/3867357.

Sen, A.K., 1975. Employment, technology and development. Oxford: Clarendon Press.

Shah, A.A., S. Qureshi, A. Bhutto and A. Shah, 2011. Sustainable development through renewable energy—the fundamental policy dilemmas of Pakistan. Renewable and Sustainable Energy Reviews, 15(1): 861-865.Available at: https://doi.org/10.1016/j.rser.2010.09.014.

Shahbaz, M., S. Nasreen, F. Abbas and O. Anis, 2015. Does foreign direct investment impede environmental quality in high-, middle-, and low-income countries? Energy Economics, 51: 275-287.Available at: https://doi.org/10.1016/j.eneco.2015.06.014.

Vinayagathasan, T., 2013. Inflation and economic growth: A dynamic panel threshold analysis for Asian economies. Journal of Asian Economics, 26: 31-41.Available at: https://doi.org/10.1016/j.asieco.2013.04.001.

Zhu, H., L. Duan, Y. Guo and K. Yu, 2016. The effects of fdi, economic growth and energy consumption on carbon emissions in asean-5: Evidence from panel quantile regression. Economic Modelling, 58: 237-248.Available at: https://doi.org/10.1016/j.econmod.2016.05.003.