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The Impact of Key Macroeconomic Determinants on Pakistan's Economy

Abstract

This paper intended to analyze key Macroeconomic factor's effect on Pakistan's economic development. The annual time-series data has been taken from 1980 to 2018 on External Debts, Foreign Direct investment, Consumer Price Index and Term of Trade. Variables stationarity is analyzed by ADF and Ng-Perron tests; afterwards, JJ test and Granger Causality test are used for Long-run (LR) & Short-run(SR) associations between variables, respectively. Also, Residuals Diagnostic Test used for checking residuals assumptions and CUSUM and CUSUMSQ are used for checking parameter constancy. The result shows significantly negative and positive long-run effects of External Debts and Foreign Direct Investment (FDI) respectively on the economic growth of Pakistan. Albeit, Consumer Price Index (CPI), Term of Trade (TOT) and, FDI significantly Granger cause economic growth in the short-run. Research suggests that economic policies devised in such a way that deteriorates External Debts and attract foreign investments and strengthen the economic growth of Pakistan in the long-term.

Key Words: Johansen's Co-Integration Method; Granger Causality; External Debt; Economic Growth

Introduction

Foreign debt has always been a notable factor for developing nations because it plays a vital role in the economic development of any country if used with proper management and policies. Pakistan has an immense amount of natural resources, good geographical and weather conditions as well as talented minds and young human capital in its region which leads to any country to its apex despite all these factors Pakistan developing indicators, economic and socio-economic conditions remains poor. Nowadays Pakistan's sovereignty is threatening by its poor economic condition due to which Pakistan must take foreign debts which turns into a basic issue for policymakers that there is a need to re-examine the components and determinants of economic growth. Since 1980 Pakistan's economic edifice is descending, total debt (internal and external) has reached its peak in June 2018 which is 28.879 trillion rupees and exceeded to Rs. 35.094 trillion till the end of March 2019 alternatively per capita debt in Pakistan reached to approximately two hundred thousand rupees which are a 350% increased as compared to 2008; Inflation has marked up to 15%. Moreover, Pakistan's debt servicing is increasing sharply along with aggravated debt to GDP ratio, which has touched to 71.69% in 2018. Pakistan is dependent on borrowing from external sources rather than focusing on our resources such as foreign direct investment which creates the most detrimental impact on the current economic crisis that has brought national development halt and low tax collection and inefficiency within the tax system raises the budget deficit. The above short financial glimpse propelled 40% of Pakistan's population below the poverty line and creating extreme economic frustration and social unrest. Under the present global economic meltdown to find the alternate and independent economic strategy which must be sustainable in the long-term. This paper is intended to identify and analyze economic growth factor which can help the policymaker in devising an economic strategy.

However, the changing conditions of politics and economics, it seems necessary to carry out more investigation by using current data and econometrics methods. A review of the literature summarizes as under. These studies have revealed numerous factors that were held responsible for

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predicting Economic patterns ([Eichengreen & Portes, 1986](#)) revealed that foreign indebtedness might cause export instability and trade openness in emergent nations.

[Ferraro & Rosser \(1994\)](#) also tried to find causal factors for high external debt ratio in underdeveloped countries, and they deduced that rise in interest rate, fluctuation in oil prices 1973 and 1979, decrease in terms of trade and poverty were the main cause for the accumulation of debts. By utilizing the panel data approach, the underlying cause of foreign indebtedness of emerging countries is income stability, debt servicing, poverty, exchange difference gap & capital-output during the 1980s toward the 1990s. This study called for attention toward those factors that are responsible for indebtedness and drowsy economic development which includes income instability, high dependence on foreign loans to pay import bills and, debt service instalments. ([Tiruneh, 2004](#))

[Zafar & Butt \(2008\)](#) by applying the econometric technique on the data from 1972 to 2007 to analyze the consequences of trade openness on the accumulation of external debt of Pakistan. It has been identified that trade openness was the main factor to increase foreign debt in Pakistan, which hamper economic progress. Identified beneficial factors that accentuate economic growth include credit to the private sector, FDI & the inflow of remittances on economic development of Pakistan by utilizing the Autoregressive Distributed Lag (ARDL) approach and log-linear model. However, it turned out that trade openness and inflation inversely effect on the development of the country ([Shahbaz et al., 2008](#)). As along both Japan and Korea for 1971-2006 and 1996-2003 respectively. By using the Johansen Cointegration method, it concluded that the Term of Trade (TOT) has an inverse effect on Economic development ([Wong, 2010](#)), FDI and CPI that either affects the Gross Domestic products of SAARC countries or not. The investigation reasoned that the general model in these nations built up a positive association with Foreign Direct Investment, while GDP was inversely influenced by CPI. The information of the SAARC nations extended from the year 2001 to 2010 (Abbaset al.I, 2011). Moreover, external debts have more negative effects on economic development than domestic debts and slow down the progress of any country because more amount of income produced by individuals was given as debt servicing which cause a consistent budget deficit issue of the country.

Literature Review

[Sulaiman & Azeez \(2012\)](#) explained the case study of Nigeria, where data extracted from 1970 to 2010. This study used Johansen's cointegration technique and showed that external debt has positively affected economic development.

[Sagib et al. \(2013\)](#) suggested that FDI in developing countries like Pakistan plays a negative role not just only FDI, but debts, inflation and, trade have a jointly negative influence on the economy of Pakistan, but domestic investment in this regards beneficial for the country. Therefore, dependency on FDI should remain limited.

[Havi et al. \(2013\)](#) explained that Johansen's cointegration method through the neo-classical growth model identified that physical capital, FDI, labour force, CPI, government spending, military rule were notable components helped to contribute in real GDP per capita of this country.

[Abdalla & Abdelbaki \(2014\)](#) utilized the JJ and VECM to identify the core factors of economic progress, independently for all Gulf Cooperation Council (GCC) individuals. The outcomes reveal that FDI and gross capital formation were the essentials of economic development in Bahrain. While for Kuwait, Saudi Arabia and Qatar exports and gross capital formation were the core factors respectively, and in the UAE, two other factors were Foreign Direct Investment and exports. There was no cointegrating vector among the variables in Oman.

[Kalumbu & Sheefeni \(2014\)](#) examined data from 1980 to 2018 to discover the relation between TOT and the economic development of Namibia. The cointegration technique was being used, and it is found that TOT harms economic growth.

[Siddique et al. \(2015\)](#) examines data of 40 countries to discover the relation between economic development and debts and also used population, capital formation and, trade as other significant factors and found that capital formation has a positive influence on the long and short-term but debts may harm in the LR as well as SR while the economic growth influenced positively by the increase in population.

[Chaudhry et al. \(2017\)](#) studied over the sample of 25 region-wise emerging countries by using

Johansen Fisher Panel Co-Integration Test. This study concluded that to grow the economy of the nation, two factors were essential, FDI and, External Debts. Further, this study found that government expenditure, labour and, gross domestic savings also positively affect economic growth, while gross capital formation has a declining effect on economic development.

[Gudaro et al. \(2010\)](#) found that FDI influenced positively, while CPI has a significant adverse influence on economic development. In addition to FDI positively affect the economy of emerging countries as cited the study of [Agrawal et al. \(2015\)](#)

[Akram \(2017\)](#) analyzed the data of Sri Lanka from 1975 to 2014 by using the ARDL method. The conclusion of this study showed that foreign debts negatively influenced the economic development, but foreign debts(as a percentage of GDP) had helped to process the economic development in the time of civil war in Sri Lanka while debt servicing also inversely affect the GDP per capita and investment. As well as domestic debts positively associated with per capita GDP.

[Jebran et al. \(2018\)](#) explained the study conducted on Pakistan's Economic growth by taking a sample from 1980 to 2013. To deduce the result, the autoregressive distributed lag model was used. Result induced that TOT had a negative influence on economic development. In the wake of the current situation, whereas as found that there are various components inferred in economic development. External debt accumulation is one of the factors which have threatening behaviour for developing countries like Pakistan. Because due to high indebtedness, one cannot make the monetary policies for their benefit, especially when Pakistan's political and monetary policies have changed rapidly for almost three decades. There is a need to recognize the components responsible to hinder the economic growth. Given the outcomes, the examined features will help to strategize the alternatives that may get accommodating for the legislature to make improved conditions for economic growth.

Methodology

To conduct this study, the cointegration technique is being used to find the correlation among some time series variables. First, the model VAR (Vector Autoregressive) has been utilized before the model can be picked; the stationarity of the data must be checked. To check the stationarity of variables time series plot, unit root tests, and correlogram of ACF can be utilized. The subsequent stage is to test the cointegration to examine the LR association among the variables. At the point when the data gets stationary at order one, and there is a cointegration relationship, at that point, the model VAR which will be utilized is VECM. Fundamentally, two techniques of cointegration that have reliably been utilized. First was EG(Engle-Grangers) Two-Step Estimation Method & second was Johansen's ML(Maximum Likelihood).

Along these lines, to dissect the relationship among at least two non-stationary time variables, we have two techniques which are referenced previously. In this paper, the Johansen's Method was being used for analyzing five macro-economic determinants as we need the capacity to inspect them in a multivariate structure, taking into consideration the conceivable disclosure of more than one cointegrating vector, which the EG Two-step Estimation Method can't achieve. Right now, JJ better option to be used as per the requirement of this study, because this method can examine two or more variables and treated all the variables as endogenous ([Brooks.,2008](#)).

Unit Root Test

In this study, two tests have been used to verify the stationarity and the order of the series, ADF Test and Ng-Perron test. Many researchers criticized the low power test of ADF due to which we used the Ng-Perron test as well because it is viewed as a better test for a limited sample size.

ADF

To carry out this study, we will test each variable independently by unit root test to guarantee their non-stationarity at the level, and then they become stationary at I(1). [Tsay \(2005\)](#) proposed to confirm the presence of a unit root in an autoregressive AR(p) procedure; one may test the following hypothesis

$$H_0 : \beta = 1 \text{ vs. } H_a : \beta < 1$$

using the regression

$$y_t = c_t + \beta y_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta y_{t-i} + \epsilon_t \quad \text{Eq 1. 1}$$

where c_t is a deterministic function of the time index t and $\Delta y_j = y_j - y_{j-1}$ is the differenced series of y_t . c_t can be zero or a constant or $c_t = \omega_0 + \omega_1 t$.

The equation for the ADF_Test is given below:

$$ADF_Test = \frac{\hat{\beta}-1}{std(\hat{\beta})} \quad \text{Eq 1. 2}$$

where $\hat{\beta}$ is the least-squares estimate of β , which is known as the ADF method unit-root test. After the first differencing equation one can be written as:

$$\Delta y_t = c_t + \beta_c y_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta y_{t-i} + \epsilon_t \quad \text{Eq 1. 3}$$

where $\beta_c = \beta - 1$ which can be tested with the hypothesis $H_0: \beta_c = 0$ against $H_a: \beta_c < 0$.

It is necessary to determine the optimal lag length for each model. Therefore, to maximize the log-likelihood function of the model one must choose the model with the lowest SBIC (Schwartz Bayesian Information Criterion) and for accuracy Cross-check it by using the AIC (Akaike Information Criterion).

Ng et al. (2011) argued that ADF_Test is not that decisive in limited sample sizes. This test tends to reject when the null hypothesis is true and accept when it is false. Therefore Ng & Perron (2001) developed four test statistics by using the GLS method detrended procedure to solve the difficulties regarding power distortion and meagre sample size, which is associated with the ADF test.

Johansen's Cointegration Method

Johansen's Cointegration method is utilized when we need to see the correlation among at least two non-stationary time series variables, and they must be stationary at I(1) independently so their combination will likewise be I(1). Nonetheless, it is conceivable that two non-stationary variables, i.e. I(1) can be cointegrated if their linear combination would be stationary, which is I(0).

If we combine variables with varying order of difference, then the combination of integration will be the order of the higher one, i.e., if

$$Y_{i,t} \sim I(d_i) \quad \text{Eq 1. 4}$$

for $i=1,2,3,\dots,k$

$$X_t = \sum_{i=1}^k \beta_i Y_{i,t} \quad \text{Eq 1. 5}$$

Let then

$$X_t \sim I(\max d_i) \quad \text{Eq 1. 6}$$

It shows a steady-state or long-run relationship among variables which might be a consequence of economic behaviours and patterns.

The method uses in this study is [Johansen & Juselius \(1990\)](#) this procedure depends on the maximum likely hood method. For applying this method first, we should need to select the ideal lag length for the Gaussian error term, which is no autocorrelation and heteroskedasticity and normally distributed. Their approach decides the numbers of cointegrating vectors in non-stationary time series. VAR which can be composed as:

$$y_t = \alpha + \sum_{k=1}^m \Pi_k y_{t-k} + \epsilon_t \quad \text{Eq 1. 7}$$

Where y_t is a matrix of five variables having dimension $g \times 1$ and they should be integrated at I(1), α is a vector of constant with dimensions $g \times 1$ and ϵ_t is a vector of an error term with zero mean and constant variance having dimension $g \times 1$.

After the first difference, it turns into VECM which can be written as:

$$\Delta y_t = \alpha + \sum_{k=1}^{m-1} \Gamma_k \Delta y_{t-k} + \Pi y_{t-1} + \epsilon_t \quad \text{Eq 1. 8}$$

Where y_t and ϵ_t are the vectors of five variables and the white noise error term, respectively. K shows lag length. Π is a long-term coefficient matrix which is also known as impact matrix with the

dimension of $g \times g$. Therefore, 5×5 is the dimension of the impact matrix because there are five variables in the study. The impact matrix's rank(r) will be the number of cointegrating vectors, and there should be $r \leq h-1$ cointegration relationship where h is the number of variables and r is the rank. [Johansen \(1995\)](#) introduced two test statistics to test the rank of the cointegrating vector, which are mentioned below:

Trace Statistics

$$\lambda_{trace}(r) = -N \sum_{i=r+1}^k \ln(1 - \lambda_i) \tag{Eq 1. 9}$$

Where N shows the number of observations, r shows the number of cointegrating vectors, k shows the total number of variables and, λ_i is the eigenvalues.

The hypotheses for trace statistics are as under:

$$H_0: r \leq r \text{ vs. } H_a: r > r$$

Maximal Eigenvalue Test Statistics

$$\lambda_m(r, r + 1) = -N \ln(1 - \lambda_{r+1}) \tag{Eq 1. 10}$$

Similarly, the hypotheses for maximal eigenvalue test statistics are as under:

$$H_0: r = r \text{ vs. } H_a: r = r + 1$$

Significant cointegrating vectors are related to significant non-zero eigenvalues.

VECM

Granger et al. (1987) proposed that TS variables were integrated on $I(1)$ then at that point we should use VECM to get the joint behavior of both series and through VECM we can find the long term and short-term relationships. Pre-requirement to use VECM is that every variable ought to be integrated of order one $I(1)$, and there must be at least one co-integrating vector present among the variables. Following are the VECM models for the economic growth of Pakistan with its determinants

$$\begin{aligned} \Delta EG_{1t} = & \alpha_{10} + \sum_{i=1}^p \alpha_{11,c} \Delta EG_{1,c-1} + \\ & \sum_{i=1}^p \alpha_{12,c} \Delta ED_{2,c-1} + \sum_{i=1}^p \alpha_{13,c} \Delta TOT_{3,c-1} + \sum_{i=1}^p \alpha_{14,c} \Delta LOG_FDIMIL_{4,c-1} + \sum_{i=1}^p \alpha_{15,c} \Delta CPI_{5,c-1} + \\ & \lambda_1 ECT_{t-1} + \epsilon_{1t} \end{aligned} \tag{Eq 1. 11}$$

$$\begin{aligned} \Delta ED_{2t} = & \alpha_{20} + \sum_{i=1}^p \alpha_{21,c} \Delta EG_{1,c-1} + \\ & \sum_{i=1}^p \alpha_{22,c} \Delta ED_{2,c-1} + \sum_{i=1}^p \alpha_{23,c} \Delta TOT_{3,c-1} + \sum_{i=1}^p \alpha_{24,c} \Delta LOG_FDIMIL_{4,c-1} + \sum_{i=1}^p \alpha_{25,c} \Delta CPI_{5,c-1} + \\ & \lambda_2 ECT_{t-1} + \epsilon_{2t} \end{aligned} \tag{Eq 1. 12}$$

$$\begin{aligned} \Delta TOT_{3t} = & \alpha_{30} + \sum_{i=1}^p \alpha_{31,c} \Delta EG_{1,c-1} + \\ & \sum_{i=1}^p \alpha_{32,c} \Delta ED_{2,c-1} + \sum_{i=1}^p \alpha_{33,c} \Delta TOT_{3,c-1} + \sum_{i=1}^p \alpha_{34,c} \Delta LOG_FDIMIL_{4,c-1} + \sum_{i=1}^p \alpha_{35,c} \Delta CPI_{5,c-1} + \\ & \lambda_3 ECT_{t-1} + \epsilon_{3t} \end{aligned} \tag{Eq 1. 13}$$

$$\begin{aligned} \Delta \log_FDIMIL_{4t} = & \alpha_{40} + \sum_{i=1}^p \alpha_{41,c} \Delta EG_{1,c-1} + \\ & \sum_{i=1}^p \alpha_{42,c} \Delta ED_{2,c-1} + \sum_{i=1}^p \alpha_{43,c} \Delta TOT_{3,c-1} + \sum_{i=1}^p \alpha_{44,c} \Delta LOG_FDIMIL_{4,c-1} + \sum_{i=1}^p \alpha_{45,c} \Delta CPI_{5,c-1} + \\ & \lambda_4 ECT_{t-1} + \epsilon_{4t} \end{aligned} \tag{Eq 1. 14}$$

$$\begin{aligned} \Delta CPI_{5t} = & \alpha_{50} + \sum_{i=1}^p \alpha_{51,c} \Delta EG_{1,c-1} + \\ & \sum_{i=1}^p \alpha_{52,c} \Delta ED_{2,c-1} + \sum_{i=1}^p \alpha_{53,c} \Delta TOT_{3,c-1} + \sum_{i=1}^p \alpha_{54,c} \Delta LOG_FDIMIL_{4,c-1} + \sum_{i=1}^p \alpha_{55,c} \Delta CPI_{5,c-1} + \\ & \lambda_5 ECT_{t-1} + \epsilon_{5t} \end{aligned} \tag{Eq 1. 15}$$

Diagnostic tests:

Moreover, to explain the effectiveness of the fitted model, three diagnostic tests have been used, which is based on VECM. First, we checked the serial correlation on VEC residuals by Lagrange Multiplier Serial Correlation Test under the following Null hypothesis:

$$H_0: E(\mu_t, \mu_{t-k}) = 0 \text{ for } t \neq k \text{ and } k = 1, 2, 3 \dots p$$

Second, we checked the normality of the VEC residuals by Jarque_Bera test under the following Null Hypothesis:

$$H_0 : \text{Residuals are normally distributed}$$

Third, we checked Heteroscedasticity of the VEC residuals by Breusch-Pagan-Godfrey Heteroscedasticity Test under the following Null Hypothesis:

$$H_0 : \text{There is no Heteroscedasticity (variance is constant)}$$

Stability tests

In the stability test, we check the constancy of the parameter. In many econometric models, there are such a significant number of parameters which are thought to be consistent. Therefore, [Brown et al. \(1975\)](#) proposed that we must check the constancy of the parameter over the sample. To check this, they proposed two CUSUM and CUSUMSQ tests based on recursive residuals. By plotting these residuals, we get beneficial insight for analysis of the constancy of parameter. The CUSUM test depends on the cumulative sum of recursive residuals. At the same time, CUSUMSQ is based on the cumulative sum of squared recursive residuals. Both tests should not cross the critical lines of five percent if they cross it means that the stability of the parameter has not been verified.

Data Collection

World Bank use as a data source.

S.NO.	Variable Name
1	Economic Growth
2	External Debt to GNI
5	FDI
6	CPI
7	TOT

Moreover, TS data has been used from 1980 to 2018. By utilizing the JJ and VECM is used to investigate the behaviour of CPI, ED, FDI, TOT over Pakistan's Economic Growth. The data for the external debt taken as a % of GNI, FDI in US dollars as BoP, from WDI of the World Bank.

Results

Stationary of the Variables

We are taking five variables to study EG, CPI, TOT, FDI and, ED as a percentage of GNI. To study the relationship between these variables first, we check their stationarity on the level, and first difference sees Table 1 stationarity of the variables have been checked by ADF test-taking intercept, intercept and, trend and without intercept and trend (None) into account. It demonstrates that variables are not stationary at level except CPI which shows that it is stationary through intercept and intercept and trend and non-stationary with none at level, but each variable is stationary at 1st difference with none. Therefore, there might be a long and short-term association. For Further confirmation, we test stationarity with the Ng-Perron test see Table 2.

Table 1. Estimate (P-Value) ADF Test.

VARIABLES	AT LEVEL		
	Intercept	Intercept with Trend	None
ECONOMIC_GROWTH	-2.22 (0.20)	-2.33 (0.40)	-1.20 (0.20)
CPI	-3.64 (<0.001*)	-3.89 (0.02**)	-0.38 (0.54)
FDI_MILLION	-1.99 (0.28)	-3.13 (0.11)	-0.55 (0.46)
TOT	-0.86 (0.78)	-3.00 (0.14)	-1.49 (0.12)
EDTG	-0.81 (0.80)	-2.36 (0.39)	-0.69 (0.41)
AT 1ST DIFFERENCE			

VARIABLES	AT LEVEL	VARIABLES	AT LEVEL
	Intercept		Intercept
ECONOMIC_GROWTH	-2.57 (0.11)	-3.06 (0.13)	-2.52 (0.01*)
CPI	-6.01 (<0.001*)	-5.98 (<0.001*)	-6.10 (<0.001*)
FDI_MILLION	-9.75 (<0.001*)	-6.51 (<0.001*)	9.89 (<0.001*)
TOT	6.65 (<0.001*)	-6.60 (<0.001*)	-6.51 (<0.001*)
EDTG	-5.06 (<0.001*)	-5.18 (<0.001*)	-5.13 (<0.001*)

*Significance at 1%, **Significance at 5%

Table 2. NG-Perron Test.

VARIABLES	MZA		MZT		MSB		MPT	
	C	CT	C	CT	C	CT	C	CT
NG PERRON IN LEVELS								
ECONOMIC_GROWTH	-6.92	-12.56	-1.84	-2.44	0.28	0.19	4.59	7.59
LOG_FDIMIL	-12.50	-13.64	-2.49	-2.60	0.19**	0.19	1.96**	6.71
CPI	-10.76	-13.11	-2.30	-2.53	0.28	0.19	2.32**	7.11
TOT	-0.50	-8.74	-0.24	-2.09	0.49	0.23	17.11	10.42
EDTG	-1.92	-3.53	-0.86	-1.32	0.44	0.37	11.37	25.63
NG PERRON IN FIRST DIFFERENCES								
ECONOMIC_GROWTH	-18.22*	-17.26*	-3.01*	-2.93**	0.16*	0.17***	1.36*	5.31**
LOG_FDIMIL	-42.44*	-42.47*	-4.60*	-4.60*	0.10*	0.10*	0.58*	2.15*
CPI	-17.30*	-15.09***	-2.93*	-2.74***	0.17*	0.18***	1.44*	6.05***
TOT	-18.14*	-18.15**	-3.00*	-3.01**	0.16*	0.16**	1.36*	5.03**
EDTG	-16.98*	-17.42**	-2.89*	-2.94**	0.17*	0.16**	1.50*	5.25**
CRITICAL VALUES								
0.01	-13.80	-23.80	-2.58	-3.42	0.17	0.14	1.78	4.03
0.05	-8.10	-17.30	-1.98	-2.91	0.23	0.16	3.17	5.48
0.1	-5.70	-14.20	-1.62	-2.62	0.27	0.18	4.45	6.67

*at 1% significance level, ** 5% significance level, and ***10% significance level.

Asymptotic critical values are taken from Ng-Perron (2001, Table 1). c - constant and t - trend.

The outcomes uncovered that all variables at their levels were not stationary but rather their stationarity excluding one test of Ng- Perron test suggested that CPI is stationary and two tests for Log_FDIMIL but their stationarity at 1st difference was confirmed.

Johansen's Cointegration

After confirming the stationarity, there may be a long-term association among variables are present. Therefore, to detect the cointegrating relationship among variables. First, VAR was applied with default lags to get optimal lags length. AIC, LR, HQ and, FPE jointly agreed on three years lags.

Table 3. Johansen and Juselius Cointegration Test Results 1980-2018.

JJ Test				
PART A TS Statistics				
Ho	Hi	Trace Test	Critical value test (5%)	P-VALUE
$H_0: r \leq 0$	$H_a: r > 0$	120.44	69.82	<0.001*
$H_0: r \leq 1$	$H_a: r > 1$	69.44	47.86	<0.001*
$H_0: r \leq 2$	$H_a: r > 2$	35.35	29.8	0.01*
$H_0: r \leq 3$	$H_a: r > 3$	11.62	15.49	0.18
$H_0: r \leq 4$	$H_a: r > 4$	3.55	3.84	0.06
PART B Max EV Test				
Ho	Hi	Trace Test	Critical test (5%)	P-VALUE
$H_0: r = 0$	$H_a: r = 1$	51.01	33.88	<0.001*
$H_0: r = 1$	$H_a: r = 2$	34.09	27.58	<0.001*

JJ Test				
PART A TS Statistics				
$H_0: r = 2$	$H_a: r = 3$	23.73	21.13	0.02**
$H_0: r = 3$	$H_a: r = 4$	8.07	14.26	0.37
$H_0: r = 4$	$H_a: r = 5$	3.55	3.84	0.06
PART C Normal Cointegration Test				
ECONOMIC_GROWTH	ED	TOT	LOG_FDIMIL	CPI
1	0.45*	0.38*	-13.55*	1.37*
standard error	-0.11	-0.06	-2.54	-0.25
T-Stats	3.94	-6.00	5.33	-5.40

co-integrating vector has Economic Growth, External Debt, Term of Trade, Log_FDIMIL and, CPI as variables. * At 1% significance level, **5% significance level and *** 10% significance level.

Above table No. 3 represents trace and maximum eigenvalue statistics. Trace statistics find cointegrating vectors in quite different ways. For example, in trace statistics, $r \leq 0$ means no cointegrating vector is present against the alternative hypotheses that there is at least one cointegrating vector. Moreover, it accepts means there is a cointegrating vector while in Max EV statistics where H_0 that there is no cointegrating vector against the alternative of there is exactly one cointegrating factor. For both statistics, we found that we have three cointegrating vectors. With this proof, it very well may be deciphered that Pakistan's EG, ED to GNI, CPI, TOT, FDI were cointegrated in the long-run. The cointegrating vectors were normalized by EG. The outcomes of the estimated long-term EG function are shown in equation form.

$$\text{Economic Growth} = -0.45 \text{ ED} - 0.38 \text{ TOT} + 13.55 \text{ LOG_FDIMIL} - 1.37 \text{ CPI} \text{ Eq 1. 16}$$

This shows that the Economic Growth was influenced positively by FDI. However, External Debt, the term of trade and, consumer price index has a negative influence on Economic growth. Table 3 also shows that all normalized variables are statistically significant at a 5 % level of significance.

VECM

Table 4. VECM Estimates 1980-2018.

PART A					
Error Correction:	D(EG)	D(ED)	D(TOT)	D(LOG_FDIMIL)	D(CPI)
(EC t-1)1t	-0.59*	-0.42	3.46	-0.23*	-1.03
t-stats	[-2.31]	[-0.72]	[1.27]	[-2.34]	[-1.45]
(EC t-1)2t	0.03	-0.36	0.67	-0.02	-0.14
t-stats	[0.49]	[-2.26]	[0.89]	[-0.86]	[-0.70]
(EC t-1)3t	-0.09	0.15	-0.25	0.01	0.03
t-stats	[-2.82]	[2.17]	[-0.77]	[1.12]	[0.38]
D(EG(-1))	-0.64	-0.58	-3.01	0.16	0.51
t-stats	[-2.75]	[-1.10]	[-1.21]	[1.76]	[0.79]
D(EG(-2))	-0.60	-0.32	-2.43	0.12	0.43
t-stats	[-2.80]	[-0.64]	[-1.05]	[1.48]	[0.71]
D(EG(-3))	-0.48	0.21	-1.05	0.02	0.51
t-stats	[-2.87]	[0.56]	[-0.58]	[0.34]	[1.11]
D(ED(-1))	0.02	0.16	0.04	0.05	0.07
t-stats	[0.23]	[0.72]	[0.03]	[1.36]	[0.26]
D(ED(-2))	0.11	0.07	-1.39	0.02	0.38
t-stats	[1.19]	[0.35]	[-1.46]	[0.73]	[1.53]
D(ED(-3))	0.06	0.12	-0.30	0.06	0.34
t-stats	[0.75]	[0.70]	[-0.37]	[1.97]	[1.64]
D(TOT(-1))	0.06	-0.04	0.06	-0.01	-0.06
t-stats	[1.79]	[-0.53]	[0.16]	[-0.72]	[-0.69]

PART A					
Error Correction:	D(EG)	D(ED)	D(TOT)	D(LOG_FDIMIL)	D(CPI)
D(TOT(-2))	0.09*	-0.19	0.19	0.00	0.00
t-stats	[3.01]	[-2.70]	[0.57]	[-0.25]	[-0.03]
D(TOT(-3))	0.02	0.03	0.42	-0.01	-0.16
t-stats	[0.61]	[0.50]	[1.31]	[-1.12]	[-1.95]
D(LOG_FDIMIL(-1))	-3.44*	-0.50	8.32	-0.13	-7.17
t-stats	[-3.78]	[-0.24]	[0.85]	[-0.37]	[-2.81]
D(LOG_FDIMIL(-2))	-1.77*	-2.43	0.74	0.00	0.64
t-stats	[-2.45]	[-1.46]	[0.09]	[0.01]	[0.31]
D(LOG_FDIMIL(-3))	-0.69	0.02	1.93	-0.28	-2.93
t-stats	[-1.06]	[0.01]	[0.27]	[-1.10]	[-1.61]
D(CPI(-1))	0.48*	-0.29	-0.23	0.06	0.03
t-stats	[4.24]	[-1.12]	[-0.18]	[1.43]	[0.08]
D(CPI(-2))	0.37*	0.16	-0.78	0.00	0.30
t-stats	[4.09]	[0.76]	[-0.80]	[0.07]	[1.17]
D(CPI(-3))	0.07	0.23	-0.24	-0.03	0.13
t-stats	[0.82]	[1.21]	[-0.26]	[-0.96]	[0.54]
C	-0.06	-0.41	-1.37	-0.01	0.02
t-stats	[-0.32]	[-0.88]	[-0.63]	[-0.17]	[0.03]
PART B					
R-squared	0.86	0.80	0.35	0.70	0.75
Adj. R-squared	0.71	0.57	-0.39	0.37	0.46
Sum sq. residents	17.18	90.21	1977.38	2.56	134.76
S.E. equation	1.04	2.37	11.12	0.40	2.90
F-statistic	5.63	3.54	0.47	2.11	2.62

NOTE: * Significant variable and t-stats reported in []

Table 4 reports include ECM for the five variables in the framework. The ECM coefficient (CointEq1) demonstrates which of the variables change by reestablishing equilibrium. This shows because of some stun that upsets the long-run equilibrium so how some or all system variables will adjust to restore equilibrium. If

$$\text{Economic_Growth} > -0.45 \text{ ED} - 0.38 \text{ TOT} + 13.55 \text{ LOG_FDIMIL} - 1.37 \text{ CPI Eq 1. 17}$$

Table 4 shows that in equation 1.17 CPI and LOG_FDIMIL establishing significant short term relationship with economic growth while the coefficient of error correction is also significant with a negative sign which indicates that if this system receives any shock or disturbance so it will restore equilibrium with the speed of adjustment of 59% over a year. Equation 2 shows the coefficient of error correction of ED is not statistically significant, but it is negatively signed which indicates that in case of any disturbance the correction to disturbance will take place at the speed of 42% while in equation three coefficients of EC_{t-1} for TOT is not statistically significant and it is signed positively which demonstrates that despite any unsettling event occur there would be a discrepancy from equilibrium which makes the system destitute to bring back equilibrium position. In equation four coefficient of EC_{t-1} for LOG_FDIMIL is statistically significant, and it is negatively signed which indicates that in case of any disturbance the correction to disturbance will take place at the speed of 23% while in equation five error correction coefficient of CPI is not statistically significant.

Table 5. VECM based Granger Causality Estimates 1980-2018.

Dependent Variable	Independent Variable					ECT _{t-1} t-stats	Σχ ² (p-value)
	D(EG)	D(ED)	D(TOT)	D (LOG_FDIMIL)	D(CPI)		
D(EG)	-	1.95 (0.58)	10.08 (0.01*)	17.95 (<0.001*)	21.41 (<0.001*)	-0.59* (-2.31)	46.75* (<0.001)

Dependent Variable	Independent Variable					ECT _{t-1} t-stats	Σχ ² (p-value)
	D(EG) χ ² (p-value)	D(ED)	D(TOT)	D (LOG_FDIMIL)	D(CPI)		
D(ED)	3.45 (0.32)	-	11.37 (<0.001*)	2.42 (0.49)	6.45 (0.09)	-0.42 (-0.72)	27.87* (<0.001)
D(TOT)	1.63 (0.65)	2.19 (0.53)	-	1.00 (0.80)	0.95 (0.81)	3.45 (1.27)	7.52 (0.82)
D(LOG_FDIMIL)	4.31 (0.22)	7.09 (0.07)	1.76 (0.62)	-	4.51 (0.21)	-0.23* (-2.34)	15.66 (0.20)
D(CPI)	1.33 (0.72)	4.70 (0.19)	5.18 (0.15)	11.52 (<0.001*)	-	-1.03 (-1.45)	21.60* (0.04)

NOTE: * Significance at 1%, ** at 5% and *** at 10% level.

As we see our variables are cointegrated so there should be a causal relationship existed. Long term Causal relationship checked by Lagged error correction term with t-values in parenthesis see Table 5 reports p-values of chi-square for individual short-term causality while p-value tells the significance of overall short-term causality. The outcomes demonstrated that lagged residual term of D(EG) is statistically significant that shown a stable long-term association among explained and explanatory variables. We can entail that due to the significant long-term relationship; variables may not deviate too much and concurrence can be adept. Whereas static value for the lagged term was affirmed that t-statistics & significant Σχ² means that short-run causality, as well as, we see significant individual causality too, i.e. D(LOG_FDIMIL) granger cause to D(EG) and D(CPI) also granger Cause to D(EG) and D(TOT) granger cause to D(EG). In the case of D(ED) as a dependent variable, there is no significant long-run causality, but Σχ² were statistically significant therefore we can conclude D(TOT) granger cause to D(ED) on the short-run whereas for D(TOT) and D(LOG_FDIMIL) as dependent variable no channels of short-run causalities were found, but D(LOG_FDIMIL) has significant long-run causality. D(CPI) as dependent Variable has significant short-run causality

Diagnostic Tests

Table 6. Diagnostic Tests.

Test Statistics	Prob.	Results
LM-stat	0.10	There is no serial correlation in Residuals
Jarque-Bera	0.37	Residuals are normally distributed
Chi-square	0.55	There is no heteroscedasticity

Table 6 shows diagnostic tests for residuals. Our results show these residuals are free from serial correlation and have homoscedasticity (same variance) as well as they normally distributed, which validates that the fitted model can give us useful insights.

Stability Tests

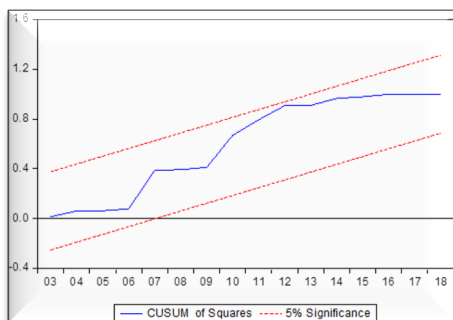


Figure 1

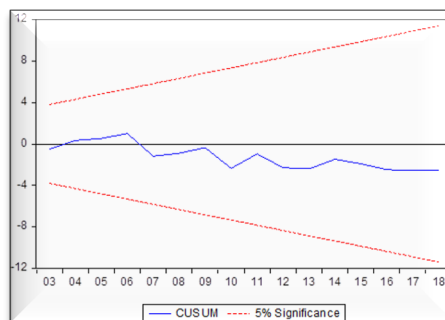


Figure 2

Figure 1 and Figure 2 on the Previous page, show that CUSUM and CUSUMSQ do not pass over the 5% critical lines, so the estimated parameters are stable and can be used safely for policy implications.

Discussion

The purpose of conducting this study was to find some specific determinants and their effects on Pakistan's economic development. From the review of literature, it has been found that many factors may contribute to any nation's economic growth. But no one can encompass all potential factors in one study; therefore, this paper focuses on some important macroeconomic indicators, i.e., external debt, Consumer price index, the term of trade and, foreign direct investments to establish the relationship among these variables. We have taken annual data of 38 years from 1980 to 2018. Based on empirical results external debts, consumer price index, and term of trade inversely affects the Economic growth these results were also supported by Antique & Malik (2012; Gudaró et al. (2010; Jawaid & Raza (2015; Jebran et al. (2018; Saqib et al. (2013; Shahbaz et al. (2008). While the economic growth was positively influenced by FDI. Foreign debt and term of the trade (TOT) have a notable long-term relationship with economic development which means that dependency on external debts and goods which is imported may harm the growth in a long run because Jebran et al. (2018) stated that the pace of increment in imports value comparatively with exports value will antagonistically affect the economic development. The negative impact of TOT can likewise be clarified by the phenomena; when local demand of foreign goods expands, it prompts a decline in local products that further impacts the trade balance, thus it will antagonistically affect economic growth. The speed of adjustment for external debt is 59% and for the term of trade is 23% which means that if the system receives any shock so it will restore the equilibrium at the rate of 59% and 23% respectively over a year. Also, we found that TOT, CPI and, FDI have a significant short-term relationship with Economic Growth. While External debt significantly granger cause to TOT on the short term and CPI granger cause to FDI in the short-term.

Recommendations

As indicated by this empirical study, Pakistan is by all accounts confronting debt overhang and prompt moves ought to be made to dispose of this issue since it hampers the economic development of Pakistan in the long-run just as it causes inflation. The legislature and political Government of Pakistan must take sound initiatives to provide a business-friendly environment, proper law and order situation tax-free budgets to attract foreign investors. Good relations with neighbouring and other nations should be built up and with common consents, trade barriers ought to be diminished so the domestically made products can be export to numerous other countries. The government should facilitate domestic industries to make good products.

Limitations and Future of the Study

There can be many other significant factors are present which hampers the economic growth of Pakistan which cannot be incorporated here due to limited dataset availability like foreign exchange, Balance of payment, debt servicing, etc. But this study provides insight for policymakers for the future that the primary objective of taking external debts from the IMF and World Bank is not serving, which is to boost the economy. Despite the fact that these results show that Pakistan should pay attention to policies regarding trade which can boost its economy.

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