

Nexus between Fiscal Deficit and Economic Growth: An Empirical Evidence of Pakistan

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ABSTRACT

The study's main objective is to analyze the nexus between fiscal deficit and economic growth. A comprehensive review of the literature has been reviewed to address this objective, which presented different other intertwined factors resulting impact due to fiscal deficit, thereby economic growth. Data regarding all the variables such as GDP Growth (GDP), Fiscal Deficit (FD), Public Investment (PI), Inflation Rate (INF), Exchange Rates (EXR), and Debt to GDP Ratio (GDP) has been collected from different secondary sources such as World Bank (WB), State Bank of Pakistan (SBP) and Ministry of Pakistan (MOP) for the period between 1979 and 2019 for Pakistan. Due to the time-series nature of the dataset, the trend in the data was initially assessed. After confirming the trend, the unit root test has been performed to test the stationarity in the dataset. The results revealed a unit root in the dataset at a level for each variable. A cointegration test has been performed to check if there are any cointegrating equations for the data. The results revealed the presence of two (2) cointegrating equations in the dataset. Because of the cointegrating vectors, a vector error correction model has been performed to normalize the effect of cointegrating equations. Additionally, the VECM provided both the short-run and long-run effects of the variables. Both the long and short VECM model run outcomes revealed that the fiscal deficit, public investment, and inflation rate have a strong negative impact on economic growth while exchange rate and debt to GDP ratio have a strong positive impact on economic growth in the long run.

Keywords: Fiscal Deficit, Economic Growth, Public Investment, Inflation Rate, Debt to GDP Ratio.

1 | INTRODUCTION

In each economic system in the world, the primary objective of the government of every country is its economic development, but such aspiration of development is affected by budget/fiscal deficit (FD) (Elizabeth, 2013). The most debatable topic among the policymakers and macroeconomists in the recent era is exploring the association between fiscal deficit and other factors like trade, growth, interest rate, and exchange rate (Saleh, 2003).

Fiscal deficit (FD) refers to the difference of overall receipts collected to the overall spending by the state (Buhari, 1994). For the past few decades, the government of Pakistan has been confronted with one of the important issues, which is the fiscal deficit (FD). Scholars and policymakers are interested in mitigating this deficit as it negatively affects Pakistan's economic growth. Scholars are

consistently putting their efforts into suggesting different policies to enhance economic performance via breaking the chain of cumulative chain of fiscal deficit (FD) (Saleh, 2003 and Fatima et al., 2011). The authors identified different reasons for attaining a higher fiscal deficit (FD), such as external debts and insufficient funds with the government because of low tax collection. This cumulative chain of fiscal deficit (FD) can be mitigated via purpose-oriented and effective macroeconomic policy that leads to favorable economic growth (EG), poverty alleviation, and employment generation (Fatima et al., 2011).

The effect of fiscal deficit (FD) on economic growth (EG) has initiated a greater interest among scholars and policymakers from the past few decades. Economists preserved the issue of policy debate on the frontline in every developed and

underdeveloped economy, including South Asia. It is also deeply explained in the literature review that the growing fiscal deficit (FD) should be taken into consideration as it is one of the key constraints which preclude the economic growth (EG) and performance of many developing economies. Meanwhile, another author argued that a large fiscal deficit is a hallmark of fashionable macroeconomic instability that damages economic growth (EG) (Fisher, 1993). Initially, the problem of fiscal deficit (FD) was envisioned by Keynes in his general theory about the fiscal deficit (FD) and its impact on an economy which later became an interesting policy debate for all school of thought economists (Keynes, 1936). The theory suggested that fiscal deficit (FD) can increase economic growth (EG) in times of recession. During, private sector expenditure decreases, and saving increases, resulting in unused resources. Government borrowing is a way of using those unused financial savings and 'kick-starting' the economy. The reduced expenditure thereby assists in selling higher, increasing larger revenues in the form of taxes, consequently declining fiscal deficit (FD) over the horizon.

While the effect of the economic deficit on the economic increase is rather a debated problem among economists and policymakers, there may be no consensus among them whether the fiscal deficit is bad, neutral, or in terms of its real effects on the economic boom. Increasing financial deficit is a major difficulty in retaining macroeconomic stability. In this context, analyzing the impact of fiscal deficit (FD) on economic growth (EG) has much greater implications from the policymaker's view about the suitable techniques and regulations required to be followed to promote sustainable boom and development. Though many empirical types of research have shed a few attentions and taken the connection of monetary deficit and economic growth (EG) to the fore of instructional discussion, the literature remains confined in scope, and the empirical consequences remain inconclusive. Thus, the objective of this study is to fill the prevailing gap in the empirical literature via re investigating the connection between monetary deficit and economic growth (EG), specifically selected South Asian countries over the duration from 1980 to 2014, and

to enhance the electricity of the consequences through employing extra appropriate econometric techniques.

Among the South Asian economies, there has been a continual tendency towards monetary deficit on account of their independence due to always expanding expenditure and insufficient revenue generation capability of government. Notably, in the early 1980s, South Asia witnessed an unprecedented boom in economic deficit. Table 1.A. suggests the common financial deficit as a percent of GDP and economic boom for six growing regions, including South Asia, over the period 2000 to 2013. Considering the financial position, the SAARC region, on average, has the best fiscal deficit (FD) in a few of the six developing regions. During this duration, the economic increase in South Asia became 6.6 percent, which is the second maximum rate compared to other developing regions besides the East Asia and Pacific region, which had the highest economic increase. High economic deficit within the SAARC international locations compared to other developing international locations are likely to crowd out productive investment and erode destiny growth potential. In mild of this, an empirical investigation of the effect of the economic deficit on the economic increase within the case of South Asian nations is playing an important role for policymakers in those countries and international companies and the World Bank who offers financial assistance.

The fiscal performance of the last five years shows a deceleration in Tax revenues and increase in Govt. expenditures compared to set targets, causing a rise in the budget deficit to 6.5 percent of the GDP in the Fiscal year 2018, which is highest through the past five years (Pakistan Economic Survey, 2018-19). During the fiscal year 2016, the budget deficit reduced to 4.6 % of the GDP in the short term; however, it went up from 5.8% to 6.5% in the long run. The performance of budget indicators portrays that total govt. Revenue growth practiced a slowdown (5.9 percent in FY2018 against 11.0 percent growth in FY2017), whereas govt. Total expenditure rise was checked at 10.1% in the Fiscal year, 2018, compared to 17.3% in FY2017 (Pakistan Economic Survey, 2018-2019).

Table 1. Trends in Economic Growth

Countries	South Asia	Middle East & North Africa	Latin America	Sub Saharan Africa	East Asia & Pacific	Central Asia and Europe
Fiscal Deficit	-7.52	-3.9	-2.56	-2.28	1.8	-0.82
Economic Growth	6.64	2.1	4.15	4.75	8.18	4.14

This study is important because Pakistan is one of the developing economies that has a zig-zag graph for the economic growth and fiscal deficit. This zig-zag graphic pattern of fiscal deficit affects the economic health of Pakistan adversely (Hussain et al., 2021). At the same time, other factors like inflation rates and exchange rates will also be affected because of fluctuations and consistent fiscal deficit increases. An economy's standard is measured by a few parameters that include fiscal deficit and economic growth. Therefore, this area needs to be addressed to check if these parameters hold significance and whether their fluctuation affects other economic parameters or not.

2 | REVIEW OF LITERATURE

Spending by authorities occurs in different ways. It was revealed by Ahmed and Miller (2000) in a cross-sectional study based at 39 states and a scope ranging from 1975 to 1984 using the OLS model, other methods like fixed effect and random effect. They postulated that the spending might occur in the areas like welfare and social safety, which decreases the funding, which lessens the sales, and causes deficit. Sill (2005) reported that due to delays in the resources of the revenues, i.e. sales and taxes, a deficit could occur, and the effect of the deficit transmitted to the coming monetary year if there is an inconvenience to generate funds using external resources. While using data from G-7 countries throughout 1964-1993, the VAR model revealed that in the short-run, the deficit in financing also causes to shoot up the interest rates. However, this effect is not always seen in the long run. It is also evident that deficit adversely affects the trade balance (Al-Khedar (1996).

A study conducted by Hauner & Aisen (2008) identified the effect of the budget deficit on the economy of unique international countries for the period 1985-1994, and it was found that the budget deficit negatively influences interest prices. In the United States, the impact of the trade deficit is also

quite effective and sizable on economic prosperity. Similarly, the study of Huynh (2007) revealed that the economic boom of the United States faced some undesirable consequences as a result of the budget deficit while studying the traits of growing Asian countries. It was revealed that the crowding-out effect would surface with an increase in the budget deficit. Similarly, Cebula (1988) stated that the long-term nominal interest rate also experiences a strong effect because of the budget deficit. In Turkey, using statistics from 1960-2003, Gulcan and Bilman (2005) studied the stationarity time series for men and women by using Augment-Dicky-Fuller (ADF), Phillip Pearson (PP), Unit root and Cointegration test of Johansen. The results revealed that the price range deficit strongly affects actual trade prices.

Fiscal Deficit and Economic Growth: International Evidence

In recent, exploring and finding the association between FD and EG is one of the well-debated issues among policymakers and economists in almost all economies. Economic-growth (EG) and fiscal-deficit (FD), both are highly debated for the past few decades; nevertheless, no such consensus has been developed for whether FD is bad or good or neutral in terms of its impact on EG because the different schools of thought have different beliefs regarding the effect of FD on EG. As discussed earlier Keynesian paradigm believes that there is a positive association between FD and EG, while Neoclassical economists believe that FD has a detrimental impact on EG. On the contrary, Ricardian economists' claims are neutral or have no association between FD and EG.

Yallwe & Buscemi (1999) reported a positive relationship between FD and EG. To derive empirical evidence, the author collected data from 30 developing nations for some time between 1970 and 1990. The author performed Generalized-method-of-moments (GMM) on the panel data revealing a positive impact of FD on EG in the long run. Accordingly, Hendrik and Ghosh (1973) revealed a

positive long-term relationship between FD and EG by collecting data for the US between 1973 and 2004. Contrarily, Drazen and Brender (1990) previously reported that there is no long-term positive association between FD and EG in the case of Sri Lanka and India. The author performed the VAR model selecting optimal lag one at the first difference on the panel data collected for 74 economies from 1960 till 2003, revealing a positive impact of FD on EG in the long run for all except Sri Lanka and India.

Accordingly, another scholar inspected the association between FD and EG of Pakistan. The author took the EG (GDP) proxy as dependent variables while fiscal deficit (FD) and FDI were independent variables. The results of the study revealed less or zero effect of fiscal deficit (FD) on economic growth (EG) while significant positive effect of FDI on economic growth (EG). These results are in line with the outcomes of Ricardian's (2002) perspective, which thinks of the existence of no relationship between fiscal deficit (FD) and economic growth (EG).

Following the prior literature, another scholar researched investigating the impact of FD on EG in Bangladesh. The study's main objective was to investigate whether FD helps in economic growth (EG). To address this objective, the author collected data for a period between 1989 and 2015. The author selected GDP, exchange rate, net domestic financing, per capita debt, and GNI in existing market-price as dependent factors. Fiscal deficit (FD) was taken as an independent factor for all the above dependent variables. Debt per capita is considered because fiscal shortfall is usually covered via loans for servicing debts perused from financiers that eventually increase fiscal shortfall yearly. The study outcomes revealed a significant positive effect of fiscal deficit (FD) on net domestic financing, GNI in the current market price, per capita debt, and GDP while negatively impacting exchange rates (Najid et al., 2012).

Fiscal Deficit and Economic Growth: National Evidence

Economic development and economic growth (EG) are two different terms that are pronounced;

however, they are one of a type from another. Economic growth (EG) means societal welfare and financial uplift in the income level on average in the overall economy. Ahmad (2012) emphasized the significance of subsidy for Pakistan's economic growth (EG). The author claimed that capital is the bloodstream for the growth of an economy. 1% increase in capital or the level of investment leads to a 0.89% increase in GDP on average. The scholar suggested that the state must put a major chunk of investments and devotion towards the productive tasks in an economy and then will only result in the growth of an economy. The state needs to improve both international and national investors positively to contribute to an economy's progress. The author originated exchange as an effective approach for economic development and growth in Pakistan. The author observed that economic growth (EG) in trade liberalization had not been explored yet. Liberalization of trade helps in reducing the fiscal deficit (FD), consequently leading to economic growth (EG). Additionally, other such benefits are poverty alleviation. By emphasizing the fiscal deficit (FD) of Pakistan, the synchronized progression in the past few decades revealed that fiscal deficit (FD) harms the economic growth (EG) of Pakistan.

Another author investigated the harmful effect of fiscal deficit (FD) on economic growth (EG). They were patronizing the Keynesian economist's perspective, which states that an increase in fiscal deficit (FD) (FD) leads to an increase in interest rates that results in a real investment decrease. The author believed that solely relying on a single-equation model will not address the study's key objectives as FD's indirect and direct impact on EG. Hence, the author used two equations, the first one addressing the direct impact while the second equation addressed the indirect impact of FD on EG, inflation rate, interest rate, and population growth. The negative value of the FD coefficient confirmed the harmful effect of FD on EG. Also, due to the current-account deficit, inflation rate and debt per capita have a detrimental effect on economic growth (EG). The cointegration approach followed by VECM revealed a long-run relationship between FD and EG. The author concluded that there exists a

unidirectional causality both in the short and long run among FD and EG (Anusic, 1999).

After an extensive review of the literature, gaps in the following areas have been identified. Prior studies have mostly focused on analyzing the nexus between fiscal deficit and economic growth (Selvanathan, 2016 and Alam, 2014) in economies like India and G10. Although, Pakistan is an economy that has been in the trap of fiscal deficit for the past three decades. It leads to a gap in the geographical context. Moreover, these studies employed cross-sectional data that leads to the problem of generalizability. Additionally, factors like public investment have been ignored by prior studies, leading to specification bias (Hyunh, 2007). The reason for conducting this study is to help the policymakers develop a strategy on how to alleviate the fiscal deficit problem alongside other interlinked factors.

3 | RESEARCH METHODOLOGY

This study has implemented an inclusive research design to address the study's objectives. When it comes to a debate on the effect of fiscal deficit (FD) on economic growth (EG), one cannot ignore three major schools of thought, namely Neoclassical, Keynesian, and the modern school of thought, namely Ricardian-Equivalence-Hypothesis (REH). Among the analytical perspectives mainstream, Keynesian economists claim that a positive link exists between fiscal deficit (FD) and economic growth (EG), while Neoclassical economists believe that fiscal deficit (FD) is antagonistic to economic growth (EG). The REH claims a neutral association between fiscal deficit (FD) and economic growth (EG). Their relationship cannot be definite and cannot be precisely confirmed for other factors. Keynesian paradigm believes that a high fiscal deficit (FD) increases capital accretion and thus growth of an economy. They provided a problem in the necessity of crowding influence by developing a link with the expansionary aspect of fiscal deficit (FD).

On the contrary, the Neoclassical paradigm believes that state interference crowds out, thereby ignoring the economic activities of private sectors. They focused on the state's fiscal deficit (FD), its miles taking in runs short than miles spending more.

Discount saving or increase in state dissaving should harm economic growth (EG) if declination in state saving often completely offset through an increase in personal saving, thus by guarantying in decline into the usual saving-charge.

On the other hand, the Ricardian paradigm believes that reducing the saving of state is disguised with the fiscal deficit (FD) aid might be seen by an equalizing surge in saving of private sectors, leaving behind the funding and saving of the whole state unchanged. Due to this, the fiscal deficit (FD) has zero or less impact on economic growth (EG) in the long run.

Description of Data

Six variables have been used in this study, and the data for those variables have been taken from the Ministry of Pakistan (MOP), State Bank of Pakistan (SBP), and World Bank (WB) for Pakistan. The study considered time series data to determine whether there is a nexus between fiscal deficit and economic growth. Additionally, the study focused on figuring out which factors affect economic growth and to which extent. Previously, numerous scholars have used Fiscal Deficit (FD) as a factor for predicting deficit (Saleh, 2007). This study also used the fiscal deficit as a factor for estimating the fiscal deficit. Numerous scholars used GDP growth to proxy for economic growth (Huynh, 2007 and Ghali, 1997). Thus, the study used GDP growth as a proxy for economic growth. Accordingly, the Debt to GDP ratio (DTGDP), Public Investment (PI), inflation rate (I), Exchange Rates (EXR) has been considered in this study as fiscal deficit and economic growth are highly interlinked with such factors and are perceived to be affected with the fiscal deficit.

Description of Variables

Six different variables have been used in this research. Economic Growth (GDP Growth) has been taken as a dependent variable while Fiscal Deficit (FD), Public Investment (PI), Inflation Rate (I), Exchange Rate (EXR) have been taken as independent variables in this study.

GDP Growth

GDP is the monetary percentage of the market value of overall service and goods developed in a particular period. It shows the development of services or goods manufactured in an economy. The more the

GDP growth, the lesser the fiscal deficit. The study considered GDP growth as the independent variable for the study.

GDP growth has been calculated as follow:

$$\text{GDP Growth (GDPG)} = \frac{\text{Current Year GDP} - \text{Previous Years GDP}}{\text{Previous Years GDP}}$$

Fiscal Deficit

It is a shortage in government revenue paralleled with the overall expenditures. A fiscal deficit indicates expenditures beyond means. In this study, it has been taken as the independent variable.

It can be computed as the proportionate GDP or overall dollars consumed in addition to revenue.

Public Investment

Public investment refers to allocating resources and funding for the services and projects at large. Because of large investments, the public sector cannot complete them, so the usual government funds such large investments. In this study, public investment has been taken as the independent variable.

It can be computed by the total dollar amount spent on investment projects or services in one year and vice versa.

Exchange Rates

It refers to the official rates figured out by governments or the rates figured out in legally approved exchange markets. In this study exchange rate (EXR) has been taken as the independent variable.

It can be computed by taking annual average rates based on monthly average rates.

Inflation Rate

A general increase in prices over time reduces the purchasing power of money. In this study, it has been taken as the independent variable.

It can be computed as follow:

$$\text{Inflation Rate (I)} = \frac{\text{Current Year CPI} - \text{Previous Year CPI}}{\text{Base Year CPI}} * 100$$

Debt to GDP Ratio

It is a ratio between an economy's debt and its GDP. The lower debt to GDP ratio exhibits that the economy is producing and selling services and goods

enough to compensate debts irrespective of calling for additional debts. In this study, it has been taken as the independent variable.

It can be computed as follow:

$$\text{Debt to GDP Ratio} = \frac{\text{Total Debt for the Year (In Dollar Terms)}}{\text{Total GDP for the Year (In Dollar Terms)}}$$

Data Analysis

The study utilized the vector error correction model (VECM). This vector error correction model (VECM) is inspired by Tekin (2012). After confirming the certainty of cointegrating vectors in the equation, the study applied the VEC model to test interdependency among the variables. The generalized error correction term equation for the long run is as follow:

$$ECT_{t-1} = [Y_{t-1} - n_j X_{t-1} - \varepsilon_m R_{t-1}] \quad \text{Eq (1)}$$

Here, the ECT is the error correction term, in the long run, Y_{t-1} is the variable of interest and X_{t-1} is the independent variable.

The generalized equation for the short run is as follow:

$$\Delta y_t = [\sum_{i=1}^{k-1} \gamma_i \Delta y_{t-i} - \sum_{j=1}^{k-1} n_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \varepsilon_m \Delta R_{t-m} + \lambda ECT_{t-1} + u_t] \quad \text{Eq (2)}$$

Where y_t is the variable of interest, X_t is the independent variable and u_t is the error term in the equation.

4 | RESULTS AND DISCUSSION

The graphs (see appendix A) for the growth of GDP growth and fiscal deficit (FD), public investment (PI), and exchange rates (EXR) alleviated in the recent except for inflation (I) which exhibits an increase in the recent years. The reason behind the graphical presentation is to check the trend in the dataset. Now, to test the stationarity in the dataset, a unit root test has been performed illustrated below:

Optimum Lag Selection Criteria

To select the optimum lag, an unrestricted VAR model has been performed. The rule of thumb indicates that when annual data has been taken, the optimum lag length criteria should be 1 or 2. Because the lag exceeds more than 2, it illustrates the chances of multicollinearity in the dataset

considered for the study—the minimum the lag per the criterion, the more appropriate the model. As per Table 2, relying on the Schwartz Information Criterion (SIC), the lag opted for the model is 1.

Table 2. Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	151.07	NA	1.58E-11	-7.84162	-7.58039	7.74952
1	216.44	106.005 4*	3.33E-12	-9.42919	-7.600579*	8.78452
2	254.912 4	49.9101 4	3.42E-12	-9.56283	-6.16684	8.36559
3	304.080 5	47.8392 2	2.66E-12	-10.2746	-5.31125	-8.5248
4	363.610 9	38.6143 7	2.23E-12*	11.54654*	-5.01579	9.244143*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Unit Root Test

To analyze the dataset's stationarity for all the variables to check whether the data is stationary or not using the Augmented Dicky Fuller (ADF) test. The graphs for all the variables (See appendix A) confirmed the presence of trends in the dataset. So, the unit root test (widely used ADF test) has been performed at all levels of differences by making SIC at 1 lag order as a standard. The outcomes for the unit root test in the table above 4.3 illustrated that variables are stationary at their 1st level of difference. The value of probability less than 5% indicates that all the series are stationary at 1st level of difference. The study proceeded with the cointegration test to confirm cointegrating vectors in the dataset. As shown in Table 3.

Table 3. Unit Root Test using the measure of Augmented Dicky Fuller Test

Variables	Level	Prob	1st Diff	Prob
GDPG	-5.50146	0.0003	-7.08748	0.000
Debt to GDP				
Ratio	-2.09465	0.5325	-12.8296	0.000
INF	-3.46316	0.0574	-7.80027	0.000
PI	-3.70492	0.3350	-8.32221	0.000
EXR	-4.68187	0.0029	-9.21502	0.000
FD	-2.85994	0.1858	-7.11908	0.000

Johansen Cointegration Test

The Johansen cointegration test has been performed to choose the appropriate model for the dataset. A golden rule of the null hypothesis states no cointegrating vectors. When the probability value either for trace statistics or max eigenvalue is more than 5%, it indicates that there are no cointegrating vectors, and in such case, we opt vector autoregression model (widely known as VAR). However, on the contrary, when the value of probability for either trace statistics or max eigenvalue is less than 5%, there are cointegrating vectors, and in such case, we opt for vector error correction model (widely known as VECM).

Johansen cointegration test has been performed on the dataset to test whether there are cointegrating vectors; the outcomes revealed three (02) cointegrating vectors because the probability value for both trace statistics and max eigenvalue is less than 5%. That confirms the presence of cointegrating vectors, and thus the study opted for using the vector error correction model (VECM). As shown in Table 4.

Table 4. Johansen Cointegration Test

Hypothesize d No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value 0.05	Prob.**
None *	0.830592	145.5171	95.75366	0.000
At most 1 *	0.611615	78.05012	69.81889	0.0095
At most 2	0.459501	42.11134	47.85613	0.1556
At most 3	0.280775	18.73139	29.79707	0.5123
At most 4	0.080256	6.207319	15.49471	0.671
At most 5	0.076598	3.028237	3.841466	0.0818

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Vector error correction model has been performed as the dataset has more than 02 cointegrating vectors. Both the short and long-run dynamics have been derived for the dataset. Also, the error correction term equation can be illustrated as

The Generalized Equation for the error correction term is as follows.

$$ECT_{t-1} = [Y_{t-1} - n_j X_{t-1} - \varepsilon_m R_{t-1}]$$

$$ECT_{t-1} = [1.000GDPG_{t-1} - 4.42FD_{t-1} - 1.78PI_{t-1} + 2.71INF_{t-1} - 0.0378EXR_{t-1} + 1.341DTGP_{t-1} - 0.41972]$$

The long-run dynamics model of error correction term illustrates the following outcome.

- A percentage change in FD with a 442% decrease in GDPG on average ceteris peribus in the long run.
- A percentage change in PI with a 178% decrease in GDPG on average ceteris peribus in the long run
- A percentage change in INF with a 271% decrease in GDPG on average, ceteris peribus in the long run.
- A percentage change in EXR with a 0.3% increase in GDPG on average, ceteris peribus in the long run.

And finally, a percentage change in Debt to GDP Ratio (DTGDP) with a 134% increase in GDPG on average, ceteris peribus in the long run.

Table 5. Vector Error Correction Model (Long Run Estimates)

Cointegrating Eq:	CointEq1
GDPG (-1)	1.0000
FISCAL DEFICIT(-1)	-4.41774
	-1.25526
	[-3.51937]
PI (-1)	-1.78191
	-0.30321
	[-5.87691]
I (-1)	2.711377
	-0.66462
	[4.07958]
EXR (-1)	-0.00378
	-0.00108
	[-3.48447]
DTGDP (-1)	1.340775
	-0.26779
	[5.00678]
C	-0.41972

Short-run dynamics model of error correction term illustrated the following outcomes (also shown in Table 6, see on next page):

The previous year's deviation from long-run equilibrium is corrected at a speed of 22.2%.

- A percentage change in Fiscal Deficit is associated with a 172% decrease in GDPG on average ceteris peribus in the short run.

- A percentage change in Public Investment (PI) with a 36.8% increase in GDPG on average ceteris peribus in the short run.
- Also, a percentage change in INF with a 26.5% increase in GDPG on average ceteris peribus in the short run.
- A percentage change in Exchange Rates (EXR) with a 0.05% increase in GDPG on average ceteris peribus in the short run.
- A percentage change in Debt to GDP Ratio (DTGDP) with a 17.04% increase on average ceteris peribus in the short run.

5 | CONCLUSION

The budget deficit is a multifaceted issue that most economies face and resolve this macro problem. Because of the country's expansion fiscal policies, the budget deficit has also been drastically enhanced in evolving markets and developing economies. Pakistan is among one of the rapidly growing global economies during the three eras, so the proof for this country is useful references for other economies (particularly in the group of evolving economies, e.g. Middle Eastern Economies). The study used VECM to thoroughly analyze the effect of budget deficit on economic growth (EG) in Pakistan. The study collected data between 1979 and 2018 with 39 observations.

Based on quantitative techniques, the study results show that fiscal deficit (FD) negatively impacts economic growth (EG) in Pakistan. Moreover, it also illustrated that fiscal deficit (FD) has bad effects on some other macro-economic variables, namely public investment, inflation rates, and as well as on debt to GDP. The analyzed results are strong proof that the policymakers in Pakistan and evolving economies must have instant solutions to rapidly slow down the pace of deficit to grip sustainable growth in the upcoming time. The results confirmed that public investment has a vital role in encouraging economic growth in Pakistan. Lastly, the study results contributed some examined reference to theoretical framework regarding the relationship of fiscal deficit and macroeconomic-problems in the case of Pakistan.

Table 6. Vector Error Correction Model (Short Run Estimates)

Error Correction:	D(GDPG)	D(FISCAL_DEFICIT)	D(PI)	D(I)	D(EXR)	D(DTGDGP)
CointEq1	-0.220359 -0.12162 [-1.81180]	0.008578 -0.02345 [0.36577]	0.330752 -0.08554 [3.86652]	-0.091401 -0.05851 [-1.56223]	48.64201 -26.7102 [1.82110]	-0.009773 -0.09332 [-0.10473]
D(GDPG(-1))	-0.312042 -0.1309 [-2.38385]	-0.034343 -0.02524 [-1.36061]	-0.222347 -0.09207 [-2.41510]	0.007028 -0.06297 [0.11162]	-54.76958 -28.7469 [-1.90524]	-0.166956 -0.10043 [-1.66237]
D(FISCAL_DEFICIT(-1))	-1.725102 -0.97415 [-1.77089]	-0.075183 -0.18784 [-0.40025]	0.723982 -0.68515 [1.05668]	0.108569 -0.46861 [0.23168]	-323.8945 -213.934 [-1.51399]	0.298325 -0.74742 [0.39914]
D(PI(-1))	0.368993 -0.23238 [1.58791]	0.032691 -0.04481 [0.72957]	0.063643 -0.16344 [0.38940]	-0.183539 -0.11178 [-1.64192]	120.813 -51.0327 [2.36737]	-0.083238 -0.17829 [-0.46686]
D(I(-1))	0.265012 -0.41888 [0.63266]	0.011321 -0.08077 [0.14016]	-0.347283 -0.29462 [-1.17877]	-0.129141 -0.2015 [-0.64089]	-0.47121 -91.992 [-0.00512]	-0.031732 -0.32139 [-0.09873]
D(EXR(-1))	0.000567 -0.00087 [0.65466]	-8.71E-05 -0.00017 [-0.52180]	3.73E-05 -0.00061 [0.06132]	0.000156 -0.00042 [0.37402]	-0.346358 -0.19006 [-1.82233]	-0.000111 -0.00066 [-0.16741]
D(DTGDGP(-1))	0.170149 -0.1801 [0.94476]	-0.032517 -0.03473 [-0.93635]	-0.405232 -0.12667 [-3.19916]	0.07832 -0.08663 [0.90403]	-52.74772 -39.5514 [-1.33365]	-0.56255 -0.13818 [-4.07112]
C	-0.002521 -0.01243 [-0.20280]	0.00063 -0.0024 [0.26292]	-0.00548 -0.00874 [-0.62667]	-0.00097 -0.00598 [-0.16226]	0.399178 -2.73034 [0.14620]	0.003739 -0.00954 [0.39195]
R-squared	0.520594	0.126102	0.512809	0.236608	0.498721	0.435593
Adj. R-squared	0.412341	-0.07123	0.402798	0.064229	0.385529	0.308146
Sum sq. residual	0.183084	0.006807	0.090568	0.042366	8830.035	0.107779
S.E. equation	0.07685	0.014819	0.054051	0.036968	16.8772	0.058964
F-statistic	4.809046	0.639035	4.66144	1.372604	4.405966	3.41784
Log likelihood	49.20815	113.4008	62.9332	77.74819	-161.0745	59.54053
Akaike AIC	-2.113238	-5.405167	-2.817087	-3.57683	8.670486	-2.643104
Schwarz SC	-1.771995	-5.063924	-2.475844	-3.235587	9.01173	-2.301861
Mean dependent	-0.00359	0.000513	-0.00359	0.000256	-0.333333	0.004359
S.D. dependent	0.100249	0.014318	0.069943	0.038216	21.53027	0.070889
Determinant residual covariance (dof adj.)						2.39E-12
Determinant residual covariance						6.03E-13
Log-likelihood						216.622
Akaike information criterion						-8.339588
Schwarz criterion						-6.036195
Number of coefficients						54

Recommendations

Our results suggest that policymakers in Pakistan have to put their greater effort into reducing the expenditure like privatizing state corporations, so the public budget does not employ to sustain large state-owned enterprises because the government-expenditure for that sector is one major reason amongst resulting in a deficit. Alongside, the government of Pakistan must try to generate more revenues in the form of taxes that emphasize the expenditure of households for luxurious services and commodities from abroad economies. The study results also imply that the Pakistani government needs to find some hard solutions to reduce its

employees in the public sector by employing IT more and more so to ensure the cost, which is one of the major solutions. This reduction in the public sector's wage expenditure will help decrease the deficit in the coming time.

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