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Effects of Foreign Shocks on Fiscal Variables in Pakistan

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	Abstract
Muhammad Ali Kakar Assistant Professor (Economics), BUIITEMS Arbab Muhammad Jehandad Kasi Lecturer (Economics), University of Balochistan	This study examines the domestic and foreign economic effects of fiscal shocks in Pakistan using the Johansen Cointegration technique and a Vector Error Correction Model with foreign exogenous variables (VECMX*). The analysis considers domestic fiscal and macroeconomic variables alongside their foreign counterparts and oil prices as a global variable. Time-series and panel data for Pakistan, India, Sri Lanka, Bangladesh, China, and the USA covering 1980–2020 were obtained from DOTS, IFS, and WDI. The findings indicate significant long-run relationships between domestic and foreign output, trade revenues, and Pakistan’s GDP. Foreign output has a positive effect on domestic output, while oil prices have a small negative effect. Overall, the results highlight the importance of considering both domestic and global factors when formulating fiscal policies aimed at promoting economic growth and stability.
Keywords:	Domestic variables, foreign variables, global variable, VECMX*.

Introduction:

Fiscal policy, through government decisions on taxation and public expenditure, plays an important role in determining economic growth, employment, investment, income distribution, and macroeconomic stability in Pakistan. During economic crises, expansionary fiscal measures such as increased public spending, tax reductions, subsidies, and targeted transfers can support aggregate demand and economic activity (Spilimbergo et al., 2008). However, such measures may also increase fiscal deficits and public debt, creating challenges for long-term fiscal sustainability.

Fiscal shocks can originate from both domestic and external sources. Domestic shocks include changes in government expenditure, taxation, and public debt. An increase in government spending can stimulate output and employment, while tax reductions may increase disposable income, consumption, and investment (Ramey, 2019; Feldstein, 2020). Conversely, contractionary fiscal measures can reduce aggregate demand and economic activity. Rising public debt may also increase borrowing costs, crowd out private investment, and reduce the government's fiscal space to respond to future economic shocks (Reinhart & Rogoff, 2011).

External shocks arise from global economic conditions, international trade, financial crises, interest rates, exchange rates, and commodity prices. These shocks are particularly relevant to Pakistan because of its dependence on imports and external financing. Changes in global interest rates can increase external borrowing costs, while a slowdown in global economic activity can reduce export demand and government revenues (Aizenman & Jinjarak, 2016). Similarly, fluctuations in oil prices can influence inflation, production costs, the exchange rate, and fiscal conditions.

The effectiveness of fiscal policy depends on the nature of the shock, available fiscal space, the efficiency of public expenditure, and coordination between fiscal and monetary policies. Fiscal policy may be more effective in addressing demand-side shocks such as recessions, while its impact can be more limited during supply-side shocks such as sharp increases in oil prices (Blanchard et al., 2010). Implementation lags and limited access to international capital markets can further constrain the effectiveness of fiscal interventions (Cogan et al., 2010; IMF, 2021).

Revival of Fiscal Policy

The global financial crisis of 2008–09 renewed interest in fiscal policy as governments around the world adopted stimulus measures to support economic activity. These measures included increased government spending, tax cuts, subsidies, and transfers. The crisis also generated renewed debate about fiscal multipliers, fiscal sustainability, and the appropriate balance between fiscal stimulus and austerity.

Pakistan was significantly affected by the global financial crisis, with economic growth slowing considerably. In response, the government introduced a fiscal stimulus package of approximately PKR 350 billion in 2009, including spending on infrastructure, social safety nets, and agriculture (Ahmed & Butt, 2017). Other measures included tax exemptions and increases in public-sector salaries. More recently, fiscal policy has continued to focus on public investment, infrastructure development, social programs, small businesses, and export promotion (Ministry of Finance, 2021).

Overall, fiscal policy has important implications for Pakistan's output, employment, investment, inflation, public debt, and economic stability. Therefore, examining domestic, foreign, and global fiscal shocks is essential for understanding their macroeconomic consequences and for developing fiscal policies that promote sustainable economic growth and stability.

Literature Review

Fiscal policy is a major instrument through which governments influence economic activity, employment, investment, inflation, income distribution, public debt and macroeconomic stability. Through taxation, government expenditure, transfers, public investment and borrowing, fiscal authorities affect aggregate demand in the short run and productive capacity in the long run. Consequently, fiscal policy remains central to research on fiscal multipliers, fiscal expansion, crowding out, public-debt sustainability and fiscal consolidation (Hemming, Kell, & Mahfouz, 2002; Spilimbergo, Symansky, Blanchard, & Cottarelli, 2008; Ramey, 2019).

The theoretical foundations of fiscal policy are strongly associated with Keynesian economics. Keynes (1936) argued that when private demand is insufficient, government expenditure can raise aggregate demand, output and employment through the expenditure multiplier, while tax reductions can increase disposable income and stimulate consumption and investment. However, fiscal effects depend on the marginal propensity to consume, expectations, interest rates, exchange rates, openness and the extent to which additional demand is directed toward domestic rather than imported goods (Keynes, 1936; Hemming et al., 2002). The crowding-out perspective highlights that government borrowing may compete with private borrowers, raising interest rates and reducing private investment. Persistent deficits can also increase debt-servicing costs and future fiscal constraints (Kormendi, 1983; Elmendorf & Mankiw, 1999). Barro's (1974) Ricardian equivalence hypothesis further suggests that forward-looking households may anticipate future taxation associated with current borrowing and therefore increase saving rather than consumption.

Empirical research has consequently focused on identifying fiscal shocks and estimating fiscal multipliers. Blanchard and Perotti (2002) used a structural vector autoregression (SVAR) framework to distinguish fiscal shocks associated with government expenditure, net taxes and real GDP, finding that spending increases and tax reductions can raise output and consumption, although effects on private investment may differ. Identification is difficult because fiscal variables respond automatically to economic conditions: recessions can reduce tax revenues and increase expenditure without representing discretionary expansion. Alternative methods include sign restrictions (Mountford & Uhlig, 2009), narrative identification (Ramey, 2011; Ramey, 2019) and historical identification of tax shocks (Romer & Romer, 2010). These approaches demonstrate the importance of timing, anticipation and policy motivation when estimating fiscal multipliers.

Fiscal multipliers are also state-dependent. Auerbach and Gorodnichenko (2012) found evidence that multipliers may be larger during recessions, when unused resources and weak private demand allow fiscal stimulus to operate with less immediate inflationary pressure. During periods of high capacity utilization, however, additional demand may increase inflation and provoke monetary tightening. The global financial crisis of 2008–09 renewed attention to fiscal policy as a stabilization instrument, while Blanchard and Leigh (2013) found evidence during the European sovereign-debt crisis that fiscal multipliers were larger than some earlier estimates. Ramey (2019) emphasizes that multiplier size depends on monetary policy, openness, exchange rates, financial constraints, public debt and fiscal space.

Fiscal and monetary policies therefore interact closely. Monetary tightening following fiscal expansion can offset part of its stimulus, whereas accommodative monetary policy may strengthen its effects. Openness and exchange rates also influence transmission because increased demand may leak into imports, while currency appreciation under flexible exchange rates can reduce net exports (Blanchard & Perotti, 2002; Hemming et al., 2002; Spilimbergo et al., 2008). The composition of fiscal policy is equally important. Government consumption, public investment, transfers and subsidies can have different short- and long-term effects, while investment in infrastructure, education, health, technology and research may improve productivity and complement private capital (Afonso et al., 2005). In Pakistan, Rehman et al. (2015) found that transportation, communications and health expenditure could support private investment, whereas debt-related and community-service expenditure produced less favourable effects. Taxation also has heterogeneous consequences: Romer and Romer (2007) found contractionary effects from tax increases, while Gemmell et al. (2006) identified adverse long-term growth effects associated with distortionary taxation.

Fiscal policy also affects inflation and public debt. Expansionary policy can generate inflationary pressure near capacity, whereas fiscal consolidation can reduce demand and inflation depending on its timing and composition. Persistent deficits increase borrowing and debt-servicing requirements, potentially limiting future fiscal space. Elmendorf and Mankiw (1999) emphasize the long-term consequences of excessive debt, while Bertola and Drazen (1993) and Sutherland (1997) stress fiscal adjustment, credibility and the initial fiscal position.

These issues are particularly important for developing economies because weak revenue mobilization, shallow financial markets, external financing needs and international shocks constrain fiscal policy. Haque and Montiel (1992) provide an important basis for understanding Pakistan's fiscal imbalances and their implications for investment and macroeconomic stability. Developing economies may also experience procyclical fiscal policy because financing conditions deteriorate during international financial stress (Chu, 1987; Tanzi, 1989). External movements in trade, commodity prices, global interest rates, capital flows and exchange rates can therefore affect fiscal revenues, expenditure and debt independently of domestic policy.

Commodity and oil-price shocks represent an additional source of external disturbance. Hamilton (1983) established the importance of oil shocks for economic activity, while subsequent research identified effects through inflation, output, interest rates and capacity utilization (Burbidge & Harrison, 1984; Gisser & Goodwin, 1986; Mork, 1989; Hooker, 1996; Lee et al., 2001; Tang et al., 2010). UNCTAD (2000) similarly emphasizes developing countries' vulnerability to external trade shocks, which can simultaneously reduce fiscal revenues, increase financing requirements and weaken economic growth.

Fiscal decentralization provides another dimension of fiscal policy. Its potential benefits arise from allowing public decisions to reflect local conditions, but evidence is mixed. Davoodi and Zou (1998) identified differences between developed and developing economies; Zhang and Zou (1998) found an inverse relationship between decentralization and provincial growth in China, whereas Lin and Liu (2000) reported positive effects. Thiessen (2003) also identified positive effects in OECD countries. Akai and Skata (2002) and Ebel and Yilmaz (2002) emphasize measurement issues, while Malik et al. (2006) stress expenditure responsibilities, revenue authority and intergovernmental transfers.

Pakistan's fiscal literature reflects these wider debates. The country has historically faced recurring fiscal deficits, limited revenue mobilization, significant debt-servicing obligations and reliance on domestic and external borrowing (Haque & Montiel, 1992). Earlier studies examined taxation and distribution, including the burden of indirect taxation on lower-income groups (Alauddin & Raza, 1981; Malik & Saqib, 1985), direct taxation and redistribution (Jeetun, 1978), tax progressivity (Malik & Saqib, 1989), provincial and municipal taxation (Ghaus, 1997), and weaknesses in revenue mobilization (Ahmed et al., 1998). Expenditure composition is also important because interest payments and defence expenditure can constrain development spending (Ismail & Hussain, 2012; Nazir et al., 2013). Khalid et al. (2007) found evidence of procyclical fiscal policy, while Ali and Ahmed (2010) suggested that fiscal deficits may stimulate activity in the short run but create adverse consequences when sustained.

The interaction between fiscal and monetary policy has also been examined in Pakistan. Jawaid et al. (2010) found that both policies influence long-term economic activity, while Ali et al. (2008) reported limited evidence of a strong fiscal effect relative to monetary policy in South Asia. Using an SVAR framework, Shaheen and Turner (2010) found that positive government-spending shocks could increase output and inflation in the short run, with interest rates potentially increasing. Rehman et al. (2015) further demonstrated the importance of expenditure composition for private investment. Raashid, Saboor and Ahmad (2020), using an open-economy New Keynesian DSGE framework, emphasized interactions among fiscal policy, monetary policy and external conditions. Fiscal space is therefore important for countercyclical policy, particularly in economies exposed to international shocks (Aizenman & Jinjark, 2019; IMF, 2014).

Recent evidence reinforces these concerns. The IMF's 2025 *Fiscal Monitor* emphasizes rising global public debt, uncertainty, financial-market volatility, credible medium-term fiscal frameworks, debt management and fiscal buffers (IMF, 2025a). Its 2025 assessment of low-income countries stresses domestic revenue mobilization, expenditure efficiency and productivity-enhancing reforms (IMF, 2025c), while the IMF's 2025 Pakistan programme review emphasizes fiscal consolidation, revenue mobilization, public-finance improvements, state-owned-enterprise reforms and improved public services (IMF, 2025b).

Rashid et al., 2023, investigated the relative importance of internal and external shocks for macroeconomic performance (both real and nominal sectors) of a small open economy, namely Pakistan. The study used various external sector shocks (world oil price shocks, world commodity price shocks, and world interest rate shocks) to assess the relative importance of each shock in determining macroeconomic performance of Pakistan. The findings of the study portray that the impact of external sector shocks significantly differ in the real and nominal sectors. Specifically, oil-price shocks and commodity-price shocks remain the dominant source of external sector shocks for both nominal and real sectors, whereas stock market volatility appears prevailing source of fluctuations for both industrial production index and nominal money supply

Optimal fiscal policy internalizes a trade-off between output stability and fiscal stability. With lump-sum taxation, the noncooperative equilibrium is inefficient and both countries are better off under coordination (Agénor, P.-R. 2024). Okorie and Lin (2024), analyzed and investigated the economic, energy, and environmental effects of these global shocks on Nigeria, a developing, oil-producing, oil-dependent, and oil-exporting country. Furthermore, the mitigating roles of a fiscal stimulus-response package (palliative). The study shows the sectorial-specific impacts exist as some sectors experience output declines while others do not. Environmental quality is improved since more carbon is abated, nonetheless. Carbon intensities increased given that the price effects outweighed the quantity effects— reduced emission results from reduced economic activities and not from technological progress.

Overall, the literature shows that fiscal policy affects output, investment, employment, inflation, debt and external balances, but its effects vary with fiscal instruments, business-cycle conditions, monetary policy, exchange rates, openness, financial constraints, fiscal space and public debt (Hemming et al., 2002; Auerbach & Gorodnichenko, 2012; IMF, 2014; Ramey, 2019). For Pakistan, fiscal transmission must also be examined within an open economy exposed to external shocks (Haque & Montiel, 1992; Raashid et al., 2020). Distinguishing domestic, foreign and global fiscal disturbances therefore provides a useful framework for analysing fluctuations in output, inflation, investment, interest rates and other macroeconomic variables, consistent with the open-economy perspective emphasized by Buiter (1986), Chu (1987) and Tanzi (1989).

Methodology

A general structural VARX model for endogenous variables with a vector of $m \times 1$ can be expressed as (The order of the distributed lag functions correlated with endogenous and exogenous variables may be explicate in a number of ways. The distributed lag functions on x_t and x_t^* can be interpreted as having a maximum order of 'p' lags.

$$Ax_t = A_1 x_{t-1} + \dots + A_p x_{t-p} + B_0 x_t^* + B_1 x_{t-1}^* + \dots + B_p x_{t-p}^* + Dd_t + \varepsilon_t \quad (1)$$

Where $t = 1, 2, \dots, T$, and the deterministic variables is denoted by d_t which is a $q \times 1$ vector, exogenous variables ($m^* \times 1$ vector) are denoted by x_t^* , while $\varepsilon_t = (\varepsilon_{1t}, \varepsilon_{2t}, \dots, \varepsilon_{mt})$ is a $m \times 1$ vector of serially uncorrelated errors of individually distributed of x_t^* having a zero mean and a constant positive fixed variance-covariance matrix, $\Omega = (\omega_{ij})$, where ω_{ij} is the $(i, j)^{th}$ element of Ω . The reduced form of the model shown in equation (1) that demonstrates the endogenous variables with reference to the exogenous variables is denoted as:

$$x_t = \Phi_1 x_{t-1} + \dots + \Phi_p x_{t-p} + \Psi_0 x_t^* + \Psi_1 x_{t-1}^* + \dots + \Psi_p x_{t-p}^* + Yd_t + u_t, \quad (2)$$

Where
 $\Phi_i = A^{-1}A_i$,
 $\Psi_i = A^{-1}B_i$,
 $Y = A^{-1}D$,

$u_t = A^{-1}\varepsilon_t$ is i.i.d. $(0, \Sigma)$ with $\Sigma = A^{-1}\Omega A^{-1} = (\sigma_{ij})$

Using a VAR (p), where all variables are considered endogenous, several researchers have studied the cointegration econometric method. We begin by reviewing the literature assuming that the VAR model only incorporates endogenous I(1) variables and linear deterministic trends. If the value of $B_i = 0$ in equation (1) then we have

$$x_t = \Phi_1 x_{t-1} + \dots + \Phi_p x_{t-p} + a_0 + a_1 t + u_t, \quad (3)$$

Here a_0 and a_1 are $m \times 1$ vectors of anonymous coefficients. We shall consider a model which not only contains the endogenous variables but also accommodates the exogenous I(1) variables. The above model can be rewrite as a Vector Error Correction Model (VECM)

$$\Delta x_t = -\Pi x_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta x_{t-i} + a_0 + a_1 t + u_t, \quad (4)$$

Where
 $\Pi = I_m - \sum_{i=1}^p \Phi_i$,
 $\Gamma_i = -\sum_{j=i+1}^p \Phi_j$, $i = 1, \dots, p-1$.

Under cointegration, equation (20) can be written as:

$$\Delta x_t = -\alpha \beta' x_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta x_{t-i} + a_0 + a_1 t + u_t, \quad (5)$$

Here α represents the matrix of the coefficients of the adjustments or feedback that measure the strength of the deviances from equilibrium, the 'r' stationary variables $\beta' x_{t-1}$, response onto the structure. When the cointegrating vectors are $m > r > 0$ then there essentially be some non-zero components of α , reflecting the existence of some relationships of Granger Causality. The best and most complete econometric model is one with linear deterministic trends for both endogenous and exogenous variables. This form of model was explored by Pesaran, Shin, and Smith (2000). We start with the extended Vector Error Correction Model (VECM) in z_t

$$\Delta z_t = -\Pi z_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta z_{t-i} + a_0 + a_1 t + u_t, \quad (6)$$

Where $z_t = (x_t', x_t^*)'$ is comprised of $m_x \times 1$ vector of endogenous variables x_t and $m_x^* \times 1$ vector of exogenous variables, x_t^* , with $m = m_x + m_x^*$ for representing the total number of variables. Long-run multipliers are denoted by Π which is $m \times m$ matrix, while the short-term responses are noted by the matrices $\{\Gamma_i\}_{i=1}^{p-1}$. With $m \times 1$ fixed intercept are explained by a_0 while the deterministic time trends are denoted by a_1 which is $m \times 1$ vector of coefficients of these deterministic time trends. U_t is $m \times 1$ vector of shocks. It is assumed that the shocks, u_t , are not serially correlated, with a zero mean and a non-singular covariance matrix Σ . In compact terms, $u_t \sim$ i.i.d. $(0, \Sigma)$.

(For a more thorough discussion, see Garratt et al., 2006: pages 135-138)

An application for the Pakistan economy

Using annual data for macroeconomic variables and data for monetary and fiscal variables from 1980 to 2019, this section of the research estimates a VECMX* model for the Pakistani economy. All three of these variables—real GDP (Y_t), inflation (P_t), and the exchange rate (ER_t)—are used as exogenous inputs in the model. Total public receipts (TR_t) and total public expenditures (TPE_t) are two additional fiscal indicators that we incorporate into our research model to better understand the effect of fiscal shocks on Pakistan's economy (TE_t). To be more precise, $Y_t = \ln(GDP_t/CPI_t)$, $P_t = \ln(CPI_t)$, $TR_t = \ln(TR_t/CPI_t)$, $TE_t = \ln(TE_t/CPI_t)$, and $ER_t = \ln(ER_t/CPI_t)$ are the formulas used to determine the variables (ER_t). In this equation, GDP_t represents the gross domestic product, CPI_t the consumer price index, TR_t the total public receipts, TE_t the total public spending, and ER_t the exchange rate in terms of units of domestic currency per US dollar. In our model, Y_t^* (GDP), TE_t^* (total Public Expenditures), TR_t^* (total Public Receipts), ER_t^* (exchange Rate), and P_t^* (CPI) are all exogenous variables that act as foreign variables. A "star" represents each of these foreign variables. Using the above-described relation, these international variables (the "star" variables) are derived as the weighted averages of the corresponding domestic variables.

Results and Discussion

To assess the stationarity of the variables included in the models, the Augmented Dickey-Fuller (ADF) test was employed. Testing for stationarity is essential prior to conducting regression analysis, as the use of non-stationary variables may result in spurious regression relationships. The results indicate that the variables included in the models are stationary at first difference. The results of the Augmented Dickey-Fuller test are presented in Table 1 below.

Table 1: Unit Root Test for the Foreign Shocks

	ADF			
	Level		1 st Difference	
	t-stat	p-value	t-stat	p-value
ER	7.8711	0.7951	77.4038	0.0000
ER*	2.08803	0.588	123.11	0.0000
P	15.2836	0.2263	28.8439	0.0042
P*	2.56315	0.131	87.0569	0.0000
TE	6.93566	0.8618	73.9376	0.0000
TE*	11.6371	0.4752	86.2612	0.0000
TR	7.1814	0.8978	125.364	0.0000



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TR*	6.64534	0.8801	92.4563	0.0000
Y	9.24673	0.6817	22.422	0.0331
Y*	5.95857	0.9182	117.886	0.0000

Source: Author's own estimation

The table 1 illustrates the result of the unit root test. Since the Panel data is used thus unit root test has performed in order to check the Stationarity in the data and to show whether variables are integrated of order I (0), I (1), I (2) or amalgamation of all. This test has used the well-known technique i.e. Augmented Dickey Fuller to verify the Stationarity of variables in the model. In our model all the variables i.e. Y (domestic GDP for Pakistan), Y* (foreign GDP for Pakistan), ER (domestic exchange rate of Pakistan), ER* (foreign exchange rate for Pakistan), TR (domestic total revenue for Pakistan), TR* (Foreign total revenue for Pakistan) and TE (domestic total expenditures for Pakistan) P (domestic inflation rate of Pakistan), P* (Foreign inflation rate of Pakistan) and TE* (foreign total expenditures for Pakistan) are stationary at 1st difference. In this case, we applied Johnsen cointegration test and VECMX* technique, which was widened by (Pesaran et.al 2001).

Table: 2 *Lag Selection Criteria*

VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SBC	HQ
0	-742.056	NA	3.29E-09	8.847722	9.032181	8.922573
1	2272.839	5639.628	4.22E-24	-25.4452	-23.41612	-24.62180
2	2398.723	220.6667*	3.15e-24*	-25.74968*	-21.8761*	-24.1778*
3	2473.567	122.3918	4.35E-24	-25.4537	-19.7355	-23.13334
4	2547.131	111.6446	6.28E-24	-25.1427	-17.5799	-22.07382

Source: Author's own estimation

* 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

The findings of the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC) for determining the number of lags in the VAR model are shown in Table 2 above. The AIC favours a VAR of order 2, as expected, while the SBC, LR, FPE, and HQ are likewise in favor of an order 2 VAR. In light of this, we continue the investigation with p = 2 delays. Although we are aware of Kilian's (2001: p. 162) proposal, a number of factors were taken into account when making this decision. It was discovered that the stability of the model is attained for an intermediate number of lags with respect to the values proposed by both criteria (AIC: 2, SBC: 2).

Table: 3 *Johannsen's Cointegration (Unrestricted Rank Test, Trace)*

Johannsen Fisher Panel Cointegration Test				
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-Eigen test)	Prob.
None	333	0.0000	123.7	0.0000
At most 1	133.2	0.0000	163.1	0.0000
At most 2	369.1	0.0000	127.1	0.0000
At most 3	196	0.0000	79	0.0000
At most 4	148.1	0.0000	53.33	0.0000
At most 5	104.5	0.0000	42.53	0.0000
At most 6	70.19	0.0000	31.51	0.0005
At most 7	46.56	0.0000	28.89	0.0013
At most 8	27.87	0.0019	24.87	0.0056
At most 9	17.46	0.0648	17.46	0.0648

Source: Author's own estimation.

In Table 3, we present the results of the Johansen fisher Test for determining the number of cointegrating relations, together with their simulated probability values at the 5 percent levels of significance. The probability of Trace Statistic and the maximum Eigen values suggest that there are 9 cointegrating relationships among the variables at the 95 percent level of confidence. There are so many cointegrated parameters that need to be calculated and the sample size is so small, the Johansen test does not yield any definitive results. We observed the long-run relationship between all the variables based on the Johansen cointegration test, but in order to determine the correct relationship between all the

variables in the short and long runs, we will move on to the VECMX* test to determine the rate of adjustment and the long and short run relationship between all the variables in the current model.

Table: 4 *Long-Run Equilibrium*

Cointegrating Eq:	Y*t-1	TRt-1	TR*t-1	TEt-1	TE*t-1	Pt-1	P*t-1	ERt-1	ER*t-1	C
Coefficient	0.4491	2.4864	0.2874	3.2283	1.2797	-0.4934	-0.3329	0.0910	0.4839	23.44
Std. Dev	0.0709	0.1529	0.0663	0.2247	0.2964	0.1142	0.1323	0.0415	0.1363	
t-statistics	6.3272	16.256	4.3319	14.367	4.3166	-4.3207	-2.5157	2.1935	3.5502	

Source: Author's own estimation.

Table 4 shows the outcome of the long-run equilibrium or cointegration for the foreign variables to assess the foreign shocks for Pakistan. The result describes that at Y^*_{t-1} (the first lag of foreign GDP for Pakistan) has positive and statistically significant impact on Y (domestic GDP of Pakistan) in the long-run. This analysis confirms that in the long-run a one percent increase in the Y^*_{t-1} results an increase of 0.44% in Y.

The results of the estimation shown in the table 4 above explains that both the TR_{t-1} (the first lag of total revenue of Pakistan) and TR^*_{t-1} (first lag of foreign TR) have positive correlation and statistically significant effect on Y in the long-run. This correlation shows that if TR_{t-1} and/or TR^*_{t-1} escalates by 1% would increase the domestic GDP (Y) by 2.48 % and 0.28% respectively. Furthermore, the finding shows that public revenues help the economy advance because they are raised through taxes imposed on either income or consumption. Consequently, an increase in tax revenue implies an increase in the level of income and/or consumption, which implies an increase in the economy's overall demand and output. The collection of surcharges, specific levies, donations, gifts, fees, and grants, on the other hand, were bundled together as additional receipts and are now known to be risky for economic growth because they are made from a specific group of people, a specific class of people, or institutions regardless of their development and rise in earning capacity. Therefore, more revenue does not enhance economic growth rather it devalues it (Rehman et al (2020)).

The outcomes of both the TE_{t-1} (domestic total expenditures) and TE^*_{t-1} (foreign total expenditures) shows a positive relationship with domestic GDP (Y) in the long-run. This relationship is statistically significant also. This significant and positive correlation between TE_{t-1} and TE^*_{t-1} and Y expresses that a 1% increase in TE_{t-1} and TE^*_{t-1} compels the Y to increase by 3.22% and 1.27% respectively. The results of this investigation are consistent with Adolph Wagner's and John Maynard Keynes' theoretical framework. Adolph Wagner predicted that economic growth would lead to an increase in public economic activity and hence public spending. This is because the state needs to carry out administrative and security responsibilities more efficiently and give the legal system greater weight than it previously did (Aksoy, 1991:114). Keynes believed that government expenditure is an external element that may be utilized as a tool for policymakers to influence economic growth and reduce short-term swings. Keynesian economists contend that the budget deficits brought on by the rise in government spending have improved domestic production, expanded the economy, and subsequently boosted private sector investment. John Maynard Keynes, in contrast to Wagner, contends that rising public spending causes economic growth rather than the other way around.

The results estimated above in the table 4 also depict that both P_{t-1} (domestic inflation of Pakistan) and P^*_{t-1} (foreign inflation for Pakistan) has inversely related with domestic GDP (Y) and are significant statistically. Both these relationships of P_{t-1} and P^*_{t-1} with Y show that if both P_{t-1} and P^*_{t-1} are increased by 1% results Y to decrease by 0.49% and 0.33% respectively. Our findings are theoretically congruent with those of Gokal, V., & Hanif, S. (2004). They discovered that rising prices can make investors concerned about the future viability of their investment projects (especially when high inflation is also associated with increased price variability). As a result, investment plans become more cautious than they otherwise would be, which ultimately results in a decline in investment and economic growth. Inflation can affect a country's balance of payments and decrease its ability to compete internationally by making exports substantially more expensive. Furthermore, when combined with the tax code, inflation might affect borrowing and lending decisions.

While in the case of ER_{t-1} (domestic exchange rate) and ER^*_{t-1} (foreign exchange rate) as given in the above estimated table show a positive and statistically significant effect on domestic GDP (Y). This correlation between ER_{t-1} and ER^*_{t-1} with Y determines that a 1% rise in ER_{t-1} and ER^*_{t-1} positively changes Y by 0.09% and 0.48% respectively. A mixed association between ER and ER* and economic growth is also revealed in the economic literature (Y). There have been numerous studies that evaluated the link between changes in the exchange rate and economic expansion. The expansionary impacts of devaluations were generally supported by earlier research by Connolly (1983), Gylfason and Schmid (1983), Krueger (1978), Taylor and Rosensweig (1984), and Kamin (1998). The contractionary effects then started to show up in several investigations, including those by Gylfason and Radetzki (1985), Atkins (2000), Kamin and Roger (2000), Odusola and Akinlo (2001), Berument and Pasaogullari (2003), and El-Ramly and Abdel-Haleim (2008). Several researches have reported contradictory findings. According to Edwards (1986) and Rhodd (1993), devaluation had negative (contractionary) short-run impacts but looked to have a beneficial long-term effect on output. El-Ramly and Abdel-(2008) Haleim's research indicates that adverse reactions take time to manifest before spreading consequences. There are studies that also claim that changes in exchange rates have no discernible impact (e.g., Bahmani-Oskooee, 1998 and Upadhyaya and Upadhyay, 1999). Studies that took into account multiple nations frequently found contrasting results. For instance, Bahmani-Oskooee and Miteza (2006) found that long-term devaluations are contractionary in non-OECD nations while the results are mixed for OECD economies using a panel of 42 countries.

Table: 5 *Estimation of Vector Error Correction Model with Exogenous Variable (VECMX*)*

Error Correction:	D(Y)	D(Y*)	D(TR)	D(TR*)	D(TE)	D(TE*)	D(P)	D(P*)	D(ER)	D(ER*)
VECMt-1	0.022510	-0.475579	-0.075118	-0.091909	-0.018656	0.034941	0.001609	0.010494	-0.044883	0.001388
Std. Dev	(0.00788)	(0.08924)	(0.02493)	(0.05560)	(0.00374)	(0.02422)	(0.00727)	(0.02368)	(0.01775)	(0.04135)
t-statistics	[2.85808]	[-5.32912]	[-3.01270]	[-1.65302]	[-2.31705]	[1.44239]	[0.22128]	[0.44310]	[-2.52852]	[0.03357]
D(Yt-1)	0.255948	2.266397	-0.127546	0.043087	0.082576	0.176981	0.250583	-0.128506	-0.202812	0.531707
Std. Dev	(0.08862)	(1.00418)	(0.28056)	(0.62564)	(0.04204)	(0.27258)	(0.08182)	(0.26649)	(0.19974)	(0.46525)
t-statistics	[2.88805]	[2.25697]	[-0.45460]	[0.06887]	[1.96436]	[0.64928]	[3.06274]	[-0.48222]	[-1.01539]	[1.14285]

D(Y_{t-2})	0.251475	-0.777414	-0.177423	0.090627	0.045877	-0.129000	-0.055603	-0.033755	0.314529	-0.257806
Std. Dev	(0.08927)	(1.01156)	(0.28263)	(0.63024)	(0.04235)	(0.27458)	(0.08242)	(0.26845)	(0.20121)	(0.46867)
t-statistics	[2.81687]	[-0.76853]	[-0.62777]	[0.14380]	[1.08338]	[-0.46980]	[-0.67464]	[-0.12574]	[1.56322]	[-0.55008]
D(Y*_{t-1})	0.010406	0.093603	-0.022526	0.132908	-0.000337	0.002404	0.007179	0.015411	-0.006259	0.010712
Std. Dev	(0.00631)	(0.07154)	(0.01999)	(0.04457)	(0.00299)	(0.01942)	(0.00583)	(0.01899)	(0.01423)	(0.03315)
t-statistics	[1.64818]	[1.30842]	[-1.12697]	[2.98190]	[-0.11251]	[0.12382]	[1.23157]	[0.81173]	[-0.43989]	[0.32320]
D(Y*_{t-2})	-0.014319	-0.090120	-0.005986	0.022683	-0.006485	0.024270	0.006965	-0.008808	0.002627	-0.026830
Std. Dev	(0.00649)	(0.07356)	(0.02055)	(0.04583)	(0.00308)	(0.01997)	(0.00599)	(0.01952)	(0.01463)	(0.03408)
t-statistics	[-2.20561]	[-1.22515]	[-0.29127]	[0.49495]	[-2.10611]	[1.21550]	[1.16210]	[-0.45120]	[0.17957]	[-0.78725]
D(TR_{t-1})	-0.003126	-0.890038	-0.439074	0.266089	-0.004070	0.032893	-0.026559	0.021290	0.085280	-0.086732
Std. Dev	(0.02731)	(0.30945)	(0.08646)	(0.19280)	(0.01295)	(0.08400)	(0.02521)	(0.08212)	(0.06155)	(0.14337)
t-statistics	[-0.11446]	[-2.87618]	[-5.07838]	[1.38014]	[-0.31416]	[0.39159]	[-1.05338]	[0.25925]	[1.38550]	[-0.60494]
D(TR_{t-2})	-0.032478	-0.820637	-0.265950	0.017156	-0.011251	-0.032720	-0.003977	-0.064744	0.032771	-0.073529
Std. Dev	(0.02475)	(0.28042)	(0.07835)	(0.17471)	(0.01174)	(0.07612)	(0.02285)	(0.07442)	(0.05578)	(0.12992)
t-statistics	[-1.31231]	[-2.92645]	[-3.39445]	[0.09820]	[-0.95840]	[-0.42985]	[-0.17407]	[-0.87001]	[0.58753]	[-0.56594]
D(TR*_{t-1})	-0.004402	0.136478	-0.014941	0.095727	0.005131	-0.005813	-0.013034	0.039643	0.025139	0.044259
Std. Dev	(0.01335)	(0.15122)	(0.04225)	(0.09421)	(0.00633)	(0.04105)	(0.01232)	(0.04013)	(0.03008)	(0.07006)
t-statistics	[-0.32987]	[0.90254]	[-0.35364]	[1.01607]	[0.81049]	[-0.14163]	[-1.05789]	[0.98788]	[0.83579]	[0.63172]
D(TR*_{t-2}) Std. Dev	0.012666	-0.063753	-0.015459	-0.013224	0.011397	-0.001914	-0.012429	0.026201	-0.039556	0.031251
	(0.01262)	(0.14294)	(0.03994)	(0.08906)	(0.00598)	(0.03880)	(0.01165)	(0.03793)	(0.02843)	(0.06623)
t-statistics	[1.00402]	[-0.44600]	[-0.38709]	[-0.14848]	[1.90455]	[-0.04933]	[-1.06716]	[0.69069]	[-1.39122]	[0.47187]
D(TE_{t-1})	0.352718	-2.305299	0.252931	-0.506715	0.133151	-0.121906	-0.508542	0.187935	-0.618636	0.238925
Std. Dev	(0.19753)	(2.23815)	(0.62533)	(1.39445)	(0.09369)	(0.60754)	(0.18236)	(0.59396)	(0.44519)	(1.03696)
t-statistics	[1.78567]	[-1.03000]	[0.40448]	[-0.36338]	[1.42113]	[-0.20066]	[-2.78874]	[0.31641]	[-1.38961]	[0.23041]
D(TE_{t-2})	-0.116009	2.559776	-0.146934	-0.786219	-0.134471	-0.370686	0.071028	0.164938	-0.556728	-0.409741
Std. Dev	(0.20066)	(2.27363)	(0.63524)	(1.41655)	(0.09518)	(0.61717)	(0.18525)	(0.60338)	(0.45224)	(1.05340)
t-statistics	[-0.57814]	[1.12586]	[-0.23130]	[-0.55502]	[-1.41283]	[-0.60063]	[0.38342]	[0.27336]	[-1.23104]	[-0.38897]
D(TE*_{t-1})	-0.083466	-0.294312	0.066042	0.140105	-0.031785	0.019359	0.215658	-0.026039	-0.077683	0.288899
Std. Dev	(0.04268)	(0.48357)	(0.13511)	(0.30128)	(0.02024)	(0.13126)	(0.03940)	(0.12833)	(0.09619)	(0.22404)
t-statistics	[-1.95575]	[-0.60862]	[0.48881]	[0.46503]	[-1.57014]	[0.14748]	[5.47365]	[-0.20291]	[-0.80764]	[1.28948]
D(TE*_{t-2})	0.039484	-0.093421	0.048251	0.390348	0.005841	0.050832	0.002691	0.031473	0.262103	0.023255
Std. Dev	(0.04166)	(0.47205)	(0.13189)	(0.29411)	(0.01976)	(0.12814)	(0.03846)	(0.12527)	(0.09389)	(0.21871)
t-statistics	[0.94775]	[-0.19790]	[0.36584]	[1.32724]	[0.29557]	[0.39670]	[0.06997]	[0.25124]	[2.79146]	[0.10633]
D(Pt-1)	-0.108532	-0.027268	-0.052765	-0.443659	-0.097622	-0.007511	0.716726	0.058469	-0.284287	-0.606514
Std. Dev	(0.09113)	(1.03259)	(0.28850)	(0.64334)	(0.04323)	(0.28029)	(0.08413)	(0.27403)	(0.20539)	(0.47841)
t-statistics	[-1.19095]	[-0.02641]	[-0.18289]	[-0.68962]	[-2.25840]	[-0.02680]	[8.51914]	[0.21337]	[-1.38414]	[-1.26777]
D(Pt-2)	0.077914	2.065960	-0.201858	0.436629	-0.023963	0.029783	-0.067101	0.100670	-0.043868	0.563353
Std. Dev	(0.07972)	(0.90331)	(0.25238)	(0.56280)	(0.03781)	(0.24520)	(0.07360)	(0.23972)	(0.17968)	(0.41851)
t-statistics	[0.97733]	[2.28710]	[-0.79981]	[0.77582]	[-0.63371]	[0.12147]	[-0.91171]	[0.41995]	[-0.24415]	[1.34608]
D(P*_{t-1})	0.010648	-0.840631	-0.124200	-0.207742	0.011985	-0.031964	-0.069492	0.052837	0.168531	-0.039558
Std. Dev	(0.03584)	(0.40612)	(0.11347)	(0.25303)	(0.01700)	(0.11024)	(0.03309)	(0.10778)	(0.08078)	(0.18816)
t-statistics	[0.29708]	[-2.06990]	[-1.09457]	[-0.82102]	[0.70494]	[-0.28995]	[-2.10015]	[0.49025]	[2.08628]	[-0.21024]
D(P*_{t-2})	0.016380	0.269387	0.065298	0.178675	0.013383	0.032087	-0.004629	-0.041033	-0.222046	0.224527
Std. Dev	(0.03237)	(0.36675)	(0.10247)	(0.22850)	(0.01535)	(0.09955)	(0.02988)	(0.09733)	(0.07295)	(0.16992)
t-statistics	[0.50607]	[0.73452]	[0.63724]	[0.78194]	[0.87167]	[0.32231]	[-0.15490]	[-0.42159]	[-3.04381]	[1.32136]
D(ER_{t-1})	-0.010881	0.353715	-0.192204	-0.310940	-0.033115	-0.083535	0.070613	-0.017604	0.166887	-0.044650
Std. Dev	(0.03740)	(0.42379)	(0.11841)	(0.26404)	(0.01774)	(0.11504)	(0.03453)	(0.11247)	(0.08430)	(0.19635)
t-statistics	[-0.29094]	[0.83464]	[-1.62325]	[-1.17763]	[-1.86657]	[-0.72616]	[2.04504]	[-0.15653]	[1.97977]	[-0.22740]

D(ER_{t-2})	0.005733	1.158351	-0.011897	0.110369	-0.006934	0.010408	-0.044710	-0.044766	0.012626	-0.007474
Std. Dev	(0.03610)	(0.40901)	(0.11428)	(0.25483)	(0.01712)	(0.11102)	(0.03332)	(0.10854)	(0.08136)	(0.18950)
t-statistics	[0.15883]	[2.83207]	[-0.10410]	[0.43311]	[-0.40499]	[0.09375]	[-1.34164]	[-0.41243]	[0.15519]	[-0.03944]
D(ER*_{t-1})	0.002632	-0.098534	-0.027839	-0.082587	-0.007933	0.011124	0.014264	0.001638	-0.016103	0.042365
Std. Dev	(0.01824)	(0.20670)	(0.05775)	(0.12878)	(0.00865)	(0.05611)	(0.01684)	(0.05485)	(0.04111)	(0.09576)
t-statistics	[0.14427]	[-0.47671]	[-0.48207]	[-0.64131]	[-0.91679]	[0.19827]	[0.84701]	[0.02986]	[-0.39166]	[0.44239]
D(ER*_{t-2})	0.031900	0.103086	0.107291	0.209032	0.015457	0.095362	-0.004609	0.075194	0.003880	-0.063862
Std. Dev	(0.01804)	(0.20444)	(0.05712)	(0.12737)	(0.00856)	(0.05549)	(0.01666)	(0.05425)	(0.04066)	(0.09472)
t-statistics	[1.76802]	[0.50424]	[1.87836]	[1.64110]	[1.80607]	[1.71843]	[-0.27672]	[1.38596]	[0.09542]	[-0.67423]
C Std. Dev t-statistics	0.023793	-0.049881	0.046904	0.016249	0.002850	-0.002427	0.012908	0.030289	0.009791	-0.030252
R-squared	(0.00652)	(0.07383)	(0.02063)	(0.04600)	(0.00309)	(0.02004)	(0.00602)	(0.01959)	(0.01468)	(0.03421)
Adj. R-squared	[3.65174]	[-0.67564]	[2.27390]	[0.35326]	[0.92223]	[-0.12112]	[2.14594]	[1.54598]	[0.66677]	[-0.88443]
Sum sq. resids	0.456229	0.293740	0.352016	0.157594	0.303065	0.073798	0.651487	0.052064	0.230860	0.077691
S.E. equation	0.382079	0.197432	0.263654	0.042720	0.208028	-0.052502	0.603963	-0.077200	0.125977	-0.048079
F-statistic	0.114882	14.74954	1.151384	5.725395	0.025848	1.086782	0.097913	1.038761	0.583554	3.166112
Log likelihood	0.027313	0.309477	0.086467	0.192816	0.012955	0.084006	0.025215	0.082129	0.061557	0.143385
Akaike AIC	6.152748	3.050008	3.983813	1.371889	3.188929	0.584308	13.70845	0.402772	2.201120	0.617722
Schwarz SC	395.6879	-31.55722	192.8645	51.71719	526.9569	197.9460	409.7533	201.9229	252.6678	103.8490
Mean dependent	-4.246453	0.608605	-1.941642	-0.337695	-5.738146	-1.999386	-4.406288	-2.044578	-2.621224	-0.930103
S.D. dependent	-3.850143	1.004915	-1.545332	0.058615	-5.341836	-1.603075	-4.009977	-1.648268	-2.224914	-0.533792
Determinant resid covariance (dof adj.)	0.049542	0.089878	0.009328	0.046027	0.003757	0.003402	0.057389	0.038702	-0.012672	-0.004188
Determinant resid covariance	0.034746	0.345452	0.100765	0.197071	0.014558	0.081884	0.040067	0.079131	0.065844	0.140057
Log likelihood					2.13E-24					
Akaike information criterion					5.61E-25					
Schwarz criterion					2416.547					
					-24.84713					
					-20.70388					

The table 5 estimated short-run phenomena of foreign variables and explains the results of VECMX*. According to the results of cointegration in the short-run shown in the table above, the coefficient of the VECM term of the domestic GDP (Y) is statistically significant and positive depicting that the variables in the equation are not cointegrated in the short-run. It implies that all the variables in the equation will diverge away from the equilibrium at a speed of 0.02 %. In the same equation Y_{t-1} and Y_{t-2} are positive and statistically significant at 5% while TE_{t-1} and ER^*_{t-2} are positive and statistically significant at 10 %. On the other hand, Y^*_{t-2} is negative and statistically significant and TE^*_{t-1} is negative and statistically significant at 10 %. All the remaining variables are insignificant in the short-run.

The second column of the table shows the estimated coefficient of VECM term of the foreign output i.e. Y^* equation. It has the correct negative sign but is statistically significant in the short which confirms that the variables in the equation are cointegrated in the long-run. It implies that all the variables in the equation are converging towards the equilibrium at a speed of 0.47% from short-run to the long-run. Y_{t-1} , P_{t-2} and ER_{t-2} are positive and statistically significant while TR_{t-1} , TR_{t-2} and P^*_{t-1} are negative and statistically significant. All the other variables in the system are insignificant.

The third column of the table above shows the VECM term of domestic TR. It yields negative sign but statistically significant showing that all the variables included in the equation are cointegrated in the short-run. It means that all the variables in the equation are converging towards the equilibrium at the speed of 0.07% to the long-run. TR_{t-1} and TR_{t-2} are statistically significant but negative while ER^*_{t-2} is positive and statistically significant at 10% in the short run. All the remaining variables are insignificant in the short-run.

The fourth column of the estimation above explains the coefficient of VECM term of TR^* in the equation. It shows the negative sign and statistically significant at 10% implying that the variables cointegrated in the short-run and the equation is converging towards the equilibrium at a speed of 0.09% to the long-run. Y^*_{t-1} is positive and statistically significant while all other variables in the equation are insignificant in the short-run.

The fifth column of the estimation shows the VECM term of TE displaying a negative sign and is statistically significant. It means that all the variables in the equation are cointegrated in the short-run and the equation is converging towards the equilibrium at a speed of 0.01% towards the long-run. Y^*_{t-2} and P_{t-1} in the system are statistically significant but negative. Y_{t-1} , TR^*_{t-2} and ER^*_{t-2} are positive and statistically significant at 10% in the short-run while ER_{t-1} is negative and statistically significant at 10 % in the short-run.

Sixth column shows the VECM term of TE^* with a positive sign and statistically insignificant confirming that all the variables in the equation are not cointegrated and are diverging away from the equilibrium. Only ER^*_{t-2} is statistically significant at 10% with a positive sign. All the remaining variables are insignificant in the short-run.

The seventh column of the estimation displays the VECM term of P which shows a positive sign and statistically insignificant showing that all the variables in the equation are not cointegrated in the short-run and thus are diverging away from the adjustment point. Y_{t-1} , TE_{t-1}^* , P_{t-1} and ER_{t-1} are positive and significant statistically while P_{t-1}^* has a negative sign but statistically significant in the short-run. All the other variables are insignificant in the short-run.

The eighth column of the table expresses the VECM term of P^* which exhibits positive sign but statistically insignificant. It implies that all the variables in the equation are not cointegrated and are diverging away from the equilibrium. All the variables in the equation are insignificant in the short-run.

The ninth column of the Table tells the VECM term of ER . The coefficient of ER exhibits negative sign and is statistically significant implying that all the variables in the system are cointegrated and are converging towards the equilibrium towards the long-run at a speed of 0.04%. TE_{t-1}^* and P_{t-1}^* are positive and statistically significant in the short-run. ER_{t-1} is positive and statistically significant at 10% in the short-run. All the remaining variables are insignificant statistically.

The last column of the estimated table shows the VECM term of ER^* . ER^* has a positive sign but statistically insignificant. It portrays that all the variables in the system are not cointegrated and are diverging away from the equilibrium. All the variables in the system are insignificant in the short-run.

Conclusion

This study aimed to evaluate the impacts of foreign shocks on the fiscal variables of Pakistan. We applied two kinds of variables i.e., Domestic variables and foreign variables. The data for the study were taken from DOTS and IFS. In this work, we employed unit root tests, matrix correlation, and descriptive statistics. All of the variables are stationary at first difference $I(1)$, according to the results of the unit root test. When such an instance occurs, the Johansen Cointegration and VECM Test would be used to determine the objective. The results of this study show that domestic output (Y) in the foreign model is positively affected over the long term by Y_{t-1}^* . Foreign output has a 0.44 percent positive annual impact on domestic output. The TR_{t-1} and TR_{t-1}^* values demonstrated a positive relationship with domestic output of 2.48 percent and 0.28 percent, respectively. This indicates that because public revenues are produced by taxes levied on either income or consumption, they contribute in the growth of the economy. Therefore, a rise in tax receipts indicates a rise in income and/or consumption, which suggests a rise in overall demand and output for the economy. Furthermore, TE_{t-1} and TE_{t-1}^* have beneficial effects on the domestic GDP at rates of 3.22 percent and 1.27 percent, respectively. This positive correlation illustrated how increased government spending is the root of the expansion of the public economy. The state's need to more effectively manage its administrative and security obligations is what has caused this increase. An increase in public spending would increase domestic output, which would expand the economy and subsequently promote private sector investment. Long-term, inverse effects of P_{t-1} and P_{t-1}^* on domestic GDP occur at rates of 0.49 percent and 0.33 percent, respectively. This suggests that due to inflation, the future viability of investment programs may be questioned (especially when high inflation is also associated with increased price variability). Inflation can also reduce a country's competitiveness internationally by driving up the relative cost of its exports. The exchange rate has had a significant and favourable impact on domestic GDP. According to our research, ER_{t-1}^* had a 0.48 percent positive impact on domestic GDP, while ER_{t-1} also had a positive impact at a rate of 0.09 percent. Furthermore, whereas exchange rates can have a short-term negative (contractionary) influence on GDP, they might have a long-term positive impact on output.

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