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Interest, Price and Fiscal Deficit Nexus in Pakistan: Estimating Long Run and Short Run Relationships

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Abstract

The current study aims to find out the relationship among fiscal deficit, prices and inflation in case of Pakistan. For this purpose, annual time series data is used from 1977 to 2021 to find the cointegration among the variables. All the variables are found to be integrated of order I(1) and we use Johansen cointegration test to find the long run and short run relationships between the variables and for further analysis vector error correction model is used. The study concluded that there exists a long run relationship between prices and interest rate, but the direction of causality runs from CPI to interest rate but not in reverse direction. Our results do not support the conventional view of using interest rate to control inflation in the country. Interest rates and GDP and positively associated while budget deficit has no significant impact on interest rate, which justifies the Ricardian hypothesis in Pakistan. Our results further show that exchange rate in Pakistan is autonomous as there is no impact of any domestic variable on it accept the fiscal deficit.

Keywords: Interest, Price, Fiscal Deficit, Long Run, Short Run

1. Introduction

Every nation strives to advance economically and give its people more benefits. The struggle for macroeconomic indicator stability is a significant concern in this environment.
Financial markets and indicators are crucial to a nation's development and the achievement of its objectives, which include improving life quality, increasing life, etc. Every macroeconomic indicator is obviously important, but some are far more significant than others, such as interest rates, as they affect other indicators. Additionally, they might have additional effects on the economy. Interest rates, for instance, have an impact on other macroeconomic and microeconomic variables as well as the investment choices made by various economic actors, including funds, corporations, and public agencies. Interest rates are another way to assess the worth of money. Put another way, when interest rates rise, fewer investments are made, and vise versa. Consequently, it can be concluded that the overall effects of interest rates are (minimal). Interest rate levels and trends have a significant impact on a nation's development and economic expansion. Countries have become increasingly interdependent in the context of globalization. Although most nations have open economies, it is very difficult to achieve and maintain low-level interest rates in a situation like this. Alternatively, when interest rates rise in an economy, economic activity declines and vise versa. As a result, the capacity, growth, and development of nations are impacted by the correlation between interest rates and other macroeconomic indices. As a result, every nation

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strives for and favors low interest rates (Tumwine et al., 2018). Examining the state of interest rates across nations reveals that industrialized nations have attained and maintained usually low levels of interest rates. However, after reaching a low level, emerging nations have been experiencing trouble controlling interest rates.

Although low-level interest rates are desired; however, there may be some cases that require high-level interest rates in an economy. In other words, there should be a higher interest rate in cases, where inflation has a high-level, to keep inflation under control and make it possible to have a decreasing trend (Entrop et al., 2017). Achieving low-level interest rates is not so easy in the world which has been much more globalizing and countries have more interdependent. In such a situation, there are too many factors that should be considered. Therefore, multiple factors must be engaged into attention to control interest rates effectively. For this, factors, which have either negative or positive effects on interest rates, should be stated first. After that, countries should try to decrease the adverse effects of the effective causes on interest rates.

1.1 Interest-Inflation Relationship

SBP seems to follow the conventional argument that rising interest rates lead to decrease the inflation. The reason behind this idea is that rising interest rates raises the borrowing cost and reduction in demand throughout the economy, resulting in excess supply and reduces inflation. Higher interest rates decline inflation through different channels, including the exchange rate channel, the credit channel, the asset price, and the bank–balance sheet channel (Mishkin 1996).

Few debates have occurred about either lower inflation can be achieved by setting low policy interest rates, the so called Neo-Fisherian effect. proponents of this idea often point to the positive association between nominal interest rates and inflation (Cochrane 2016, Woodford (2015) and Garin and Sims (2016). Neo-Fisherian effect says that a lower long-term inflation rate can be achieved by everlasting setting the nominal interest rate to a lower level by working through the expectation channel.

The first objective of this study is to examine whether the central bank policy of maintaining high-interest rates to achieve lower inflation has been effective or if there is a possibility of the existence of Neo- Fisherian effect in Pakistan. This is important as in recent times Pakistan's interest payments have gone up rapidly, accounting for more than 50% of the total budget for 2023-24.

1.2 Interest – Budget Deficit Nexus

However, there are theories, which tie budget deficit and rate of interest; on the other hand, there is no agreement on the association among them. The Orthodox Keynesian Hypothesis is of the sight that budget deficit results in the decrease of loanable funds therefore, leading to a growth in the interest rate and crowding out of private sector investment. The Keynesian offer more declares that reduced loanable funds will cause net overseas investment to decrease in an open economy meanwhile domestic savings now fascinate greater rates of return and investing overseas is less attractive. Later, the budget deficit increases both domestic and overseas interest rates, initiating a drop in net overseas investment. High budget deficit is reflected to be the "Mother of Macroeconomic Evils" by the supporters of this theory.

The Ricardian Equivalent Hypothesis, on the other side, highlights the impartial impact of budget deficit on the rate of interest, that is, the government budget deficit has no impact on macroeconomic variables. The Ricardian dispute is based on the evidence that a rise in government budget deficit is equal to a future rise in tax liabilities and consequently, budget deficits do not have any influence on macroeconomic variables. Some of the authors whose readings support this hypothesis include Barro (1987), Evans (1987), Darrat (1990), Findlay (1990), and Ostrosky

(1990). Henceforth the second objective of this study is to estimate the long association among rate of interest and budget deficit in the case of Pakistan

2. Literature Review

Both businesses and consumers, as well as policymakers, are very concerned about Pakistan's present high policy rate. Thus, there is a pressing need for policymakers to take the required action to cut interest rates. Identification of the primary factors influencing interest rates in Pakistan is a necessary step in formulating a policy that will lower market rates. Although we may not always be aware of it, interest rates have a significant impact on our daily lives and our ability to purchase goods. As a result, the general direction of interest rates can significantly affect our investments, so it is crucial for investors to closely monitor the various interest rate trends. This essay's goal is to pinpoint the variables that influence the lending rate charged by Pakistani commercial banks. Here is a current and significant review of empirical studies relevant to the topic of this study. This review will offer useful details from earlier research descriptions and serve as a foundation and inspiration for the choice of variables and primary contribution of this study.

It is impossible to overstate the role that interest rates play in the distribution of resources through time and the effects they have on capital formation, long-term growth, and development (see Blanchard & Summers, 1984; Ford & Laxton, 1999; Kim & Orphanides, 2012; Woodford, 2003). The loanable funds theory was used as a framework by the classical economics to calculate an appropriate interest rate, emphasising the economy's demand and supply for investment and savings. The liquidity preference hypothesis, a rival explanation for how interest rates are set, was advanced by Keynes in his 1936 book The General hypothesis of Employment, Interest, and Money. The Keynesian concept holds that the dynamics between the money supply and demand (liquidity preference) are what drive interest rates. Accordingly, the investor expectation on the risk-return nexus is examined via the asset price channel from the q-theory of investment and life cycle theory of consumption (Gal, 2013; Lai & Tsai, 2015). The idea held that monetary tightening results in a reduction in the q, which in turn causes a decrease in output and employment. This is because a rise in nominal interest rates caused by policy makes debt instruments more appealing to investors.

Using quarterly data from 2005Q1 to 2019Q2, Yaşar Turna et al. (2021) investigated the association among foreign exchange rate, rate of interest, and inflation in Turkey. They determined that exchange rates and rates of interest are the variables that impacts inflation in Turkey both in the long term and short.

Ramzan et.al. (2025) explored the effects of fiscal policy on the price level in case of Pakistan. Using annual time series data from 1960 to 2024 for Pakistan, they examined empirical evidence on the effects of asymmetric short- and long-run fiscal deficits on inflation. They employed linear autoregressive distributed lag (ARDL) and nonlinear ARDL (NARDL) techniques to estimate the effect of the fiscal deficit on inflation within the Fiscal Theory of the Price Level (FTPL) framework. The study captured asymmetric and dynamic impacts. The results show a positive linkage between fiscal deficits and inflation in the presence of money supply, interest rates, debt-to-GDP ratio, exchange rate, and oil-price changes. They also discovered that exchange rate and oil price fluctuations amplify the inflationary pressure. Their results support the argument that a consistently high fiscal deficit, along with adverse external shocks, mitigates the effectiveness of monetary policy.

Al Sawai et.al. (2025) examined the linkage among fiscal deficit, interest rates, and the inflation rate in a model that also included Real GDP, Money supply, and the exchange rate from 2008 to 2023 in Jordan. The study employed the time series ARDL technique to explore the cointegration among the variables in the model. The results indicate that there is a long-run relationship among the variables. Further, fiscal deficit and RGDP are inversely related to each other, while an increase

in budget deficit increases the interest rate level but affects the inflation rate through changes in other variables. Hence, this study finds that the fiscal deficit, interest, and price relationship is multidimensional.

Depren et al. (2021) used quantile regression to examine the macroeconomic factors influencing rates of interest in the Bricst, Mint, and Fragile Five Countries between 1980 and 2018. The empirical findings show that the consumer price index in Mexico and Turkey, unemployment in Russia and China, total reserves in Nigeria, GDP in Indonesia, and imports of goods and services in Brazil and South Africa are the most significant factors that affect interest rates. The study concluded that each macroeconomic indicator is crucial for fostering economic growth by guaranteeing low deposit interest rates and fostering credit expansion in developing nations.

Using yearly data from 2002 to 2018 and the MARS technique for empirical verification, M. T. Kartal (2020) evaluates the effect of macroeconomics on rates of interest in emerging nations. They showed that in China, growth and reserves affect interest rates, in Brazil, credits and net export have an impact, and in Turkey, money supply and inflation have an impact on interest rates.

The Macroeconomic factors of Interest Rate Volatility in Indonesia were examined by Agus Salim (2019), who used the Structural VAR Analysis using quarterly data from 2002Q1 to 2017Q1. They showed that the money supply, exchange rate, and GDP growth coefficient estimates had negative and significant long-term implications. However, Indonesia's interest rate and inflation rate are positively and significantly impacted by the risk premium shock.

Samuel et al. (2017) used annual data from 1980 to 2013 to study the macroeconomic factors that affect interest rate spreads in Ghana. They then utilised an autoregressive distributed lag method to cointegration and an error-correction model. According to their findings, interest rate spreads in Ghana rise both over the long and short terms due to economic growth, fiscal deficit, exchange currency volatility, and public sector borrowing from commercial banks. Long-term interest rate spreads are lowered by institutional quality, but short-term interest rate spreads are lowered by lending interest rate volatility and monetary policy.

With the use of monthly data from 2002 to 2016 and the Johansen cointegration test, Bandirma et al. (2017) examined the causal link between inflation and interest rates in Turkey. The empirical findings support the idea that there is a single line of causality connecting inflation and interest rates. They concluded that maintaining price stability is crucial for effectively regulating interest rates for the Turkish economy.

Using annual data from 1970 to 2013, Lawrence Adu Asamoah et al. (2016) investigated the factors influencing interest rates in Ghana and used the autoregressive distributed lag approach to cointegration. They discovered evidence of a long term equilibrium association among the variables that affect the average lending rate commercial banks charge and its relationship to that rate. Long-term monetary policy rate and nominal exchange rates of the Bank of Ghana have a positive impact on lending rates of banks in Ghana; however, the fiscal deficit, real GDP, and inflation have a negative impact. They also find favorable relationships between the monetary policy rate, bank lending rates, and exchange rates over both short and long periods. Additionally, their results indicate that the exchange rate and the Bank of Ghana's monetary policy rate have significant simultaneous influence on Ghana's average bank lending rate.

Ayub et al. (2014) establish a long run equilibrium association among Pakistan's nominal interest rate and inflation by using annual data from 1973 to 2010 to study the relationship between interest rates and its determinants. For empirical verification, they used Engle granger residual based cointegration.

Using quarterly data from 2001 to 2008, Abayomi et al. (2010) empirically evaluated the factors impacting interest rates in Nigeria and employed the Johansen cointegration and vector error correction model. They discovered that both the rate on Treasury Bills and domestic outputs are significantly influenced over the long term by the real money supply and Expected Foreign Returns (EFR).

Tahir Mehmood et al. (2005) use yearly data from 1973 to 2003 to evaluate the link between money, interest rates, prices, and production for Pakistan using the Johansen cointegration test. They discovered a one-way causal association among production and money in their investigation. The short-term independence of money and prices has been discovered, which may be normal for a developing nation like Pakistan. Additionally, the findings indicate that there is no causal association among production and interest rates and that money has a one-way relationship with the latter. From these data, they deduce that the money supply, not the interest rate, is a suitable intermediate aim.
The above discussion has formulated the following hypothesis based on the objective of the current study:

H1: There is a significant association exists between interest rate and fiscal deficit
H2: There is a significant association exists between interest rate and inflation
H3: There is a significant association exists between interest rate and exchange rate
H4: There is a significant association exists between interest rate and money supply
H5: There is a significant association exists between interest rate and gross domestic product.

3. Model & Methodology

The study used secondary data obtained from the World Bank Development Indicators (WDI). The dataset used for the study comprises of annual data from 1977 to 2021 for Pakistan. In the model given below IR is the policy rate, FD is the budget deficit as a percentage of GDP, CPI is the consumer price index used for the measurement of inflation rate in a country, LEXR is the log of exchange rate in US dollar, M2 is the money supply as a percentage of GDP and GDPGR is the growth rate of gross domestic product. The selected variables are consistence with empirical studies carried out by (Mukhtar & Zakaria 2008; Iqbal et.al. 2001, 2002); Laubach 2009; Salim et.al 2022, Odionye; Ikechukwu Kelikume 2016 & Uma 2013; Mansoor et.al. 2020; Caporale et al. 2013; Luqman et.al.2013).

IR= f (FD, CPI, LEXR, M2, GDPGR)

Where

IR = interest rate
FD = Budget deficit as a percentage of GDP
LEXR = Log of exchange rate in US Dollar
CPI = Consumer Price Index (Inflation rate)
M2 = Money Supply as a percentage of GDP
GDPGR= GDP Growth Rate

4. Results and Discussion

The study used annual data from 1977 to 2021 for Pakistan. When you are utilizing annual data it is important to find the order of integration. To detect co-integration for short and long run correlations among the variables, the unit root test has been conducted to verify the order of integration. Table 1 displays the findings of the Augmented Dickey-Fuller (ADF).

Table 1 Unit Root Test

ADF Unit Root Test						
Variables	**Level t-statistic**	**Level Critical Value (5%)**	**Level Probability**	**First Difference t-statistic**	**First Difference Critical Value (5%)**	**First Difference Probability**
Fiscal Deficit (FD)	-2.78	-3.52	0.21	-8.28	-3.52	0.00*
Interest Rate (IR)	-2.42	-3.52	0.36	-5.43	-3.528	0.00*
Exchange Rate (LEXR)	-2.72	-3.52	0.23	-4.03	-3.52	0.01**
Money Supply (M2)	-2.92	-3.52	0.17	-5.69	-3.52	0.00*
CPI	-3.18	-3.52	0.1	-7.82	-3.52	0.00*
Interest	-2.42	-3.52	0.37	-5.43	-3.52	0.00*
Author Constructed *= 1%, **=5%, ***=10%						

The above table shows that all the variables are non-stationary at level form because all the probabilities are greater than 10%. While at first difference all the variables are stationary, all the probabilities are less than 10% level of significance. The number of co-integrating links between the dependent and independent variables can be found using Johansen's co-integration test if all of the study's variables are I(1) variables (Johansen, 1991, 1995). The Johansen test results are listed below:

Table 2 Cointegration Test

Johansen Cointegration Test				
Null Hypothesis (H0)	**Trace Test Statistic**	**Trace Probability**	**Max-Eigen Statistic**	**Max-Eigen Probability**
None *	138.19	0.0000	46.31	0.0088
At most 1 *	91.89	0.0003	43.13	0.0030
At most 2	27.75	0.1211	22.69	0.1869
At most 3	26.06	0.1269	16.31	0.2075
At most 4	9.75	0.3001	7.44	0.4384
At most 5	2.31	0.1283	2.31	0.1283
*Author Construct *= 1%, **=5%, ***=10%*				

The above table shows the results of cointegration among the dependent and independent variables by using Johansen cointegration test. The test uses two statistics, Max-Eigen value and Trace statistics. In this case both the statistics indicates that the null hypothesis of no cointegration is rejected for at most one cointegrating association because at both levels probabilities are significant at 10% level of significance. It means that there exist two cointegrating relationships among the variables.

4,1 The Long run Cointegrating equation

Interest =	61.79 + 1.439*CPI	– 0.27*FD	+ 3.09*GDPGR	+ 0.94*M2	– 0.10LEXR
Standard Error	(0.39139)	(0.72316)	(1.25595)	(3.20767)	(0.37642)
t- Statistics	[3.6]	[0.37]	[2.46]	[0.29]	[0.131]

In the above equation the coefficients of CPI and GDP growth rates were found statistically significant. Hence there are two cointegrating relationships. While FD, LEXR, and M2 are insignificantly related to interest rates. Hence according to our results, the interest rate is associated with CPI and GDP in the long run.

Table 3 VECM/ VAR Granger Causality test

VAR Granger Causality / Block Exogeneity Wald Tests / VECM

DV (Row)	CPI	FD	GDPGR	LEXR	M2	Interest
CPI	1	2.590834	2.628233	0.353828	2.16869	19.35945*
FD	0.693908	1	7.223754**	4.784855*	0.510718	0.613343
GDPGR	1.994458	1.350438	1	1.88874	4.618050***	4.159422
LEXR	4.484088	2.220885	25.96213***	1	13.26394*	1.774369
M2	7.160950**	3.614494	3.100648	2.812682	1	1.090095
Interest	4.472829	3.155647	9.883418***	1.66185	11.31294*	1
Ect-1	0.129953*	0.4438	0.068834*	0.000945	0.130423	-0.137055***

= 1%, **=5%, *=10%. Author constructed*

The above table shows the results of VECM for finding the short run direction of the variables and causality among the variables. According to the above table, there is a unidirectional dynamic relationship between CPI and Interest rate at 1% level of significance. Other than CPI, interest rates have no short-term correlation with any other variable. We have no evidence of a dynamic association from interest rates to inflation. Hence our results do not find any support for the conventional theory that high-interest rates lead to low inflation. This opens the gate for further research on the possible existence Neo-Fisherian effect in Pakistan. The error correction term is significant, confirming the long-run relation relationship. It has a negative sign, showing convergence but the speed of adjustment is too slow. The coefficient of error term shows that 13.7% discrepancy is removed in one-time period.

Fiscal deficit remains unaffected both in the LR and in the SR. The exchange rate which is also used by SBP for demand management along with interest rate is found to be unrelated to interest in the SR. In fact, it is statistically associated only with FD in the SR. It vindicates the Ricardian hypothesis in the case of Pakistan

Similarly, the GDP growth rate has a significant dynamic relationship with interest, exchange rate, and FD in the SR, its error correction term is statistically significant at a 5% level of significance showing LR association with interest rate. The exchange rate is almost autonomous like FD, with an insignificant error term, indicating that it does not have a long-run association. Similarly, though M2 has three dynamic relationships, but has an insignificant error term.

5. Conclusion and policy recommendation

We estimated the long run and short run relationship among interest rate, CPI, and Budget deficit in the existence of exchange rate, money supply, and GDP. Johansen's cointegration technique

was utilized. We establish that there is a long-run relationship among interest rate and CPI. But the flow of the association is from CPI to interest. This specifies that inflation variations have a positive significant influence on interest but we did not find indication of a association in the reverse direction.

This might be endorsed to the likely fact that utilizing interest rates to control inflation has been unsuccessful in Pakistan. Since cost-push variables can also cause inflation, interest rates are used as a policy tool to control demand-pull factors; this proposes that we need to focus on cost-push factors to control inflation along with negative prospects about the future of Pakistan's economy. Therefore, our results contradict the generally accepted view that low inflation is triggered by high interest rates. GDP and interest have a positive cointegration. The Ricardian hypothesis is supported in the situation of Pakistan since the budget deficit has no statistically significant effect on interest rates. Our results also show that the exchange rate is almost autonomous in our country as no domestic variable other than fiscal deficit (FD) has an impact on it.

REFERENCES

Al-Sawaie, K. M., et al., (2025). Analyzing the relationship between the budget deficit and macroeconomic variables. *Applied Mathematics & Information Sciences, 19*(1), 233–243

Asamoah, L. A., & Amoah, C. (2016). Determinants of commercial bank lending rates in Ghana. *Journal of Basic and Applied Research International*, 18(4), 218–227.

Ayub, M., Jalil, A., & Nasir, M. (2014). The relationship between interest rate and its determinants in Pakistan. *Journal of Economic Cooperation and Development*, 35(3), 1–22.

Barro, R. J. (1987). Government spending, interest rates, prices, and budget deficits in the United Kingdom, 1701–1918. *Journal of Monetary Economics*, 20(2), 221–247.

Blanchard, O. J., & Summers, L. H. (1984). Perspectives on high world real interest rates. *Brookings Papers on Economic Activity*, 1984(2), 273–334.

Caporale, G. M., Lodh, S., & Tam, O. K. (2013). Determinants of interest rate spreads in selected emerging market economies. *Research in International Business and Finance*, 27(1), 103–113.

Cochrane, J. H. (2016). Do higher interest rates raise or lower inflation? *Chicago Booth Paper*.

Darrat, A. F. (1990). Structural budget deficits and interest rates: The empirical evidence as affected by contextual details. *Southern Economic Journal*, 57(1), 157–170.

Depren, S. K., Depren, Ö., & Ceylan, R. (2021). Determinants of interest rates in BRICST, MINT, and Fragile Five countries: A quantile regression approach. *Financial Innovation*, 7(1), 1–21.

Entrop, O., Memmel, C., & Wilkens, M. (2017). The interest rate risk of banks and the central bank policy rate. *Journal of Banking & Finance*, 76, 115–130.

Evans, P. (1987). Do budget deficits raise nominal interest rates? Evidence from six countries. *Journal of Monetary Economics*, 20(2), 281–300.

Findlay, D. W. (1990). Budget deficits, interest rates and the monetary policy regime. *Journal of Economics and Business*, 42(3), 247–258.

Ford, R., & Laxton, D. (1999). World public debt and real interest rates. *Oxford Economic Papers*, 51(1), 158–174.

Galí, J. (2013). *Monetary policy, inflation, and the business cycle: An introduction to the new Keynesian framework and its applications*. Princeton University Press.

Garin, J., Lester, R., & Sims, E. (2016). On the desirability of nominal GDP targeting. *Journal of Economic Dynamics and Control*, 69, 21–44.

Iqbal, J., Baig, M. A., & Tahir, M. (2002). Exchange rate volatility, imports and real output determination for Pakistan. *Pakistan, Pakistan Business Review*, 4(1), 31-39.

Iqbal, J., Tahir, M., & Baig, M. A. (2001). Aggregate import demand function for Pakistan: a co-integration approach, Proc. Eighth Stat. Sem. 2001, 8,2, I7-224.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, 59(6), 1551–1580.

Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models*. Oxford University Press.

Kartal, M. T. (2020). Determining macroeconomic factors affecting interest rates in emerging markets: A MARS model approach. *Borsa Istanbul Review*, 20(2), 125–134.

Kelikume, I. (2016). The determinants of interest rate spreads in Nigeria. *Journal of Developing Areas*, 50(2), 303–318.

Kim, D. H., & Orphanides, A. (2012). Term structure estimation with survey data on inflation expectations. *Journal of Financial and Quantitative Analysis*, 47(1), 241–272.

Lai, C. C., & Tsai, J. R. (2015). Tobin's q, consumption, and monetary policy rules. *Journal of Macroeconomics*, 45, 120–135.

Laubach, T. (2009). New evidence on the interest rate effects of budget deficits and debt. *Journal of the European Economic Association*, 7(4), 858–885.

Luqman, M., Haq, M., & Lal, I. (2013). Foreign Aid and Macroeconomic Performance in Pakistan: Exploring the Role of Local Financial Sector Development, Forman Journal of Economic Studies, 9.

Mansoor, S., Baig, M. A., & Lal, I. (2020). Can Pakistan raise more external debt? A fiscal reaction approach. *Business & Economic Review*, 12(3), 1-48.

Mehmood, T., & Ahmad, E. (2005). The relationship between money, interest rate, prices, and output in Pakistan. *Pakistan Economic and Social Review*, 43(2), 253–274.

Mishkin, F. S. (1996). The channels of monetary transmission: Lessons for monetary policy. *NBER Working Paper Series*, No. 5464.

Mukhtar, T., & Zakaria, M. (2008). Budget deficit and interest rate nexus in Pakistan. *The Pakistan Development Review*, 47(4), 785–798.

Odionye, J. C., & Uma, K. E. (2013). The impact of fiscal deficits on interest rates in Nigeria. *International Journal of Development and Economic Sustainability*, 1(2), 18–31.

Ostrosky, A. L. (1990). Federal budget deficits and interest rates: Comment. *Southern Economic Journal*, 56(3), 802–803.

Ramzan M, M. R., Rehman, A., Sheikh, M. R., & Abbas, A. (2025). Linear and non-linear effects of fiscal deficit on inflation in Pakistan: A test of the Fiscal Theory of the Price Level. *Journal of Asian Development Studies, 14*(3), 2380–2402.

Salim, A. (2019). Macroeconomic determinants of interest rate volatility in Indonesia: Structural VAR analysis. *Journal of Asian Finance, Economics and Business*, 6(3), 83–91.

Salim, S., Baig, M. A., & Lal, I. (2022). Exploring dynamic causal linkages between Major Stock Exchanges of Asia and established markets of UK, USA, Germany and Japan - A comparative analysis of Pre and Post era of Global Financial Crisis. *Pakistan Journal of Economic Studies (PJES), 4(2*), 237–272.

Samuel, K. A., & Joseph, A. (2017). Macroeconomic determinants of interest rate spreads in Ghana: An ARDL approach. *African Development Review*, 29(4), 589–602.

Turna, Y., Kartal, M. T., & Depren, S. K. (2021). The nexus among foreign exchange rate, interest rate, and inflation in Turkey. *Journal of Economic Studies*, 48(6), 1120–1135.

Woodford, M. (2003). *Interest and prices: Foundations of a theory of monetary policy*. Princeton University Press.

Woodford, M. (2015). Policy options in a low-interest-rate environment. *Federal Reserve Bank of Kansas City Economic Policy Symposium*, 1–42.