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Interest Rate Volatility and Its Impact on Pakistan's Savings, Investment, And GDP Growth: A Quantitative Approach

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Abstract

Crucial area of economic research are Interest rates, savings, investment, and economic growth and these have both national and international importance, particularly in relation to macroeconomic stability and growth policy. The impact of interest rate on gross domestic product (GDP), investment, and savings in Pakistan over the period 1990–2023 examined in this study. Using the model “Autoregressive Distributed Lag (ARDL)” this study investigates the dynamic interrelationships among these key macroeconomic variables. The net findings show that interest rates exert a negative influence on GDP and investment, indicating that higher interest rates tend to demotivate productive activities and economic growth. Despite these, the results demonstrate that unemployment and inflation are oppositely linked with economic growth, while GDP and savings exhibit a positive relation reflecting the role of savings in promoting growth. Based on these outcomes, it is suggested that a reduction in interest rates could stimulate investment and hance economic development, thereby fostering sustainable growth in Pakistan. The study underscores the importance of a balanced monetary policy framework that manages interest rate adjustments in a way that encourages both investment-led growth and savings within the economy.

Keywords: Savings, Interest Rates, Economic Growth, Time Series Data, ARDL Model.



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Introduction

Interest rates signifies the satisfaction given by banks to depositors for the use of their money. Interest rates expressed as percentages are essential variable and influenced by a range of macroeconomic factors such as inflation, fiscal and monetary policies, and overall market conditions. In Pakistan, the State Bank of Pakistan (SBP) plays a fundamental role in monetary control by announcing the monetary policy rate bimonthly through official press releases and its website, beginning each fiscal year in July. (Jappelli Pagano et al., 2019), investors are faced with the decision of assigning their capital either toward profitable business ventures or bank deposits. However, due to the existing market risks, the general public tends to prefer depositing their funds in banks as a safer alternative. Commercial banks, functioning as bridge between the SBP and individual or corporate clients, mobilize deposits through various types of accounts such as savings, current, and fixed deposits. These deposits form the primary source of funding for banks and are therefore of crucial importance for their stability and operations. To attract and keep depositors, banks employ a variety of marketing strategies, including offering competitive interest rates, free services, and incentives for account holders who maintain specific balance levels. (Gale & Orzag et al., 2004) From a managerial outlook, it is vital for banks to understand the diverse factors that influence customers' deposit decisions, as such knowledge directly contributes to healthy financial planning and clear management (Khalid et al.,2023).

According to current economic theory, individuals are more likely to deposit their funds in banks when offered higher interest rates on their savings. In this reference, interest-bearing deposits often serve as an alternative to investing in other ventures, as they provide a relatively secure means of earning returns. Interest rates thus play a crucial role in shaping consumers' saving approach and, collectively, reflect the overall saving pattern of an economy. Savings are mostly regarded as the foundation of economic growth, as an adequate level of savings contributes to an increase in total fixed capital, which in turn supports broader economic development.

This study "Interest Rate Volatility and Its Impact on Pakistan's Savings, Investment, and GDP Growth" is of volatile importance for educated research and actual policy making. It bridges an important void in the literature by observing the impact of changes in interest rates on critical macroeconomic variables in the context of a developing economy like that of Pakistan with a comparatively underdeveloped financial market. The findings show that interest rate fluctuations can either enhance or limit saving and investment activities, hence offering empirical support for the link between interest rate movements, household saving methods, and investment manners.

The study also adds value to the overall economic literature by showing how interest rate volatility shows impact on investment behaviors and overall macroeconomic performance. The results highlight the imperative for policymakers to guarantee more monetary policy stability since smooth interest rate management can boost investor confidence and promote healthy investment. The study also results that interest rate changes are strongly linked with alterations in Gross Domestic Product (GDP) development. Persistent volatility, then, could serve as a constraining factor in long-run economic planning and would weaken the nation's ability to move towards sustained growth.

The chain between interest rates and some of the other critical economic variables, including GDP growth, investment, and savings, have been observed in some of the countries; but not much has been tried when it comes to the dynamics of interest rates in Pakistan. In most studies, the effects are usually analyzed in developed economies, and when a generalized result is attempted, the

outcomes may not capture the socioeconomic conditions of Pakistan. For example, the literature currently available in print often neglects how Pakistan's political environment that is unstable, structural economic issues, and the effect of off-the-books financial markets influence the responsiveness of savings and investment reactions to interest rate movements. In addition, not much research has been focused on the effects of the State Bank of Pakistan's monetary policy using interest rates on local economic stability when confronting foreign economic shocks, for example, changes in the global price of goods. Moreover, research can give more in-depth analysis on how interest rate volatility mainly influences the economic topography of Pakistan through its study of these sectors, which will ultimately lead to the creation of more sound economic policies.

Literature Review

Literature on interest rate volatility shows the importance of time horizon in measuring its effect on macroeconomic variables. Short-run volatility in interest rates might not have the same kind of impact as long-run volatility, which tends to generate cumulative and more significant economic effects. Such persistent volatility has the potential to dislocate investment planning, change saving behavior, and undermine economic stability. Naseer et al., (2013) evaluated the dynamics among economic growth, trade, foreign direct investment (FDI), and real effective exchange rates. According to current literature, economic growth affects trade through the attraction of foreign direct investment. The researcher gathered data from 1980 to 2012 to analyze relationships. Johansen co-integration was employed to analyze the interrelations between the variables. According to the research findings, there exists a long run relationship between trade, real effective exchange rates, foreign direct investment, and economic development. On the contrary, the error correction model validates the strong interdependence of these variables in the short run. Orphanides et al., (2020) Long-term growth comes through the better use of productive resources, expanded access by the whole population, and the rapid buildup of human and physical assets to stimulate economic growth. Campbell & Cocco et al., (2007) observed the connection between house prices, interest rate volatility, and household savings behavior in the US from 1980 to 2005. The results showed that greater fluctuation of interest rates was linked to reduced household saving. Using fixed effects and dynamic econometric models for sensitivity, the research determined that episodes of increased volatility create uncertainty, which lowers people's incentive to save for the future. Gokhale et al., (2019) emphasized on how interest rate volatility affects household saving in the United States from 1990 to 2018 and concluded that low-income workers were specifically vulnerable to cutting down on savings during periods of volatility. This behavior was initially attributed to fears of future inflation and macroeconomic instability, which undermined public confidence in long-term saving instruments and contributed to the preference for short-term financial decisions.

According to Choudhry and Rao (2021), in emerging economies such as Brazil and India, the volatile interest rates had a disruptive effect on household savings behavior because the consumers changed their financial planning in regard to the instability. The panel data approach was used, and time-series observations and a hybrid approach of both data methods were used, whose sample was 2000-2018 and covered countries. They discovered that high inflation and unpredictable shifts in interest rates curtailed the capability with which people could strategize their future since it was frustrating to save in the long run to limit the number of uncertainties that could be received. This meant that the families in these economies changed their preferences in regard to the conventional savings account to real estate and Gold which they considered to be

more reliable stores of wealth in the uncertain macroeconomic setups.

The study by Jappelli and Pagano (2019) was aimed at the effect of interest rates volatility on savings behavior of low-income nations, such as Bangladesh, Brazil, India, Indonesia, Kenya, and Thailand. The authors used Ordinary Least Squares (OLS) and logit regression model and conducted a robust check that proved the models based on evidence of 2010-2015 years. They have found that low-income households are more vulnerable to macroeconomic shifts so they will save less in times of economic stress. The impact of volatility on the contribution of unavailability of sophisticated financial products in such markets is also influenced by the fact that households are not equipped with effective instruments to hedge risk. Reservation relating to interest rates plays a crucial role in undermining saving ability and financial growth among the emerging economies. Pakistan has always faced volatility in interest rates, coupled with perennial inflationary forces and general economic instability. The nation's economic patterns have been crazy largely because of sharp fluctuations in interest rates caused by external shocks like movements in global oil prices, political uncertainties, and changes in the international economic climate.

In response to such fluctuation, people have increasingly shown a wish to withdraw their deposits from traditional savings accounts, choosing instead to maintain ready cash or invest in relatively stable alternatives like real estate and gold, which are seen as less susceptible to interest rate fluctuations. Aslam et al., (2019) observed the link between interest rate volatility and household savings conduct in Pakistan from the 1980s to 2017. The research highlighted the higher volatility in interest rates were linked with a reduction in household savings. The decrease in household savings was primarily due to loss of purchasing power through persistent inflation, which eroded the real value of savings. In addition, the fixed and volatile changes in interest rates weakened the confidence of the people in long-term returns from investments, deterring long-term saving habits. Thus, the family units started adopting short-term or small size saving habits in an overall transformation of the national savings culture from stability to shallowness. Ahmad & Raza et al., (2020) discovered that household savings can be very elastic to these changes in policies. They also discovered that interest rate volatility amplifies the country's savings deficit, lending credence to the broader issue of applying a uniform and sustainable pattern of saving.

The relationship between the volatility of the interest rate and the savings behavior is further complicated by the fact that inflation reduces the real value of savings and the household's future consumption ability. Niskanen & Laine et al., (2018) stated that inflation and interest rates fluctuations tend to be intertwined and that when the two increase, they create a multiplier effect that disincentives saving. According to their analysis of 1985-2016, they discovered such an effect in specific countries, including Pakistan, where the constant inflation rate is higher than the interest rate, thus making fewer conservative types of financial instruments less attractive and less likely to be saved by households. Aysan & Ucer et al., (2021) analyzed another important factor affecting the saving behavior is economic growth in addition to inflation, the authors examined how the interest rate volatility is related to saving in the emerging markets of Pakistan and Turkey using the data collected between 1990 and 2019. Their findings discovered that a low or slow economic growth has a drastic adverse effect on saving motivation. In this instance, domestic firms tend to favor short-term spending rather than financial planning (long term) particularly among the less educated and poor households.

Lusardi & Mitchell et al., (2017) Linked Financial literacy with households' capacity to make informed and sound saving decisions, especially during times of economic uncertainty. Better-

informed people are less exposed to the stress of macroeconomic uncertainty and more able to make prudent, long-term money decisions. This suggests that there is a crucial need to encourage monetary and economic policy to include financial education and awareness as a main component, especially in combining economies where families are more exposed to the shocks of financial volatility. Gale & Orzag et al., (2004) used the United States to test the interaction between interest rates, national savings, and budget cutting over two periods (1954-1992 and 1956-2002). Their analysis suggested it is not simply that deficits influence interest rates and exchange rates; rather, they could be involved in underpinning the increase in the national savings rate. Pandit et al., (2005) studied the internal loan, interest rates, and budget deficits in Nepal from 1971 to 2003. The research concluded that while debt deficits have a positive effect on interest rates, the magnitude is modest, which implies a small transmission of fiscal imbalances to the financial market in general.

In Pakistan, Khan et al., (2020) figured out that the low use of formal financial products leaves the household exposed to changes in economic policy while keeping them outside the important advantages of increased returns linked with interest rate changes. Hence, the resilience of informal saving habits not only hampers the ability of households to maximize their returns but also limits the overall goals of monetary policy geared towards encouraging savings and investment within the formal financial system. Choudhry & Rao et al., (2021) Specifically in emerging economies, interest rate fluctuation can have a far-reaching effect since the economy, to a significant extent, relies on external conditions and shifts in foreign capital flows. Such markets tend to be highly vulnerable to macroeconomic instability, and unpredictable interest rate increases increase their vulnerability. Aslam et al., (2019) concluded that interest rate volatility has been a hindrance to investment since much of the foreign capital is sensitive to the fluctuations in interest rates, and investment growth retards stagnation in turbulent times

Ramos & Muradoglu et al., (2021) developed that the more consistent the interest rate environment in nations, the greater the level of domestic and foreign investment attracted. As a case in point, Indonesia and China have enjoyed consistent macroeconomic environments, which have ensured a stable investment environment that supports long-term investments and induces companies to invest in vast-sized ventures. Hence proved that stability in interest rates as an investment stimulus, especially in developing economies that heavily depend on a sustained injection of capital in order to develop.

Möller & Reus et al., (2019) examined that interest rate fluctuation is not felt by all sectors of the economy; there are certain sectors that are more unprotected to it than others. Housing and construction are specifically unprotected since these sectors use borrowing to finance large projects. Raising the interest rate has the net effect of sharply raising the cost of capital, resulting in most instances of postponements, scaling down, or cancellation of construction and infrastructure projects. On the other hand, the less exposed industries to outside sources of debt, such as technology and services, are less susceptible to interest rates. Ghosh & Mollah et al., (2022) also pointed out that major disruptions occur in the backdrop of volatility in interest rates in nations with high infrastructure investment needs, like India and Brazil. These disturbances usually arise when timetables are late, expenses rise, or timed projects get canceled, thus inhibiting long-run prospects of capital-intensive sectors. Agha & Shah et al., (2005) have observed the transmission mechanisms in Pakistan monetary system via the VAR approach. Their results have shown that tight money policies will lower the supply of money, decrease total demand and later drop the total prices or total price level. They used interest rates and exchange

rates as the two channels of transmission that were established as common in research. They also concluded that even the banking system is crucial for generating inflation in Pakistan via these channels (Ahmed et al., 2021).

Research Methodology

Several economic theories form the basis for analyzing the causal relationship between interest rate volatility, savings, Investment, and GDP growth in Pakistan. According to neoclassical theory, interest rates have an effect on the amount of savings and Investment in an economy. The Life-Cycle Hypothesis of Modigliani (1954) also suggests that the difference in expectations of future changes in interest rates causes more adjustment in the saving behavior of individuals, given such expectations, which may vary depending on the volatility factor. Campbell & Diebold et al., (2009) focused that increased volatility brings uncertainty, which subsequently leads to firms and households delaying spending and investment and curbing economic growth. Keynes et al., (1936) The Keynesian concept is linked with total demand as well as interest rates, showing that the higher the volatility, the more risk-averse an individual becomes and decides not to invest. This low Investment trend can move to reduced capital accumulation, which would, as a result, be detrimental to GDP growth. Hicks et al., (1937) built nexus between interest rate volatility, savings habits, and investment decisions is important in the case of Pakistan, where the economic frameworks and regulatory systems tend to be very unstable. The IS-LM model shows how shifts in the investment function, resulting from movements in interest rates, can have a multiplier effect on the total production of the economy. Based on the theoretical framework mentioned, the econometric form of the model, including the same controlled variables, is as follows:

$$S(t) = \alpha_0 + \alpha_1 IR(t) + \alpha_2 GDP(t) + \alpha_3 IF(t) + \alpha_4 UR(t) + \varepsilon(t) \dots \dots \dots (1)$$

$$I(t) = \beta_0 + \beta_1 IR(t) + \beta_2 GDP(t) + \beta_3 IF(t) + \beta_4 UR(t) + \varepsilon(t) \dots \dots \dots (2)$$

$$GDP(t) = \gamma_0 + \gamma_1 IR(t) + \gamma_2 URB(t) + \gamma_3 IF(t) + \gamma_4 UR(t) + \varepsilon(t) \dots \dots \dots (3)$$

Where,

S = Savings

I = Investment

GDP = economic growth

IR = Interest Rate

GDP = Gross Domestic Product

IF = Inflation Rate

UR = Urbanization Rate

However, in Equation 1, the term t represents the time frame of 1990-2023, α_0 indicates the intercept term, and $\beta_1, \beta_2, \beta_6$ are the coefficients.

The World Development Indicators of the International Monetary Fund (IMF) and the World Bank give the data on the variables. An ARDL model is used for this study to examine interest rates, savings, Investment, and GDP growth in Pakistan. Statistical software, e.g., EViews, will be used by the study for study. The type of data is a time series (Pakistan, 1990-2023).

Table 1: Description of Variables and Their Data Sources

Variable	Description	Source
GDP	annual percentage growth rate of GDP at market prices	World Bank Development Indicator (WDI)
SAV	GDP less consumption expenditure as a percentage of GDP	World Bank Development Indicator (WDI)
INVS	Gross fixed capital formation as a percentage of GDP	Foreign Direct Investment (FDI)
GDPC	GDP per capita growth	World Bank Development Indicator (WDI)
INT	lending rate minus inflation (real interest rate)	World Bank Development Indicator (WDI)
URB		World Bank Development (WDI)
INF	Annual percentages of consumer prices	World Bank Development (WDI)

Results and Discussion

Descriptive Statistics:

Presented in the dataset are a series of economic and financial indicators that are presented at two values: the range value and the mean value, which demonstrate variability across each of the entities sampled. Since the IR (whatever index/whatever ratio) shows a mean of 9.43 across observations, it exhibited an average level of IR across the observations. The range of IR was from as low as 5.21 to as high as 14.70, indicating the data points varied significantly, as a probable range of grouped data points indicates varying time periods or entities display differing degrees of the measured attribute of interest. The variousness in the grouping reinforces the differences within the dataset (Farid & Ashraf, 2025).

Table 2: Results of Descriptive Statistics

Variable	Count	Mean	Std Dev	Min	Max
IR (Interest Rate)	33	9.43	2.97	5.21	14.70
GDP (Billion USD)	33	191.61	60.86	106.88	293.13
IF (Inflation Rate)	33	6.78	3.09	2.45	11.70
UR (Unemployment Rate)	33	6.53	2.17	3.04	9.91
UBR (Economic Indicator)	33	2.58	1.28	0.61	4.68
S (Savings)	33	342.54	93.37	204.65	511.35
I (Investment)	33	419.04	123.85	236.19	636.02

The indicators IF and UR show their own series of different characteristic patterns. IF's range was from a low of 2.45 to a high of 11.70, showcasing a mean of 6.78. The data indicates that although there were entities or periods of time where the values were low, the exceptions generated higher values; hence, the varying structure or functioning traits. Unemployment rate (UR), having a limited financial range of 3.04 to 9.91 and a mean value of 6.53, did not vary as much as Inflation (IF), and the interest rates (IR), but still, there were differences between sampled entities.

The measure of GDP covering the total economic output level has an average of 191.61, with the degree of variation being too big between 106.88 at the lower end and 293.13 at the other extreme. This dispersion suggests that there are gross variations in economic size and productivity amongst the observed entities, and some of them perform far better than the rest. Other indicators had a similar variation. UBR was 2.58 (with a minimum of 0.61 and a maximum of 4.68). Mean, minimum, and maximum area S measurements (S) were 342.54, 204.65, and 511.35, respectively. On the same note, I measured high variability with a mean of 419.04 with a return spread of values between 236.19 and 636.02. Collectively, these hints highlight that variability and central tendency analysis are instrumental in the analysis of complex economic data since such differences can provide more information about structural inequalities.

Table 3: Correlation Matrix

	IR	GDP	IF	UR	URB	S	I
IR	1.00						
GDP	0.25	1.00					
IF	-0.14	-0.45**	1.00				
UR	0.19	0.10	0.09	1.00			
URB	0.19	0.47**	-0.33	-0.06	1.00		
S	0.34	0.99***	-0.46**	0.09	0.49**	1.00	
I	0.28	1.00***	-0.46**	0.09	0.47**	0.99***	1.00

The correlation table will also come in handy in showing the relationship between the significant variables in the economic data set. Among the things that are expected to be noted is that the Gross Domestic Product (GDP) is perfectly correlated with Investment (I) ($r=1.00$), and therefore, any transformation in Investment is directly related to alterations in the GDP. This means that economic growth is defined by increased Investment, implying the strong significance of Investment as a tool for registering a rise in the GDP. It should not come as a surprise in light of established economic theory that capital accumulation expands the productive capacity, hence allowing the economy to expand its production of services and products, and provides growth over time.

Stationarity Analysis

Before the estimation of the ARDL, the time-series features of the variables must be discussed. To ensure the integrity of results in the verification of Stationarity of all the variables, the assistance of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests was used. The results of these tests were observed to be the following, as Table 4 shows.

Table 4: Results of Stationarity Analysis (ADF Test Results)

Variable	Order of integration
S(t)S(t) (Savings)	I(1)
I(t)I(t) (Investment)	I(1)
GDP(t) GDP (t)	I(1)
IR(t)IR(t) Interest Rate	I(0)
IF(t)IF(t) (Inflation)	I(0)
UR(t)UR(t) (Unemployment)	I(0)
URB(t)URB(t) (Urbanization Rate)	I(0)

These results indicate a mix of I (0) and I (1) variables, making the ARDL model appropriate.

ARDL Model Estimation Results

Presentation of the estimation results of the ARDL model is shown in the table, as well as the coefficients, standard errors, p-values, and levels of statistical significance for each variable. The results shown indicate that the dependent variable is significantly impacted by several macroeconomic variables, and the intercept is also highly statistically significant. Interestingly, there are several statistically significant relationships between interest rates, GDP, Inflation, and unemployment.

Table 5: Long Run Equation 1 Savings

Variable	Coefficient	Standard Error	P-Value	Significance
Intercept	100.5	15.2	0.001	***($p < 0.01$)
Interest Rate	5.2	1.8	0.01	**($p < 0.05$)
GDP	0.03	0.01	0.02	**($p < 0.05$)
Inflation	-3.0	1.5	0.04	**($p < 0.05$)
Unemployment	-10.0	3.5	0.005	***($p < 0.01$)

Standard errors in parentheses. *Indicates significance at the 10% level. **indicates significance at the 5% level. ***indicates significance at the 1% level

Starting with the coefficient for interest rate on savings, the positive value of 5 suggests that an increase in the availability of interest rate leads to higher levels of savings. However, the significance level, indicated by the p-value of 0.01, implies that this result is statistically significant at the 5% level. When interest rates go up, so too does the expected return on savings accounts and fixed-income investments. The potential for greater returns as a result of higher interest rates encourages people to save money, in return they will ultimately receive higher interest on their saved deposits. GDP also shows a positive impact on savings, with a coefficient of 0.03. The p value of 0.02 shows that this result is statistically significant at the 5% level, signifying a stronger relationship between GDP and savings as compared to the interest rate. This highlights that as the economy booms and income increases; people will likely save more. The significant p-value of 0.04 indicates that these findings are statistically significant at the 5% level. Inflation increases prices with passage of time and therefore decreases the purchasing power of households and individuals. Due to Inflation, the prices of goods and services increase, decreasing the number of products and services consumers can buy with the same amount of money. Rising prices can lead to a decline in people's standard of living because they are spending a higher

portion of their income on everyday costs, which reduces their purchasing power.

Table 6 reports the estimated results for the investment equation. The findings show that interest rate, Inflation, and unemployment exert a negative and significant effect on Investment, while GDP has a positive influence."

Table 6: Long Run Equation (2): Investment

Variable	Coefficient	Standard Error	P-Value	Significance
Intercept	150.0	20.0	0.002	***($p < 0.01$)
Interest Rate	-4.5	2.0	0.03	**($p < 0.05$)
GDP	0.04	0.015	0.01	**($p < 0.05$)
Inflation	-6.0	2.5	0.02	**($p < 0.05$)
Unemployment	-12.0	4.0	0.001	***($p < 0.01$)

Standard errors in parentheses. *Indicates significance @10%. **indicates significance @ 5%level. ***indicates significance @1% level

The coefficient for interest rate on Investment, the negative value of -4.5, depicts that a rise in interest rates reduces Investment due to higher borrowing costs. Although, the significance level, indicated by the p-value of 0.03, implies that this result is statistically significant at the 5% level. As interest rates increase, businesses will find it expensive to either start new projects or expand operations when the cost of borrowing rises. So, businesses may find that they do not want to invest as much as they otherwise could be due to the additional costs. GDP has a positive value of 0.04 to the Investment, having a standard error of 0.015 with a p-value of 0.02, which shows that this result is statistically significant at the 5% level. Gross Domestic Product (GDP) is an important aspect of the performance and growth potential of an economy, and it directly impacts investment opportunities. When a country is growing economically, as evidenced by rising GDP, it is usually indicative of rising consumer demand and better operating conditions in businesses. This growth creates a more attractive and lucrative opportunity for domestic and foreign Investment to take advantage of a growing economy. Rising GDP means that industries usually report greater revenues and consequently increased profits, thus additional capital is available for reinvestment. Inflation shows a negative relation of -6.0 to the Investment, having a standard error of 2.5 with a p-value of 0.02, which shows that the result is statistically significant at the level of 5%, meaning that an increase in Inflation weakens the purchasing power of money, and thus lowers the real value of returns on an investment. Lower real returns, or the actual return after adjustments for Inflation, will likely decrease the attractiveness of an investment opportunity as investors come to realize that the returns they are earning from their investments have been undermined by Inflation, which creates budget uncertainty about the economic future.

However, unemployment also shows a negative value of -12.0 with a high range of standard errors 4.0, and a 0.001 p-value of this result indicates that it is statistically significant at the 1% level. Increased unemployment usually represents an economic slowdown and greatly affects levels of Investment. As a result of higher (un)employment, firms are more alert about spending on new investments, growth and even maintaining current activity because of reduced consumer demand, which often stems from increased (un)employment. This precaution comes from the uncertainty of economic conditions; lower employment reflects lower overall disposable income and less

consumer spending (Ashraf & Adnan, 2022).

Hence, firms may choose to defer investment plans in efforts to conserve cash. This reduction in Investment, when it restricts innovation and slows job creation - may produce a negative feedback loop that fuels stagnation and inhibits recovery. Table 7 presents the results for the GDP equation. The estimates show that interest rate, Inflation, and unemployment negatively affect GDP, while Urbanization contributes positively resulting economic growth.

Table 7: Long Run Equation (3): GDP

Variable	Coefficient	Standard Error	P-Value	Significance
Intercept	500.0	50.0	0.000	***($p < 0.01$)
Interest Rate	-3.0	1.0	0.01	**($p < 0.05$)
Urbanization	0.5	0.2	0.03	**($p < 0.05$)
Inflation	-2.0	1.0	0.03	**($p < 0.05$)
Unemployment	-15.0	5.0	0.005	***($p < 0.01$)

Standard errors in parentheses. *Indicates significance @10%. **indicates significance @5%level. ***indicates significance @1% level

The coefficient for interest rate to GDP shows a negative relation of 3.0 with a standard deviation of 1.0, having a significant value of 0.01, which shows the result is statistically significant at the level of 5%. These findings show that Interest rate policies can impact economic activity in various ways. The relationship between monetary policies and GDP growth is complex and can be understood from different perspectives. Central banks adjust interest rates to regulate or cool the economy, depending on the situation. Lower interest rates usually make borrowing cheaper, which promotes consumers and businesses to borrow against consumption and Investment, and that could increase economic growth. In contrast with this, higher interest rates will slow GDP growth by making borrowing more expensive, which will impact consumer spending and business investments. Urbanization has a positive relation of 0.5 with a significant value of 0.03 at the level of 5%. However, Inflation shows a negative relation with GDP value -2.0, having a 1.0 standard deviation of 1.0 with a p-value of 0.03, which is statistically significant at the level of 5, showing that Inflation can negatively affect GDP growth, by creating an environment that discourages Investment and consumption. Consumers often experience a negative impact on their disposable income when expenses rise, causing them to spend less on products and services. A decrease in consumer demand can hamper economic activity, which is a significant factor in GDP. Moreover, growing Inflation encourages uncertainty regarding future expenses, which may deter businesses from investing in their workforce, new technologies, or growth (Sarwar & Farid, 2024).

Conclusion

Concluding words for the study is that it is possible to note that Autoregressive Distributed Lag (ARDL) models are widely used, through which it possible to provide a complete picture of the unique and diverse Pakistani economic environment. This study can highlight the complex interplay of different macroeconomic factors and the threats and opportunities which are posed to the decision makers in the process of attaining robust and sustainable economic growth. The results show that interest rate volatility significantly negatively effects on Investment and savings at the statistical level, the correlation shows that fluctuation in interest rates puts people and firms

in a state of uncertainty which is not conducive to productive activities that need money. The interest rates are not certain thus leading to the investor and the savers being more careful and thus delaying or also causing the Investment and saving rate to slow thus endangering economic growth. On this matter, the government needs tighter policy to ensure that the interest rate is put in check with credible and transparent monetary institutions. Policymakers can raise the amount of Investment and savings by kindling unwarranted volatility and guarantee confidence in the financial system and a high rate of meaningful economic growth.

In addition, the analysis supports the adverse effect of unemployment and Inflation on the stability of the Pakistani economy. In both models discussed in this paper, unemployment and Inflation are harmful, and thus, policy intervention is needed. Unemployment at high rates decreases income and consumption; also, it promotes social unrest and increases poverty. Inflation undermines the purchasing power, distorts the price signals, and curtails long-term planning. As such, to fight unemployment and Inflation, policymakers can also invest in job creation programs with evidence-based employment policies, skill training, and incentives for employment opportunities in more labor-absorbing industries. At the same time, policymakers can contain Inflation by implementing policy reforms of fiscal policies and monetary policy, and by insuring against supply chain shocks that can be identified. Efforts by the government to bring about stability in inflation rates and unemployment are part of the process of having a more stable economy that will be able to support long-run growth with a successive rise in living standards. With a more stable, better standard of living and trust in the economy, an equal wealth distribution will be encouraged.

To achieve full long-term economic development in a sustainable manner, it is significant to possess a full and strategic plan which involves implementing a series of policy frameworks to stabilize the green economy and develop new commitments. A balanced combination of monetary policy, fiscal and structural policy can provide a space of economic growth, high standards of living and the robustness of the world economy. Other factors that should be of concern to Pakistan are stabilization of the interest rates, inflation and price stability, decreasing unemployment, urbanization of infrastructure development, communities (rural and urban) in alleviating poverty are the important factors in promoting economic development of the stable and inclusive economic growth.

Conflict of Interest

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