# The Effect of Macroeconomic Uncertainty on Consumption Expenditure in Case of Pakistan

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## Abstract

Government expenditure on consumption is the core issue in the macroeconomic theory. The determination of national economic growth and the improvement of economic production also play an important role in economic and technological progress. However, a high degree of macroeconomic uncertainty directly inhibits economic growth. This study empirically estimates the macroeconomic determinants of government spending in Pakistani economy. In this study, ARCH, GRACH model was used to calculate the volatility of different macroeconomic variables. Taking the period from 1975 to 2014 in Pakistan as an example, the ARDL model was used to examine the relationship between the volatility of macroeconomic variables and government spending. The research shows that the macroeconomic uncertainty caused by the fluctuation of macroeconomic variables has a significant impact on the government's consumption expenditure. Empirical results from the study show that Pakistan experienced more volatility in the macroeconomic variables, leading to more volatile government spending and private investment.

Keywords: Volatile, ARDL, Govt Expenditure

## Introduction

Economic growth is defined as a stable statistical path that increases economic productivity and increases national output and income levels. Government consumer spending and investment play a crucial role in the investigation of economic macroeconomic performance and economic growth determination (Wagner, 1893). Fast-growing countries spend the bulk of their GDP on consumer spending and invest in resources that encourage private investment. Slow developing countries are those who do not invest. It clearly states that investment and government spending are key components of economic growth (Ganti and Kolluri, 1979; Georgakopoulos and Loizides, 1994 and Kolluri et al. 2000). Changes in the share of government spending and investment will affect economic growth.

Government expenditure on consumption is the core issue in macroeconomic theory and plays an important role in determining a country's economic growth, raising its economic productivity and promoting economic and technological progress. However, a high degree of macroeconomic uncertainty directly inhibits economic activity through various channels such as government spending, private investment and employment. Government consumer spending and private investment fluctuate because of the political, social and economic factors that depend on the economy. Volatile government spending and private investment are responsible for fluctuations in the gross domestic product throughout the business cycle (Dornbush et al. 1999). Therefore, it is very important to explore the determinants of government consumer spending and private investment volatility in the Pakistani economy.

According to the theory of endogenous growth, government consumer spending leads the way through investments in capital, skills and technology, as capital and labor taxes hinder investments

that reduce economic growth. Similarly, public spending on government reduces growth by creating more marginal revenue to reduce investment and reduce incentives to otherwise save and accumulate capital. However, empirical evidence from growth theory shows that government spending is controversial about economic growth.

The link between macroeconomic uncertainty and economic activity is one of the fundamental goals of policy makers, as the macroeconomic uncertainties directly lead to economic growth. Political turmoil affects the performance of government agencies and consumer spending. Fluctuations in macroeconomic variables have led to uncertain economic conditions. So the volatility of macroeconomic variables is one of the ways we measure the economic macroeconomic uncertainty. More volatility means more economic uncertainty and vice versa.



Political turmoil is more closely tracking the uncertainties that have caused the decline in economic growth. The following study identifies and assesses macroeconomic uncertainties, consumer spending and other control variables in Pakistan such as inflation, interest rate volatility, political instability, fluctuations in the gross domestic product, and foreign direct investment volatility. For this purpose, the secondary data for these variables were collected from publicly available sources between 1975 and 2014.

### **Review of literature**

The basic purpose of the literature review is to guide scholars to better understand the topics of previous research and different aspects of research methods used in previous studies and to describe the different evaluation procedures. Literary criticism is also used to compare and compare the opinions of different authors on a particular subject and to provide a clear explanation and understanding of the conflicting results of different studies. A brief review of some studies on macroeconomic uncertainty, government consumer spending and private investment,

Rizvi and Naqvi (2010) estimated the impact of Pakistan's inflationary uncertainty. The results of the study are based on the GJR-GARCH model and the EGARCH model, which understand the uncertainty and irregularities of inflation more effectively than the usual GARCH models. The estimates confirm the correctness of Friedman-Ball's assumption of inflationary uncertainty in Pakistan. High inflation affects inflation uncertainty and causality Uncertainty from inflation to inflation. They used the bivariate Granger causality test to determine the inflation uncertainty assumption for Pakistani data and examined the direction and causal link between inflation and inflation uncertainty.

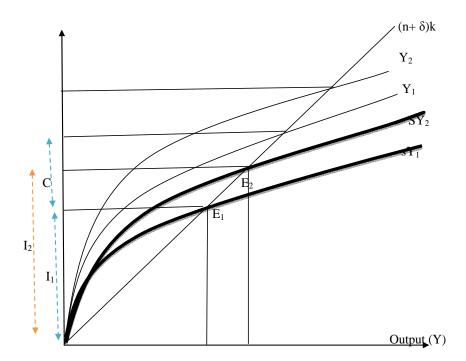
Saman (2010) argues that uncertainty can affect investment in different ways. This theoretical analysis gives only empirical information on basic historical data. Regression conditional heteroscedasticity (GARCH) leads to the exchange rate and unpredictability of prices, and quadratic equations and linear equations give the nonlinear dependence of investment on uncertainty. In the sense of four important investment variables, three give the standard deviation of the conditions. GMM technology is used for this analysis.

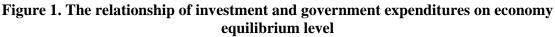
Orji et al. (2013) identified the relative impact of policy recommendations and the uncertainty of the macroeconomic variables of investment. It helps to reduce their volatility by applying the generalized autoregressive conditional heteroskedasticity (GARCH) volatility. They revealed multiple outcomes; (a) the parameters may converge from short-term to long-term and slow to adjust; (b) long-term linkages between investment and macroeconomic variables. (C) The investment has a particularly adverse impact due to the uncertainty of the macroeconomic variables in Nigeria. These results confirm that variable inflation and inflation are components of the macroeconomic instability in Nigeria, Okoro (2006) olaniyan (2000).

Rahman (2015) investigated that the effect of various sectors of government expenditure on Pakistan private investment during a period of 1974 to 2010. These sectors including health, defense, education, transport and communication, agriculture, community services, debt servicing and manufacturing expenditures. This division was derived from Pakistani statistical year books using the techniques Juselius multivariate co-integration approach and VECM. To form the way liaison in the short and long run for Pakistan. These provide evidence for a strong and positive effect on private investment by agriculture expenditures. In short, run transport and communication and health has a significant relation to private investment. However, the inflation rate has significant impact on private investment in the long run while in short run no strong impact is recorded.

## **Theoretical Background**

According to the traditional growth model of Solow Swan (1956), the school of neoclassical ideology has increased taxes, increased savings and investment due to the increase in government spending, and only a short-term impact on economic growth toward more High steady-state balance forward. Consumption and Investment in Steady State





The above figure shows that any change in the investment will change the output of the economy and consumption expenditures of the economy. The figure presented the relationship of investment and government expenditures on economy equilibrium level. The economy equilibrium shift from  $E_1$  point to  $E_2$  point due to increase in the government consumption expenditures.

The current empirical literature on economic thinkers and political parties emphasizes the importance of economic and political variables in determining government consumer spending (Hibbs 1977, 1987; Alt 1985; Garrett and Lange 1986; Kiewiet and McCubbins 1991; Alesina and Londregan and Rosenthal, 1993; Alt and Lowry, 1999). Most literature focuses on the total government expenditure on consumption, determined by income growth, inflation and nominal interest rates and capital inflows or overall fiscal policy rather than social spending. So the above literature shows that government spending depends on income growth, inflation and nominal interest rates and capital inflows.

## Measuring Macroeconomic Uncertainty

This is evidenced by the macroeconomic uncertainty debate of the early 1980s as the volatility of macroeconomic variables has increased. Numerous studies use the volatility of macroeconomic variables to test the macroeconomic uncertainties. (Ghosal and Loungani (2000)) used a generalized autoregressive conditional square (GARCH) model to measure macroeconomic uncertainty in Driver, Temple and Urga 2005 and Byrne and Davis (2002). Beaudry et al. (2001) estimate the macroeconomic uncertainty by using the level of inflation, which shows the level of economic uncertainty. Econometric estimation techniques, such as autoregressive conditional variance (ARCH) developed by Engle (1982), also allow the measurement of macroeconomic uncertainty by estimating the conditional variance of the variables used in the study

## Econometric modeling setup and data description *DATA*

The annual frequency time series data from 1973 to 2011 are used in the study, collected for all different variables like Consumption Expenditure (CE), Real Gross Domestic Product(RGDP), Foreign Direct Investment(FDI), Consumer Price Index (CPI), Exchange rate (ER), Interest Rate (I), and Political Instability (PI). The time series data were taken from different sources such as World Development indicator (WDI), published by World Bank "Hand Book of Statistics (2010), published by State Bank of Pakistan, and International Financial Statistics (IFS) published by the international monetary fund.

## MODEL

In this model, consumption expenditure which is the dependent variables with some other macroeconomic variables

CE = F (CPIV, IV, PIV, GDPV, FDIV)  $CE_t = \beta_0 + \beta_{t1}CPIV + \beta_{t2}IV + \beta_{t3}PIV + \beta_{t4}GDPV + \beta_{t5}FDIV + \mu_t$ ....(3.1) CE =Consumption Expenditure CPI = Consumer Price Index. IV = Interest Rate PI = Political Instability GDP = Gross Domestic Product FDI = Foreign Direct Investment

 $U_t$ \_stochastic error term assumed to be randomly, distributed normally with zero mean and constant variance.

Econometric Model is given as:

ARDL Model Long Run equation for consumption expenditures

$$\Delta CE_{t} = \alpha + \sum_{i=1}^{m} \beta_{1i} CPIV_{t-i} + \sum_{i=1}^{m} \beta_{2i}IV_{t-i} + \sum_{i=1}^{m} \beta_{3i}PIV_{t-i} + \sum_{i=1}^{m} \beta_{4i}GDPV_{t-i} + \sum_{i=1}^{m} \beta_{5i}FDIV_{t-i} + \sum_{i=1}^{m} \beta_{6i}CE_{t-i} + \sum_{i=1}^{m} \beta_{7i}\Delta CPIV_{t-i} + \sum_{i=1}^{m} \beta_{8i}\Delta IV_{t-i} + \sum_{i=1}^{m} \beta_{9i}\Delta PIV_{t-i} + \sum_{i=1}^{m} \beta_{10i}\Delta GDPV_{t-i} + \sum_{i=1}^{m} \beta_{10i}\Delta FDIV_{t-i} + \sum_{i=1}^{m} \beta_{11i}\Delta CE_{t-i} + \varepsilon_{t}$$

F test

of the null that:  $\beta_{1i} = \beta_{2i} = \beta_{3i} = \beta_{4i} = \beta_{5i} = \beta_{6i} = 0$   $\forall i = 1 \text{ tom}$ ARDL Model Short Run equation:

## **Results and discussion**

The chapter 4 provides the detail estimated empirical results of the macroeconomic volatility which is closely linked with the macroeconomic uncertainty by using Generalized Autoregressive Conditional Heteroscedasticity (<u>GARCH</u>) model. The dynamics of consumption expenditure, and its related volatile variables, according to given hypothesis, after estimating the data during 1975 to 2014. This section also explains the short run and long run relationship of consumption expenditures and other macroeconomic variables (volatility of interest rate, volatility of consumer price index, volatility of gross domestic product, and volatility of political instability). However, the complete empirical interpretation of both sections is given as follows.

## The volatility of macroeconomics variables

In the volatility clustering of economic data, the time series shows that the period of high volatility means the high deviation of the data and the low volatility of the period of the low deviation of the data. The volatility of government consumer spending and investment, as well as some other macroeconomic variables are calculated by the GARCH variance series, and the volatility achieved can be measured by monthly data. However, most macroeconomic variables do not have monthly data, especially in the case of Pakistan. Therefore, this study calculated the GARCH variance sequence using the annual frequency data of different macroeconomic variables from 1975 to 2014. Finally, The GARCH variance series draws one-step lead variance for each observation in a given sample based on conditional variance. The chart below shows all major macroeconomic series.

Following diagram shows the volatility of the Consumer Price index which is used as a proxy of the inflation. According to the diagram the volatility of the Consumer Price index increases after 1990s.

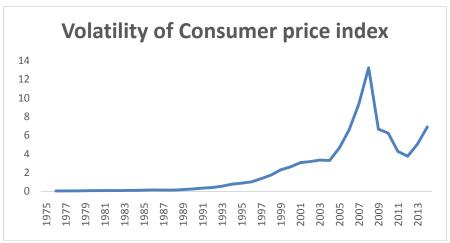


Figure 2. The volatility of the Consumer Price index

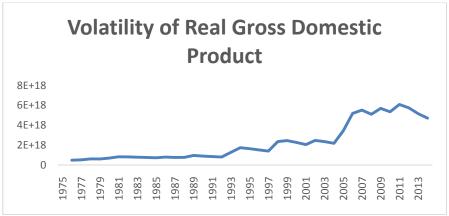


Figure 3. The volatility of the Gross domestic output increases.

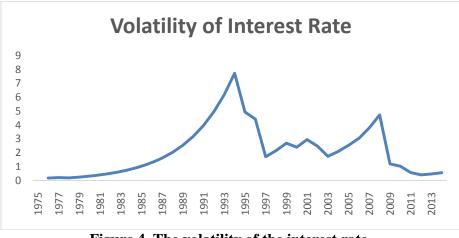


Figure 4. The volatility of the interest rate.

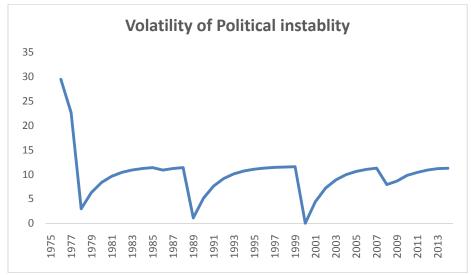


Figure 5. The volatility of the Political instability.

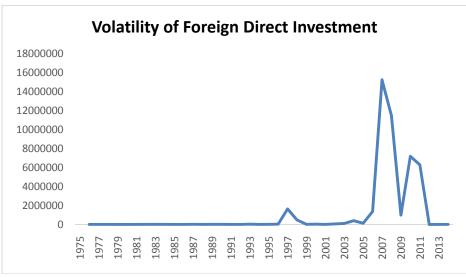


Figure 6. The volatility of the Foreign direct investment.

## **Unit Root Results**

The first step in time-series data is to empirically estimate the results, in particular to test the persistence of unit roots in the time-series data. As the unit root is a feature that evolves over time in the form of a trend, making statistical inference of time series data and predicting data becomes difficult. Although it is relatively easy to predict time series data without the sequence of unit root problems, the series is considered to be a non-stationary series if it has unit root problems and shows a trend over time. Therefore, it is important to examine the unit root problem of the data and find a suitable way to obtain statistically significant and reliable empirical results.

First, all independent variables and independent variables used in this study examined unit roots during 1975-2014. The following table shows the empirical results of the unit root test with and without a linear trend.

At Level					
	Only con	nstant	Constant and Trend		
Variables	PP test Statistics	Prob.	PP test Statistics	Prob.	
CPIV	-1.236	0.649	-2.794	0.208	
IV	-1.867	0.344	-1.574	0.785	
PIV	-6.250	0.000	-5.909	0.000	
GDPV	-0.527	0.875	-1.995	0.585	
FDIV	-3.408123	0.0168	-3.687178	0.0355	
СЕ	4.142	1.000	1.873	1.000	

<b>Table 1.Philips-Perron</b>	$(\mathbf{PP})$	Unit	Root	Results	at the Level
rable 1.1 mmps-1 criton	(11)	Unit	ROOL	Results	at the Devel

The experimental results of Philips-Perron (PP) used to test the unit root problem at the level are given in the above table. The estimation of the unit root table shows that the Philips-Perron statistics are less than the threshold. It is noteworthy that in addition to FDIV (Foreign direct investment (FDI) volatility) and PIV (volatile political instability), signatures are ignored with and without trends. All variables except FDIV (Volatility of Foreign Direct Investment) and PIV (Volatility of Political Instability) also have probability values greater than the table value. That is why there is a unit root problem for all the null and independent assumptions of independence and dependent variables except for FDIV (Foreign Direct Investment Volatility). Therefore, it can be concluded that all series except for FDIV (Foreign Direct Investment Volatility) are non-stationary. This shows that all series are not non-stationary at their level, but the two series are stationary.

At 1st difference					
	Only co	onstant	Constant and Trend		
Variables	PP test Statistics	Prob.	PP test Statistics	Prob.	
CPIV	-6.204	0.000	-6.138	0.000	
IV	-5.748	0.000	-5.814	0.000	
GDPV	-4.614	0.001	-4.480	0.005	
CE	-4.023	0.003	-5.013	0.001	

Table. 2. Philips-Perron (PP) Unit Root Test Results for the first Difference

\*identified the significance level at 1 %, 5 and 10%, \*\* identified the significance level at 10%

The above listed Philips-Perron (PP) results for all time series variables except PIV (Political Volatility Volatility) and FDIV (Foreign Direct Investment Volatility) are fixed at the first difference. The empirical results of the unit root test show that the PP statistic is greater than the critical level of significance level of 1%, 5% and 10%, and constant and trend consumer spending, private investment, interest rate fluctuations , The consumer price index fluctuated and the GDP fluctuated. H0 was negative.

The conclusion was that consumer spending, private investment, interest rate volatility, and consumer price index volatility, the first difference in GDP volatility, was steady. Finally, empirical results from the PP unit root test show that all variables have a unit root problem except for political stability volatility and foreign direct investment volatility; the first difference is static. In this case, we can use ARDL to study the dynamic changes in consumer spending and private investment, as

well as other macroeconomic variables (interest rate volatility, consumer price index volatility, gross domestic product Volatility).

## Long run results of the model

The empirical results presented in this section show that the consumer spending in Pakistan from 1975 to 2014 is in line with the volatility of some macroeconomic variables (interest rate volatility, consumer price index volatility and GDP volatility) Inter-related experience. In order to examine the dynamics of the model's consumer spending and other macroeconomic variables, we use the ARDL model. The beauty of ARDL technology is that it can only be applied in an integrated mixed order. This means that if some variables are level and level, some of them are on the first level. Despite this, Ouattara (2004) used the ARDL technique in the presence of I (2) to shout loudly that the F-statistic calculated in the model becomes ineffective because the boundary test is based on the assumption that the variables are level-stable The first difference. Therefore, before applying ARDL technology, it is important to confirm the order of consolidation.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Ln(CPIV)	-1.211	0.049	-24.671	0.000
Ln(GDPV)	0.965	0.096	10.049	0.000
Ln(IV)	0.155	0.026	6.080	0.001
Ln (PIV)	-0.015	0.003	-4.786	0.003
Ln(FDIV)	0.027	0.006	4.218	0.006
С	-22.553	3.866	-5.833	0.001
Trend	0.186	0.010	17.720	0.000

 Table3. Estimated Long Run Coefficients using the ARDL Approach

The estimated results of the long-run model obtained by applying the ARDL technique are presented in above table. Macroeconomic stability is the main fundamental goal of both developed and developing countries. Government consumer spending and inflation play a crucial role in the macroeconomic stability of any given country. According to the classical schools of business circles around the 1980s, the rise in government spending generally led to rising inflation. Agalega and Antwi (2013) examined the positive correlation between inflation and government spending. So based the classical theories there exist positive relationship between consumption expenditure and the inflation. But volatility of the inflation play negative role for the government consumption expenditure due to the macroeconomic uncertainty.

The empirical results of the above ARDL model show that there is a negative correlation between the fluctuation of consumer price index and government consumption expenditure. Probability values and t statistics show that the empirical results of the fluctuation of consumer price index and government consumption expenditure are statistically significant. The one percent change in the fluctuation of the consumer price index led to a decrease of -1.211 percentage points in government spending.

According to Wagner's law (Wagner, 1893), "laws that expand public and especially state activities" emphasize that economic growth is a major determinant of public sector growth in the economy, resulting in an increase in household consumption spending at the government level.

The model estimates show that there is a positive correlation between real GDP volatility and government spending. Probability values and t-statistics show that the empirical results of real GDP and government spending are statistically significant. A one percent change in real GDP

volatility led to a 0.965% rise in government spending, also by Ganti and Kolluri (1979); and Georgakopoulos and Loizides, 1994.

Changes in government spending directly or indirectly affect economic output and investment, price levels and real interest rates, but also lead to fiscal deficits. According to the theory of consumption, rising interest rates will reduce consumer spending. The model estimation results show that there is a positive correlation between interest rate volatility and government spending. Probability values and t statistics show that the empirical results of interest rate volatility and government spending are statistically significant. One per cent interest rate volatility led to an increase of 0.155% in government spending. The empirical results show that there is a negative correlation between the volatility of political instability and government spending. Probability values and t-statistics show that the empirical results of political instability and fluctuations in government spending are not statistically significant. One percent of the political turmoil in government led to a decrease of 0.015% in government spending.

After World War II, European countries and Japan needed the flow of funds from the United States to finance the reconstruction of the damage caused by the war, which is the foreign direct investment most favored by policymakers. The foreign direct investment (FDI) effects of the host countries are different, such as promoting economic activities in the economy, improving the market structure of the host country, and transferring the developed countries' modern technologies to developing countries so as to increase the host country's productivity (Moosa, 2002).

The estimates in the table above show that there is a positive correlation between the volatility of FDI and consumer spending and also statistically significant. The estimates in the table also show that one percent change in foreign volatility leads to a rise in consumer spending 0.027%.

Null Hypot	hesis: No long-run relationshi	ps exist
Test Statistic	Value	K
F-statistic	8.49	5
	<b>Critical Value Bounds</b>	
Significance	I0 Bound	I1 Bound
10%	2.75	3.79
5%	3.12	4.25
2.50%	3.49	4.67
1%	3.93	5.23

#### Table 4. ARDL Bounds Test

The above table presented the autoregressive distributed lag (ARDL) model bounds test results which explain the presence of the long run relationship between government consumption expenditures and volatility of the macroeconomics variables.

The empirical results bound test shows that we can reject the null hypothesis of no cointegration between the government consumption expenditures and volatility of the macroeconomics variables. The estimated results of the bound test table shows that F-Statistics greater than the all critical value of the Pesaran,*et al* (1999) table values. The estimated empirical results of the ARDL bounds test confirmed that there exit long run relationship between government consumption expenditures and volatility of the macroeconomics variables.

Short run Co-integrating Form						
Dependent Variable: (log(CE))						
Variable	Coefficient	Std. Error	t-Statistic	Prob.		
ΔLnCE t-1	0.993	0.364	2.730	0.034		
$\Delta LnCE_{t-2}$	0.076	0.222	0.341	0.745		
ΔLnCE <sub>t-3</sub>	-0.194	0.189	-1.029	0.343		
<b>ΔLnCPIV</b>	-0.597	0.118	-5.046	0.002		
∆LnCPIV <sub>t-1</sub>	0.093	0.138	0.677	0.524		
$\Delta$ LnCPIV <sub>t-2</sub>	0.967	0.246	3.935	0.008		
∆LnCPIV <sub>t-3</sub>	1.278	0.377	3.388	0.015		
∆ <b>LnGDPV</b>	0.889	0.189	4.708	0.003		
∆LnGDPV t-1	-0.574	0.267	-2.153	0.075		
$\Delta LnGDPV_{t-2}$	-0.600	0.150	-3.993	0.007		
∆LnGDPV <sub>t-3</sub>	-0.167	0.243	-0.687	0.518		
ΔLnIV	-0.034	0.071	-0.474	0.652		
∆LnIV t-1	-0.078	0.070	-1.125	0.304		
$\Delta LnIV_{t-2}$	-0.098	0.110	-0.891	0.408		
$\Delta LnIV_{t-3}$	-0.254	0.110	-2.307	0.061		
$\Delta$ PIV)	-0.026	0.009	-2.827	0.030		
△PIV t-1	-0.014	0.009	-1.560	0.170		
$\Delta PIV_{t-2}$	0.006	0.005	1.235	0.263		
∆LnFDIV	0.049	0.010	4.816	0.003		
∆LnFDIV <sub>t-1</sub>	-0.030	0.006	-4.739	0.003		
$\Delta LnFDIV_{t-2}$	0.050	0.019	2.693	0.036		
<b>ATREND</b>	0.572	0.099	5.775	0.001		
ECM <sub>t-1</sub>	-0.076	0.609	-5.050	0.002		

To test the short-run relationship between government spending and macroeconomic variables, we used the error correction model (ECM). As can be seen from the above table, the empirical results of the ECM model show that there is a short-term volatility between consumer spending and other macroeconomic variables (inflation, interest rate volatility, political instability and real GDP volatility) Relationship Pakistan. Error Correction Model (ECM) values show a convergence rate close to 0.076. The value of the error correction model shows that if the macroeconomic variables used in this analysis are impacted (fluctuations in inflation, fluctuations in interest rates, fluctuations in political instability, real GDP).

## **Conclusion and Policy recommendations**

The basic goal of this study is to assess Pakistan's macroeconomic uncertainties and consumer spending. The empirical results from the study confirm that the volatility of different variables (fluctuations in inflation, fluctuations in interest rates, political instability, fluctuations in

the GDP, fluctuations in foreign direct investment) on government consumer spending and private investment in Pakistan's economy. The estimation of the study assesses that the volatility of inflation leads to the uncertainty put forward by Able (1980) and has a negative impact on the consumer spending and private investment in the Pakistani economy. Because uncertainty directly affects the cost of capital, it also reduces the confidence of private investors. Political thinkers and policymakers believe that the volatility of macroeconomic and political variables can lead to uncertainties in developing economies and have a significant impact on government spending. The general conclusion of our study is that due to the volatility of macroeconomic variables, the macroeconomic uncertainties are very important for determining the government's consumer spending and private investment in developing countries like Pakistan. In our study, we observed that macroeconomic variables in Pakistan fluctuated greatly due to large fluctuations in government consumer spending and private investment.

#### **Policy Recommendations**

In view of the empirical results of this study, the following measures are recommended to improve private investment in Pakistan and government spending, to achieve higher levels of economic growth. Political stability is an important channel through which government spending and investment can affect economic growth. Political instability A highly fragmented political economy requires addressing its root causes in an attempt to lessen its impact on the design and completion of economic policies. The sustainability of inflation can make private investment policies more effective because fluctuations in inflation directly affect the cost of capital while also creating market uncertainty that leads to a slowdown in economic growth. As a result, stable inflation leads to private investment in Pakistan.

Due to the continuing changes in political politics, corruption, internal conflicts, external conflicts and religious tensions, a stable political situation can reduce the volatility of interest rates and foreign direct investment.

Due to the inconsistent economic policies that are detrimental to foreign investors and domestic investors, the fluctuation of foreign direct investment policies has affected the government's consumption expenditure. Stable economic policies have directly facilitated foreign direct investment by stimulating Pakistan's trade liberalization.

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