South Asian Studies
A Research Journal of South Asian Studies
Vol. 36, No. 2, July – December, 2021, pp. 399 – 418

The Relationship between Democracy and Economic Growth of Pakistan: A Cointegration Analysis

Hafiz Muhammad Qasim
Assistant Professor at Department of Economics, & Deputy Director, Quality Assurance Department (QAD) Lahore Leads University, Pakistan.
Email: muhammad.qasim@leads.edu.pk

ABSTRACT

Institutional quality is considered the major cause of income difference among the nations of the world. The primary objective of this research work is to analyze the nexus between institutional quality with a special emphasis on democracy in the economic growth of Pakistan. Economic growth is measured by Real Gross Domestic Product (RGDP), and democracy is quantified by democratic accountability (DA). Time series data on democratic accountability (DA), human capital (HC), infrastructure (INF), inflation (DEF), and RGDP from 1984 to 2018 have been utilized. Using the Johansen Cointegration approach, the results showed a long-run cointegration between the variables. Johansen Normalized results showed that democratic accountability, infrastructure, and human capital have a direct and statistically significant effect on Pakistan's economic growth. Similarly, Vector Error Correction Model (VECM) exhibits that the computed value of ECT (-1) is statistically significant, negative, and less than 1, these results confirm the convergence of the variables towards its mean position. The VECM confirmed the existence of a long-run relationship between democratic accountability and the economic growth of Pakistan. Moreover, the results showed the short-run relationship between the variables. Granger causality showed a unidirectional causality is running from democratic accountability to economic growth. The results of diagnostic tests also revealed the absence of autocorrelation and heteroscedasticity with the normality of residuals. Based on the econometric results, this study recommends that elected governments should establish such procedures and mechanisms that strengthen and support the democratic system and respond to people's problems to achieve sustainable economic growth in Pakistan.

Key Words: **Political Institutions, Democratic Accountability, Economic Growth, Time Series Model**

JEL Classification: H11, O4, C22

Introduction

Democracy has considered one of the essential determinants of economic growth (EG) and development. A large number of studies had been documented on the important role of democracy (DC) for EG (Acemoglu et al. 2019; Barro 1996; Barro 1994; Baum and Lake 2003; Bhagwati 1995; Chan 2002; Doucouliagos and Ulubaşoğlu 2008; Feng 1997; Gründler and Krieger 2016; Lipset 1959; Madsen et al. 2015; Moses and Yuanwang 2021; Nosier and El-Karamani 2018; Razaq et al. 2020). Although numerous theoretical, as well as empirical studies, carry out to address the question, "Does democracy stimulate economic growth?" but the debate is still controversial. For instance, some studies provide empirical evidence

that democracy accelerates economic growth (Kormendi and Meguire 1985; Scully 1988; Acemoglu et al. 2019; Chan 2002; George 2019; Gründler and Krieger 2016; Khan 2010; Mahmood et al. 2010). Conversely, some studies find the ambiguous and negative effect of DC on the EG.

(Barro 1996; Djezou 2014; Gerring et al. 2005; Lopes and Rivera-Castro 2017; Madsen et al. 2015; Moses and Yuanwang 2021). democracy is measured by democratic institutions. "This study uses the definition of institutions offered by (North 1990) institutions are the formal rule and informal norms together with the enforcement mechanism shape the human interaction and exchange and production".

North (1990) categorizes the institutions in the formal (written rules, contracts, & constitutions), and informal rules (unwritten rules, norms, traditions, code of conducts, & culture). (Acemoglu et al. 2005) further divided the formal rules into economic and political institutions or democratic institutions. Democracies are considered one of the important drivers of economic growth as compared to authoritarian regimes.

Democratic institutions have an indirect positive effect on EG through human capital accumulation, political stability, economic freedom, and infrastructure development (Acemoglu et al. 2019). Democracies play a significant in the allocation of resources efficiently (North 1990). Similarly, Rodrik (2000) argued that democratic institutions are positively correlated with the provision of education and healthcare to their masses. Democracies established peace through negation, which is further helpful to enhance growth (Bhagwati 1995).

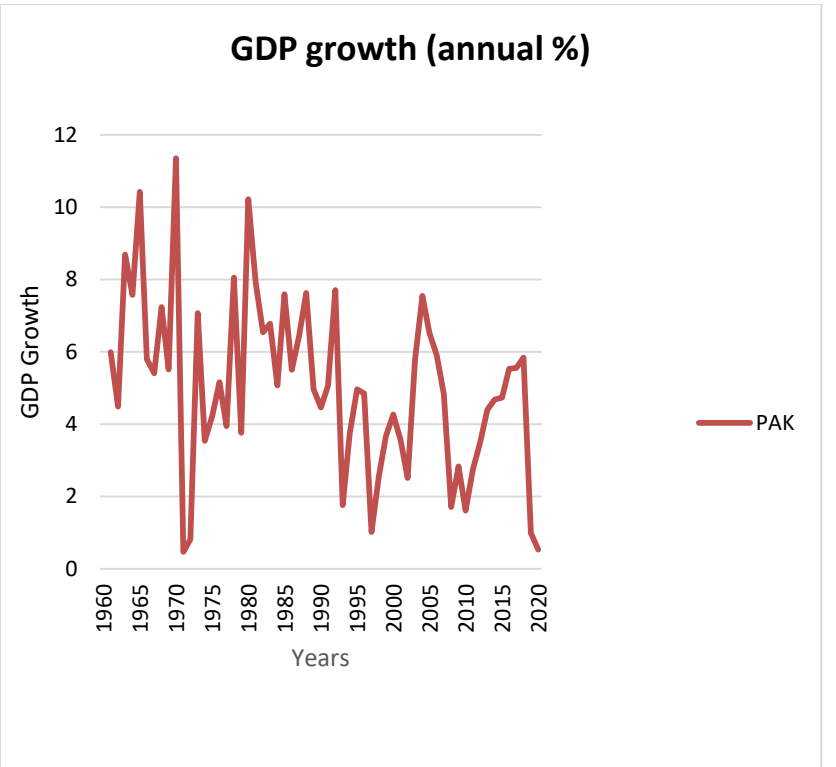
The opponents of the democratic regime argued that the political democracies are weak and unable to eliminate poverty, redistribution of wealth, especially in poorer groups in low-income countries (Huntington 2006). Furthermore, democratic institutions ignite internal conflicts, religious tension, and ethnic tension which ultimately hamper economic growth, (Doucouliagos and Ulubaşoğlu 2008). Similarly, Bhagwati (1982) and Krueger (1974) argued that democratic societies create "rent-seeking" activities. In a nutshell, democracies are "luxury goods" and costly especially for developing countries.

Pakistan came into being in August 1947. On the occasion of its 74th Independence Day, the Pakistan economy had faced three successful martial laws[1] due to political instability, corruption, the lack of visionary leadership, internal conflicts, and religious tensions. The score of political stability ranges from -2.5 to +2.5. the negative 2.5 indicates the weak democracies while the positive 2.5 strong democracies. The average score of political stability of Pakistan is -2.12. The maximum score is -1.1 in the year 2000, while the minimum score was -2.81 observed in 2011. The latest score was -2.25 in 2019. While the world average was -0.05 for 195 countries of the world covering the period of 1996-2019[2].

[1] Zaidi, S. A. (2005). Issues in Pakistan's economy. *OUP Catalogue*.
[2] WGI reports

In the light of the above discussion, democratic institutions played a central role in accelerating economic growth through multi-channels. The main objective of the present research work is to establish democratic institutions and economic growth in the case of Pakistan's economy.

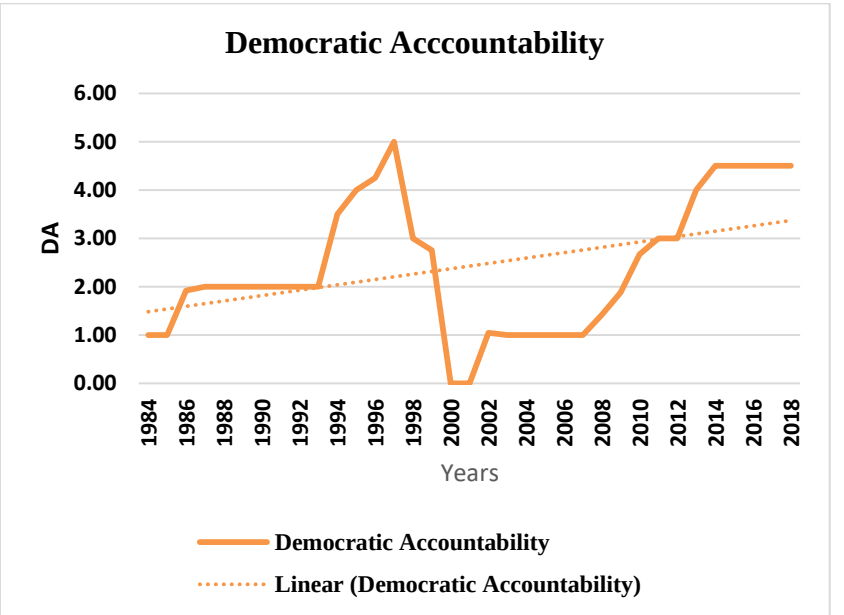
Figure 1.1: GDP Growth Rate of Pakistan (1960-2020)



Source: World Development Indicators

Figure 1.1. shows the pattern of GDP growth rates of Pakistan's economy for the years 1960-2020. Pakistan's economy has experienced the highest growth rate 11.35% in 1970. In the very next year due to the war of 1971 with the neighbor country India the growth rate fell 0.47%. In 2020, the growth rate record 0.52%. This decrease is due to the Covid-19 pandemic.

Figure 1.2: Pakistan Democratic Accountability (1984-2018)



Source: Worldwide Governance Indicators

Figure, 1.2. portray the situation of democratic accountability of Pakistan's economy for 1984-2018. The average trend shows the gradual improvement of DA of Pakistan. The highest score of Pakistan is 5 in 1997. While lowest score zero experienced the Pakistan economy in the year 2000.

Objectives of the Study

This research probes the following objectives:

- To empirically examine the connection between democratic accountability and economic growth with the presence of explanatory variables like human capital, infrastructure, and inflation.
- To investigate the short-run (SR) and long-run (LR) impact of democratic accountability, human capital, infrastructure, and inflation on the economic growth of Pakistan.

Literature Review

The myriad literature has been documented on the association between democracy and economic growth. However, there were still dissension views on the role of democracy and economic growth nexus. For instance, some studies found a positive and significant correlation between democracy and economic growth.

(Acemoglu et al. 2019; Gründler and Krieger 2016; Madsen et al. 2015). While others argued that the negative effect (Gerring et al. 2005; Przeworski et al. 2000). On the other hand, some draw inconclusive results (Murtin and Wacziarg 2014; Baum and Lake 2003).

Barro (1996) investigated the impact of democracy on the growth of 100 sample countries. longitudinal data for the period of 1960-1990 has been utilized. Their findings have confirmed the positive impact of democracy on growth with rule of law, human capital, minimum government consumption, and free markets. Similarly, Tavares and Wacziarg (2001) examine some new indirect channels of democratic institutions for growth. Democracy deters growth by reducing physical capital accumulation. Democracy is helpful for the poor because it enlarges education and depends on income inequality at the expense of PK accumulation. By using the time series data (Khan 2010) probe the LR and SR association between DC and economic EG in Pakistan. The time-series data for the period of 1970-2007 was utilized. The ARDL model established the direct effect of DA on Pakistan EG in LR & SR.

Djezou (2014) examine the casualty DA and EG in Cote d'Ivoire from 1960 to 2012. This study estimated both ARDL and Johansen cointegration approaches for LR & SR. The bound testing approach has confirmed the cointegration between variables. The granger causality test confirmed the LR one-way causality running from growth to democracy. This study also tested the non-linear relation between economic growth and democracy. In linear form, GDP is negatively associated with democracy. While in the square form it shows the positive association with democracy. This implies that democracy work with strong institutions.

Likewise, Madsen et al. (2015) argued that by increasing the democracy 1 std. dev. the economic growth would accelerate by 44%-98% point. These findings are robust with various estimates. This uses the two-panel data samples one from 1820-200 and the other from 1500-2000 with 141 sample countries.

Rachdi and Saidi (2015) explored the correlation of DC & EG in the sample of 17 MENA countries. Panel data for 1983-2012 has been utilized. They have estimated the fixed effect, random effect, & system GMM for empirical analysis. The other control variables include inflation, population, trade, and government size. The results of this study have confirmed the negative and statistically significant impact of DA on EG. On the other, hand Lopes and Rivera-Castro (2017) studied the relationship between DC, trust, and EG for the period of 1994-2014 for a sample of 79 countries. Static panel data models (FE & RE) and dynamic panel data models (IV) have been employed for empirical analysis. The empirical results of this study revealed the negative impact of democracy on GDP growth. While the trust is positively associated with the GDP growth in the case of all sample countries. similarly, Nosier and El-Karamani (2018) explored the indirect effect of democracy on economic growth by using the panel data for 1990-2015 in 17 MENA countries. This study also grouped the countries concerning

democratic ranking and income level. The indirect channel was were used to test the democracy's impact on growth were education, health, trade openness, government consumption, and capital. The results were very interesting, democracy impedes growth via trade openness and size of government. While it stimulated the growth through health in all sample countries. on the other hand, the impact of democracy via PK and Edu. inconclusive. Furthermore, democracy positively correlated with growth in the high-income groups, while hindering the economic growth of low-income countries. In the same way, Acemoglu et al. (2019) have found a positive association between democracy and economic growth in a large panel sample of 175 countries. they construct the panel data for 1960-2010 for the sample countries to overcome the measurement error. A dynamic panel data model has been applied. Their empirical findings confirm that democracy stimulates the growth of sample countries by 20 percent in the long run. Even the results are consistent with the different econometric models and functional forms.

Razaq et al. (2020) studied the correlation between governance, DC, and Pakistan's EG. Time series data for 1984-2017 has been used. Their findings reveal a positive association between DC and EG. The granger causality established the bi-directional causality is running from governance, and democracy to economic growth. On the other hand, (Santi and Afif 2021) incorporated the group of seven Indonesian economies to test the democracy-economic growth. Panel data for the period of 2011-2019 were imported from various secondary data sources. The random effect model has confirmed the statistically significant and positive impact of democracy on the growth of all sample countries. conversely, Moses and Yuanwang (2021) examine the hypothesis of democracy-economic growth nexus in the sample of 50 African economies throughout 1996-2017. They have applied extensive dynamic panel data modeling, namely, Tobit regression, GMM, & Panel Stepwise regression. empirical findings of this study had indicated the negative and statistically significant impact of democracy on the growth of all sample economies of Africa.

In nutshell, the above-cited literature mixed the effect of DC on EG. Some studies conclude the positive association between DC and EG for instance, (Acemoglu et al. 2019; Barro 1994; Bhagwati 1995; Feng 1997; George 2019; Gründler and Krieger 2016; Heo and Tan 2001). While others find the indirect impact of democracy on economic growth. They argued that democracy hinders economic growth (Djezou 2014; Lopes and Rivera-Castro 2017; Madsen et al. 2015; Nosier and El-Karamani 2018). Similarly, most of the studies documented on democracy and growth used panel data or cross-sectional data (Acemoglu et al. 2019; Bhagwati 1995; Chan 2002; Lipset 1959; Madsen et al. 2015). The present study uses the time series data for 1980-2018 in Pakistan. The study has applied the Johansen co-integration approach to test the LR and SR relationship between democracy and EG.

Data and Methodology

Section 3 of the study briefly explains the data sources, variables descriptions, functional form, econometric model, and time series modeling process used in this research.

Data Sources

To explore the LR and SR connection between DC and EG. The current research employs the time series for the period of 1984-2018 in Pakistan. The data on Real GDP, DA, HC, INF, and DEF has been retrieved from secondary data sources, for instance, "International Country Risk Guide" Methodology (Group 2012), Penn World Tables PWT (Summers and Heston 1991), United Nation Development Program Database (UNDP)[3] and World Development Indicators (Bank 2016).

The Econometric Model

To examine the relation between DC and ED, this study has experimented with many functional forms. The best model is given below:

$$[[GDP_t = \beta_0 + \beta_1 DA_t + \beta_2 HC_t + \beta_3 INF_t + \beta_4 DEF_t + \mu_t \ldots (i)]]$$

where,
β_0 is intercepted while other βs are the slopes in the model.
Here,
GDP: Gross Domestic Product
DA: Democratic Accountability
HC: Human Capital
INF: Infrastructure
DEF: GDP Deflator

Definition of Variables

The conceptual definitions and rationale of the variables of interest are given below.

Gross Domestic Product (GDP)

GDP is defined as the sum of the monetary assessment of all final products and services produced within an economy in one year. However, it excludes asset depreciation and the natural resources diminution value of an economy. Here, real GDP at constant 2005 million US$ is used.

[3] HDI data retrieve from various HRD. http://hdr.undp.org/en/data

Democratic Accountability (DA)

DA is defined as the degree of responsiveness of elected government towards its people. The less responsive the government, the more the chances of end of government. ICRG scores it out of six points. More points are awarded to altering democracies while lesser points are awarded to autarkies.[4]

Human Capital (HC)

HC refers to the quality of labor available in an economy. It doesn't take all available labor as equal rather the quality can be improved by more investment in them. It includes their expertise, understanding, and capability to work in terms of their economic value to an economy. Here, the Human Development Index (HDI) has been taken as a measure for HC. HDI is a combined statistic of longevity, knowledge, and living standard of the population of an economy. Its value lies between 0 and 1. More value of HDI if people are expected to live more years at birth, people have more education level and a better standard of living.

Infrastructure (INF)

INF can be defined as essential facilities prerequisites for the functioning of an economy. It contributes to the smooth working of an economy. Here, the production of electricity via natural gas as a percentage of total production is used as a proxy for infrastructure. It includes natural gas as an input to produce electricity except for natural gas liquids.

GDP Deflator (DEF)

GDP deflator or implicit price deflator is defined as a measure of the price level of newly-produced final domestic goods and services within an economy. It is used as a measure of inflation. Moreover, it is not based on a specific commodity basket rather it varies according to consumption patterns of the domestic population.

Modeling Framework in Time Series Data

This section briefly explains the econometric modeling and process of time series modeling used in this study**.**

[4] Altering democracy is categorized as following:

(i) an executive haven't served for two consecutive terms
(ii) free and fair electoral process according to the constitution
(iii) active involvement of more than one political party
(iv) autonomous working of judiciary
(v) checks and balance among the government ranks
(vi) personal liberty under legal process

Unit Root Test

Given the time-series dimension of the model, the checking of the unit root process becomes inevitable. For this purpose, Augmented Dickey-Fuller (ADF) proposed by (Dickey and Fuller 1979) and Phillips & Perron test (PP) tests by (Phillips and Perron 1988) are used. ADF test is the augmented version of the Dickey-Fuller (DF) test. Considering an Auto-regressive or (AR) process:

$$Y_t = \eta Y_{t-1} + X_t^{/}\gamma + \varepsilon_t \ldots (ii)$$

where Xt represents the set of regressors, η and ɣ are parameters to be estimated while εt is expected to be white noise. If $|\eta| \geq 1$, the series is non-stationary. While the variance is expected to increase and approach infinity with time. If $|\eta| < 1$, the series is stationary. Similarly, this stationary postulate can be tested whether the absolute value of η is lesser than 1. Now, the DF test is estimated by subtracting Yt-1 from both sides of the equation (ii):

$$\Delta Y_t = \alpha Y_{t-1} + X_t^{/}\gamma + \varepsilon_t \ldots (iii)$$

where, α = η-1. The DF test is applicable only when it has an AR (1) process. Moreover, if the series is correlated at higher lag order, εt no longer remains white noise. ADF on the other hand corrects higher lag order correlation by assuming the AR(η) process. ADF also adds η lagged difference terms of explained variable Y on the right-hand side of regression:

$$\Delta Y_t = \alpha Y_{t-1} + X_t^{/}\gamma + \alpha_1 \Delta Y_{t-1} + \alpha_2 \Delta Y_{t-2} + \ldots + \alpha_\eta \Delta Y_{t-\eta} + \nu_t \ldots (iv)$$

On the other hand, Philips-Peron (PP) estimates the non-augmented DF regression equation (ii). It modifies the α parameter to control serial correlation not to affect the asymptotic distribution of test statistics. The PP statistic is as follows:

$$t_\alpha^{/} = \left(\frac{\zeta_o}{f_o}\right)^{1/2} - \frac{T(f_o - \zeta_o)(se(\hat{\alpha}))}{2 f_o^{1/2} s} \ldots\ldots\ldots\ldots\ldots\ldots (v)$$

where ά is the estimate, tα is the coefficient of standard error, s is the standard error of test regression.

Johansen Cointegration Test

Using both ADF and PP, all the variables were integrated on order one or I (1). Given the order of integration, this research uses the Johansen cointegration approach (Johansen 1995) to estimate the presence of stochastic trends or cointegration between the variables. For this purpose, the long-run relationship between the variables is targeted using the Johansen Cointegration approach. Johansen cointegration can be processed by an estimated VAR object. Consider a VAR of order ω:

$$Y_t = A_1 Y_{t-1} + \ldots\ldots + A_\omega Y_{t-\omega} + BX_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (vi)$$

where Yt is the K-vector of I(1) variables, Xt is the D-vector of deterministic variables and εt is the vector of innovations. This VAR can be rewritten as follows:

$$\Delta Y_t = \prod Y_{t-1} + \sum_{i=1}^{\omega-1} T_i \Delta Y_{t-i} + B X_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (vii)$$

where,

$$\Pi = \sum_{i=1}^{\omega} A_i - I$$

&

$$T_i = -\sum_{m=i+1}^{\omega} A_m$$

Now if coefficient matrix Π consists of reduced rank or r < k, then there exists r*k matrices α and β each with rank r such that Π=αβ' and B'Yt is I (0). Here, r is the cointegrating rank and each column of β is the cointegrating vector. Similarly, the elements of α are called 'adjustment parameters' in Vector Error Correction (VEC) model. Johansen uses an unrestricted VAR to determine the Π matrix. To find the cointegrating rank or r, conditional upon the trend assumption we proceed from r=0 till r=k-1. In the Johansen cointegration approach, the trace statistic tests the null hypothesis of r cointegrating ranks against the alternative of k cointegrating ranks. Here, k represents the number of explained variables. While r ranges from 0 to k-1. The test statistic of the null hypothesis of r cointegrating ranks as follows:

$$LR_{tr}(r|k) = -T\sum_{i=r+1}^{k} \log(1-\lambda_i) \ldots\ldots\ldots\ldots (viii)$$

where λi is the biggest value of the Π matrix. On the other hand, eigenvalue statistic tests the null hypothesis of r cointegrating ranks against the alternative of r+1 cointegrating ranks. The test statistic is computed as:

$$LR_{\max}(r|r+1) = -T\log(1-\lambda_{r+1})$$

$$= -LR_{tr}(r|k) - LR_{tr}(r+1|k).....(ix)$$

where, r= 0 to k-1. Lastly, the trend assumption used for Johansen Cointegration analysis of level data of Yt is linear trends but the cointegrating equations have intercepts only:

$$H_1(r) = \prod Y_{t-1} + B X_t = \alpha(B'Y_{t-1} + \omega_o) + \alpha_\perp \gamma_o .....(x)$$

where $\alpha_\perp$ are called deterministic terms outside the cointegrating ranks. When the deterministic terms lie outside or inside the cointegrating rank, the decomposition is not considered unique. (Johansen 1995) identify the deterministic term that lies inside the cointegrating rank by the orthogonal projection of explained terms onto the space of α. Whereas, $\alpha_\perp$ is the null space of α because $\alpha'\alpha_\perp$

The Equation of Vector Error Correction Model (VECM)

VECM restricts the LR behavior of explained variables to converge their cointegrating relations along with short-run dynamics. The cointegration term shows the correction of deviation from LR equilibrium via partial SR adjustments. The cointegration equation is given as:

$$Y_t = \beta X_t .....(xi)$$

The corresponding VECM is as follows:

$$\Delta Y_t = \alpha_1(X_{t-1} - \beta Y_{t-1}) + \varepsilon_{1t} .....(xii)$$

$$\Delta X_t = \alpha_2(Y_{t-1} - \beta X_{t-1}) + \varepsilon_{2t} .....(xiii)$$

where αi represents the speed of adjustment of ith explained variable towards long-run equilibrium.

Granger Causality Test

Granger (1969) referred to check the causality between cointegrated variables. The causality shows the ability of a variable to predict other variables of interest. Using a VAR model captures the causality relationship between the variables such as follows:

$$Y_t = \alpha_o + \alpha_1 Y_{t-1} + ... + \alpha_i Y_{t-i} + \beta_1 X_{t-1} + ... + \beta_i X_{-i} + \varepsilon_t .....(xiv)$$

$$X_t = \alpha_o + \alpha_1 X_{t-1} + ... + \alpha_i X_{t-i} + \beta_1 Y_{t-1} + ... + \beta_i Y_{-i} + \varepsilon_t .....(xv)$$

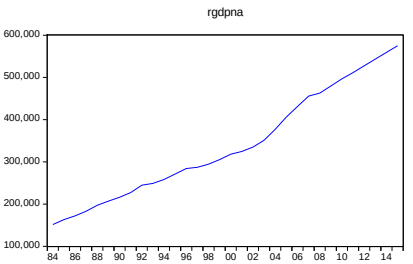
where I represent the selected lag length in the model.

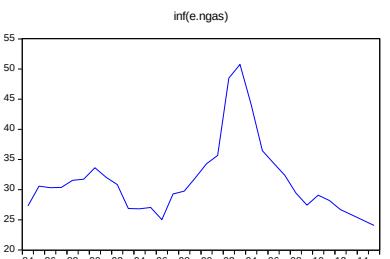
Results and Discussion

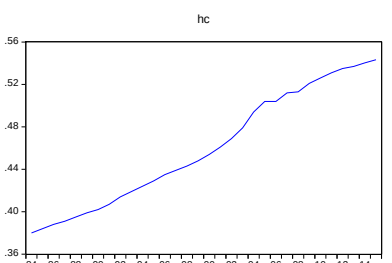
The preceding chapter consists of detailed results, discussion, and their economic as well as econometric interpretations.

Figure 4.1. Visual Representation

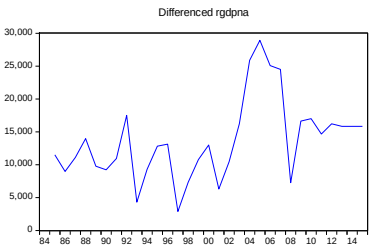
Visual Representation at Level

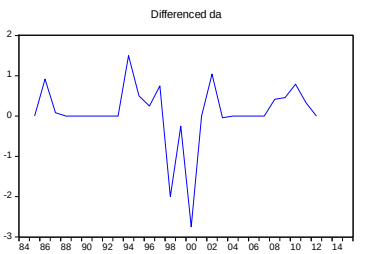


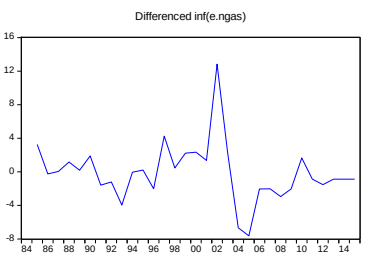


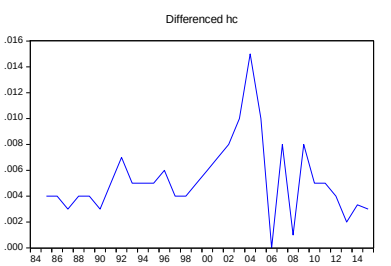


Visual Representation at First Difference









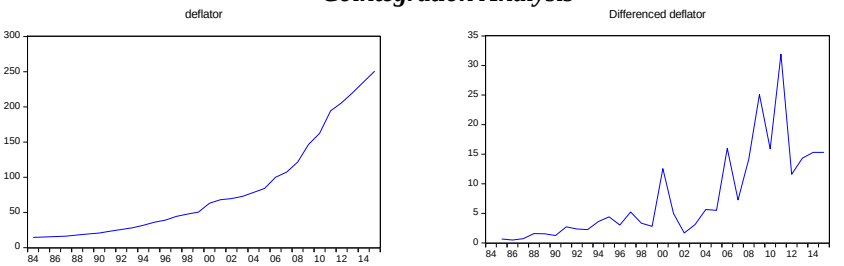


Figure shows the visual representation of the economic time series, all the series in column one exhibit the trends which indicate the unit root in time series. Column two represents after taking the first difference of series.

Table The Results of Unit Root Test

Variables	Augmented Dickey-Fuller Test (ADF)		Phillips-Perron Test (PP)	
	Level	1st Difference	Level	1st Difference
Gross Domestic Product (GDP)	-0.75	-3.29*	-0.75	-3.29*
Democratic Accountability (DA)	-1.78	-4.51***	-1.78	-4.51***
Human Capital (HC)	-1.64	-3.76***	-1.64	-3.76***
Infrastructure (INF)	-1.37	-3.83***	-1.37	-3.83***
Inflation (DEF)	0.81	-4.69***	0.81	-4.69***

Source: Authors' estimates.
Note: * and*** indicates significance at 10% and 1%.

The results of Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) tests showed stationarity at 1st difference or order of integration I (1). Using the test equation of intercept and trend with lag length via Schwarz Information Criteria (SIC), the order of integration one or I (1) leads to the determination of cointegration between the variables. Given that all the referred variables have been integrated on order one, this research corresponds to the Johansen Cointegration approach.

Table Johansen Cointegration Results

Johansen Cointegration Test			
Hypotheses		Test Statistics	
Maximum Rank	Parms	Trace	Max Eigen
0	30	113.95	55.32
1	39	58.62	29.02***
2	46	29.59***	16.12

Source: Authors' estimates.
Note: *** indicates significance at 1%.

The trace statistics show that there are at most two cointegrating ranks in the model. Similarly, max Eigen statistics show at most one cointegrating rank in the model. This shows that there exists a cointegration between economic growth, democratic accountability, human capital, infrastructure, and inflation in the case of Pakistan.

Table Johansen Normalized Restriction Results

Johansen Normalized Coefficients	
Variables	Coefficients
DA	-22563.26***
HC	-1749009***
INF	-12254.54***
DEF	1250.244***

Source: Author's estimates
Note: *** indicates significance at 1%

Johansen's normalized results show that democratic accountability, human capital, infrastructure, and inflation have a positive impact on the EG of Pakistan in the LR. The positive sign of DC shows that the responsiveness of governments towards their people boasts EG in Pakistan. As government responsiveness

increases, GDP increases in Pakistan, these results are similar to (Acemoglu et al. 2019; Khan 2010; Nosier and El-Karamani 2018; Przeworski et al. 2000; Quinn and Woolley 2001; Santi and Afif 2021) in the literature. Similarly, the improvement in the human capital of the population will positively influence the GDP of Pakistan (Asteriou and Agiomirgianakis 2001; Becker 2009, 1975, 1992; Goode 1959; Hopkins 1991). An educated and healthy workforce will be efficient and productive for the economy. Moreover, the availability of infrastructure (electricity through natural gas complements) in the production process in Pakistan. As the infrastructure increases, GDP increases in Pakistan. Lastly, the negative sign of deflator shows that as the price of newly-produced goods and services increases, it hinders the real GDP of Pakistan (Easterly and Fischer 2001; Pérez 2020).

Table Vector Error Correction Model (VECM) Results

Vector Error Correction Model (VECM)						
	ΔGDP	ΔDA	ΔHC	ΔINF	ΔDEF	ECT(-1)
GDP	-	1914.1*	-213393.6	-688.9***	926.7***	-0.07***
DA	-0.00	-	53.44	-0.03	-0.03	0.00
HC	-0.00	-0.00	-	0.00	0.00***	-0.00***
INF	-0.00*	-0.65	215.95	-	-0.24	0.00
DEF	0.00	1.12	431.3	0.398	-	0.00

Source: Authors' estimates
Note: ECT (-1) represents error correction term. *** is significance at 1%.

The VECM results also confirm the long-run association among variables or cointegration in the model. The error correction term is negative, lesser than one, and also significant at 1%. It means that 7% of the disequilibrium is corrected in one year. Similarly, there also exists a positive short-run relationship of democratic accountability and inflation with the economic growth of Pakistan. While infrastructure and human capital show a negative impact on growth in the short run.

Table Granger Causality Wald Test Results

Granger Causality Wald Test			
Causality	W-stat	P-value	Remarks
DA→ GDP	15.72	0.00	Unidirectional Causality
HC↔ GDP	16.46	0.00	Bidirectional Causality
INF↔ GDP	30.32	0.00	Bidirectional Causality
DEF→ GDP	12.00	0.00	Unidirectional Causality
Source: Author's estimates			

Granger causality results show that there exists a unidirectional causality running from democratic accountability and inflation to the economic growth of Pakistan. While bidirectional causality exists of human capital and infrastructure with economic growth.

Table Diagnostic Test Results

Diagnostic Tests		
Test	P-value	Remarks
ADF Test	0.00	Residuals are level
Jarque-Bera	0.70	Normality of Residuals
Lagrange-multiplier	0.39	No autocorrelation
Breusch-Pagan Godfrey	0.57	No heteroscedasticity
Source: Authors' estimates		

The extracted residuals appeared integrated at level or I (0). This further justifies the existence of long-run cointegration between the referred variables. Similarly, the p-value of the Jarque-Bera statistic is 0.70 showing that the selected sample data skewness and kurtosis match the normal distribution. The Lagrange multiplier test reports a p-value of 0.39. This result shows that the fitted model is independent of auto-correlation. Breusch-Pagan Godfrey's statistic shows a p-value of 0.57, which means that there is no problem of heteroscedasticity in our model.

Conclusion

The present study focuses on the important role of democracy in the economic growth of Pakistan. For this purpose, this study uses democratic accountability,

human capital, infrastructure, and inflation as explanatory variables. Time series data throughout 1980-2018 has been utilized. Johansen cointegration results show that there exists a long-run cointegration between Democracy, human capital, infrastructure, inflation, and economic growth. DC shows a positive impact on economic growth in the long run. The study also confirms the short-run relationship of democratic accountability, infrastructure, and inflation with the economic growth of Pakistan. Similarly, there exists a unidirectional causality running from DC to EG. The diagnostic results confirm normality, no autocorrelation, and heteroscedasticity in our model. Based on econometric results', this study recommends that the policymakers should improve the quality of democratic institutions for sustainable EG in Pakistan. Moreover, the elected governments should respond to people's problems to achieve sustainable economic growth in Pakistan. HC has a multidimensional impact on economic growth. It is a necessary factor to understand the complex nature of institutions promoting economic growth. Hence, policymakers should focus on improving the quality of education and health to enhance the quality and stock of HC. Moreover, should strengthen the political institutions and democracy for sustainable economic growth in Pakistan. Inflation hinders EG the government of this country should control inflation to enhance growth and development.

References

Acemoglu D, Johnson S, Robinson JA (2005) Institutions as a fundamental cause of long-run growth. Handbook of economic growth 1:385-472

Acemoglu D, Naidu S, Restrepo P, Robinson JA (2019) Democracy does cause growth. Journal of Political Economy 127 (1):47-100

Asteriou D, Agiomirgianakis GM (2001) Human capital and economic growth: time series evidence from Greece. Journal of Policy Modeling 23 (5):481-489

Bank W (2016) World development indicators (WDI). World Bank Washington, DC,

Barro R (1996) Democracy and Growth. Journal of Economic Growth 1

Barro RJ (1994) Democracy & Growth. National Bureau of Economic Research Cambridge, Mass., USA,

Baum MA, Lake DA (2003) The political economy of growth: democracy and human capital. American Journal of Political Science 47 (2):333-347

Becker GS (1975) Front matter, human capital: a theoretical and empirical analysis, with special reference to education. In: Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, Second Edition. NBER, pp -22-20

Becker GS (1992) Human capital and the economy. Proceedings of the American philosophical society 136 (1):85-92

Becker GS (2009) Human capital: A theoretical and empirical analysis, with special reference to education. University of Chicago press,

Bhagwati J (1995) Democracy and Development: new thinking on an old question. Indian Economic Review:1-18

Bhagwati JN (1982) Directly unproductive, profit-seeking (DUP) activities. Journal of Political economy 90 (5):988-1002

Chan Sylvia (2002) Liberalism, Democracy and Development. Cambridge University Press, New York

Dickey DA, Fuller WA (1979) Distribution of the estimators for autoregressive time series with a unit root. Journal of the American statistical association 74 (366a):427-431

Djezou WB (2014) The democracy and economic growth nexus: empirical evidence from cote d'Ivoire. The European Journal of Comparative Economics 11 (2):251

Doucouliagos H, Ulubaşoğlu MA (2008) Democracy and economic growth: a meta-analysis. American Journal of Political Science 52 (1):61-83

Easterly W, Fischer S (2001) Inflation and the Poor. Journal of Money, Credit and Banking:160-178

Feng Yi (1997) Democracy, Political Stability and Economic Growth. British Journal of Political Science 27

George A (2019) Democracy, Trade openness and economic growth: A Cross-Country study. ZENITH International Journal of Multidisciplinary Research 9 (4):236-248

Gerring J, Bond P, Barndt WT, Moreno C (2005) Democracy and economic growth: A historical perspective. World politics 57 (3):323-364

Goode RB (1959) Adding to the stock of physical and human capital. The American Economic Review 49 (2):147-155

Granger CW (1969) Investigating causal relations by econometric models and cross-spectral methods. Econometrica: journal of the Econometric Society:424-438

Group P (2012) International country risk guide (ICRG).

Gründler K, Krieger T (2016) Democracy and growth: Evidence from a machine learning indicator. European Journal of Political Economy 45:85-107

Heo U, Tan AC (2001) Democracy and economic growth: A causal analysis. Comparative Politics:463-473

Hopkins M (1991) Human development revisited: A new UNDP report. World Development 19 (10):1469-1473

Huntington SP (2006) Political order in changing societies. Yale University Press,

Johansen S (1995) Identifying restrictions of linear equations with applications to simultaneous equations and cointegration. Journal of econometrics 69 (1):111-132

Khan K (2010) Democracy Displaced in Pakistan: Case History of Disasters of Social Pollution. The Journal of History and Social Sciences 1 (1)

Kormendi RC, Meguire PG (1985) Macroeconomic determinants of growth: cross-country evidence. Journal of Monetary economics 16 (2):141-163

Krueger AO (1974) The political economy of the rent-seeking society. The American economic review 64 (3):291-303
Lipset SM (1959) Some social requisites of democracy: Economic development and political legitimacy. The American political science review 53 (1):69-105
Lopes T, Rivera-Castro MA (2017) Democracy, Trust and Economic Growth. The Empirical Economics Letters 16 (12):1277-1286
Madsen JB, Raschky PA, Skali A (2015) Does democracy drive income in the world, 1500–2000? European Economic Review 78:175-195
Mahmood K, Azid T, Siddiqui P, Mashkoor M (2010) Democracy and Economic growth in Pakistan. Available at SSRN 1675732
Moses S, Yuanwang X (2021) Democracy and Economic development in africa: a friend or foe? Epra International Journal of Economic and Business Review 9 (6):1-8
Murtin F, Wacziarg R (2014) The democratic transition. Journal of Economic Growth 19 (2):141-181
North DC (1990) Institutions, institutional change and economic performance. Cambridge university press,
Nosier S, El-Karamani A (2018) The Indirect Effect of Democracy on Economic Growth in the MENA Region (1990–2015). Economies 6 (4):1-24
Pérez JP (2020) The minimum wage in formal and informal sectors: Evidence from an inflation shock. World Development 133:104999
Phillips PC, Perron P (1988) Testing for a unit root in time series regression. Biometrika 75 (2):335-346
Przeworski A, Alvarez RM, Alvarez ME, Cheibub JA, Limongi F, Neto FPL (2000) Democracy and development: Political institutions and well-being in the world, 1950-1990, vol 3. Cambridge University Press,
Quinn DP, Woolley JT (2001) Democracy and national economic performance: the preference for stability. American journal of political science:634-657
Rachdi H, Saidi H (2015) Democracy and economic growth: Evidence in MENA countries. Procedia-Social and behavioral sciences 191:616-621
Razaq A, Nazir R, Adil F, Akhtar M (2020) DEMOCRACY, GOVERNANCE AND ECONOMIC GROWTH: TIME SERIES EVIDENCE FROM PAKISTAN. Journal of Economics and Economic Education Research 21 (3):1-14
Rodrik D (2000) Institutions for high-quality growth: what they are and how to acquire them. Studies in comparative international development 35 (3):3-31
Santi NR, Afif FY (2021) The impact of the quality of democracy on the economic growth of provinces in Indonesia. Journal of Governance and Accountability Studies 1 (2):121-132
Scully GW (1988) The institutional framework and economic development. Journal of Political Economy 96 (3):652-662

Summers R, Heston A (1991) The Penn World Table (Mark 5): an expanded set of international comparisons, 1950–1988. The Quarterly Journal of Economics 106 (2):327-368

Tavares J, Wacziarg R (2001) How democracy affects growth. European economic review 45 (8):1341-1378