The nexus between economic growth, corruption and external debt in Pakistan

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Abstract

Corruption hurts various factors of a country, including welfare systems, governments and, most importantly, economic growth. This paper investigates the relationship between economic growth and corruption in Pakistan from 1998 to 2021. We used time series models to check this relationship. The prerequisite of the time series model is the unit root test. We use the augmented dicky fuller (ADF) and Philips-Perron (PP) tests. To check the short-run and long-run relationship between economic growth and corruption, along with other macroeconomic variables, ARDL was used. As per our findings, the effects of crime and interest rates on economic growth (LGDP) are positive and statistically significant. However, the short-run association between LED and LGCF with LGDP is not statistically significant. Furthermore, corruption and gross capital formation truly influence economic growth over the long-term for this specific data, yet LED, and LIR factors are statistically insignificant, suggesting that these variables do not have a long-run relationship with economic growth. According to the results of the Short-run model, immorality and interest payment influence on income progress (LGDP) are statistically significant at a significance level of 95% and 90%, respectively.

Keywords: *Economic growth, Corruption, External debt, Gross Capital Formation and Interest Rate.*

Introduction

Corruption plays a vital role in countries' economies, affecting entire welfare systems and political and economic environments, creating inequality, frustration and hardship within the people. Corruption is defined as the "abuse of public power for private gain" (Gujarati, D. 2004). It is essential to focus and analyze corruption at the present moment as, keeping in mind the increasing corruption scandals of government officials and global economic crises, Panama and paradise papers are living proof of it. This study aims to analyze the relationship between economic growth, corruption, external debt, gross capital formation and the interest rate of Pakistan from 1998 to 2021(Huang, C.-J. 2016).

Corruption is an age-old problem to which we have yet to find a solution. Analysts have split down the middle whenever it relates to how corruption affects a country's economy. According to the "grease the wheels" hypothesis, corruption boosts economic growth by decreasing adherence to inefficient regulations (Huntington, S.P. 1968). Paying off politicians and bureaucrats is likely to spur dynamic financial mobility in a climate where regulations on new businesses are strict. Constant "sand the wheels" rumors persist. On the other hand, corruption slows down the economy since it stifles productive innovation and progress. The evidence suggests that corruption lowers economic growth in nations with low entrepreneurship rates and poor quality government (IDS 2017).

It is essential to study corruption and its adverse effects on several factors, most notably on economic growth, as it has become the top issue. It has been distinguished as the primary obstruction to the development of the nations, as it structures one of the main pressing concerns of worry that block development and advancement. In addition, the slowing growth rate is a result of debt obligations on the one hand and corruption on the other, and both of these factors have weakened the various financial recovery and adjustment efforts (Im, K.S., Pesaran, M.H. and Shin, Y. 2003). This is evidenced by the fact that a disproportionately large amount of the district's assets are either used to settle debts or put to inappropriate use rather than being invested in ways that would positively impact its people and material resources. Owing to the pervasiveness of corruption, any offer to fund aid programs would be a waste of time and a further incentive for financial looting and graft at worst. Since it stunts economic growth and

weakens the government's lawful, financial, and political institutions, corruption is often seen as a significant barrier to progress and improvement (Jayaraman, T.K. and Lau, E. 2009).

Research Problem

In some cases, the contemporary advancements that happened alongside the economic and legitimate progress prompted an expansion in the enormous scope of corruption. While the breakdown of socialism changed the design of chances and motivators for sin, it did not dispense with them. Specifically, the creation of casual individual ties laid out during the time of focal arranging did not fail to exist, and the privatization that followed the breakdown of socialism made new motivating forces and valuable open doors for corruption. Corruption had the option to thrive because most post-socialist nations had insignificant or no pleasant societies. Consequently, the responsibility of the reformers (some of whom were socialist lawmakers) was non-existent (Keynes, J.M. 1929).

Besides, a few researchers had contended that the wrong masses equitably produced new wrong elites, in any event, when the previous socialist elites were constrained out. Subsequently, notwithstanding the high introduction of any desires for expanding development rates and moving along ways of life through a progression of economic changes after the breakdown of socialism, non-straightforward privatization may, truth be told, have deteriorated the financial execution of a few post-socialist nations. The point is that the cancerous economic system that includes interest deceitfulness, rigged elections, bribes, blackmail and even murder starts with very fundamental corruption. Hence it should be our foremost stress to eliminate corruption from ourselves and our nation (Krugman, P. 1988).

Significance of the research

Corruption unfavorably affects the government assistance framework, political turn of events, social history and above all, the financial development of nations, causing shortcomings and imbalance among individuals; subsequently, in this paper, we concentrate on the connection between economic growth and debasement of Pakistan from 1998 to 2021. To investigate this connection, we used time series models(Lambsdorff, J.G. 2005). The unit root test is necessary for every time series model. We employ the enhanced dicky fuller (ADF), and Philips-perron

(PP) tests to make data stationery. This study used ARDL to examine the short- and long-term connection between economic growth and corruption, controlling for other macroeconomic parameters. Based on our findings, both crime and interest rates have significant and positive effects on the gross domestic product (GDP). LED and LGCF are unrelated to LGDP in the near run. In addition, for this data, corruption & gross capital creation have a long-term effect on economic growth, but LED and LIR components are statistically negligible, suggesting they do not have a lengthy link with economic growth.

Review of Literature

According to Shittu et al. (2018), this research aims to analyze the impact of debasement and foreign debt on economic growth in five selected SSA nations between 1990 and 2015. Cointegration root & board cointegration tests are used to examine overall series stationarity and the severe coupling independently. Moreover, we use static OLS and substantially modified OLS to look at the significant coefficients of such model components. Causation between variables can be investigated using the Granger causality test (Leff, N.H. 1964). The board investigation concluded that the escalating levels of budget deficit in the chosen nations warrant serious attention. The 46 SSA nations' foreign debt analysis shows that the top five commitments account for about half of the overall external debt. This kills the public venture because of unforeseen commitments. Despite the potential harm to the economy, it is in states' best interest to accept speculative money from a variety of sources in order to spread out the risk associated with the growing national debt. More money may be made while protecting the environment if certification requirements for imported goods with high labor and impact costs are relaxed (Megersa, K.A. 2015).

Gründler et al. (2019) use additional data for 175 countries from 2012 to 2018 to assess the connection between debasement and economic development. To quantify the public sector's apparent decline from 2012 to 2018, we utilize Transparency International's updated List of Corruption Index (CPI) for 175 countries. We use data from the IMF on actual per capita GDP. In 2012, World Bank oversaw a significant upgrade to the CPI system. World Bank gathered data before 2012 to determine the percentage of debasement that has been seen. At a particular point, this methodology produced a nearly equivalent record across all countries; however, the

pre-2012 CPI was not comparable over the long term (Mohd Dauda, S.N., Ahmad, A.H. and Azman-Saini, W. 2013). Long-term CPI's distinctiveness stems from the tendency toward equivalence disseminated unevenly across critical geographies and nations. Together, corruption's long-term effects on development resulted in a 17% decline in per capita GDP when the switched CPI increased by one confidence interval. Debasement hinders growth by decreasing FDI and increasing expansion, which is particularly well-articulated in absolutism (Ndikumana, L. and Boyce, J.K. 2011).

This research uses a nonlinear method to analyze how dishonesty might impede economic growth to pinpoint corruption's precise cutting edge. This research examines the impact of wrongdoing on monetary advancement across regions in Indonesia between 2004 and 2015 to determine if areas with lower levels of corruption benefit from debasement by propping up their economic and social development whenever the amount of defilement cases is less than the corruption limit (Panizza, U. and Presbitero, A.F. 2014). When corruption reaches epidemic proportions, it stymies progress in economically depressed regions. When comparing levels of corruption in Indonesia, this study uses a new metric: the number of debasement instances examined by Komisi Pemberantasan Korupsi (KPK; Indonesia Corruption Eradication Commission).

Hansen's (2000) example parting and limit paradigm is used to survey the debasement limit impact, and the multiple recursive least square (2SLS) assessor is appropriately used to address the endogeneity problem. The assessment's findings show that corruption has a development-destabilizing effect in regions where debasement levels are below the limit of 1.765 places and a detrimental impact that is more pronounced in locations where debasement levels are beyond the limit (Alfada, 2019).

This study examines how debasement control and guidelines have affected global development from 1996 to 2015. Our findings are similar to the beneficial effects of debasement control after handling the potential endogeneity problem with the unique board information models. So, as a first step, we decided to use the distinction summarized approach for intervals (DIF-GMM) assessor (Arellano and Bond, 1991), (AB from this point forward). This method uses the information's dynamic qualities to produce instrumental factors. Detail tests are presented by Arellano and Bond (1991) and are pertinent once the GMM has evaluated a potent model from

International Journal of Social Sciences and Entrepreneurship (IJSSE)
ISSN (Online): 2790-7716 , ISSN (Print): 2790-7724

Vol 2, Issue 2
July to December 2022

board data. The model, sometimes referred to as the first-distinction GMM strategy, is suitable for assessing this particular model for a board of nations using only temporarily available information (N is enormous and T is minor). The previously discussed difficulties can be overcome using the structure GMM (sys-GMM) inspector, designed to have relatively limited example properties. Debasement control has clear benefits, especially for low and lower-middle-income countries (Agha, A., Rashid, A., Rasheed, R., Khan, S., & Khan, U., 2021). For the MHI nations, the impact of involvement in the economy is hardly ever seen in isolation; nevertheless, when combined with superior standards of guidance, it is demonstrated to lead to more remarkable growth and development. Our findings have also shown that exchange and the kind of human resources, or teaching, propel progress in generally developed countries. Anti-corruption estimates should be provided for a broad range, particularly in low-income countries with widespread corruption in various sectors (SHARMA et al., 2019).

The effects of wrongdoing on economic growth are analyzed here. The World Bank collected information from 120 different nations between 2004 and 2017, and we used that information to make our estimates. This is how the research attempts to put a number on the effect that writing down bad loans and advances has on economic expansion. However, this presents a challenge because NPLs are an integral aspect of economic growth, one of the factors that determine NPL levels independently. We develop a model that combines NPLR and RGDP criteria to solve the concurrency problem. According to Belsley (1988), the more stages of SLS used, the stronger the correlations between error terms, making 3SLS far more effective than 2SLS. Nosier and El-Karamani propose utilizing 3SLS to verify the oblique impact of a component on economic growth (2018). The 3SLS auditor, which we discuss here, combines the 2SLS with SUR and instrumental variable evaluation and is used to evaluate the aforementioned concomitant condition. The findings of 3SLS relapses show that debasement positively correlates with the share of nonperforming lending, which reduces the banking system's viability. In addition, this analysis provides proof that the financial system mediates the effect of devaluing on growth in the economy: When corruption is present, there is an increase in loans that end up being defaulted on, which slows down economic growth (Son et al., 2020).

Capital formation in 17 Asian nations with rising and developing economies is analyzed, along with the impact of devaluation and the shadow economy. This article examines yearly data from

the World Bank, the United Nations, and the International Monetary Fund from 2000 through 2015 to see if debasement and the shadow economy affect financial progress. This study employs the GMM methodology, a condensed version of the original. The results show that while the black market benefits economic growth, debasement has a much more significant negative effect (Khan, S., Rashid, A., Rasheed, R. and Amirah, N.A. 2022). These results show that currency debasement is still not "oil on the wheel" of expansion. Asia's growing economic sectors and emerging economies will benefit even more from a smaller shadow economy (NGUYEN et al., 2020).

Ten ASEAN nations' experiences with the impacts of a fair and square depreciation of their currencies between 1999 and 2018 are examined. The following findings are suggested by the results obtained using a Bayesian various leveled blended effects relapse using a Monte Carlo approach paired with the Gibbs sampler: (I) In terms of likelihood, the indicators of property rights, government reliability, taxation rate, colossal opportunity, employment opportunity, and venture opportunity decisively affect the reaction seen in the devaluation file; (ii) Public expenditure, exchange opportunity, and freedom from the rat race apply an unmistakably negative consequence, while the impact of money-related opportunity is debatable; and (iii) irregular captures are present as we speak. Following the results of the experiment, the following suggestions for arrangements are made: Right away, the eleven ASEAN governments should make clear disclosures about their organizational structures. Additionally, state-run administrations must assist in regulating people and social-political organizations (Thach et al., 2021).

Through board information analysis of 75 rural nations from 1995 to 2014, we investigate if debasement alters the positive effects of psychological wellness use and income tax on development (Khan, S., Rashid, A., Rasheed, R. and Amirah, N.A. 2022). This study makes use of board information analysis. This methodology is adequate for evaluating economic growth since it considers the significant effects not captured by cross-sectional regressions and recognizes the differences in innovation between different countries (Rashid, A., Rasheed, R., Amirah, N.A., Yusof, Y., Khan, S., & Agha, A. A., 2021). This inquiry considers the Generalized Method of Moments in addition to OLS models (GMM - distinction and framework). GMM is a valuable tool for examining the relationship between friendly pointers

and income growth, as Baldacci et al. (2008) noted. The findings show that while tax assessment and general well-being consumption can increase financial development, their effects are lessened in countries with more unfavorable legislative systems (Mendonça et al., 2018).

This research explores the relationship between corruption, monetary progress, and financial advancement over time in 142 countries using panel cointegration and panel blunder repair models from 2002 to 2016. The instances are further divided into an agricultural nations sub-test and a constructed nations sub-sample to clarify the conclusion. By connecting and endogenizing the relapse components in conventional OLS assessment, the FMOLS technique can correct the divergence. Finally, the VECM assessment results demonstrate that the sub-tests for emerging nations' GDP and COR only have a long-term impact on BM for the complete case. According to the precise conclusion reached in this process, we have determined that both financial sector development and corruption impact monetary improvement (Song et al., 2021).

To begin with, we propose that policymakers for the developing countries in our example launch a few initiatives that affect and help progress financial development to hasten the currency turn of events. Second, preventing debasement is detrimental to rising countries' ability to advance economically(Khan, S., Zaman, I., Khan, M., I., & Musleha, Z., 2022). Equal illegal payments like debt repayment do not typically result in failure, damage assets, or reduce third- and fourth-party benefits and developed countries cannot promote economic development alone by controlling corruption and boosting economic growth. This article investigates the effects of devaluation and privatization on economic growth in the former USSR and Central and Eastern European socialist countries. We use a debasement and privatization enlarged expansive pioneer ardent endogenous development model to establish our exploratory theories. Our experimental verification of these projections is based on a database of 29 post-socialist countries from 1996 to 2014. Examine experimentally confirmed hypotheses using econometric techniques that take advantage of the dataset's board qualities. The most effective approach to address the difficulties stated above has been Assessors using the summarized Method of Moments (GMM) for dynamical board information models. In these circumstances, the Blundell & Bond (1998) Simultaneous Equations assessor prevails in a specific case of inclined Root Average Square Error. As a result, the Granger causality is measured by the relapsing coefficient of an endogenous variable chosen in advance. Our assessment findings confirm the adverse effects of

devaluation, while the positive effects of privatization are only seen in limited contexts (Cieślik et al., 2018).

Research Methodology

Research Design

There are just a few reliable sources for data collection in Pakistan, including the Ministry of Finance, Central Bank, Securities & Futures Commission of Pakistan, and the Pakistan Bureau of Statistics. We obtained information from the Pakistani State Bank of Commerce regarding the GDP and external debt. While details on the gross formation of capital (GCF) and interest payment (IR) were gathered from several sources, corruption information was collected from Transparency International's bribery perception index data collection. Given that many studies use GDP to show economic growth, we use the logarithm of GDP (LGDP) instead. Due to the lack of evidence, we use data for this study between 1998 and 2021 to examine how corruption and economic growth are related. The dependent variable in this study is gross domestic product, while the primary independent factors are corruption, gross domestic product, foreign debt, and interest rate (GDP).

To examine this association, we employed time-series models. The unit root test is a requirement for the time series model, and we use the augment Dicky Fuller (ADF) or Electric (PP) tests to fulfill this requirement. ARDL was used to thoroughly examine the short- and long-term connection between economic expansion, corruption, and other macroeconomic issues.

Evaluative Analysis

Before beginning any regression or time series modeling, it is crucial to get a sense of your dataset—precisely, what your population suggests. The data design of your data set provides a straightforward explanation for this. The primary or descriptive statistics for the variables utilized in this investigation are provided in Table 1. We have a 24-observation yearly data collection from 1998 to 2021. Natural logarithms are used to transform all variables.

Table 1

Descriptive Statistics

	LCORR	LED	LGCF	LGDP	LIR
Mean	4.7482	10.8998	14.5936	15.9565	3.5893
Median	4.8283	10.9405	14.6627	15.9777	3.5838
Maximum	4.9698	11.7801	15.7973	16.3833	4.2440
Minimum	4.2627	10.3228	13.4253	15.4687	2.7762
Std. Dev.	0.2252	0.4705	0.7974	0.2945	0.4150
Skewness	-0.9809	0.3509	-0.0841	-0.1842	-0.2452
Kurtosis	2.5111	1.8377	1.6378	1.7838	2.2735
Jarque-Bera	4.0873	1.8433	1.8838	1.6149	0.7681
Probability	0.1296	0.3979	0.3899	0.4460	0.6811
Observations	24	24	24	24	24

The most significant value for the corresponding variable is (4.969), while the smallest value is (4.748)—the mean value for the logarithmic of corruption (LCORR) (4.262). Data points are near the mean, as indicated by the standard deviation of 0.225 and the lower skewness value (-0.980), which implies negatively skewed data. The platykurtic kurtosis (2.511) would be less than 3. The JB statistic's P-value (0.1296) is higher than 0.05. Thus we can accept Ho and conclude that the series usually is distributed.

The lag of the public debt (LED) variable's median value is 10.899, its highest value is 11.780, and its mean price is (10.322). A standard deviation of 0.470 means that the statistics are close to the mean, while a skewness of 0.350 indicates that the data are positively skewed. Kurtosis (1.837) is below 3, which indicates platykurtic. We can accept Ho because the JB statistics P-value (0.397) is higher than 0.05.

The maximum and minimum values for the lagged increased capital formulation (LGCF) variable are 15.797 and 14.593, respectively (13.425). The data sets are far from the mean, as indicated by the standard deviation of (0.797) and the lower value of skewness (-0.084), which implies negatively skewed data. When kurtosis (1.637) is far less than 3, platykurtic is indicated. We can accept Ho because the JB statistics P-value (0.389) is higher than 0.05.

The peak range for the lagged economic output (LGDP) variable is (16.383) as well as the minimum value is (15.956), respectively (15.468). Data points are near the mean, as shown by

the standard deviation of (0.294) and the lower skewness value (-0.184), which implies

negatively skewed data. The platykurtic kurtosis (1.783) is less than 3. We can accept Ho

because the JB statistic's P-value (0.44) is higher than 0.05.

The mean value for the lagged cost of borrowing (LIR) variable is (3.589), while the maximum

value and minimum values for the corresponding variables are (4.243 and (2.776). Data sets are

close to the mean, as shown by the standard deviation of (0.414) and the lower skewness value (-

0.245), which implies negatively skewed data. Kurtosis (2.273) is below 3, which indicates

platykurtic. We can accept Ho because the JB statistics P-value (0.681) is higher than 0.05.

The mean value for the lag of risk premium (LIR) variable is (3.589), while the maximum value

and minimum values for the corresponding variables are (4.243 and (2.776). Statistics are close

to the mean, as shown by the standard deviation of (0.414) and the lower skewness value (-

0.245), which implies negatively skewed data. Kurtosis (2.273) is below 3, which indicates

platykurtic. JB statistics' P-value (0.681) is higher than 0.05. Thus, we can accept it. The

minimum value is, and the maximum value is (10.322). A standard deviation of 0.470 means that

the statistics are close to the mean, while a skewness of 0.350 indicates that the data are

positively skewed.

Table 2
Unit Root Test

| Variables | Augmented Dickey-Fuller test | | | | Phillips-Perron test | | | | |
| | At Level | | At Ist Difference | | At Level | | At Ist Difference | | Stationarity Decision |
	ADF-Stat	P-Value	ADF-Stat	P-Value	ADF-Stat	P-Value	ADF-Stat	P-Value	
LCORR	-1.4922	0.5187	-3.5145	**0.0174**	-2.1640	0.2236	-3.5915	**0.0147**	I(1)*
LED	0.7668	0.9909	-2.6693	**0.0952**	0.9002	0.9936	-2.7453	**0.0826**	I(1)**
LGCF	0.1463	0.9624	-3.3588	**0.0263**	0.1463	0.9624	-4.4598	**0.0021**	I(1)*
LGDP	-1.2828	0.6195	-2.6434	**0.0998**	-1.1258	0.6874	-2.6926	**0.0912**	I(1)**
LIR	-2.8759	0.0637	-4.2985	**0.0031**	-2.8759	0.0637	-4.3668	**0.0026**	I(1)*

Note: * : 5% Significance Level, ** : 10% Level of Significance Level

The sequence must be stationary to be used in time series models. This study uses the ADF and

PP tests to determine whether the variables are static. "Series has a unit root" or "series is non-

stationary" is the Ho for both tests. By employing the ADF and PP tests for the unit root, Table

2's results show that all series are stable at the first difference, or I(1), for a 95% confidence level.

When a model is presented, the Granger causality test is used to determine how closely related the dependent and dependent elements are. Table 3's Ardl test results showed that Ho had been rejected at lag one because the F-statistic value (30.01) was more pronounced than the theoretical limit at a 5% significance level, confirming that of the founder in the model. Both the ARDL (short-run) and ECM (long-run) models have been established because the elements are co-integrated.

Table 3

ARDL Bound Test

F-Bounds Test	Null Hypothesis: No levels of relationship				
Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**	**Cointegration**
			Asymptotic: n=1000		
F-statistic	**30.01**	10%	2.2	3.09	
k	4	**5%**	**2.56**	**3.49**	Yes
		3%	2.88	3.87	
		1%	3.29	4.37	

ARDL and ECM Model

Table 4

ARDL Co-integrating And Long Run Form (1, 0, 0, 0, 1)

ARDL Short-run Co-efficient(s)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LGDP(-1))	0.6145*	0.2558	2.4027	0.0297
D(CORR)	0.0479*	0.0223	2.1497	0.0483
D(LED)	0.0573	0.0490	1.1698	0.2603
D(LGCF)	0.1022	0.0743	1.3747	0.1894
D(LIR)	-0.0194**	0.0098	-1.9825	0.0660
Cintiq(-1)	-0.3999	0.2163	-1.8486	0.0843
ARDL Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SCORE	0.1197**	0.0689	1.7381	0.1027
LED	0.1433	0.1222	1.1725	0.2593
LGCF	0.2555*	0.0781	3.2701	0.0052
LIR	-0.0485	0.0425	-1.1410	0.2718
C	10.2775	0.3871	26.5482	0.0000
Note: * 5% significance, ** 10% significance				

The outcomes of the ARDL relatively brief and ECM lengthy models are displayed in Table 4. According to the Short-run Model's findings, the impact of interest rates and corruption on income progress (LGDP) is favorable and statically relevant at 95% & 90% of the time, respectively. There is no short-term association between LED and LGCF with LGDP because all other variables are statistically insignificant. The cointegration equation (ECM) coefficient indicates a long-term association between the variables because it is harmful and statistically significant (at 90% significance).

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Cointeq = LGDP - (0.1197*LCORR + 0.1433*LED + 0.2555*LGCF -0.0485
*LIR + 10.2775)

The outcomes of the ARDL relatively brief and ECM lengthy models are displayed in Table 4. According to the Short-run Model's findings, the impact of interest rates and corruption on income progress (LGDP) is favorable and statically relevant at 95% & 90% of the time, respectively. There is no short-term association between LED and LGCF with LGDP because all other variables are statistically insignificant. The cointegration equation (ECM) coefficient indicates a long-term association between the variables because it is harmful and statistically significant (at 90% significance).

Residual Diagnostics

Table 5
 Heteroskedasticity Test: ARCH

F-statistic	0.2324	Prob. F(1,19)	0.6353
Obs*R-squared	0.2538	Prob. Chi-Square(1)	0.6144
H0: There is no heteroskedasticity			
At a 5% level of significance			

The ARCH test for heteroskedasticity demonstrates no heteroscedasticity in the model at the 5% confidence level, as shown in Table 5, where the p-value of the observed R-squared is greater than 0.05.

Table 6

Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.1380	Prob. F(1,14)	0.7158
Obs*R-squared	0.2148	Prob. Chi-Square(1)	0.6430
H0: There is no heteroskedasticity			
At a 5% level of significance			

The results of the Breusch-Godfrey serial correlation LM test proposed by Trevor S. Breusch and Leslie G. Godfrey (Breusch and Godfrey, 1981) to investigate autocorrelation in the model are shown in Table 6; the p-value of the observed R-squared is greater than 0.05, which means that the null hypothesis has been accepted and there is no autocorrelation in the model at the 95% confidence level.

Table 7
Histogram Normality Test

Jarque-Bera	0.7459	P-Value	0.6887
H0: There is a normality			
At a 5% level of significance			

Table 7 also shows the results of a statistical normality test performed on the model. The null hypothesis has been accepted since the Jarque-Bera p-value is larger than 0.05, and the model is considered standard at the 5% significance level.

Stability Diagnostics
Figure 1
CUSUM and CUSUMQ Stability Test
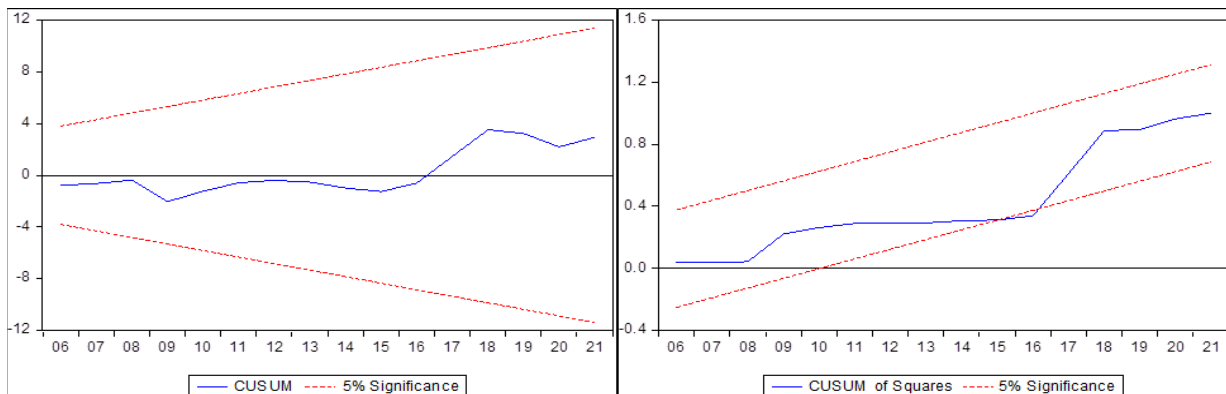
In addition, the stability of the Research model has been demonstrated using the cumulative percentage of standardized residuals (CUSUM) and cumulatively sum of squares of standardized residuals (CUSUMSQ) stability tests (Brown et al., 1975). According to the two techniques ARDL model, depicted in Figure 1, the two approaches' level of relevance remains constant at 5%.

Test of Granger Casualty

To distinguish the causation between the model's variables, the Granger causality test (Granger, 1969) has been applied; this method determines whether a variable deserves to predict another variable.

Table 8

Pairwise Granger Causality Tests

Null Hypothesis:	Obs.	F-Statistic	Prob.
LCORR does not Granger Cause LGDP	23	1.5174	0.2323
LGDP does not Granger Cause LCORR		0.0004	0.9833
LED does not Granger Cause LGDP	23	3.1128**	0.0929
LGDP does not Granger Cause LED		6.1196*	0.0225
LGCF does not Granger Cause LGDP	23	1.2632	0.2744
LGDP does not Granger Cause LGCF		22.2004*	0.0001
LIR does not Granger Cause LGDP	23	9.7792*	0.0053
LGDP does not Granger Cause LIR		0.0063	0.9377
Note: * 5% significance, ** 10% significance			

Since cointegration was confirmed using the ARDL bound test, causation may occur. The existence of the cause has therefore been determined using the Granger causality test. According to Table 8, there is a clear link between GDP growth and both GCF and interest rate (LGDP). Growth in gross domestic product (GDP) and net international debt (LED) are positively related with a confidence level of 5% and 10%, respectively.

Conclusion

Within the time frame of 1998-2021, this study analyzes how rising GDP affects corruption levels in Pakistan. We utilized time-series data models to examine this association. Unit root test is a prerequisite for time series models; for this, we employ the augment dicky fuller (ADF) & Philips-perron (PP) tests. ARDL was utilized to examine the long and short association between productivity expansion and corruption relative to other macroeconomic factors.

According to the results of the Short-run model, immorality and interest payment influence on income progress (LGDP) are statistically significant at a significance level of 95% and 90%, respectively. Even if the respective independent covariates are statistically meaningless, there is no short-term relationship between LED and LGCF and LGDP.

In addition, the estimated coefficient for the founder equation (ECM) is significantly negative, indicating a long-term relationship between components. Consequently, corruption and economic growth affect economic growth in the long run at 90% and 95% significance for this index, which is also reflected in the overall result of a long-run panel of ARDL. However, LED and LIR factors are statistically insignificant, indicating that they do not have a long-run positive effect on economic growth.

The research got the above results because of two reasons. One is the particularity and shortness of available data. At the same time, the other is the argument that defilement spikes monetary venture furthermore, rivalry among firms by lessening dangers of political vulnerability and by advancing cutthroat offering among firms for political blessings, which in turn puts an exceptional on a company's capacity to create economic rents. These legal crimes by the white collars demonstrate the corrupt performances of the institutions and government of Pakistan. The country's current situation is living proof of the above argument, which is very alerting and alarming at the same time.

It is possible for there to be a causal relationship because the ARDL bound test finds evidence of cointegration. The level of rationality was calculated using the Granger causality test. Table 8 demonstrates the one-way link between GDP growth, inflation, and interest rates (LGDP). However, at both the 5 and 10 percent thresholds, there is a statistically significant inverse correlation between GDP growth and the fiscal deficit (LED).

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ISSN (Online): 2790-7716 , ISSN (Print): 2790-7724

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July to December 2022

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