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Country-Level Institutional Quality and Public Debt: Empirical Evidence from Pakistan

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Abstract

This paper aims to investigate the relationship between country-level institutional quality and public debt in the context of Pakistan. The hypotheses of this study were assessed by using the country-level institutional quality data for Pakistan throughout the years from 1996 to 2018. Data came from the World Databank, IMF and Worldwide Governance Indicators databases. For the analysis, ordinary least square, quantile regression and robust regression were employed to assess the factors influencing the public debt. The results of this study indicate that the factors of voice and accountability, regulatory quality, and control of corruption have a positive and significant relationship with public debt, while political stability, government effectiveness, and the rule of law have a negative and significant effect on public debt. Based on the findings, a weak country-level institutional quality poses a substantial market risk as it signals the existence of an unfavorable economic condition that raises public debt. It was also revealed that an improved performance of country-level institutional quality can lead to the improvement of financial market transparency, hence reduce public debt. In contrast to previous studies, the present study will be breaking ground in enhancing public insight regarding the impact of country-level institutional quality on Pakistan's public debt.

Keywords: Country-Level Institutional Quality, Public Debt, Pakistan, Quantile Regression, Robust Regression

JEL Classification Code: F55, F34, O47, C21

1. Introduction

There has been a substantial increase in government debt in the last decades, and numerous researchers have endeavored to comprehend and explicate the possible adverse effect of public debt on economic growth (Chen et al., 2020). The key outcomes of their works suggest a non-linear effect of external debt on growth, together with its damaging impact after the threshold for debt to GDP ratio is exceeded (Kumar & Woo, 2010; Panizza & Presbitero, 2014; Reinhart & Rogoff, 2010). Likewise, Pakistan's total external debt has reached Rs 42.8 trillion/US$256 billion in year 2020, accounting for 98.2 percent of present gross domestic product (GDP) of the country, which is as the highest percentage throughout the years from 1996 to 2020. In comparison, the total amount of external debt in 2019 was US$109.9 billion (Figure 1). As such, the basic purpose of imperative borrowing is to bridge the gaps in the internal and external economic capital, and thus boost the performance inflows. It has been seen as a basic justification for the government's huge borrowing that adversely affects economic growth, as well as constraining savings and country imports. In this vein, Atique and Malik (2012) and Akram (2011) argued that high debt is adversely affecting the development in developing countries. Those researchers also highlighted the chain effect, specifically the risk of default and vulnerability to internal and external shocks that have increased due to the continuous increase in public debt.

Several recent studies have focused on the public debt issue in Pakistan (Ali et al., 2015; Awan et al., 2011; Mahmood et al., 2009; Malik & Kemal, 2018). Likewise,

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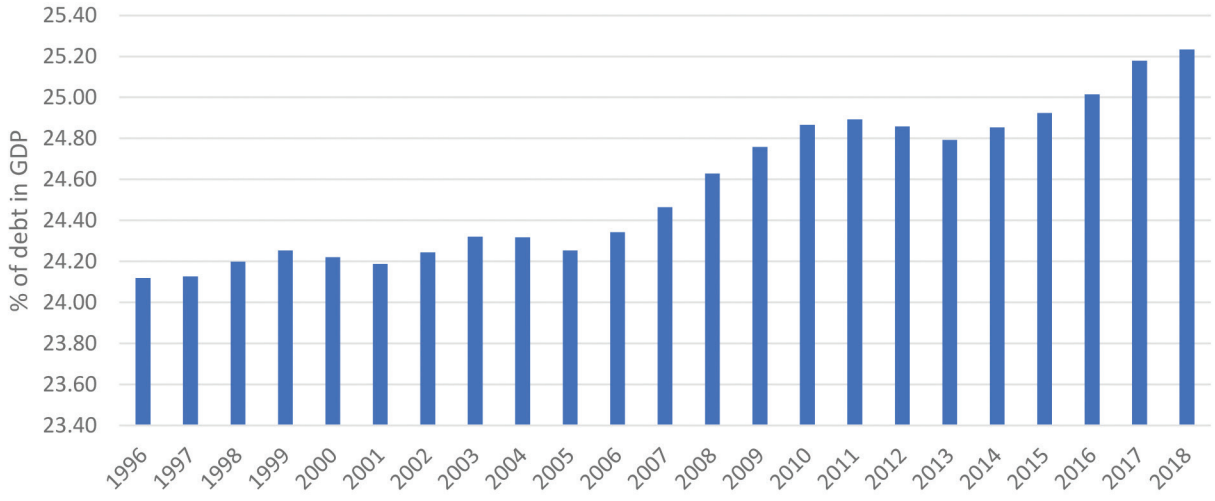

Figure 1: Total Debt of Pakistan from 1996–2018
Source: World Development Indicators

a number of empirical studies in the context of developing countries indicate that the impact of public debt on economic growth depends, not only on debt size, but also on policy and institutional quality. According to Kim et al. (2017) and Tarek and Ahmed (2017), good governance is assumed to have better institution quality, which could assist countries in managing public debts effectively via the reduction of borrowing costs, containment of financial risks, and development of domestic debt markets. Good governance can also help to maintain financial stability and develop the domestic financial system. Likewise, Asiedu (2003) and Dessy and Vencatachellum (2007) indicated the necessity of adequate levels of institutional quality in encouraging investments, stimulating growth and leveraging on debt relief policies.

The current study is motivated to analyze public debt accumulation by considering country-level institutional quality. The institutional quality of a country is assessed by the six governance indicators classified by World Bank Governance Indicator (WGI). Throughout the database of WGI, the six-dimension country-level institutional quality shows the outstanding performance in developed countries, specifically in United States (U.S.) and Australia, by obtaining a percentile ranking between 59.05 and 92.79, and between 77.62 and 98.08, respectively. Conversely, emerging country specifically Pakistan scored within a range between 1.90 and 29.33 in all six-dimensions institutional quality, and this is assumed as tremendously weak as compared to other developed countries. In addition, Pakistan's percentile ranking was below 30, given the weak performance in all the six governance indicators, albeit an overall improvement had occurred during the previous two decades (Sherani, 2017). Daud and Podivinsky (2014) and Sani et al. (2019) contended that the deterioration in the institutional quality aggravates the negative impact of national debts on the performance of economic. The poor institutional quality leads to higher fiscal deficit, then weaken the economic sustainability and induce government to raise greater national debts.

Despite the abundance of literatures on the negative impacts of weak governance on growth (Al-Marhubi, 2000; Depken & Lafountain, 2006; Gupta & Abed, 2002; Mauro, 1998; Mo, 2001), the association between institutional quality and public debt had only been addressed very recently. Based on the literature review of political and institutional factors that drive public debt, it has been found that very few studies have focused on regional differences, or on South Asian countries, especially Pakistan. This study differs from Tarek and Ahmed (2017) and Sani et al. (2019), as the researchers direct their attention on the influence of institutional quality on public debt accumulation in the Pakistani market. Hence, this paper intends to bridge the gap by paying special attention to the economic region. In addition, existing studies on the correlation between institutional quality and public debt only focused on the aspect of corruption index and ignored other governance factors. Therefore, this study also contributes through the investigation on how institutional quality affects Pakistan's public debt via the six global governance determinants.

This study hypothesizes that weak governance results in increased public debt in Pakistan. The Pakistan government has been facing severe policy challenges due to many factors including the civil war, oil price drops, poor fiscal revenues and dearth of currency, refugee issues, terrorist attacks, regional conflicts, and political shifts in nations caused by the Arab Spring. All these have resulted in significant fiscal

and external disproportions in Pakistan, mainly due to the exorbitant costs of war, oil price decline and lower trade (Mustaqeem et al., 2020). This leads the country to engage in higher public debts as a means to improve its economy and fund its economic growth. Yet, by doing so, the measure increases its exposure to national and international financial shocks. Such exposure is typically greater for small and emerging nations due to their less diversified economies, smaller domestic financial savings, and underdeveloped financial systems. This makes them susceptible to financial contagion via the numerous degrees of capital flow. According to the 2016 Global Risk Report by the World Economic Forum, the sixth most likely global risk is the "failure of national government", which entails the failure of the rule of law, prevalence of corruption, and political standstill among others (IMF, 2016). This paper contributes to the body of knowledge on the macroeconomic impacts of governance via the suggestion of several valuable insights for the politicians of the afflicted countries, which mainly concerns sound public debt management practices that have been widely agreed upon in the public arena.

The rest of this paper is structured as follows: Section 2 presents the literature review, Section 3 discusses the study methodology and the empirical results, and Section 4 concludes the paper with several policy suggestions.

2. Literature Review

In the present arena of political economy, a number of empirical and theoretical studies have confirmed the positive influence of debt on the economic performance, but only in controllable limits. For instance, it depends upon two basic reasons: (1) fluctuation-smoothing role of public debt (Barro, 1979), and (2) wealth-reallocating role of public debt (Cukierman & Meltzer, 1989). However, the benefits of debt can only be possible in the presence of good governance. Good governance is the traditions and institutions by which the authority in a country is exercised (Kraay et al., 2010; Nguyen et al., 2020). Worldwide, six governance indicators percentiles ranging from lowest (0) to highest (100) quality performance of institutions or good governance.

Based upon the above definition, governance covers three types of areas, namely, (1) government selection, monitoring and replacement, (2) government's capacity to formulate and implement sound policies, and (3) respect by public and government for those institutions responsible for governance and social interaction. Each area comprises governance's measures, providing a group of six indicators that are used to assess the institution's quality: voice and accountability, political stability, government effectiveness, rules of law, control of corruption, and regulatory quality. According to the definition provided by World Bank Governance, voice and accountability encapsulates the perceptions of the degree to which citizens are able to take part in choosing their government, and enjoy freedom of expression and association, and a free media.

Political stability encapsulates the perceptions of the government's possibility of being deposed by unconstitutional or violent means, involving terrorism activities. Government effectiveness captures the insight of the government's abilities to implement policies that are aimed to ensure the successful delivery of public services and the credibility of the government's dedication to the policies. Regulatory quality encapsulates insights of the government's capability in formulating and implementing policies and regulations in relation to the authorization and promotion of private sector development. Rule of law encapsulates perceptions of the degree to which citizens have confidence and conform to the laws of society, including the quality of contract enforcement. Lastly, control of corruption captures insight of the degree of governing the public official use of powers for private gain.

Thus, the impact of governance of public debt through its six components is still unexplored. The researcher was interested in the factors influencing the quantity and composition of the governance of debt; particularly focusing political and institutional factors of public debt accumulation. In this context, positive debt theory developed by Alesina and Tabellini (1990) and Persson and Svensson (1989) states that disagreement among ruling politicians is the sole reason behind high public debt problem because it is impossible to develop a consensus position as everyone defends their own interests. Other studies also illustrate that governance is a vital determinant of public debt (Kim et al., 2017; Roubini & Sachs, 1989; Woo, 2006).

In line with this, Kaufmann et al. (1999) found voice and accountability to have a positive association with growth. Further, previous literature also shows that greater accountability is needed in government's tax levying and revenue spending as it shares a direct link with political decision-makers and the public (Mello & Barenstein, 2001). They also concluded that, in the presence of democracy, decentralization can help reduce corruption through competition among institutions. Further, encouraging voice and accountability along with reduced corruption is found to be a critical requirement of an adequate effort for tax collection in both developed and developing countries (Bird et al., 2008). They also found that willingness to contribute among taxpayers can be improved by properly taking care of their preferences. Moreover, in local development, citizen participation should be encouraged through civil society organizations, which will help in societal development as well as the reduction of corruption; it is only possible through political freedom. Voice and accountability have the ability to enhance the borrowing power of a government as it indicates that the government is respecting its debts. Moreover, it is easier

for such governments to access credit as compared to their non-democratic rivals (Schultz & Weingast, 2003). It is arguably that institutions of limited government have better ability to enforce sovereign loans by providing means of punishing sovereigns like electoral accountability. It is therefore concluded that those states with representative institutions will enjoy greater access to credit, along with lower interest rates, as compared to those in which political leaders are less constrained.

According to political economy theory, governments are the key player in controlling, regulating and adjudicating the business sector. They pass legislations for economic regulations that help in creating a competitive environment for businesses and establishing such environment where business tends to follow those regulations religiously (Henisz, 2000). Therefore, government can efficiently fight against corruption by enforcing such regulations. Consequently, governments can regain some good perceptions about their ability to formulate and implement sound policies and regulations that permit and promote private sector development. Hence, uncertainty in the rule of law will leave room for corruption, vagueness and complexity that will also create the potential for discretion by authorities. Discretion will further lead to corruption through manipulation. Additionally, with government actors who are actively involved in regulatory issues, the potential for corruption will increase greatly.

For Meon and Sekkat (2005), the rule of law helps in getting political stability, specifically in establishing an effective government. Meanwhile, its absence would cause government inefficiency and political conflict, and this combination leads to corruption surges in investment. Further, corruption brings damage to the environment as illegitimate leaders encourage organized crimes and social polarization (Tanzi, 1998). Kraay et al. (2010) found that all dimensions of governance are somehow similar. For instance, systems with better accountability would minimize the corruption and increase the effectiveness of government, which simultaneously lead to better regulatory environment. Additionally, a fairer rule of law leads to fair selection processes. While replacing the government, less abuse will be observed from public office for private gain in the presence of rule of law. Therefore, all these six composite measures of governance show positive coordination across the world (Kraay et al., 2010).

According to Adams and Opoku (2015) and Pham (2020) foreign direct investment plays a key role in the economic growth of developing countries. However, when good governance is combined with effective regulatory quality, it plays a vital role in benefits enhancement of foreign direct investment in developing countries. Indeed, government seeks help from the effective quality regulations in formulation and implementation of sound policies in order to promote private sector development. Along other indexes, governance index is closely associated with public debt as well. This association can occur either directly or indirectly.

Political corruption particularly brings negative effects on fundamental pillars of the state: legislative, executive and judiciary. Moreover, measurement of efficiency and effectiveness is not an easy task, rather it is a conceptual challenge. The basic problem of public spending is that it has multiple objectives. For example, outcomes of public sector cannot be sold in the market, the pricing data is not available, and the output cannot be exactly qualified. These characteristics of public spending provide a fertile ground for corruption. Further, a number of factors have influence on government effectiveness, for example outputs and exogenous environment factors like regulatory quality and rule of law. As a result, in the absence of control over corruption and with the introduction of additional standards in government policies for public good allocation, the efficiency of government is diminishing. Bosco (2016), after thoroughly observing the hypotheses on the determinants of perceived corruption in public and political sector in Europe, found that perception of effective public policy helps in reducing the influence of poverty on corruption.

Initially, public corruption is responsible for all the inefficiencies prevailing in the public governance of a country, for example, when public funds are used for personal benefits other than the desired goals like improving the welfare of citizens and so forth (Alt & Lassen, 2014). This misuse of power by public officials leads directly or indirectly to different strategies like legislative support for their own political parties, choice of sellers in government tenders, the power to set own salaries and benefits, and regulate self-protection and the protection of the families of representatives of the public authorities.

However, there exist some methods that help in calculating and verifying corruption on government debt, in both developed and developing countries. Previous literature shows that public expenditure is distorted by corruption, which trims down the government's public spending (Mauro, 1998; Tanzi & Davoodi, 2012). In this context, Kraay et al. (2010) and Kaufman (2010) stated that "*to maximize the rent-seek activities, government officials could be more inclined towards large capital investments at the cost of labour-intensive ones*". Sometimes, in the presence of corruption, governments try to manage their expenses through debt increase, which again requires more debt to cover up the previous one, which itself leads to higher costs of servicing that debt. This is how corruption increases the volume of public expenditure and diverts expenses away from where it has to be spent. Health and education are among the basic areas to be spent on, and the expenses should run toward those with less transparency like infrastructure development with greater potential for corruption (Mauro, 1998;

Wei & Zeckhauser, 1999). Most of the large-scale projects are usually financed through borrowing, which therefore leads to corrupt practices to increase the public debt and debt servicing costs (Kraay et al., 2010). Moreover, in the presence of corrupt practices, it is difficult to maintain the quality of the projects (for example infrastructure quality like roads, buildings) as the quality decreases when the focus is directed only on those areas with good chances of getting involved with corruption (Tanzi & Davoodi, 2012). This idea is empirically endorsed by Gupta et al. (2001), and Delavallade (2006), as they also concluded that corruption is directly linked with additional expenditure on public service, order, fuel and energy, and culture and defense, and a fall in public spending devoted to education, health and social protection. Thus, reduction in corruption will help increase tax revenues and improve public welfare.

Collectively, the early studies on institutional quality provide better understandings into the prediction of public debts in South Asian countries, specifically Pakistan. Despite the presence of numerous empirical studies on the determinants of public debts accumulation in Pakistan, there has been a lack of studies on the impact of the institutional quality on public debt accumulation in that particular country. Thus, the researchers of the present study attempt to bridge this gap.

3. Research Methodology

3.1. Variable, Data Source and Sample Frame

This study used data obtained from the World Databank, IMF (International Financial Statistics), and the Worldwide Governance Indicators databases, which cover the period from 1996 to 2018 specifically for the Pakistani region. The dependent variable is the public debt to GDP ratio, and this is defined as the central public debt, which accounts for over 90% of the government's total debt (Shittu et al., 2020). Based on the Worldwide Governance Indicators, this study employed the six institutional quality measures, namely, voice and accountability, political stability and absence of violence/ terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption (Kim et al., 2017; Ogunniyi et al., 2020; Sani et al., 2019). The measures are ranked from 0 to 100 with the higher values denoting the more superior governance. Good governance has a negative effect on public debt, whilst poor governance has a positive effect on public debt.

3.2. Empirical Model

This current study employed the ordinary least square (OLS) to explain the relationship between the independent and dependent variables. All the variables were deemed to measure the determinants of public debt. Below is the cross-sectional regression model equation (1):

$$\begin{aligned}\text{PUBLIC DEBT} = {} & a + \beta_1 \text{VOICE AND} \\ & \text{ACCOUNTABILITY}_i \\ & + \beta_2 \text{POLITICAL STABILITY}_i \\ & + \beta_3 \text{GOVERNMENT EFFECTIVENESS}_i \\ & + \beta_4 \text{REGULATORYQUALITY}_i \\ & + \beta_5 \text{RULE OF LAW}_i \\ & + \beta_6 \text{CONTROL OF CORRUPTION}_i + \varepsilon_i\end{aligned} \quad (1)$$

3.3. Robust Equation

This study also measured the model's efficiency and examined quantile regression and robust regression models. First of all, quantile regression was employed to attain a complete representation of the predictor variable effect. In quantile regression, certain percentiles (or quantiles) such as the 50th, 75th, and 90th are used to delineate the predictor variables' relationships as the percentile's parameter estimates the changes based on a unit change in the predictor variable. Next, robust regression analysis is different from OLS regression as it offers more superior regression coefficient estimates, that based on the removal of outliers in the dataset during the least square regression.

$$y_i = x_i\beta_0 + \varepsilon\theta_i \text{ with Quant } (y_i, x_i) = x_i\beta_0 \quad (2)$$

$$\begin{aligned}Q_{0.50}\text{PUBLIC DEBT}_i = {} & \beta_{0.50,1} \text{VOICE AND} \\ & \text{ACCOUNTABILITY}_i \\ & + \beta_{0.50,2} \text{POLITICAL STABILITY}_i \\ & + \beta_{0.50,3} \text{GOVERNMENT} \\ & \text{EFFECTIVENESS}_i \\ & + \beta_{0.50,4} \text{REGULATORY QUALITY}_i \\ & + \beta_{0.50,5} \text{RULE OF LAW}_i \\ & + \beta_{0.50,6} \text{CONTROL OF} \\ & \text{CORRUPTION}_i + \varepsilon_i\end{aligned} \quad (3)$$

$$\begin{aligned}Q_{0.75}\text{PUBLIC DEBT}_i = {} & \beta_{0.75,1} \text{VOICE AND} \\ & \text{ACCOUNTABILITY}_i \\ & + \beta_{0.75,2} \text{POLITICAL STABILITY}_i \\ & + \beta_{0.75,3} \text{GOVERNMENT} \\ & \text{EFFECTIVENESS}_i \\ & + \beta_{0.75,4} \text{REGULATORY QUALITY}_i \\ & + \beta_{0.75,5} \text{RULE OF LAW}_i \\ & + \beta_{0.75,6} \text{CONTROL OF} \\ & \text{CORRUPTION}_i + \varepsilon_i\end{aligned} \quad (4)$$

$$
\begin{aligned}
Q_{0.90}\text{PUBLIC DEBT}_i = {} & \beta_{0.90,1}\text{VOICE AND} \\
& \text{ACCOUNTABILITY}_i \\
& +\beta_{0.90,2}\text{POLITICAL STABILITY}_i \\
& +\beta_{0.90,3}\text{GOVERNMENT} \\
& \text{EFFECTIVENESS}_i \\
& +\beta_{0.90,4}\text{REGULATORY QUALITY}_i \\
& +\beta_{0.90,5}\text{RULE OF LAW}_i \\
& +\beta_{0.90,6}\text{CONTROL OF} \\
& \text{CORRUPTION}_i + \varepsilon_i
\end{aligned} \tag{5}
$$

4. Results and Discussion

4.1. Preliminary Results

The descriptive statistics over the period from January 1996 to December 2018 are presented in Panel A (Table 1). This study employed a descriptive statistical method for explaining the relationships between the variables using the mean, median, maximum, minimum, and standard deviation. Based on the results, the public debt mean value is at 24.5671 percent, the median value at 24.4629, while the minimum and maximum values are between 24.1117 and 25.2376 percent, respectively. As stated by Malik and Kemal (2018), Pakistan has a tremendously high public debt compared to many other Asian and developing nations. A statistical outline of the country-level institutional quality was also gauged, as well as the set of percentile ranking, which is from 0 (weak governance) to 100 (strong governance) by employing the six indicators: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.

Voice and accountability produced mean and median values of 23.9316 and 25.0922, respectively, with values ranging between 11.6730 and 34.7228. Political stability produced mean and median values of 5.7308 and 3.2217, respectively, with values ranging between 0.3216 and 16.5066. Government effectiveness generated mean and median values of 31.6199 and 31.0802, respectively, with values ranging between 22.0553 and 41.7566. Regulatory quality shows mean and median values of 26.9341 and 28.4269, respectively, with values ranging between 17.0741 and 34.9438. Rule of law exhibited mean and median values of 20.7036 and 21.3513, respectively, with values ranging between 11.4172 and 32.8150. Finally, control of corruption attained mean and median values of 21.0904 and 21.8056, respectively, with values ranging between 6.3316 and 29.3252. All these results indicate that Pakistan's governance performance is weak in comparison to developed countries like Canada, France, Germany, and the UK. Hence, local and international investors are facing greater uncertainties when depending on weak performance of country-level institutional quality.

Pakistan's general country-level institutional-quality performance trend is presented in Panel B of Table 1. Voice and accountability attained the percentile in 1996 at 31.5000 and 25.6158 in 2018. Political stability reached 14.3600 percentile in 1996 and 3.3333 percentile in 2018, denoting the lowest performance ever. Government effectiveness reached 31.6900 and 26.9231 percentile from 1996 to 2018, while regulatory quality attained 28.8000 in 1996, with a slight increase to 27.4038 in 2018. Rule of law recorded a declining trend from 7.5300 in 1996 to 27.8846 in 2018. Lastly, control of corruption attained 31.6600 percentile in 1996, and continued with a decreasing trend that reached 23.5577 in 2018. These results show that all the six dimensions of Pakistan's country-level institutional-quality performance were very weak compared to other developing nations.

In this study, the Pearson's correlation coefficients were employed to delineate the correlation between the independent and dependent variables (Table 2). It was found that voice and accountability, rule of law, and control of corruption have a positive correlation with public debt. This indicates that positive alterations in the dimensions of voice and accountability, rule of law, and control of corruption can elevate Pakistan's public debt. On the contrary, the dimensions of political stability, government effectiveness, and regulatory quality have a negative and significant correlation with public debt. Maddala and Lahiri (1992) asserted that a robust correlation can alter the impacts of the individual variable on the dependent variable.

4.2. Regression Analysis

The cross-sectional regression analysis results on all the samples are presented in Table 3, gauging the effect of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption on public debt. As shown in Table 3, the *R*-squared is 89.2 percent, denoting the total public debt variation, which is higher than the results derived by Zulfiqar et al., (2020). The dimensions of voice and accountability, rule of law and control of corruption have positive and significant effects on public debt. The results mean that improvement of these three governance indicators plays a crucial role in driving the Pakistan government to borrow greater debts. The results provide support to Schultz and Weingast (2003), who argued that greater accountability is capable to enhance the borrowing power of nations as liberal nations are constrained to honor their debts. However, the results are contradicted by Tarek and Ahmed (2017). For them, countries with better rule of law encourage government to issue greater debts, which could minimize the negative

Table 1: Descriptive Statistics

	Mean	Median	Max	Min	Std. Dev.	VIF
PD (ratio)	24.567	24.462	25.237	24.111	0.356	
VA (percentile)	23.931	25.092	34.722	11.673	5.682	3.608
PS (percentile)	5.730	3.221	16.506	0.321	5.571	4.917
GE (percentile)	31.619	31.080	41.756	22.055	6.394	1.563
RQ (percentile)	26.934	28.426	34.943	17.074	3.992	3.385
RL (percentile)	20.703	21.351	32.815	11.417	5.054	2.727
CC (percentile)	21.090	21.805	29.325	6.331	4.997	2.748
	VA	**PS**	**GE**	**RQ**	**RL**	**CC**
1996 (percentile)	31.500	14.360	31.690	28.800	7.530	31.660
1997 (percentile)	32.415	14.625	34.500	28.910	10.725	28.580
1998 (percentile)	33.330	14.890	37.310	29.020	13.920	25.500
1999 (percentile)	23.135	15.380	33.785	24.510	17.850	24.935
2000 (percentile)	12.940	15.870	30.260	20.000	21.780	24.370
2001 (percentile)	14.430	11.110	35.540	20.970	24.010	22.790
2002 (percentile)	15.920	6.350	40.820	21.940	26.240	21.210
2003 (percentile)	14.930	7.540	41.330	22.960	25.740	25.760
2004 (percentile)	16.830	5.830	38.920	17.730	19.620	13.170
2005 (percentile)	20.670	5.340	39.710	26.470	22.010	14.150
2006 (percentile)	24.520	2.900	40.980	34.310	22.970	21.950
2007 (percentile)	21.150	0.970	37.380	31.070	21.050	20.870
2008 (percentile)	25.480	0.960	26.700	30.580	17.790	18.930
2009 (percentile)	24.170	1.420	23.440	30.620	21.800	14.830
2010 (percentile)	27.490	0.470	25.360	29.670	27.490	13.810
2011 (percentile)	25.820	0.470	22.270	28.910	19.720	14.690
2012 (percentile)	24.880	0.950	25.590	25.590	21.130	14.220
2013 (percentile)	25.350	0.950	24.170	26.070	22.070	17.540
2014 (percentile)	27.090	3.330	23.080	28.370	25.000	22.120
2015 (percentile)	27.090	1.430	27.880	28.850	24.520	21.630
2016 (percentile)	27.590	1.430	28.370	27.400	20.190	17.310
2017 (percentile)	28.080	1.900	31.250	29.330	24.040	22.600
2018 (percentile)	25.615	3.333	26.923	27.403	27.884	23.557

impact of corruption, subsequently lower the debt borrowing activities. Furthermore, nations with better control of corruption show that minimizing corruption causes the likely reduction of government's revenues or increase in government's expenses. In line with Tarek and Ahmed (2017), minimizing the corruption index possibly hold the firms from completing their duty in an economy beset by bureaucracy.

Pakistan's debt entanglement started in the 1970s when oil prices increased, and the government had to borrow in order to

Table 2: Correlation Matrix

	1	2	3	4	5	6
VA	0.316					
PS	–0.756	–0.082				
GE	–0.703	–0.382	0.417			
RQ	0.332	0.718	–0.391	–0.260		
RL	–0.412	0.175	0.696	0.304	0.052	
CC	0.487	–0.480	–0.542	–0.085	–0.146	–0.410

Notes: PD public debt to GDP ratio is the dependent variable. Kaufmann et al. (2009) asserted the measure of country-level institutional quality through voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), control of corruption (CC) computed by percentile rank which shows 0 (lowest) to 100 (highest).

Table 3: OLS Regression

Variable	Expected result	Coefficient	Std. Error	*t*-Statistic	Prob.
C		24.501	0.268	91.334	0.000
VA	Positive	0.033	0.007	4.645	0.000
PS	Negative	–0.040	0.008	–4.932	0.000
GE	Negative	–0.020	0.003	–5.570	0.000
RQ	Negative	–0.030	0.008	–3.747	0.000
RL	Positive	0.016	0.006	2.468	0.015
CC	Positive	0.029	0.007	4.207	0.000
R-squared		0.892			
Adjusted *R*-squared		0.884			

Notes: PD is a public debt to GDP ratio is the dependent variable. Kaufmann et al. (2009) asserted the measure of country-level institutional quality through voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), control of corruption (CC) computed by percentile rank which shows 0 (lowest) to 100 (highest).

cope with the impacts. Until then, the external debt of the nation has started to mount, with detrimental consequences on the people. The debt crisis forced the country to reach for persistent bailout loans from the International Monetary Fund (IMF). For the past 32 years, Pakistan has been receiving loans from the IMF, thus making it among the nation with the longest lending periods. Today, Pakistan is suffering from one of the largest external debts in the world, deep-rooted inequality, and failure to achieve a majority of the Millennium Development Goals. The substantial debt amassed from the bailout loans has been passed down generationally, enabling the IMF to have massive power over Pakistan's growth via the economic preconditions placed upon the nation by the institution. Lending and grants have been used as a prop-up measure on Pakistan's military governments backed by the West. Hence, a country like Pakistan, which is suffering from high debts may also receive public investments (e.g., for infrastructural expansions), thus helping to increase their capacity in supplying total outputs (Baumol & Peston, 1955; Haavelmo, 1945).

Meanwhile, the dimensions of political stability, government effectiveness and regulatory quality have negative and significant effects on Pakistan's public debt. The results mean that the improvement of these three governance indicators reduces the external debt borrowing activities by the Pakistan government. These findings are consistent with Tarek and Ahmed (2017); the burden of external debt has adverse effects on a developing nation's economic and political autonomy. Unpaid foreign debts will lead to prolonged defaults or further borrowings. When default occurs, global confidence on the country's economy will decrease. Consequently, the country will face difficulties in terms of importing supplies such as food, oil, machinery and equipment and other crucial raw materials for producing goods, domestically and internationally.

Table 4: Quantile Regression

Variable	Expected Result	50th		75th		90th	
		Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
VA	Positive	0.025	0.000	0.038	0.000	0.046	0.000
		3.827		7.694		10.442	
PS	Negative	–0.034	0.000	–0.045	0.000	–0.049	0.000
		–6.934		–7.478		–8.556	
GE	Negative	–0.022	0.000	–0.023	0.000	–0.023	0.000
		–11.031		–9.160		–10.163	
RQ	Negative	–0.024	0.000	–0.041	0.000	–0.052	0.000
		–3.834		–5.987		–8.513	
RL	Positive	0.009	0.025	0.024	0.000	0.030	0.000
		2.280		4.092		5.055	
CC	Positive	0.027	0.000	0.040	0.000	0.045	0.000
		3.732		6.513		5.130	
Pseudo *R*-squared			0.738		0.697		0.730

Notes: PD is public debt to GDP ratio is the dependent variable. Kaufmann et al. (2009) asserted the measure of country-level institutional quality through voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), control of corruption (CC) computed by percentile rank which shows 0 (lowest) to 100 (highest).

The findings indicate that the condition of the country's political stability, government effectiveness and regulatory quality could determine the failure or success of a firm, specifically when investing in a country with such uncertainties (Busse & Hefeker, 2007; Holmes et al., 2013). The outcomes of the studies also indicate that improved regulatory quality leads to market transparency, which in turn reduces existing uncertainties.

4.3. Robust Analysis

The correlation between the variables was also explained using the quantile regression, and the results are presented in Table 4. The significance of the predictor variables can be distinctively and suitably explained by the quantile regression, providing an in-depth understanding of the data external to the mean value (Koenker & Bassett, 1978). The method uses the median to justify the non-linear correlation between the variables, particularly in the case of abnormal data distribution. Facilitated by the median, quantile regression also has the ability to explain the conditional distribution that cannot be achieved using the mean. Hence, as opposed to the use of the maximum or minimum values, median is the unique tool for explicating the effect of the predictor variable. Although quantile regression has limited restrictive assumptions in comparison to the OLS regression, its practicality renders it a prominent approach for clarifying the correlation between the dependent and independent variables. The accuracy of the results produced via quantile regression has also been confirmed by Andriansyah and Messinis (2016) and Angrist and Pischke (2008).

Table 4 presents the 50th, 75th and 90th quantile results that highlight the linear correlation. Based on the results, the dimensions of voice and accountability, rule of law and control of corruption have positive and significant correlations at the 50th quantile. Meanwhile, at the same quantile, the dimensions of political stability, government effectiveness and regulatory quality have negative and significant correlations with public debt. The results for the 75th and 90th quantiles are similar to that of the 50th quantile. The Pseudo *R*-squared for the 50th, 75th, and 90th quantiles are 73.82%, 69.75% and 73.02% respectively, which are higher than the results derived by Mehmood et al. (2020a). The results confirmed that the 50th, 75th and 90th quantiles of Pakistan's public debt are more robust with the effect of the predictor variables.

4.4. Further Analysis

In this study, the robust regression was alternatively used to explain the correlation between the independent and dependent variables under a less restrictive assumption as compared to the ordinary least square (OLS) method and quantile least square. The robust least square method was employed to ascertain the regression results via

Table 5: Robust Least Square

	Expected results	Coefficient	Std. Error	*z*-Statistic	Prob.
VA	Positive	0.019	0.002	6.719	0.000
PS	Negative	–0.030	0.003	–8.943	0.000
GE	Negative	–0.022	0.001	–13.256	0.000
RQ	Negative	–0.016	0.003	–4.170	0.000
RL	Positive	0.005	0.002	1.791	0.073
CC	Positive	0.019	0.002	7.123	0.000
R-squared		0.688			
Adjusted *R*-squared		0.666			

Notes: PD public debt to GDP ratio is the dependent variable. Kaufmann et al. (2009) asserted the measure of country-level institutional quality through voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), control of corruption (CC) computed by percentile rank which shows 0 (lowest) to 100 (highest).

better coefficient estimates, following the removal of data outliers. Outliers affect the OLS regression's assumptions, which subsequently distort the resulting coefficients. Such distortion interferes with the identification of the outliers due to their smaller residual size, particularly when there are only one or two independent variables in the study. Hence, the robust regression has a decreasing effect on the outliers, making it an iterative method that minimizes the effect of the coefficient estimates. The results of the robust regression and the correlation between the study variables are presented in Table 5. The results indicate that the dimensions of voice and accountability, rule of law and control of corruption have positive and significant correlations with public debt. Meanwhile, the dimensions of political stability, government effectiveness and regulatory quality have negative and significant effects on public debt. These outcomes are in line with the outcomes of the ordinary least square for Pakistan. The *R*-squared of 68.8% denotes the variation in explaining public debt, which is higher than the results derived by Mehmood et al. (2020b). Meanwhile, the robust least square results are parallel to the OLS and quantile least square.

5. Conclusion

This study had examined the effect of country-level institutional quality on Pakistan's public debt over the period from January 1996 to December 2018. The study enriches the current body of public debt literature by providing a more in-depth understanding of the country-level institutional quality, specifically by suggesting the harsh market conditions in Pakistan to manage the country's ongoing public debt. Ordinary least square was employed to explain the correlation between public debt and country-level institutional quality. Quantile regression was also utilized to ensure the robustness of the results. The robust least square approach was subsequently employed to further the study analysis.

By using the econometric methods, it was proven that the dimensions of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption play significant roles in signaling the prevalence of an unfavorable economic environment, specifically to manage the country's ever-increasing public debt. This study fundamentally concluded that weak governance leads to an increased public debt to GDP ratio. The outcomes offer significant policy implications for developing nations in general and Pakistan in particular. Countries like Pakistan, which seek to lessen their public debts, should aim to improve their political stability, regulatory quality and rule of law as these dimensions have been proven to be significant in increasing government debts. Likewise, countries with substantial public debts should also improve their institutional quality by combatting private gains, framing and executing rigorous policies and regulations, and permitting the people to express and implement their visions in an effective manner.

The countries should also change their spending structure from one that is liable to corruption to one that can be supervised, managed and implemented in a more effective manner, thus leading to better public debt management. Allocations of government spending and usage of public funds should work toward the goal of improving people's welfare. Bad governance related to public debt can also be remedied by mitigating the nation's shadow economy. This is because tax evasion by the private sector decreases tax revenues, which in turn reduces public revenues and leads to a fiscal deficit.

By reducing government spending and implementing a rigorous fiscal policy, Pakistan will be capable of restoring its budget balance and reducing its public debt. The projected results can be achieved by employing strategic measures for

the implementation of such policy, including by improving and consolidating the quality of governance and public institutions. These are urgent political interventions for country like Pakistan, which operate with significant fiscal and external imbalances exacerbated by major policy challenges in the form of civil wars, drop in oil prices, decreasing fiscal revenues and currency crises, refugee concerns, terrorist attacks, global instability ramifications, and political changes in the countries impacted by the Arab Spring.

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