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Public Debt and Economic Growth in Development Spectrum with Moderating Role of Governance Quality

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Abstract

The study aims to investigate the influence of (PD) public debt on economic growth in the presence of governance quality for 53 selected developing countries over a period extending from 1996 to 2017. The researchers used a method known as the Dynamic System Generalized Method of Moments (SYS-GMM). In their regression equation of the study is augmented by variables including public debt, GDP growth, governance quality, saving-investment gap, and governance public debt. The results show that (PD) appears to inversely affect economic output in the case of selected developing nations. However, the saving-investment gap and governance quality positively determined economic growth. The moderating role of governance excellence in the presence of public debt is positive. Hence, this shows that improvement in institutions not only contributes to economic growth, but it also helps in weakening the negative effect of public debt on economic growth. This influence of governance quality can attract policymakers to set policies that can enhance the quality of institutions so that the path to economic growth and development can be settled in developing countries.

Keywords Governance Quality, Public Debt, Moderating Role, Economic Growth, Developing Countries

Introduction

This research study starts with the question of how governance influences economic growth in the presence of public debt in developing nations. The effect of public debt and governance quality (institutional quality) has been examined many times. The conventional theory of public debt and economic growth is that in short-run demand determined output and higher public debt (fiscal deficit) positively affect aggregate demand, disposable income, and output. In long-run, the increasing positive effect remains in function when the aggregate output is not at full capacity or otherwise, the effect, in long-run, may alter by crowding out the capital (see, Barro & Sala-i-Martin, 1995; Elmendorf & Mankiw, 1999; Reinhart & Rogoff, 2010; Salotti & Trecroci, 2016) highlighted that the nonlinear relations between public debt and economic growth has a tipping point. Outside that tripping point, the connection between public debt and economic growth is negative. Alongside, there is not any connection between public debts and economic growth for developed sample countries. According to Aizenman et al. (2007) that the enlargement of debt to GDP adversely affects capital stock, increases default risk, and thus tends to show an inverse association between public debts and output.

An presence of a tipping point and beyond that point, the establishing a detrimental effect of public debt on economic growth may not be true and/or common across the countries in a multi counties data sets (also see, Ahlborn & Schweickert, 2018; Ghosh et al., 2013). Eberhardt and Presbitero (2015) further explain the situation of cross countries' differences in three major ways. First is the fundamental difference in technology in hand, second is the institutional framework, macroeconomic setup, and learning from past debt crises and third is the composition of public debt for a country and its associated risk and effects. If the effects of public debt heavily fall on the public expenditures productivity, decrease private investment through increasing interest rates, and create uncertainties about the financial suppression in the expected future, a large negative impact on economic growth can be expected (see, Cochrane, 2011; Laubach, 2009; Teles & Mussolini, 2014) The governance (institutional quality) of a country over the history shows a close link to the economic growth. Property rights, access to economic resources and transparency in the process all are referred to as economic institutions. All these economic institutions in a better shape ensure equal and transparent access to economic resources with property rights provided to all economic agents broadening the distribution across society. The instability in the output (GDP) can be controlled by having strong economic institutes, democracy, and political stability over time (Acemoglu et al., 2005).

The current study estimates the relations between (public debt % of GDP) and economic growth (GDP growth) for selected developing countries focusing on the importance of governance quality (institutional quality). The published articles about the noteworthiness of debt and institutions in economic growth is well documented. But studying the significance of public debt over economic growth in the presence of upgrading in governance quality is a bit scant in literature. The research question of the current study is, does an improvement in the governance quality of the selected developing countries alter the debt-growth relationship? We can say that either governance quality weakens or strengthens the effect of public debts over economic growth in developing nations. Answering this research, question an interaction variable is constructed from public debt and governance and the focus will be on the sign and significance of the coefficients of the interaction variable and public debt variable. The remaining study is arranged in the following ordered; Literature review is the second section which is followed by third section, methodology and data. Results and discussion are presented in the fourth section, while conclusion and policy which is the last section.

Literature Review

Literature centered on the effect of public debt on output either at the country level or cross countries level for both developing countries and developed are available in large numbers. The tie of public debt with growth is studied on two broader approaches i.e. linear and nonlinear. Studies that used linear models to scrutinize the association of public debt with growth are (Puente-Ajovin et al., 2015: Bal & Rath, 2014; Kumar & Baldacci, 2010; Spilioti & Vamvoukas, 2015), nonlinear interaction between public debt and growth is also reported in literature see (Checherita-Westphal & Rother, 2012; Greiner, 2013; Mitze & Matz, 2015; Reinhart & Rogoff, 2010).

Higher public debt through several channels can adversely affect economic growth, total factor productivity, accumulation of capital, long-run interest rate, and the spread of autonomous risk associated with corporate borrowing cost (Corsetti et al., 2013; Gale & Orszag; Kumar & Baldacci, 2010) future higher distortionary taxation policies and lower public sector spending in infrastructure (Aizenman et al., 2007; Dotsey, 1994). Public debt also increases the uncertainties in the future targets and prospects of policies with counter-cycling fiscal policies and reducing economic growth by higher inflation (Aghion & Kharroubi, 2007; Cochrane, 2011; Woo, 2009).

Moreover, the impact of public debt over macro-economy are in the form of making a country vulnerable to shocks but it also helps in making it able to run a stimulative fiscal policy to alleviate unemployment in a recession. Economic theory suggests the link between public-debt and growth is country and time specific depending on factors like the business cycle, aggregate endowments, and institutional quality (see, DeLong et al., 2012; Eberhardt & Presbitero, 2015; Égert, 2015; Krugman, 2012; Reinhart et al., 2003). Debt at a moderate level positively affects economic growth in the short run if supported by improved monetary policy and institutional quality, enhanced private saving, and a financial system (Abbas & Christensen, 2010).

However, there is contradictory evidence about the link between governmental debt and growth. (Pattillo et al., 2011) discovered an "inverted U-shaped relationship between (PD) and

economic growth for 93 developing nations", indicating that it has beneficial impact over growth if it is lower and a negative one when it is larger. According to Lof and Malinen (2014), public-debt doesn't have a substantial impact on economic growth in a subset of wealthy nations. In a study of 79 industrialized, developing, and rising economies, Woo and Kumar (2015) explored an opposing correlation between public debt and growth. In a study including 82 nations, Kourtellos et al., (2013) revealed a non-linear correlation between public debt and growth. They also identified that a nation's institutional qualities affect the link between public-debt and economic development.

Furthermore, Checherita-Westphal and Rother (2012) studied 12 European countries and found that government debt and growth relate nonlinearly and the harmful impact on long-run growth was observed after a certain tipping point. Further, the study points out that private savings, factors productivity, public investments, and both long term nominal and real rate of interest are the paths responsible for having an impact of debt on growth. Wyplosz (2007) addresses the sustainability of public debt through different approaches used in literature. Besides sustainability, the study also shows that low-quality institutions tend to make an association between amount of debt and long-term growth. Liu and Lyu (2020) studied 102 selected countries from developed, developing, and emerging spectra for the link between public-debt and growth to influencing factors. The study empirics came up with a non-linear relationships between public debt and growth with significant influencing factors like current account balance, gross saving, and degree of openness.

Methodology

Concept

The analysis starts with the production function of (Solow, 1956) modified in the form of (Acemoglu et al., 2005) as;

$$Y_{it} = f\ (S_{it}, I_{it}, GQ_{it}, PD_{it}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

Where Y mean output (GDP), S represents saving, I mean investment, GQ is governance quality used for institutional quality and PD show public debt. i mean cross-section and is $i \dots\dots\dots = N$ and t mean time series and is $t \dots\dots\dots = T$. In the current study saving S and investment I is combined to represent a single variable named as saving-investment gap (SIG), the difference between saving and investment. So the borrowed production function can be given as;

$$GDP_{it} = f\ (SIG_{it}, GQ_{it}, PD_{it}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2$$

Now econometric representation of the equation (2) can be written as;

$$GDP_{it} = \beta_1 + \beta_2 SIG_{it} + \beta_3 GQ_{it} + \beta_4 PD_{it} + \varepsilon_{it} \dots\dots\dots 3$$

Where ε_{it} is the error term.

Data

This study aims to examine the affiliation between public debt and output in the context of governance in 53 developing nations chosen from various regions, including South Asia, the Pacific, Central Asian, Europe, Sub-Saharan Africa, and Latin America, between 1996-2017. The WDI database provides relevant macroeconomic variable data, while the World Governance Indicators (WGI) database provides the data on governance dimensions. Based on (Kraay et al., 2010), a combined single institutional factor is obtained for each country in the current study.

Table 1. The Descriptive Stat

Variables	Mean	Standard deviations	Jarque Bera (JB)	JB (Prob)	Observation
GDP growth (GDPG)	4.862	4.697	73578.47	0.000	923
Saving investment gap (SIGPG)	-6.741	60.00	154753.6	0.000	923
Governance quality (GQ)	-0.537	0.539	9.524670	0.000	923
Public debt (PDPG)	44.03	28.02	5168.203	0.000	923
Governance public debt	-24.13	39.05	43430.03	0.000	923

Authors' calculations

Econometric Methodology

The current study used dynamic panel regression analysis to estimate the effect of the public debt on output in panel of selected developing counties. In order to take serial correlation into account and reduce the possibility of constructing a misleading regression, dynamic panel regression models are used. The model in question can be broadly represented as follows:

$$GDPG_{it} = \beta GDPG_{i\,t-1} + \beta X_{it} + \gamma X_{it-1} + \pi_i + \varphi_t + \varepsilon_{it} \dots\dots\dots (4)$$

Where $GDPG_{it}$ is the GDP growth rate, $GDPG_{i\,t-1}$ depicts lagged GDP growth rate, X_{it} & X_{it-1} are set of $(K \times 1)$ vectors of exactly predictor co-variates of explanatories and lagged

explanatories variables respectively. π_i are disturbance terms of an individual effects, while φ_t is an individual time effects, $\beta\ \gamma$ are vectors of parameter to be estimated. $i, \dots, N$ represent cross-sections while $t, \dots, T$ mean time-period, and $\varepsilon_{it}$is $\sim iid\ (0, \Omega)$. The important problem is the correlation of a lagged response (dependent) variable stochastic terms ε_{it} and the problem still exists if there isn't autocorrelation is expected. A generic strategy developed by Arellano and Bond (1991) and then refined by (Blundell & Bond, 1998) called the Dynamic System Generalized Method of Movement (SYS-GMM) with an IV produced from the explanatories variable's lagged values can be applied to solve this issue. When the variance of the error term together with unknown forms, SYS-GMM estimates are more effective than least square estimates (Baum et al., 2003) Equation (4) is modified for empirical analysis by taking into account the chosen macroeconomic variables and institutional factor, and the result is the following equation:

$$GDPG_{it} = \beta_1 GDPG_{i\,t-1} + \beta_2 SIGPG_{it} + \beta_3 GQ_{it} + \beta_4 PDPG_{it} + \beta_5 GQ * PDPG_{it} + \varepsilon_{it} \dots\dots\dots (5)$$

Where $GDPG$ is GDP growth rate, $SIGPG$ is saving-investment gap percent of GDP, $GDPG$ represents GDP growth rate, GQ governance quality, $PDPG$ is public debt (% of GDP), $GQ * PD$ is the interaction variable between governance quality and public debt, $\beta_{,S}$ are coefficients to be estimated, ε_{it} is disturbance term, i represents cross-sectional and t represents time. We apply (SYS-GMM) technique for estimating an equation (5) because, among other dynamic panel techniques, it can retain robust estimates in the existence of an endogeneity problem and has an integrated process for resolving endogeneity resulting from omitted variable biases (Roodman, 2009).

Results and Discussions

Data Analysis

The descriptive statistics are given in table 1. The saving-investment gap, public-debt, and Governance public-debt are spread and the rest of the values of the variables are near to their own mean. The correlation among variables is given in table 2. The highest correlation is between public debt and governance public debt while the lowest is between governance quality and public debt.

Table 2. Correlation Matrix

Variables	GDP growth (GDPG)	Saving-Investment gap (SIGPG)	Governance quality (GQ)	Public debt (PDPG)
GDP growth	—			
Saving investment gap	0.065	—		
Governance quality	-0.060	0.039	—	
Public debt	-0.097	-0.114	-0.029	—
Governance public debt	0.031	0.107	0.627	-0.637

Author's calculations

Table 2 depicts that there is no high multicollinearity problem and all values are satisfactory.

Empirical Results

The overall results are given in table 3. The study uses the Dynamic-Generalized Method of Movement (SYS-GMM) for empirical analysis but in table 3 other methods' results are given to compare the robustness of results based on standard errors. The J-test probability shows that the instruments of the model are not over-identified. The saving-investment gap and governance quality significantly and positively contributes to growth. Coefficient of public debt is negative and significant which means that public-debt decreases growth for the selected developing countries in the time under consideration. The positive and significant coefficient of interaction variable of governance quality and public debt explains that governance quality improvement weakens the negative effect of public-debt over economic growth for the selected developing nations. One can say that improvement in governance quality (institutional quality) can help in the flow of debt funds in the right direction so that maximum benefits can be gained from it. Government should borrow for the productive sectors so that it can generate enough surpluses from which debt can be repaid timely and all these are possible when institutions are improved and well developed. Comparing the results of our study with existing literature on the impact on economic output growth, the adverse effect of public-debt over economic growth is consistant with (Teles & Mussolini, 2014; Woo & Kumar, 2015). The positive impact of governance quality on economic growth is also reported in (Acemoglu et al., 2005).

Table 3. Estimated results

Regressors	DSGMM	POLS	FE	RE
GDPG (-1)	0.197*	0.324*	0.124*	0.229*
	(0.006)	(0.034)	(0.037)	(0.033)

SIGPG	0.012*	0.003	0.004	0.004***
	(0.0007)	(0.002)	(0.002)	(0.002)
GQ	0.694*	1.156*	0.100	1.042
	(0.230)	(0.486)	(1.164)	(0.663)
PDPG	-0.089*	0.023***	-0.045**	-0.028***
	(0.008)	(0.013)	(0.021)	(0.015)
GQ*PDPG	0.011**	0.019**	0.010	0.015
	(0.005)	(0.009)	(0.015)	(0.013)
Constant	…	3.713*	6.177*	4.507*
		(0.523)	(0.879)	(0.665)
R-square	…	0.12	0.30	0.11
J-statistic	47.50	…	…	…
Prob-J test	0.411	…	…	…
Observations	1166	1166	1166	1166

Where *, ** and *** mean significance at 1%, 5% &10& correspondingly. (Standard errors) are mentioned in parentheses.

Conclusion and Policy

For 53 selected developing nations from Latin Ameria, the Pacific, Central Asia, Europe, South Asia, and Sub-Saharan Africa, this study goal to assess the influence of public-debt over economic development in the presence of quality governance between 1996 and 2017. According to the dynamic SYS-GMM results, public-debt has a hostile effect over growth in a subset of developing nations. Economic growth is strongly correlated with both the quality of governance and the saving-investment gap. The positive moderating effect of governance quality in the presence of public debt demonstrates that institutional quality improvements not only support economic growth in the targeted regions but also mitigate the detrimental effect of public-debt on growth. This study adds to the corpus of knowledge by offering empirical support to the notion that effective governance promotes economic growth by mitigating the detrimental effects of public debt

It is concluded that governance quality not only directly affects economic growth but can also influence growth through the channel of public debt. This twofold effect of governance quality can attract policymakers to set policies that can improve the quality of institutions so that the path to economic growth and development can be settled in developing countries.

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Appendix A. **List of Countries in Sample**

1	Afghanistan	15.	Ecuador	29.	Mali	43.	Tajikistan
2.	Albania	16.	El Salvador	30.	Mexico	44	Tanzania
3.	Argentina	17.	Ethiopia	31.	Nepal	45.	Thailand
4.	Bangladesh	18.	Georgia	32.	Nicaragua	46.	Turkey
5.	Bhutan	19.	Ghana	33.	Nigeria	47.	Turkmenistan
6.	Bolivia	20.	Guatemala	34.	Pakistan	48.	Uganda
7.	Botswana	21.	Haiti	35.	Paraguay	49.	Ukraine
8.	Brazil	22.	India	36.	Philippines	50.	Uzbekistan
9.	Bulgaria	23.	Indonesia	37.	Rwanda	51.	Venezuela
10.	Cameroon	24.	Kazakhstan	38.	Romania	52.	Vietnam
11.	Central Africa	25.	Madagascar	39.	Russia	53.	Zimbabwe
12.	Chad	26.	Malawi	40.	South Africa		
13.	China	27.	Malaysia	41.	Sri Lanka		
14.	Colombia	28.	Maldives	42.	Sudan		