Research Article

Role of Governance and Public Trust on Government Debt-Economic Growth Nexus (A Global Empirical Analysis)

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ABSTRACT

High government debts in several countries have the potential to trigger or exacerbate economic instability. These concerns are consistent with the results of this study, where countries that have a high debt ratio tend to have declining economic growth. To provide more understanding about this effect, this study tries to examine the effect of debt on economic growth by utilising the governance and public trust level as a contextual variable and mediator. Empirically, both variables have a prominent role in the debt and economic growth nexus. The debt threshold as a budgetary rule is necessary but might not be sufficient to validate the rationality of rising debt. The capability of government in providing public governance and the effect of additional debt on public trust is another crucial aspect that needs to be seriously scrutinised, or when the addition of debt becomes inevitable (such as in pandemic situation), the government should strengthen governance capability to ensure the productivity of debt and mitigate the decreased public trust. This finding implies that the debt policy should not only be based on budgetary rule but also the capacity of governance and the potential implication of the falling public trust.

Keyword: *debt, governance, growth, public trust.*

Introduction

High government debts in several countries have the potential to trigger or exacerbate a crisis, as had previously occurred in 1997-1998 (Asia Financial Crisis), 2008 (Global Financial Crisis), and 2009 (Greek Debt Crisis). However, government debt remains and even becomes significantly more extensive after the Global Financial Crisis. The world government debt

increases to more than 200% and reaches \$60 trillion in mid-2017 (McKinsey, 2018). This massive increase responds to limited fiscal capacity due to tax revenue stagnation and the immense expansion of public expenditure, such as social assistance programs (Yared, 2019).

This phenomenon is also feared as the weakening factor of economic growth. Romer (2012) stated that the rising debt would inhibit

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the growth via crowding-out investment effect, the tax burden in the future, ineffective allocation in public spending, or inflation effect due to the seigniorage¹. However, the rising government debt might still positively be impactful when the government maintains a conducive and stable condition through successful tax-smoothing² (Romer, 2012), good public governance (Rosen & Gayer, 2008), simplifying investment procedure, so forth.

In the literature, the impact of debt on economic growth has varied results. The studies about debt impact on economic growth concentrate on determining the debt ratio threshold. Most of the studies conclude that the debt-to-GDP ratio reaching 40%-60% harms economic growth (Reinhart & Rogoff, 2010; Checherita-Westphal & Rother, 2011; Baum et al., 2013; Égert, 2015; Gómez-Puig & Sosvilla-Rivero, 2015, 2017; Chen et al., 2017). However, another study based on non-parametric analysis shows that countries with debt ratios above 90 %, such as Belgium, Greece, Italy, and Japan, still have economic growth driven by debt (Brida et al., 2017). An instrumental variable estimation between debt and economic growth in the OECD countries did not show a negative relationship (Panizza & Presbitero, 2014). Ueshina (2018) simulated that the appropriate allocation of debt, especially in the productive sector, will generate positive economic growth in the long run. Therefore, there might be another factor that must be included to explain these mixed findings.

The debt and growth studies might not provide profound comprehension of the varied impact of debt on economic growth. Hence, some researchers try to relating the institutional aspect such as government effectiveness, regulatory quality, corruption, political rights, and democracy on debt-economic growth relationships (Daud & Podivinsky, 2014; Jalles, 2011;

Kim et al., 2017; Sani et al., 2019). They found that these factors have a significant and prominent role. Sani et al. (2019) argued that good institutional quality is necessary to minimise the negative effect of debt on the economy by ensuring debt effectiveness. Meanwhile, Tarek & Ahmed (2017) found that low institutional quality implies macroeconomic condition cost. It could lead to a higher accumulation of public debt and decreased economic growth.

The institutional quality is an important contextual factor. The rising government debt, coupled with good institutional quality, might generate a different economic growth impact. Nonetheless, the institutional aspects used in the literature do not consider public trust yet. The OECD (2017) reported that low trust in government could hamper the revenue-generating³ and make the government harder in policy implementation⁴. Public trust is essential to represent how the citizen and business sector behave and react to government policies. Hence, public trust might also need to be considered.

In this study, the institutional aspect will be refined by good governance and public trust. This setup aims to answer whether governance and public trust have important role in debt and economic growth nexus. The composite indicator will be used to represents political stability, bureaucracy quality, regulatory quality, law enforcement, control of corruption, and public trust level. Moreover, this study also tries to deal with the endogeneity problem due to the possibility of omitted variable bias and reverse causality. The estimation will be conducted in panel data regression and two-stage least square method as an alternative. The debt will be instrumented by its lagged values (Pattillo et al., 2002). The governance will be instrumented by Western European language usage as the official language (Hall & Jones, 1999)

¹ The seigniorage occurs when the government "prints" the money to repay their public debt. Then, the money supply blows up and leads to inflation.

² Tax-smoothing is conducted to restraint the burden effect of rising tax rate to the private sector. Hence, to rise the tax smoothly, the government reallocate a part of their financing by issuing bonds (Romer, 2012).

³ The low level of trust might make the citizen less likely to pay their tax because they don't believe that the tax will be allocated efficiently and effectively by the government (OECD, 2017).

⁴ The low level of trust represents the low expectation of citizens about whether the government has the capacity to fulfil their needs in the future (OECD, 2017).

and the history of Western European colonisation (Acemoglu et al., 2002).

By using global dataset, empirical estimation consistently shows that the increase of 10 unit (%) of the debt-to-GDP ratios corresponds to an expected decrease in GDP Per-capita by approximately 1,8% to 2,3%. Then, to provide more understanding about this effect, we utilise governance and public trust level as a contextual variable. The interaction between governance and debt ratio has a significant positive effect on growth. However, the quality of governance in each country varies. The low rate of governance might not offset the adverse effects of debt or even exacerbate it. Therefore, this condition might be an early warning signal that high debt, coupled with weak governance, can magnify macroeconomic instability.

In opposite, the role of public trust in the debt-growth nexus is weak. The empirical test provides an inconsistent result. However, by conducting another scheme, we find that public trust is likely to become a mediator rather than a contextual factor. The rising debt corresponds to the declining of public trust, and the falling public trust associates with the decreasing economic growth.

These findings imply that the debt threshold as a budgetary rule is necessary but not sufficient to validate the security of debt rising. The capability of government in providing public governance and the effect of additional debt on public trust is another crucial aspect that needs to be seriously scrutinised, or when the addition of debt becomes inevitable (such as in pandemic situation), the government should strengthen governance capability to ensure the productivity of debt and mitigate the decreased public trust.

This paper contributes to the literature in several ways. First, this issue is worth to be investigated because the impact of debt cannot only be explained by its fiscal sustainability, but the nexus may also vary depending on the contextual factors in each country, such as governance and public trust level. This study provides a deeper understanding of how debt affects economic growth and why countries with similar debt levels have different economic growth. Second, this study gives more insight on how the combination of debt level and

governance/public trust level might become the early warning system of economic instability.

This paper is organised as follows: section 2 will discuss the literature review; section 3 presents the conceptual framework and hypothesis; section 4 describes the empirical framework, including statistical model and data/choices of variables; section 5 discusses the result; and the last section is conclusion and recommendation.

Literature Review

The empirical debate related to the impact of debt on economic growth mostly focuses on determining the debt-to-GDP ratio threshold as a fiscal rule to restrain the debt growth and its effect. Baum et al. (2013) concluded that the positive impact of debt on growth disappears at the debt ratio level 67%, and the negative effect occurs for countries with debt ratios above 95%. Furthermore, Gómez-Puig & Sosvilla-Rivero (2015) stated that the impact of debt in Belgium, Greece, Italy, and the Netherlands on economic growth shows a negative effect in the range of debt ratio 56% up to 103%. A similar conclusion is also found by Chudik et al. (2015). While in Africa, Henri (2019) found that decreasing debt growth has a positive impact on growth in the long run. These debt threshold studies showed that there is a decreasing rate in the debt and economic growth nexus. It implies that the shape of the relationship is inverted U curve or non-linear (Eberhardt & Presbitero, 2015; Guei, 2019; Pattillo et al., 2002; Woo & Kumar, 2015; and Checherita-Westphal & Rother, 2012).

However, Panizza & Presbitero (2014) did not find this non-linearity relationship in OECD countries. Brida et al. (2017) also concluded that countries with high debt ratios (above 90%) have economic growth driven by debt. The possibility of a two-way relationship between government debt and economic growth is also exercised in several studies (Afonso & Jalles, 2013; Checherita-Westphal & Rother, 2012; Woo & Kumar, 2015).

Moreover, some researchers also consider several contextual factors such as institutional quality, democracy, and corruption in debt on economic growth studies. Sani et al. (2019)

found that institutions' quality, such as government effectiveness, control of corruption, and regulatory quality, can alleviate the negative debt impact on economic growth. Another study conducted by Jalles (2011) found that the countries with a lower level of corruption have more effective debt management, but the low level of corruption does not always positively affect the debt-economic growth relationship. These findings are different from the findings of Kim et al. (2017).

From the previous studies, it can be concluded that the impact of debt on economic growth might have a decreasing rate (non-linearity relationship). The debt has a positive effect on a specific range of debt ratio, and the positive impact will gradually disappear and turn negative when the debt exceeds its threshold. This positive effect is caused by productive debt allocations that can trigger economic growth in the long run (Ueshina, 2018), the low levels of corruption (Jalles, 2011; Kim et al., 2017), and the improvement of institutional governance (Daud & Podivinsky, 2014; Sani et al., 2019; Tarek & Ahmed, 2017). Meanwhile, the negative effect along with the rising of government debt can be caused by crowding-out investment effect, the tax burden in the future, ineffective allocation in public spending (lousy governance), or inflation effect (Chen et al., 2017; Romer, 2012). Overall, these varied transmissions lead to the ambiguity of debt effects on economic growth.

Conceptual Framework and Hypotheses **Government Debt and Economic Growth**

The notion of economic growth as a function of government debt can be explained from several theories, such as Wagner's Law and Rahn's Curve. Wagner's law predicts that an industrial economy's development will be accompanied by an increased share of public spending in the gross national product (Rosen & Gayer, 2008). In the private sector, debt is used to leverage business capacity. Align with this; the government uses debt to expand its activity in reaching social welfare as soon as possible.

However, the association between debt financing and growth capacity might have a decreasing rate either in the private or public

sector. In the Low-Democracy regime, the higher public debt will result in lower economic growth (Kourtellos et al., 2013). The rising government spending and financing not accompanied by good governance will produce ineffective and inefficient allocation (Rosen & Gayer, 2008). These conditions are not advantageous for the economy. Daud & Podivinsky (2014) argued that government debt management is about managing its amount and how to allocate it to enhance economic performance properly.

Governance and Public Trust

The governance was born in the corporate world. It emphasised the agency problem. As stated by Jensen & Meckling (1976), the agent (management) and the owner (principal) will face a conflict of interest. This conflict of interest also occurs in the public sector between bureaucrats and the citizens (included private sectors). The bureaucrats have their own interests. According to this motive, they will ignore the citizen's interest; hence, they tend to corrupt and mispend the budget. The power of governance will enhance government spending and financing in terms of productive investments and public services. Bureaucrats who work professionally in providing public services will be able to create long-term stability (Rauch, 1995).

Align with this concept, the impact of governance on economic growth has also been empirically studied by some researchers such as Hall & Jones (1999); Kaufmann et al. (1999); Acemoglu et al. (2002); Jalilian et al. (2007); Fayissa & Nsiah (2013); Wilson (2016); and Huang & Ho (2017). Overall, they found that good governance has a positive impact on economic growth and vice versa. D'Agostiono, Dunne, & Pieroni (2016) found that the interaction between corruption, government investment, and spending will dampen economic growth. The bureaucratic process that cannot mitigate corruption opportunities will not encourage productive investment (Campos et al., 2008).

Good governance is also the way of government getting trust from the citizen. Public trust was a consequence or outcome of good governance. However, it is not always fulfilled because

the trust is blended in the belief and the logical sense (OECD, 2017). Public trust also represents the behavioural and psychological effect that describes how the citizen and business sector behave and react due to government debt policy (Döring & Oehmke, 2019).

Hypotheses

According to the conceptual framework and several prior studies, the hypotheses are divided into three conditions. First, the relationship between government debt and economic growth might be non-linear (inverted U shape). This hypothesis will be accommodated in the model by adding the square of the debt-to-GDP ratio. Second, when the debt-economic growth

relationship shows a positive effect, governance and public trust will strengthen it. Third, when debt-economic growth turns out to negative effects, governance and public trust will weaken it.

Empirical Framework

The empirical model used in this paper is divided into two: the basic and interaction model. The basic model is to estimate the effect of government debt on economic growth (path A), and the interaction model evaluates the impact of governance and public trust level on government debt and economic growth relationship (path B1 and B2).

source: author's illustration

Figure 1. The Research and Empirical Framework

The basic model simply describes the estimation of government debt on economic growth. This estimation is essential to assess how government debt affects economic growth. The estimation can be used as a basis in the comparative analysis between the effect of government debt on economic growth and the interaction effect in the second model. The debt-to-GDP ratio is the proxy of debt as used by many prior researchers. For economic growth, the GDP per capita will be used as a proxy (Kim et al., 2017; Sani et al., 2019). The empirical model is as follows.

$$Y_{it} = \alpha_0 + \beta_1 DR_{i,t} + \beta_2 PB_{i,t} + \beta_3 IR_{i,t} + \beta_4 CG_{i,t} + \beta_5 ER_{i,t} + \beta_6 EA_{i,t} + \varepsilon_{i,t} \quad (1)$$

The non-linear estimation is as follows:

$$Y_{it} = \alpha_0 + \beta_1 DR_{i,t} + DR_{i,t}^2 + \beta_2 PB_{i,t} + \beta_3 IR_{i,t} + \beta_4 CG_{i,t} + \beta_5 ER_{i,t} + \beta_6 EA_{i,t} + \varepsilon_{i,t} \quad (2)$$

Notes:

Y_{it} : annual log of GDP Per-capita on country i in year t

DR_{it} : annual debt-to-GDP ratio on country i in year t

DR_{it}^2 : the square value of annual debt-to-GDP ratio on country i in year t

PB_{it} : annual primary balance on country i in year t

IR_{it} : annual interest rate on country i in year t

CG_{it} : annual capital-to-GDP ratio country i in year t

ER_{it} : annual employment rate on country i in year t

EA_{it} : annual educational attainment on country i in year t

The interaction model is further estimation in examining the effect of contextual factors focused on governance and public trust toward the relationship between government debt and economic growth. The empirical model is as follows.

Interaction Model – Governance

$$Y_{it} = \mu_0 + \gamma_1 DR_{i,t} + \gamma_2 (DR_{i,t} * GI_{i,t}) + \gamma_3 GI_{i,t} + \gamma_4 PB_{i,t} + \gamma_5 IR_{i,t} + \gamma_6 C_{i,t} + \gamma_7 E_{i,t} + \gamma_8 EA_{i,t} \vartheta_{i,t} \quad (3)$$

Notes:

GI_{it} : annual governance index on country i in years t

Interaction Model – Public Trust

$$Y_{it} = \theta_0 + \delta_1 DR_{i,t} + \delta_2 (DR_{i,t} * PT_{i,t}) + \delta_3 PT_{i,t} + \delta_4 PB_{i,t} + \delta_5 IR_{i,t} + \delta_6 C_{i,t} + \delta_7 E_{i,t} + \delta_8 EA_{i,t} + \epsilon_{i,t} \quad (4)$$

Notes:

PT_{it} : annual public trust index on country i in years t

In the basic model, the effect of government debt will be represented by β_2 , but in the interaction model, the total effect of government debt will be represented by $\gamma_2 + \gamma_3 * G$ and $\delta_2 + \delta_3 * PT$.

To deal with the endogeneity of interest variable (debt, governance, and public trust variable) caused by omitted variable bias⁵, we will incorporate several control variables that may affect the interest variable and economic growth at the same time (confounding effect). The identified control variables are primary balance (PB), interest rate (IR), capital (CG), the employment rate (ER), and education attainment (EA) (Afonso & Jalles, 2013; Baum et al., 2013a; Blanchard, 2019; Checherita-Westphal & Rother, 2012; Cuddington, 1996; Mankiw et al., 1992; Solow, 1956). The education variable is also used to control the variation of governance and public trust in a country that may also be affected by education level. The control variables will also be used in the interaction model.

However, the unobservable confounders might exist and must be treated to reduce omitted variable bias. Therefore, this study will check first whether the unobservable variable remains and then assess whether it correlates

with the interest variables or not. Random Effect Model (REM) is a valid method if there is no correlation, but if there is a correlation, the Fixed Effect Model provides a more precise estimation (Wooldridge, 2010).

Economic growth and government debt may experience a two-way relationship or reverse causality⁶ (Afonso & Jalles, 2013; Checherita-Westphal & Rother, 2012; Woo & Kumar, 2015). Governance and public trust may also experience an endogeneity problem through reverse causation. For example, the low economic growth might stimulate the government to raise the debt due to the shortfall of tax revenue. The high economic growth may lead to rising governance and public trust levels due to its rising popularity. Hence, to deal with this problem, this study will use two-stage least square regression (TSLS) as used by Acemoglu et al. (2002); Hall & Jones (1999); Pattillo et al. (2002) as an alternative estimation method.

The debt will be instrumented by its lagged (Pattillo et al., 2002). Meanwhile, the governance will be instrumented by Western European language usage as the official language (Hall & Jones, 1999) and the history of Western European colonisation (Acemoglu et al., 2002). Hall & Jones (1999) argued that Western Europe (England, Germany, France, Spain, and Portugal) has a significant influence on the institution development in other countries, for example, in the property rights system, law, and government management. Hall & Jones (1999) utilised Western Europe Language usage as the official language in a country to represent this influence. In line with this, Acemoglu et al. (2002) also found that the colonised areas tend to have a well-developed institution. By this argument, Western Europe's colonisation can be used as another instrument of governance. Unfortunately, we do not yet find the instrument for the public trust level.

⁵ Omitted Variable Bias (OVB) is generated when the important and relevance variable is not included in the model. The OVB will reduce if we succeed in identifying and including them as control variables in the model. But if the variable remain unobservable, some

techniques are needed to eliminate the OVB, for example by conducting fixed/random effect model in panel dataset (Wooldridge, 2010).

⁶ Reverse causality occurs when the outcome (dependent) variable and interest (independent) variable affect each other. In this study, the economic growth may also affect the debt, governance, and public trust.

Hence, the estimation of public trust will be conducted only by panel data regression.

This study uses a global dataset from 1) World Economic Outlook (IMF) for debt-to-GDP ratio; 2) World Development Indicator (World Bank) for GDP, primary balance, interest rate, capital, employment rate, and educational attainment; 3) World Governance Indicator (World Bank) and OECD for governance index, and; 4) Global Competitiveness Report and OECD Trust Indicator for public trust index, and 5) Geodist for the data of Western Europe language usage and colonisation.

Result and Discussion

The data used for the analysis varies between the model due to the availability of data. Overall, the data is extracted from 217 countries in the period 1991 to 2018. The governance data is between 1996 to 2018, and public trust is between 2008 to 2018. The summarise of information is presented in Table 1 as follows.

Table 1. Descriptive Statistics

VARIABLES	(1) N	(2) Mean	(3) Standard Dev	(4) Min	(5) Max
All Countries					
gdppc	5426	13893	21152	164,3	195.88
debt	4231	56,39	44,33	0,05	514,9
governance	4058	-0,01	0,91	-2,44	1,97
public_trust	1474	3,79	0,87	2,01	6,45
capital	4625	23,46	8,27	-2,42	85,10
interest	3419	17,41	40,14	0,50	1.444
primary_balance	4696	-2,40	13,95	-557,5	125,1
employment	5236	57,66	11,95	26.33	90,45
secondary_school	2237	70,03	24,78	2,76	99,91
tertiary_school	3217	32,11	25,43	0	136,6
Low-Middle Income					
gdppc	3611	3211,61	2938	164,33	20512,94
debt	2811	56,26	46,85	0,07	514,91
governance	2743	-0,50	0,61	-2,44	1,10
public_trust	916	3,40	0.58	2,01	5,54
High Income					
gdppc	1815	35144.18	25335,34	4352,26	195879
debt	1420	56,64	38,85	0,05	237,13
governance	1315	1,00	0,52	-0,48	1,96
public_trust	558	4,44	0,89	2,44	6,45

Source: WDI, WEO, WGI, GCI, processed by Stata 14

The real GDP per-capita (*gdppc*) varies between \$164,3 in Ethiopia (1992) as the lowest value to \$195,88 in Monaco (2018) as the highest value. In panel data, this difference is related to location and time. In line with GDP, the debt-to-GPR (*debt*) ratio also shows a wide range, from 0,05% in Hongkong (2018) to

514,92% in Liberia (2003). Based on the income group, the debt-to-GDP in low-middle income countries is between 0,07 to 514,92%, while the high income varies between 0,052% to 237,13%. The high debt ratio occurs in both income groups.

For governance data (governance), the lowest governance index is -2,44, but the highest governance value is no more than 2. The governance index range is between -2,5 to 2,5. By income group, as expected, the mean of governance index in high-income countries is higher than in low-middle countries (-0,50 in low-middle, 1,00 in high income). Meanwhile, for the public trust level (*public_trust*), in all states, it varies between 2,01 to 6,45 with a mean value of 3,79. This value is not too different if the data is divided by income group.

General Analysis of Government Debt on Economic Growth

In general, prior literature highlights two different findings on the relationship between government debt and economic growth. First, it follows an inverted U-shaped curve (Baum et al., 2013b; Checherita-Westphal & Rother, 2011; Chudik et al., 2015; Eberhardt & Presbitero, 2015; Gómez-Puig & Sosvilla-Rivero, 2015; Guei, 2019; Pattillo et al., 2002; Reinhart & Rogoff, 2010; Woo & Kumar, 2015). Second, it does not follow non-linearity relationship (Brida et al., 2017; Panizza & Presbitero, 2014).

To confirm this, we utilise 217 countries in the period of 1991 to 2018. However, due to a lack of data availability, many countries cannot be included in the sample. Empirical estimation

shows that government debt has a negative impact on economic growth. This result is consistent in the various estimation, either in panel data regression (FE dan REM) or TSLS. But in OLS, the debt coefficient shows a positive sign. This contradiction might result from OLS's shortage in treating the unobserved heterogeneity between the cross-section unit. OLS assumes all observations identically. Breusch Pagan LM Test can be used to check whether the variance of unobserved heterogeneity has constant value or not. If it is constant, the unobserved heterogeneity can be ignored. The test shows that the variance of unobserved heterogeneity is not constant. Therefore, OLS tends to provide a biased estimator.

Due to unobserved heterogeneity, FE and RE might be more appropriate in estimating the model. Besides that, to deal with the possibility of reverse causation, TSLS is also presented as an alternative estimation. According to Table 2, the coefficient of debt is stable in the range of -0,0018 to -0,0023. It means that the increase of 10 unit (%) of debt-to-GDP ratio corresponds to (approximately) an expected decrease in GDP Per-capita growth by 1,8% to 2,3%. This magnitude is much lower than Sani et al. (2019) result that uses Sub-Saharan Africa countries as a sample.

Table 2. Regression of Government Debt on Economic Growth

VARIABLES	(1) OLS	(2) FE	(3) FE	(4) FE TSLS	(5) RE TSLS
debt	0.00152 (0.00106)	-0.00190*** (0.000565)	-0.00186*** (0.000556)	-0.00232*** (0.000711)	-0.00227*** (0.000694)
capital	-0.00806** (0.00379)	0.00187 (0.00130)	0.00172 (0.00126)	0.00241* (0.00124)	0.00223* (0.00121)
interest	-0.0349*** (0.00386)	-0.00315 (0.00193)	-0.00372* (0.00200)	-0.00400** (0.00167)	-0.00465*** (0.00175)
primary_balance	0.0254*** (0.00603)	0.00415*** (0.00125)	0.00437*** (0.00120)	0.00402*** (0.00133)	0.00431*** (0.00125)
employment	0.0217*** (0.00339)	-0.00514 (0.00409)	-0.00580 (0.00400)	-0.00596 (0.00365)	-0.00657* (0.00362)
secondary_school	0.0407*** (0.00199)	0.00344 (0.00257)	0.00555** (0.00245)	0.00269 (0.00263)	0.00495** (0.00246)
tertiary_school	0.00683*** (0.00149)	0.00285*** (0.000921)	0.00369*** (0.000967)	0.00288*** (0.000903)	0.00377*** (0.000950)

VARIABLES	(1) OLS	(2) FE	(3) FE	(4) FE TSLS	(5) RE TSLS
Observations	876	876	876	844	844
R-squared	0.722	0.720			
Number of idcountry		101	101	100	100
Country FE		YES		YES	
Year FE		YES	YES	YES	YES
Instruments				Lagged Var	Lagged Var

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

This negative effect of debt can be explained as follows. Chen et al. (2017) state that excessive government debt can hamper long-term economic growth caused by three things. First, high debt crowds out private investment. The government bond that is purchased by a household or firm might decrease the private saving level or disrupt the loanable-fund market. Finally, it might dampen investment. Second, the soaring debt is incorporated with high long-term interest that must be paid by the government. This high-interest cost will reduce government investment in the productive sector in the long run. Third, to pay high-interest and debt, some governments raise their tax rate in the next period, which is certainly not beneficial for the private sector.

Furthermore, Aschauer (2000) also argues that how the government uses debt is essential. He finds that the enhancement of debt effectiveness and efficiency is advantageous for economic growth and vice versa. The rising government spending and financing that is not accompanied by good governance tends to produce ineffective and inefficient allocation (Rosen & Gayer, 2008). Hence, this negative effect of debt might also be related to the issue of bad governance. Daud & Podivinsky (2014) argued that government debt management is

about how to manage its amount and how to allocate it to enhance economic performance properly. The explanation about this issue will be empirically elaborated in the next section.

The Impact of Governance on Debt and Economic Growth Nexus

Sani et al. (2019) highlight that the institution's quality, such as government effectiveness, control of corruption, and regulatory quality, can alleviate the negative debt impact on economic growth. Empirically, good governance is also advantageous for economic performance (Acemoglu et al., 2002; Fayissa & Nsiah, 2013; Hall & Jones, 1999; Huang & Ho, 2017; Jalilian et al., 2007; Kaufmann et al., 1999; Wilson, 2016). It also explains why some countries produce more output than others (Hall & Jones, 1999).

This study uses the composite indicator of governance index provided by the World bank. It consists of several components such as (1) democracy quality, (2) political stability, (3) government effectiveness, (4) regulatory quality, (5) the rule of law, and (6) control of corruption. This composite indicator is utilised to get a more comprehensive representation of governance.

Table 3. Various Regression of Governance and Debt on Economic Growth

VARIABLES	(1) FE	(2) FE	(4) FE	(3) 2SLS	(5) 2SLS
debt		-0.00152*** (0.000576)	-0.00141** (0.000563)	-0.00254*** (0.000445)	-0.00247*** (0.000433)
governance	0.169*** (0.0620)	0.178** (0.0681)	0.131* (0.0708)	12.48*** (1.215)	12.42*** (1.214)

VARIABLES	(1) FE	(2) FE	(4) FE	(3) 2SLS	(5) 2SLS
governance*debt			0.00113** (0.000548)		0.00112** (0.000450)
capital	0.00309** (0.00135)	0.00146 (0.00145)	0.00164 (0.00145)	-0.0308*** (0.00320)	-0.0307*** (0.00321)
interest	-0.00646*** (0.00222)	-0.00639*** (0.00241)	-0.00596** (0.00237)	0.0285*** (0.00390)	0.0288*** (0.00386)
primary_balance	0.00735** (0.00285)	0.00380*** (0.00127)	0.00418*** (0.00124)	-0.000468 (0.00105)	5.84e-05 (0.00109)
employment	0.00504 (0.00667)	-0.00262 (0.00535)	-0.00165 (0.00557)	-0.00986*** (0.00296)	-0.00845*** (0.00300)
secondary_school	0.00910*** (0.00230)	0.00818*** (0.00212)	0.00807*** (0.00210)	0.00949*** (0.00155)	0.00947*** (0.00154)
tertiary_school	0.00691*** (0.00125)	0.00792*** (0.00116)	0.00762*** (0.00119)	-0.00473*** (0.00116)	-0.00502*** (0.00118)
Observations	827	795	795	830	830
R-squared	0.551	0.597	0.605		
Number of idcountry	104	101	101		
Country FE	YES	YES	YES	YES	YES
Instrumented				debt	debt
Instrument (debt)				governance	governance
Instrument (gov)				lagged var	lagged var
				language &	language &
				colonization	colonization
First Stage F Stat (debt)				184.85	184.85
First Stage F Stat (gov)				673.60	673.60

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Model (1) in Table 3 shows that the governance directly has a positive effect on economic growth. This positive effect remains when the governance interacts with debt in various models. It implies that governance as a contextual factor positively influences government debt and economic growth nexus. The negative coefficient of debt is also lower when the interaction term is included to the model. By deriving the marginal effect, we can explain how the governance became a prominent role in debt and economic growth. Based on the model (4) in Table 3, it can be estimated that the marginal effect of debt is as follows.

$$\frac{\partial \text{growth}}{\partial \text{debt}} = -0.00141 + 0.00113 * \text{governance} \quad (5)$$

This derivation represents that the effect of debt on growth now also depends on the governance level. A larger governance index corresponds to a larger impact on the interaction term and vice versa. Hence, excellent governance implies a positive effect on the relationship between debt and economic growth. However, Huang & Ho (2017) states that improving governance will benefit a country's economic growth, but the impact will vary from country to country. It means that when governance is deficient, the negative effect of debt will be more massive. If this condition occurs, it may lead to economic instability.

Moreover, based on the breakdown of governance indicator, not all component shows the

positive and significant result. Table 4 shows that control of corruption, government effectiveness, and the rule of law positively and

significantly affect debt and economic growth nexus, while other components are not significant. This result can be elucidated as follows.

Table 4. The Regression of Governance Indicator on Debt and Economic Growth Nexus

VARIABLES	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) FE
debt	-0.00158*** (0.000566)	-0.00165*** (0.000569)	-0.00167*** (0.000585)	-0.00157*** (0.000560)	-0.00144*** (0.000546)	-0.00165*** (0.000580)
corrupt*debt	0.000963** (0.000428)					
control_corrupt	0.0198 (0.0583)					
effective*debt		0.00115** (0.000529)				
govn_effective		0.0666 (0.0488)				
politic*debt			0.000563 (0.000548)			
politic_stab			-0.00736 (0.0321)			
regula- tory*debt				0.000613 (0.000650)		
reg_quality				0.0982* (0.0541)		
rule*debt					0.00111*** (0.000408)	
rule_law					0.108* (0.0591)	
voice*debt						0.000634 (0.000582)
voice						0.0992* (0.0578)
Observations	795	795	795	795	795	795
R-squared	0.586	0.597	0.576	0.602	0.611	0.592
Number of id- country	101	101	101	101	101	101
Country FE	YES	YES	YES	YES	YES	YES
Contra Var	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This estimation only use FE due the the result of Hausmann Test.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Control of Corruption

Campos et al. (2008) state that a bureaucratic process that can mitigate corruption opportunities will encourage productive

investment either from government spending or the private sector. In another point of view, D'agostinos, Dunne, and Pieroni (2016) concluded that the interaction between

corruption, government investment, and spending would negatively impact economic growth. The target of government spending and investment is not achieved due to corruption. Therefore, control of corruption has an essential role in ensuring public financing integrity, especially related to debt allocation and its productivity.

Government Effectiveness

Bureaucrats who work professionally in providing public services might create long-term stability because they prioritise investments that are more productive and long-term oriented rather than unproductive spending (Rauch, 1995). It means that the more effective in government business process, the programs that are planned will be appropriately realised, so that debt financing is also on target. Evans & Rauch (1999) state that bureaucratic synergy through the commitment-based decision-making and systematic rules will increase the effectiveness of large infrastructure projects that are mostly financed by debt. Overall, this effectiveness of government business will create a conducive atmosphere in the economy. This result is also in line with Sani et al. (2019).

Rule of Law

Law enforcement is vital in creating political stability, government integrity, national security, and social capital. The enhancement of government integrity, for example, might promote the efficiency and effectiveness of public spending and financing (debt). Besides that, this condition also reduces the level of country risk for potential investors. Hence, enhancing law enforcement will attract more investment in a country and promote more economic activities.

The Impact of Public Trust on Debt and Economic Growth Nexus

The empirical study about the effect of public trust on the relationship between government debt and economic growth or directly on economic growth is likely less in evidence. However, two studies discuss it. OECD (2017) documented that only 43,3% of citizens have trust in their national government in OECD countries. This low trust may affect their behavior in responding to public policies and reacting to economic activity. Second, Döring & Oehmke (2019) argued that the lack of public trust might imply the avoidance behavior on government policy, such as declining tax compliance or increasing risk aversion in the market. From this rationale, public trust is one of the contextual factors that important in the economy.

To precisely examine this argument, this section tries to test the role of public trust in debt on economic growth nexus empirically. Based on Table 5, model (1) shows that public trust has a positive effect on economic growth directly. Interestingly, the relationship between public trust and debt might establish a strong relationship. It can be identified by looking at the sign when debt and public trust are included in the model. The debt coefficient that initially shows a negative sign in model 2 becomes a positive sign in model 3. Hence, in the interaction model, we consider dropping the public trust to reduce serious multicollinearity (model 6). From model 6, the interaction term between public trust and debt shows a significant positive effect. This result is identical to the impact of governance on debt and economic growth nexus.

Table 5 Various Regression of Public Trust and Debt on Economic Growth

VARIABLES	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) FE
debt		-0.00195*** (0.000627)	0.00115** (0.000505)	0.00176*** (0.000661)	0.000777 (0.00166)	-0.000671 (0.00134)
public_trust	0.0418** (0.0162)		0.0518*** (0.0181)	0.0466** (0.0224)	0.0326 (0.0334)	

VARIABLES	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) FE
public_trust*debt					0.000301 (0.000449)	0.000733** (0.000306)
capital				0.00184 (0.00127)	0.00185 (0.00128)	0.00186 (0.00132)
interest				-0.00774*** (0.00246)	- (0.00243)	-0.00740*** (0.00245)
primary_bal				0.00614*** (0.00130)	0.00635* (0.00132)	0.00671*** (0.00134)
employment				0.00474 (0.00532)	0.00451 (0.00535)	0.00415 (0.00545)
teritiary_school				0.00745*** (0.00174)	0.00740* (0.00174)	0.00737*** (0.00173)
Constant	8.635*** (0.0616)	8.639*** (0.0350)	8.545*** (0.0833)	7.836*** (0.302)	7.898*** (0.326)	8.032*** (0.316)
Observations	1,469	4,172	1,446	685	685	685
R-squared	0.015	0.063	0.032	0.367	0.368	0.364
Number of idcountry	146	186	144	92	92	92
Country FE	YES	YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

By calculating the marginal effect of debt in model 6, we can highlight that the effect of debt on economic growth now depends on the debt and the level of public trust in the country.

$$\frac{\partial growth}{\partial debt} = -0.000671 + 0.000773 * public_trust \quad (6)$$

A larger public trust index corresponds to with larger effect on interaction term and vice versa. Hence, high public trust implies a positive impact in the nexus between debt and economic growth. This finding aligns with Döring & Oehmke (2019) and OECD (2017) argumentation. A high public trust might provide a conducive situation for the government in implementing the policy. It also represents the increased confidence of society and the private sector in reaching the government's decision. However, this positive and significant result is

obtained by dropping the public trust from the model and keep the debt and interaction of debt and public trust. When the public trust is included back to the model, the significance of the interaction term disappears. Hence, it might need to retest with different assumptions or schemes to assess whether this result is consistent.

Lagged Variable, Long-Run, and Clustering Analysis

The estimation of debt, public trust, and governance effect needs to be assessed in different assumptions or schemes to check the result's consistency and understand. The test is as follows.

Lagged Variable

The estimation will be conducted by using the lagged variable as a regressor. This lagged

scheme has an advantage in reducing the simultaneity bias. Table 6 provides an estimate of the lagged variable of debt on economic growth. The debt coefficient consistently shows a negative effect in the 1-year to the 5-

year lag scheme. However, the magnitude varies from -0.0012 (3-year lag) to -0.0018 (1-year lag). This result also confirms the negative relationship between government debt on economic growth in the previous estimation.

Table 6. The Regression of Lagged Debt on Economic Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	Fixed Effects (1-year lag)	Random Effects (1-year lag)	Fixed Effects (2-year lag)	Random Effects (2-year lag)	Fixed Effects (3-year lag)	Random Effects (3-year lag)	Fixed Effects (4-year lag)	Random Effects (4-year lag)	Fixed Effects (5-year lag)	Random Effects (5-year lag)
L.debt	0.00186*** (0.000697)	0.00180*** (0.000678)								
L2.debt			0.00158** (0.000691)	0.00149** (0.000671)						
L3.debt					0.00132* (0.000710)	0.00123* (0.000688)				
L4.debt							0.00139* (0.000711)	0.00129* (0.000684)		
L5.debt									0.00152** (0.000686)	0.00144** (0.000655)
Constant	8.277** (0.393)	8.015** (0.389)	8.364** (0.376)	8.080** (0.377)	8.435*** (0.358)	8.121** (0.361)	8.479** (0.333)	8.157** (0.337)	8.692** (0.327)	8.413** (0.340)
Observations	857	857	804	804	757	757	704	704	650	650
R-squared	0.540		0.507		0.443		0.412		0.385	
Number of idcountry	100	100	98	98	96	96	95	95	90	90
Control Var	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES		YES		YES		YES		YES	

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The estimation use FE and RE due to the result of Hausmann Test. The test shows that RE is the best method, however FE still provides consistent estimator. Hence, the both models are used to make a comparison.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Moreover, Table 7 summarises lagged governance and lagged public trust in debt and economic growth relationship in a 1-year and 2-year lag scheme. The result shows that governance and debt interaction's positive significant effect disappear either in 1-year or 2-year lag, while the public trust shows the opposite. The coefficient of public trust and debt interac-

tion consistently delivers a positive and significant effect either in 1-year or 2-year lag. It means that the impact of governance is likely more direct than a public trust. To check this result, we conduct an estimation in an interval scheme (5-year interval and 10-year interval) to show whether, in an extended period, the effect is still consistent or not.

Table 7. The Regression of Lagged Governance and Public Trust on Economic Growth

VARIABLES	(1) Fixed Effect with Inter- action (1 year lag)	(2) Fixed Effect with Inter- action (2 year lag)	VARIABLES	(1) Fixed Ef- fects 1-year lag (Re- duced)	(2) Fixed Ef- fects 2-year lag (Re- duced)
debt	-0.00139** (0.000587)	-0.00117** (0.000583)	debt	-0.000246 (0.00106)	8.81e-05 (0.000918)
governance	0.106 (0.0688)	0.0841 (0.0667)	public_trust		
govern- ance*debt	0.000923 (0.000560)	0.000826 (0.000553)	public_trust*debt	0.000729*** (0.000250)	0.000682*** (0.000259)
Observations	775	722	Observations	658	595
R-squared	0.570	0.533	R-squared	0.360	0.323
Number of id- country	100	98	Number of id- country	91	91
Country FE	YES	YES	Country FE	YES	YES
Control Var	YES	YES	Control Var	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This estimation only use FE due the the result of Hausmann Test.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Long-Run and Clustering Analysis

Table 8 and 9 shows that the debt effect on economic growth consistently indicates a negative sign either in a 5-year or 10-year interval. The magnitude of the coefficient is also not too different from annual or short-term estimations. However, consistent with the lag scheme, governance's positive and significant effect

disappears either in a 5-year or 10-year interval. It confirms the lag scheme result that governance and debt interaction are likely to show a short run impact. Meanwhile, public trust and debt interaction consistently show a positive and significant effect. It implies that public trust is likely to embody a long-run effect characteristic.

Table 8. Long Run and Cluster Analysis for Governance on The Debt and Economic Growth Nexus

VARIABLES	(1) FE (5-year inter- val)	(2) FE (10-year interval)	(3) FE (High In- come)	(4) FE (Low-Mid- dle Income)
debt	-0.00120** (0.000580)	-0.00122* (0.000723)	-0.00179* (0.00102)	-0.00128* (0.000763)
c.debt#c.governance	-0.000210 (0.000397)	0.000169 (0.000493)	0.00154** (0.000682)	0.00229** (0.000968)
Observations	635	400	609	526
R-squared	0.495	0.513	0.697	0.656
Number of idcountry	160	162	48	74
Country FE	YES	YES	YES	YES
Control Var	YES	YES	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This estimation only use FE due the the result of Hausmann Test.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Table 9. Long Run and Cluster Analysis for Public Trust on The Debt and Economic Growth Nexus

VARIABLES	(1) Fixed Effects (5-years interval)	(2) Fixed Effects (10-years interval)	(2) Fixed Effects (High Income)	(5) Fixed Effects (Low- Middle Income)
debt	-0.00385** (0.00174)	-0.00870*** (0.00278)	-0.00132 (0.000849)	-0.00140 (0.00293)
c.debt#c.public_trust	0.00127** (0.000495)	0.00207*** (0.000771)	8.95e-05 (0.000188)	0.000728 (0.000904)
Observations	347	242	372	269
R-squared	0.242	0.407	0.632	0.670
Number of idcountry	131	133	48	55
Country FE	YES	YES	YES	YES
Control Var	YES	YES	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This estimation only use FE due the the result of Hausmann Test.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Table 8 and 9 also show the estimation based on the income group: low-middle-income and high-income countries. This estimation aims to get more understanding of whether the result is identical or different in each cluster. The results highlight that the debt effect in high income and low-middle is identical. It consistently shows a negative and significant effect. However, the effect in the low-middle-income is larger than the high-income group.

Then, related to the governance, the effect of governance and debt interaction consistently shows positive and significant results either in low-middle or high-income groups. In contrast, the significant impact of public trust and debt interaction disappears either in high-income or low-middle-income group. This result confirms that the public trust is likely to have a weak role in affecting the debt-growth nexus. To improve public trust understanding,

we also estimate how debt level and governance might affect public trust (Döring & Oehmke, 2019). Hence, it might be more proper to assign public trust as a mediator rather than a contextual factor.

The Connection Between Debt, Governance, and Public Trust

OECD (2017) argue that good governance is the foundation of getting public trust. Meanwhile, Döring & Oehmke (2019) argue that the higher government debt might be correlated to the avoidance behaviour. In short, higher debt implies the reduction of public trust. These rationales predict that governance promotes a positive effect on public trust, while debt negatively affects it (see table 10)

Table 10. The Regression of Debt and Governance on Public Trust

VARIABLES	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE 1-year lag	(6) FE 2-year lag	(7) FE 3-year lag
debt	-0.00679*** (0.00160)	-	-	-	-	-0.00620*** (0.00167)	-
governance		0.00595*** (0.00162)	0.00637*** (0.00128)	0.00694*** (0.00214)	0.00669*** (0.00194)	0.00466*** (0.00167)	0.00466*** (0.00167)
debt*governance		0.555*** (0.141)	0.769*** (0.147)	0.670** (0.259)	0.840*** (0.269)	0.803*** (0.262)	0.658*** (0.218)
			-	-	-0.00516** (0.00217)	-0.00490* (0.00266)	-0.00230 (0.00278)
Observations	1,451	1,451	1,451	704	731	713	698
R-squared	0.078	0.109	0.135	0.194	0.271	0.275	0.182
Number of id-country	144	144	144	116	115	116	114
Country FE	YES	YES	YES	YES	YES	YES	YES
Control Var				YES	YES	YES	YES

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

This estimation only use FE due the result of Hausmann Test.

Source: WDI, WEO, WGI, GCI (processed by Stata 14)

Align with the conceptual, the empirical result shows that governance has a positive sign, while the debt has a negative sign on public trust. Both coefficients are statistically significant. This result implies that public trust's role may not be a contextual variable but a mediating variable. Governance and debt become a significant variable that affects the public trust. Then, public trust becomes one of the crucial variables that affect economic growth (see Table 4). This result may answer why in contextual set up, the effect of public trust is inconsistent and weak. Nevertheless, this relationship will not comprehensively be discussed in this study. This finding is a preliminary analysis that can be more elaborated in future research.

Conclusion and Recommendation

High government debts in several countries have the potential to trigger or exacerbate economic instability. These concerns are consistent with this study's results, where countries with rising debt ratios tend to have declining economic growth. The increase of 10 unit (%) of the debt-to-GDP ratios corresponds to an expected decrease in GDP Per-capita growth by approximately 1,8% to 2,3%. This result is consistent in various estimation.

To provide more understanding about this effect, we utilise governance and public trust level as a contextual variable. The interaction between governance (specifically in three aspects) and debt ratio has a significant positive

effect on growth. These three aspects are control of corruption, government effectiveness, and the rule of law. Good governance can become a restraining tool for the adverse effects of debt on economic growth. However, the quality of governance in each country varies. The low rate of governance might not offset the harmful effects of debt or even exacerbate it. Therefore, this condition might be an early warning signal that high debt, coupled with weak governance, can magnify macroeconomic instability.

In opposite, the role of public trust in the debt-growth nexus is weak. The empirical test provides an inconsistent result in various estimation. However, by conducting another scheme, we find that public trust is likely to become a mediator rather than a contextual factor. According to empirical result, the rising debt corresponds to the declining of public trust, and the falling public trust associates with the decreasing economic growth.

Broadly speaking, governance and public trust are essential factors that need to be considered in government debt management or fiscal policymaking. These findings imply that the debt threshold as a budgetary rule is necessary but not sufficient to validate the security of debt rising. The capability of government in providing public governance and the effect of additional debt on public trust is another crucial aspect that needs to be seriously scrutinised, or when the addition of debt becomes inevitable (such as in pandemic situation), the government should strengthen governance capability to ensure the productivity of debt and mitigate the decreased public trust. This finding also implies that the debt policy should not only be based on budgetary rule but also the capacity of governance and the potential implication for the falling public trust. This study has several limitations. Firstly, the fixed effect model might be imperfect in eliminating the unobserved time variant, hence the potential control variable confounding the model should be deeply identified. Secondly, the instrumental variable 2SLS estimation might also not valid enough due to the exclusion restriction assumption. The lagged debt as instrument might violate the assumption of valid instrument because this variable might also affect the

economic performance in the future. Therefore, the future study might need to find a stronger instrument for debt.

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