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Demystifying the Role of Governance Quality and Fiscal Space on Nonperforming Loans in Zimbabwe

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Abstract: *The paper examines the effects of governance quality and fiscal space on non-performing loans (NPLs) in Zimbabwe. We estimated pooled ordinary least squares (OLS) and quadratic regressions with panel-corrected standard errors (PCSE) and Driscoll-Kraay standard errors using the full dollarisation era dataset for 13 banks from 2009 to 2017. We noted that all the governance indicators are on average negative (bad) and that improvement in the rule of law, political stability and control of corruption stimulates reduction in NPLs if the indicators improve beyond -1.654, -0.876 and -1.361, respectively. More interestingly, the results revealed that an improvement in the interaction terms of political stability and control of corruption with rule of law, governance index and voice and accountability significantly reduces NPLs, which is new empirical evidence in the literature. Regarding fiscal space, we find evidence that fiscal balance positively and significantly affects NPLs. We contribute to the literature by providing new evidence on the role of governance quality in NPLs formation in Zimbabwe, especially when corruption and political stability interact with all governance indicators. We recommend that the Zimbabwean government improve political stability, control of corruption, voice and accountability and the rule of law to reduce NPLs.*

Keywords: Non-performing loans; Governance quality; Fiscal space; PCSE model; Dollarisation
JEL Classification: E51, E62, G38

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1. Introduction

Governance quality provides a conducive environment for a thriving financial system, which is critical for economic development. This implies that for economies to thrive, they require appropriate governance standards that support the flow of activities in an economy (Gani & Rasul, 2020). As Büyükoğlu et al. (2021) point out, governance facets, such as the rule of law, control of corruption, political stability and regulatory quality, significantly influence economic activities, including banking system activities. Thus, due to its macro nature, country governance significantly influences banks, like any other sector of the economy. Governance quality affects the banking industry performance in several ways, such as disruptions in credit supply and compromising loan portfolio quality. In addition, growth in non-performing loans (NPLs) is associated with several spill-over effects, such as the erosion of bank solvency and profitability, as well as the crowding out of new loans, ultimately destabilising the banking system (Naili & Lahrichi, 2022; Phung et al., 2022).

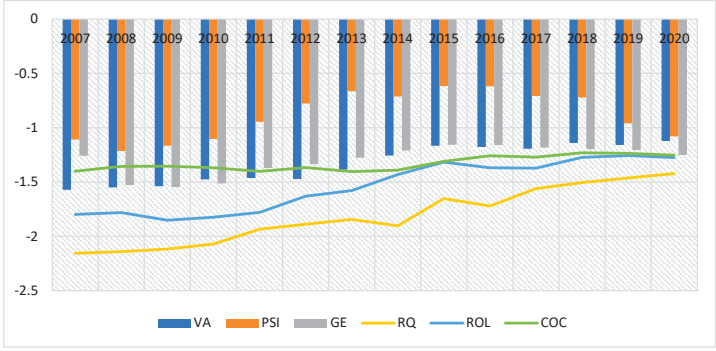
In the particular context of Zimbabwe, the banking industry's average NPLs ratio worsened during the 2007 to 2008 hyperinflationary era and later improved during the early stages of formal dollarisation. Initially, Zimbabwe was unofficially dollarised until the government legalised the policy in 2009 to preserve the economy from an impending collapse. During the dollarisation era, the economy stabilised, as evidenced by the decline and stabilisation of inflation figures to single digits, and improved economic output. However, the Zimbabwean government abandoned the dollarisation policy in 2017 before reinstituting it in 2022. Despite introducing a stable currency during the formal dollarisation period, the economy experienced a significant deterioration in governance quality and fiscal space, which, according to several studies in different country contexts, increases NPLs (Büyükoğlu et al., 2021; Karadima & Louri, 2022; Rehman et al., 2020).

There are six indicators which explain the quality of any country's governance, namely, control of corruption, voice and accountability, rule of law, political stability and absence of violence/terrorism, government effectiveness, and regulatory quality (Kaufmann et al., 2010). All the indicators range from -2.5 to +2.5, with negative values translating to weak governance, and positive values implying strong governance (Gani & Rasul, 2020). For example, the control of corruption index measures the extent to

which agents use public power for private gain, and includes both grand and petty forms of corruption. Evidence shows that corruption reduces institutional trust by economic agents and citizens (Beesley & Hawkins, 2022). Although corruption impacts the trust of national institutions, it can affect perceptions about the banking industry of a country. Governance failures in the form of corruption can affect banking industry activities from either the borrower or lender sides, or both (Goel & Hasan, 2011). For example, borrowers might engage in corrupt practices, such as paying bribes to access credit. Similarly, bank officials might demand bribes from borrowers to grant credit. Several studies have found that corruption increases NPLs (Bougatef, 2015; Hassan et al., 2022; Mohamad & Jenkins, 2021; White et al., 2022).

There are studies that confirm the prevalence of corruption in Zimbabwe (Bonga et al., 2015; Muzurura, 2019; Nyoni, 2017). However, the literature on the impact of corruption and other governance indicators on the Zimbabwean banking industry is still scarce. Zimbabwe has faced severe governance challenges, particularly after achieving independence in 1980. Figure 1 provides information on Zimbabwe's performance on all governance indicators from 2007 to 2020. In Figure 1, all governance indicators are weak. It is critical to investigate whether these indicators contributed to the growth in NPLs in the Zimbabwean banking industry since they are prerequisites of economic development.

Figure 1: Governance Indicators for Zimbabwe



Notes: COC = control of corruption; VA= voice and accountability; ROL = rule of law; PSI = political stability and absence of violence/terrorism; GE = government effectiveness; RQ = regulatory quality.
Source: WGI database.

On a different note, fiscal space is critical in determining NPL projections (Ghosh, 2015; Karadima & Louri, 2021). Fiscal space, in its broadest sense, is the availability of budgetary room that permits the government to provide resources for the intended purpose without jeopardising the financial sustainability of the government (Makala, 2022; Heller, 2005). The government debt sustainability class is one of the fiscal space categories under which government budget balance (fiscal balance) and public debt accumulation are classified. The public debt ratio for Zimbabwe was volatile before, during, and after dollarisation, and the economy has endured prolonged periods of fiscal deficit compounded by governance failure (Saungweme & Odhiambo, 2018). The literature documents mixed findings regarding the impact of public debt and fiscal balance on NPLs. Some studies argue that NPLs can worsen because of an expansionary fiscal policy (Anastasiou et al., 2016a). In contrast, government debt accumulated for capital project purposes can spur economic growth, which reduces NPLs (Mupunga & Le Roux, 2016).

The paper aims to establish whether governance quality and fiscal space affect NPL formation in Zimbabwe. The present study is motivated by the fact that Zimbabwe has persistently experienced acute deficiencies in country governance and fiscal space performance, including political instability (Benedict et al., 2022). Therefore, this paper intends to achieve the following objectives. Firstly, the influence of governance quality on NPL accumulation will be investigated. Understanding the relationship between governance quality and NPLs is vital for formulating and implementing policies that curb NPLs. The final objective is to examine the effects of public debt and fiscal balance on NPLs. Public debt accumulation and fiscal space are critical policy issues that can have macroeconomic ramifications if allowed to spiral out of control. Since corruption and political stability are the most widely discussed indicators in the literature, the present study extends the work of Gjeci and Marinc (2018) by examining the interaction terms between control of corruption/political stability and NPLs, accounting for the existing rule of law, regulatory quality, voice and accountability and government effectiveness. Additionally, the study contributes to the existing literature by providing insight into the influence of fiscal space and governance quality on NPLs in Zimbabwe, which also aid in policy formulation in other emerging economies.

This paper is organised as follows. The next section reviews the existing literature on the subject area. Then, Sections 3 and 4 discuss the

methodology and empirical results, while Section 5 concludes the paper.

2. Literature review

The quality of a country's governance plays a vital role in shaping various aspects related to banking industry activities (Goel & Hasan, 2011). Good governance promotes a smooth flow of banking industry activities and the economy. In contrast, bad governance introduces several hurdles to the banking industry and the economy. Studies on the association between banking system activities and corruption are scant and offer mixed findings. To begin with, the sand-the-wheel hypothesis holds that corruption adversely impacts bank activities (Bougatef, 2015; Goel & Hasan, 2011). Corruption negatively affects bank activities by allowing access to loans by economic agents linked to politicians who, in turn, have low credit ratings, thus leading to high NPLs (Charumilind et al., 2006).

On the other hand, the grease-the-wheel and speed-the-money hypotheses assert that borrowers circumvent administrative delays by banks through corruption. Therefore, if most economic agents that attempt to circumvent administrative delays have a low risk of default, NPLs will not rise. In this regard, the grease-the-wheel and sand-the-wheel hypotheses suggest that as corruption increases, NPLs may decline or rise.

2.1 Effect of governance quality on NPLs

A tranche of studies documented that weak governance is associated with growth in problem loans. Büyükoğlu et al. (2021) investigate Morgan Stanley Capital International (MSCI) in emerging countries from 2002 to 2008. Using the generalised methods of moments (GMM) and mean group dynamic least squares (DOLSMG) techniques, the results show that the governance index exerts negative pressure on NPLs, indicating that good governance results in a reduction in NPLs. In a related study, Rehman et al. (2020) examine the effect of corruption on NPLs using a sample of 18 commercial banks in Pakistan. The researchers employed ordinary least squares (OLS), fixed effects (FE), and random effects (RE) estimators and showed that control of corruption reduces NPLs.

Finally, Yakub et al. (2019) investigate the effect of corruption on NPLs in Indonesia using RE from 2008 to 2017. The study finds that

corruption exerts a positive effect on NPLs, implying that a rise in the level of corruption leads to an increase in NPLs. However, Yakub et al. (2019) are among the researchers that wrongly interpret the impact of governance indicators on NPLs. Their study uses Worldwide Governance Indicators (WGI), with the control of corruption variable capturing the perceived level of corruption. A positive effect of the control of corruption variable on NPLs implies that tighter control of corruption (low level of corruption) results in rising NPLs. Based on this view, the results reported by Yakub et al. (2019) require proper interpretation. In the Zimbabwean context, no studies explore the connection between governance quality and NPLs. However, a different but related study by Muzurura (2017) finds that corruption harms economic performance in Zimbabwe.

2.2 Impact of government borrowing and fiscal environment on NPLs

The rate of public debt accumulation and government budget balance deterioration may affect NPLs. Public debt, expressed as a percentage of gross domestic product (GDP), measures the solvency risk in a country. High government borrowing reduces liquidity, reducing lending activity by banks and making it difficult for economic agents to refinance their loans (Ghosh, 2015). Therefore, due to high public debt, NPLs tend to rise.

Karadima and Louri (2022) investigate the role of fiscal expansion in Greece using an autoregressive distributed lag (ARDL) bounds testing approach. Application of quarterly data from 2003 to 2020 produced results that suggest a significant and positive long-term impact of government debt on NPLs. The study shows that government debt exerts a positive long-term effect on NPLs, while the long-run effect of fiscal balance was negative. Results regarding the influence of government debt on NPLs in Greece concur with Konstantakis et al. (2016), who conclude that NPLs increased due to fiscal problems in the country.

The ratio of fiscal balance to GDP measures the ability of the government to meet its financing needs (Karadima & Louri, 2021). Siakoulis (2017) explores fiscal policy effects on NPLs in 31 countries using a 15-year dataset. The study shows that the impact of austere fiscal policy on NPLs is severe and results in high NPLs. Austere fiscal policy positively affects government budget balance and is usually associated with introducing measures that impede borrowers' loan servicing capacity, which triggers

NPLs in banks. Anastasiou et al. (2016b) examined determinants of NPLs in 15 euro area countries using GMM estimations. The study, which spans from 1990 to 2015, reveals that public debt had a positive but insignificant effect on NPLs, while fiscal balance positively influenced NPLs in peripheral countries. In addition, Ofria and Mucciardi (2021) show that corruption and public debt negatively and positively influence NPLs in Europe, respectively.

Although several studies have made significant strides in exploring the effects of governance quality and fiscal space on NPLs, the literature requires further evidence to shed light on the role of fiscal space and governance quality on NPLs in the emerging markets context. Extending a step further than prior studies, the present paper enriches current literature by focusing on the effect of corruption and political stability on NPLs, taking into account the existing levels of the rule of law, voice and accountability, regulatory quality and government effectiveness. Furthermore, previous research in Zimbabwe has primarily concentrated on the impact of corruption on economic performance, which leaves a gap in knowledge that this paper intends to fill. Therefore, the paper contributes positively to governance-finance literature in broadening the understanding of the combined role of governance quality and fiscal space on loan portfolio quality in developing economies.

3. Methodology and Data

3.1 Data

The present study investigates the impact of governance quality and fiscal space on NPLs using a panel of 13 commercial banks. The article covers Zimbabwe's entire formal dollarisation period, from 2009 to 2017. We selected the dollarisation era because this was when the credit market was fully functional and inflation rates were stable in Zimbabwe.

3.2 Study variables

The current study uses the following variables: fiscal balance, public debt, inflation rate, governance indicators, bank capitalisation, and bank size. All governance indicators were sourced from the WGI dataset, whilst all bank-level variables were generated from bank annual reports. We also generated

fiscal space variables from the World Bank dataset.

3.2.1 Dependent variable

The NPLs, the ratio of non-performing loans to gross loans, were treated as the dependent variable in the analysis. NPLs refer to loans where the principal and interest payments are 90 days past due. NPLs reflect bank assets' quality and the overall soundness of the banking industry. Many studies use this variable, for example, Ghosh (2015) and Rehman et al. (2020).

3.2.2 Independent variables

The main explanatory variables in the paper are the governance index, fiscal balance, and public debt. The governance index (GOIX) is used as a proxy for governance quality, which affects many variables, including the banking industry's loan issuance policies and the overall loan portfolio performance. Good governance promotes the formulation of strong legal systems and citizens' observation of the law, which results in a reduction in NPLs. Büyükoğlu et al. (2021) are among those that developed the governance index variable and reported a negative and significant linkage with NPLs. We include control of corruption, voice and accountability, the rule of law, political stability and absence of violence and terrorism, government effectiveness, and regulatory quality in creating the index. All the governance indicators' scores range from -2.5 to 2.5 (Kaufmann et al., 2010). Negative values reveal weak (bad) governance, while positive scores imply good governance. Therefore, we expect a negative relationship between governance indicators (index) and NPLs. Several studies incorporated governance indicators in their analysis and reported mixed findings (Gjeci & Marinc, 2018; Semia & Rachid, 2019).

Fiscal balance (FB, also called government budget balance) is one of the variables that explain the fiscal space of a nation. Fiscal balance measures the government's fiscal performance and is the difference between government revenue and expenditure. The effect of fiscal balance on NPLs is ambiguous. A higher budget surplus, defined as government revenue exceeding government expenditure, may result from the employment of austere measures that adversely affect economic agents' disposable incomes

and, ultimately, borrowers' repayment capacity. In this regard, the fiscal balance variable is expected to relate positively to NPLs. On the other hand, a bigger budget surplus can be linked to a decrease in NPLs because of the decreased country risk, more affordable financing, and growing confidence in the fiscal position. Karadima and Louri (2021) and Anastasiou et al. (2016b) find a negative and positive association, respectively. Therefore, we expect the fiscal balance to be positively or negatively associated with NPLs.

High government borrowing adversely affects bank liquidity leading to a crowding-out effect, which in turn causes banks to lend less, making it difficult for economic actors to refinance their loans (Ghosh, 2015). Failure to refinance loans due to high government borrowing results in high loan default rates and NPLs. Studies that reported a positive connection between NPLs and public debt (PD) include Ofria and Mucciardi (2021). In this respect, we expect that public debt positively relates to NPLs.

We introduce some control variables into the model, namely bank size (SIZE), bank capitalisation (ETA) and inflation rate (INF). The motivation for using the equity ratio is to account for banks' capitalisation, while bank size captures the potential for banks to benefit from diversified loan portfolios associated with large banks. In addition, we included the rate of inflation variable to account for changes in the macroeconomic environment in Zimbabwe.

Bank size is measured as the natural logarithm of the bank's total assets. Large banks usually benefit from holding large and well-diversified loan portfolios compared to smaller banks. This means that big banks are expected to have high-quality loan portfolios. Anastasiou et al. (2019) report that bank size negatively influences NPLs. Based on this notion, we expect the bank size variable to affect NPLs negatively.

The ratio of equity-to-assets measures the level of bank capitalisation. Highly capitalised banks do not venture into risky lending activities than lowly capitalised banks. This means that highly capitalised banks, those with high equity ratios, will have higher quality loan portfolios than less capitalised ones. Makri et al. (2014) find that the equity ratio negatively influences NPLs. Hence, the equity ratio is expected to relate inversely to NPLs.

Inflation is the change in the general price levels of goods and services in an economy. The effect of inflation is ambiguous (Nkusu, 2011). Firstly, a high rate of inflation results in a high cost of borrowing, thus translating to

an increase in default risk and NPLs. Conversely, a high inflation rate erodes the real value of loans, making it easy for borrowers to pay back their loans and reduce NPLs. Based on these two perspectives, we expect that inflation has either a positive or negative effect on NPLs.

3.3 Model specification

The study utilises pooled OLS regression with panel-corrected standard errors (PCSE). The PCSE model was chosen because of its ability to handle the problems of heteroscedasticity and autocorrelations, and cross-sectional dependencies inherent in micro-econometric panels. The influence of fiscal space and governance quality on NPLs was analysed using the following PCSE model, adopted from Forson et al. (2022).

$$\mathrm{NPL_{it}} = \alpha_0 + \sum \beta_1 \mathrm{C}_{\mathrm{i,t}} + \beta_2 \mathrm{Q_{i,t}} + \beta_3 \mathrm{FB_{i,t}} + \beta_4 \mathrm{PD_{i,t}} + \beta_5 \mathrm{INF_{i,t}} + \varepsilon_{\mathrm{it}} \quad (1)$$

$$\mathrm{NPL_{it}} = \alpha_0 + \sum \varphi_1 \mathrm{C}_{\mathrm{i,t}} + \varphi_2 Q_{it} + \varphi_3 Q_{it}^2 + \varphi_4 \mathrm{FB_{i,t}} + \varphi_5 \mathrm{PD_{i,t}} + \varphi_6 \mathrm{INF_{i,t}} + \varepsilon_{\mathrm{it}} \quad (2)$$

$$\mathrm{NPL_{it}} = \alpha_0 + \sum \omega_1 \mathrm{C}_{\mathrm{i,t}} + \omega_2 \theta_{\mathrm{i,t}} + \omega_3 \mathrm{FB_{i,t}} + \omega_4 \mathrm{PD_{i,t}} + \omega_5 \mathrm{INF_{i,t}} + \varepsilon_{\mathrm{it}} \quad (3)$$

In the above equations, $NPL_{i,t}$ represents the non-performing loans ratio for bank *i* in period *t*. $\mathrm{FB_{i,t}}$ and $\mathrm{PD_{i,t}}$ are fiscal space variables, namely fiscal balance and public debt, respectively. C_{it} denotes bank specific control variables, namely bank size and equity-to-asset ratio, whilst $\mathrm{INF_{i,t}}$ is the rate of inflation. $\mathrm{Q_{i,t}}$ denotes a vector of governance indicators, namely control of corruption ($\mathrm{COC_{i,t}}$), voice and accountability ($\mathrm{VA_{i,t}}$), rule of law ($\mathrm{ROL_{i,t}}$), political stability and absence of violence/terrorism ($\mathrm{PS_{i,t}}$), government effectiveness ($\mathrm{GE_{i,t}}$), regulatory quality ($\mathrm{RQ_{i,t}}$) and governance index ($\mathrm{GOIX_{i,t}}$). Extending from Gjeci and Marinc (2018), we examine the interaction terms between control of corruption/political stability with all the governance indicators, as well as the governance index, to have a broader view on governance-NPL nexus. Thus, in equation (3), $\theta_{\mathrm{i,t}}$ denotes a vector of interaction terms:

$\mathrm{COC_{i,t}} * \mathrm{ROL_{i,t}}$	The interaction between control of corruption and rule of law
$\mathrm{COC_{i,t}} * \mathrm{RQ_{i,t}}$	The interaction between control of corruption and regulatory quality
$\mathrm{COC_{i,t}} * \mathrm{VA_{i,t}}$	The interaction between control of corruption and voice and accountability

$COC_{i,t} * GE_{i,t}$	The interaction between control of corruption and government effectiveness
$COC_{i,t} * GOIX_{i,t}$	The interaction between control of corruption and the governance index
$PS_{i,t} * ROL_{i,t}$	The interaction between political stability and rule of law
$PS_{i,t} * RQ_{i,t}$	The interaction between political stability and regulatory quality
$PS_{i,t} * VA_{i,t}$	The interaction between political stability and voice and accountability
$PS_{i,t} * GE_{i,t}$	The interaction between political stability and government effectiveness
$PS_{i,t} * GOIX_{i,t}$	The interaction between political stability and the governance index
$PS_{i,t} * CO_{i,t}$	The interaction between political stability and control of corruption

We use equation (2) to find the turning points where NPLs will start decreasing as the governance indices improve. To do this, we differentiated $\varphi_2 Q_{it} + \varphi_3 Q_{it}^2 = 0$ with subject to Q_{it} to get:

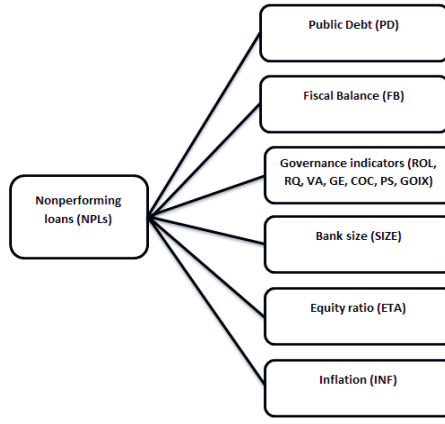
$$\varphi_2 + 2\varphi_3 Q_{it} = 0 \tag{4}$$

Then solved Q_{it} to identify the turning point.

3.4 Conceptual framework

Figure 2 depicts the conceptual framework for this paper.

Figure 2: Conceptual Framework



Source: Authors' own.

We applied principal component analysis (PCA) to create a governance index for Zimbabwe. All governance indices in Table 1 are positively correlated, and for this reason, it is inappropriate to incorporate all of them into a single model. Moreover, including certain variables while leaving out some indices would not capture some important information, since all the indices explain different but important versions of governance quality. Therefore, we employed PCA due to its ability to automatically generate the weights for each governance indicator. Table 1 indicates that the first component explains about 84% of the variation. It also demonstrates that the second, third, fourth, fifth, and sixth components explain 11.9%, 2.5%, 1.2%, 0.3%, and 0.2% of the standardised variations correspondingly. Based on the results, the first component is preferred to other combinations, given the high variability of 84%, and the first eigenvector values were used as weights to construct the governance index. The estimated weights for COC, PS, GE, VA, RQ, and ROL are 30.38%, 40.7%, 43.25%, 42.94%, 42.25%, and 43.83%, respectively.

Table 1: Governance Indicators Correlation Analysis

	COC	**PS**	**GE**	**VA**	**RQ**	**ROL**
COC	1					
PS	0.3831	1				
GE	0.5053	0.9626	1			
VA	0.6853	0.8224	0.9236	1		
RQ	0.6812	0.8427	0.9012	0.8725	1	
ROL	0.6161	0.9154	0.9667	0.9647	0.894	1

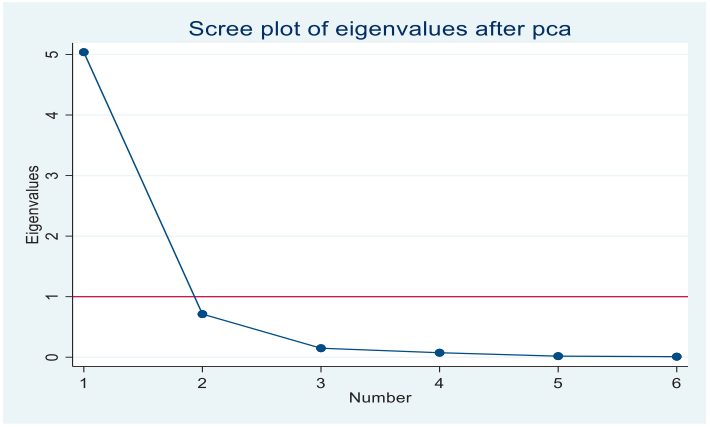
Principal component analysis output

Eigenvalues: N = 117; trace = 6, number of components = 1					**Eigenvectors (loadings)**	
Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**	**Variable**	**Comp1**
Comp1	5.038	4.325	0.840	0.840	COC	0.3038
Comp2	0.712	0.564	0.119	0.958	PS	0.4070
Comp3	0.149	0.074	0.025	0.983	GE	0.4325
Comp4	0.074	0.057	0.012	0.996	VA	0.4294
Comp5	0.018	0.009	0.003	0.999	RQ	0.4225
Comp6	0.009	–	0.002	1.000	ROL	0.4383

Notes: See methodology for definitions of variables.

We also confirmed the number of components to retain using a scree plot. Figure 3 suggests that only the first component is in the top part of the scree plot, indicating that the first component is our governance index.

Figure 3: Scree Plot of Eigenvalues



Before developing the governance index, we performed the Kaiser-Meyer-Olkin test to see if the use of PCA was justified, and the results are shown in Table 2. The obtained statistic is 0.7767, and the results support the PCA since the obtained coefficient is greater than 0.5 (Kaiser, 1974).

Table 2: Kaiser-Meyer-Olkin Measure of Sampling Adequacy

Variable	KMO
COC	0.731
PS	0.7278
GE	0.7612
VAC	0.735
REQ	0.8591
ROL	0.836
Overall	0.7767

Table 3 presents multicollinearity test results for all study variables. The correlation coefficients for all variables are less than 0.8, and such findings evidence the absence of a multicollinearity problem.

Table 3: Correlation Analysis

	NPLS	SIZE	ETA	INF	PDGDP	FB	GOIX
NPLS	1						
SIZE	-0.2105	1					
ETA	-0.0168	-0.3254	1				
INF	-0.2546	0.4366	-0.1827	1			
PD	-0.0503	0.2188	-0.1739	-0.2445	1		
FB	0.1406	0.1056	-0.0194	-0.0206	-0.3286	1	
GOIX	0.1112	-0.4187	0.1838	-0.629	0.2717	-0.6917	1

Notes: See methodology for definitions of variables.

We tested for stationarity in study variables using Pesaran's CIPS unit root test, as shown in Table 4. The results suggest that NPLs, INF, PD, FB and GOIX are stationary at level, whilst SIZE and ETA became stationary after first differencing.

Table 4: Stationarity Test

Variable	CIPS criteria		Order of integration
	CIPS stat	5% CV	
NPLS	2.746	2.35	0
SIZE	2.442	2.4	(I)
ETA	2.442	2.4	(I)
INF	2.61	2.35	0
PD	2.61	2.35	0
FB	2.61	2.35	0
GOIX	2.61	2.35	0

Notes: See methodology for definitions of variables.

Table 5 shows summary statistics for all study variables. We discovered that the banking industry's NPL ratio is 9.14% on average, with the best banks recording a 0% NPL ratio and the worst banks recording a 76.7% NPL ratio. The study findings suggest a significant difference in banks' credit risk management as evidenced by wide range on NPLs, which is the difference between the minimum and maximum values.

Table 5: Summary Statistics

Variable	Obs	Mean	Std Dev	Min	Max
NPLS	117	0.0914	0.1160	0	0.7670
SIZE	104	0.2409	0.2545	-0.2101	1.4310
ETA	104	-0.0095	0.0600	-0.3317	0.2225
INF	117	0.0031	0.0368	-0.0770	0.0490
PD	117	45.1392	6.1450	36.9440	58.7090
FB	117	-2.6204	2.7410	-8.2880	0.1640
GOIX	117	-1.11E-07	2.1252	-3.1753	2.5426
COC	117	-1.3479	0.0519	-1.4047	-1.2592
PS	117	-0.8135	0.1970	-1.1672	-0.6182
GE	117	-1.3060	0.1396	-1.5459	-1.1581
VA	117	-1.3480	0.1408	-1.5392	-1.1659
RQ	117	-1.8548	0.1742	-2.1178	-1.5611
ROL	117	-1.5728	0.1990	-1.8523	-1.3176

Notes: Sample: N = 117; T = 2009-2017.

The mean scores for all the governance indicators are negative, showing generally poor/bad governance in Zimbabwe. Our analysis discovered that the mean public debt ratio for Zimbabwe is close to 50%, which at some point in time reached the highest ratio of 59%. In addition, we observed deterioration in the government's budget balance during dollarisation, a possible indication of a prolonged budget deficit. Limited fiscal space triggered a rise in government borrowing; thus, the government had to finance the deficit by borrowing during dollarisation.

4. Results and Discussion

The regression results for the pooled OLS regressions with PCSE are presented in Tables 6, 7, 8, and 9. The Wooldridge test results for autocorrelation in the panel data display probability values greater than 5%, indicating that all models do not suffer from a serial autocorrelation problem. We applied the Blomquist and Westerlund's (2013) approach to justify using bank dummies that account for the heterogeneity effects in the regression analysis by allowing each bank to have its different intercept value. Furthermore, all pooled OLS regression models are statistically significant at 1%, implying that the estimates are reliable.

We initially examined the linkage between NPLs and each of the indicators used in constructing the governance index and presented the results in Table 6. Our findings indicate that regulatory quality, the rule of law, voice and accountability, and government effectiveness are positive and significant in models 1 to 4. The results imply that improvement in regulatory quality, the rule of law, voice and accountability, and government effectiveness causes NPLs to increase. These findings are in line with those concluded by Semia and Rachid (2019) in the Middle East and North Africa (MENA) countries.

Table 6: Regression Results

	Dependent variable: NPLS						
	Panel corrected standard errors (PCSE)						**Driscoll-Kraay standard errors**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
SIZE	-0.16***	-0.16***	-0.15***	-0.096	-0.12**	-0.16***	-0.072
	(0.053)	(0.052)	(0.051)	(0.059)	(0.057)	(0.055)	(0.049)
ETA	-0.24*	-0.23*	-0.20	-0.17	-0.19*	-0.23*	-0.24
	(0.129)	(0.125)	(0.126)	(0.113)	(0.114)	(0.127)	(0.141)
INF	-0.47	0.25	0.54	0.25	-0.15	-0.88**	0.30
	(0.377)	(0.512)	(0.474)	(0.494)	(0.876)	(0.381)	(0.698)
PD	0.00081	0.0011	-0.0017	0.00100	0.00087	0.00023	0.00035
	(0.001)	(0.002)	(0.001)	(0.002)	(0.004)	(0.002)	(0.002)
FB	0.013***	0.015***	0.019***	0.017***	0.012**	0.0064	0.018**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.007)
RQ	0.12*						
	(0.067)						
ROL		0.19**					
		(0.073)					
VA			0.40***				
			(0.117)				
GE				0.35***			
				(0.135)			
PS					0.10		
					(0.145)		
COC						-0.14	
						(0.236)	

	Dependent variable: NPLS						
	Panel corrected standard errors (PCSE)						**Driscoll-Kraay standard errors**
GOIX							0.026**
							(0.011)
Constant	0.45***	0.50***	0.87***	0.60***	0.23**	0.068	0.13*
	(0.125)	(0.118)	(0.185)	(0.152)	(0.091)	(0.378)	(0.064)
Number of groups	13	13	13	13	13	13	13
Autocorrelation (p value)	0.712	0.6431	0.6913	0.6701	0.702	0.7231	0.6937
Heterogeneity test (p value)	0.000	0.000	0.000	0.254	0.130	0.000	0.395
Bank dummies	YES	YES	YES	NO	NO	YES	NO
Prob c^2	0.000	0.000	0.000	0.000	0.001	0.000	0.000
R^2	0.604	0.616	0.623	0.327	0.310	0.624	0.126

Notes: See methodology for definitions of variables. Standard errors are in parenthesis. Levels of significance: (***) 1%, (**) 5%, and (*) 10%.

For robustness-checking purposes, we examined the relationship between the governance index and NPLs using pooled OLS regressions with Driscoll-Kraay standard errors in Table 6 as model 7. The motive was to see if the results relating to the governance index matched those of individual indicators estimated in models 1 to 6. Similar to most of the governance indicators (ROL, GE, RQ, and VA), the study found a positive linkage between the governance index and NPLs, with the variable statistically significant at 5%. Our findings suggest that an improvement in governance quality raises NPLs, which diverge from Büyükoğlu et al. (2021). The reason behind the positive relationship between NPLs and governance indicators is probably due to the fact that the averages of these variables are negative and poor/bad, such that their current levels worsen the NPL situation. Thus, their improvement from extremely bad scores is insufficient to trigger a reduction in NPLs. As a result, we resorted to employing quadratic regression models using equation (2) to determine the turning points where improvement in the governance indicator causes NPLs to decline significantly.

We presented the quadratic model results in Table 7. The coefficients for the rule of law, political stability and control of corruption scores are

negative and statistically significant in models 9, 12 and 13. Using equation (4), we established that the turning points for the rule of law, political stability and control of corruption are 1.65, -0.876 and -1.361, respectively. As new evidence in the literature, the results indicate that improvements in the rule of law, political stability and control of corruption will cause NPLs to decrease when the indicators improve beyond -1.65, -0.876 and -1.361, respectively. The sand-the-wheel hypothesis proposes that corruption adversely impacts bank activities (Bougatef, 2015; Goel & Hasan, 2011). Our results show that this scenario is evident in Zimbabwe.

Table 7: Regression Results

	Dependent variable: NPLS						
	Panel corrected standard errors (PCSE)						
	(8)	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
SIZE	-0.16***	-0.10*	-0.097	-0.15***	-0.099*	-0.092	-0.071
	(0.053)	(0.060)	(0.059)	(0.054)	(0.059)	(0.061)	(0.055)
ETA	-0.24*	-0.15	-0.12	-0.24*	-0.17	-0.12	-0.24
	(0.132)	(0.121)	(0.124)	(0.123)	(0.114)	(0.121)	(0.144)
INF	-0.46	-0.35	0.39	0.72	-1.45	-1.45***	0.37
	(0.422)	(0.483)	(0.478)	(0.647)	(1.122)	(0.493)	(0.615)
PD	0.001	-0.005*	-0.002	0.001	0.0004	-0.000022	0.0013
	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)
FB	0.013***	0.011***	0.018***	0.020***	0.0078	-0.011	0.019**
	(0.004)	(0.003)	(0.004)	(0.005)	(0.006)	(0.007)	(0.007)
RQ^2	-0.0097						
	(0.336)						
RQ	0.085						
	(1.190)						
ROL^2		0.81*					
		(0.438)					
ROL		2.68**					
		(1.366)					
VA^2			-0.50				
			(0.896)				
VA			-0.94				
			(2.350)				

	Dependent variable: NPLS						
	Panel corrected standard errors (PCSE)						
	(8)	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
GE^2				0.83			
				(1.123)			
GE				2.64			
				(3.046)			
PS^2					-0.93*		
					(0.497)		
PS					-1.63*		
					(0.933)		
COC^2						-14.7***	
						(4.284)	
COC						-40.0***	
						(11.658)	
$GOIX^2$							-0.0015
							(0.006)
GOIX							0.027**
							(0.011)
Constant	0.42	2.57**	-0.096	2.24	-0.50	-27.1***	0.096
	(1.100)	(1.162)	(1.583)	(2.146)	(0.404)	(7.949)	(0.099)
Number of groups	13	13	13	13	13	13	13
Autocorrelation (p value)	0.7066	0.6723	0.6973	0.6716	0.7066	0.7098	0.7073
Heterogeneity test (p value)	0.001	0.260	0.070	0.002	0.190	0.152	0.162
Bank dummies	YES	NO	NO	YES	NO	NO	NO
Prob c^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.604	0.281	0.305	0.618	0.332	0.308	0.127

Notes: See methodology for definitions of variables. Standard errors are in parenthesis. Levels of significance: (***) 1%, (**) 5%, and (*) 10%.

We further examined the interaction terms between political stability and control of corruption with all governance indices and the governance index in Tables 8 and 9.

Table 8: Regression Results

Dependent variable: NPLS **Panel corrected standard errors (PCSE)**					
	(15)	**(16)**	**(17)**	**(18)**	**(19)**
SIZE	-0.16***	-0.11**	-0.11*	-0.16***	-0.16***
	(0.052)	(0.057)	(0.058)	(0.054)	(0.052)
ETA	-0.23*	-0.18	-0.17	-0.24*	-0.22*
	(0.125)	(0.112)	(0.114)	(0.129)	(0.124)
INF	-0.11	-0.17	-0.089	-0.56	0.17
	(0.516)	(0.537)	(0.522)	(0.398)	(0.525)
PD	0.00017	-0.00071	-0.00039	0.000043	-0.0018
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
FB	0.013***	0.014***	0.014***	0.011***	0.017***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
CO*ROL	-0.079*				
	(0.045)				
CO*GE		-0.12			
		(0.084)			
CO*GOIX			-0.0100*		
			(0.006)		
CO*RQ				-0.046	
				(0.042)	
CO*VA					-0.18**
					(0.076)
Constant	0.42***	0.42***	0.20**	0.38***	0.67***
	(0.117)	(0.155)	(0.086)	(0.126)	(0.185)
Number of groups	13	13	13	13	13
Autocorrelation (p value)	0.648	0.657	0.692	0.722	0.657
Heterogeneity test (p value)	0.007	0.180	0.248	0.000	0.000
Bank dummies	YES	NO	NO	YES	YES
Prob c^2	0.000	0.000	0.000	0.000	0.000
R^2	0.614	0.309	0.292	0.606	0.613

Notes: See methodology for definitions of variables. Standard errors are in parenthesis. Levels of significance: (***) 1%, (**) 5%, and (*) 10%.

The results relating to models 15, 17 and 19 in Table 8 revealed that the interaction terms between control of corruption and the rule of law, governance index and voice and accountability are significantly and negatively related to NPLs at 10%, 10% and 5%, respectively. The results imply that improving the interaction between indices of corruption with the rule of law, governance index and voice and accountability significantly reduces NPLs in Zimbabwe. The results are in line with Gjeci and Marinc (2018), who conclude that the interaction between corruption and NPLs is higher when the legal environment (rule of law) is weak. However, we noted that improvement in the interaction term between control of corruption and government effectiveness and regulatory quality do not induce a decline in NPLs, as evidenced by insignificant probability values relating to the two interaction terms in models 16 and 18.

Additionally, we examined the interaction between political stability and other governance indicators in Table 9. The results suggest that the interaction terms between political stability and rule of law, governance index and voice and accountability are negative and significant at 10%, 10% and 5%, respectively. These findings imply that improvement in the interaction terms between political stability, rule of law and voice and accountability significantly reduces NPLs, as evidenced in models 20, 22 and 24, respectively. On the contrary, the interaction terms between political stability and government effectiveness, regulatory quality and control of corruption are statistically insignificant, implying little to no effect in Zimbabwe.

Table 9: Regression Results

Dependent variable: NPLS						
Panel corrected standard errors (PCSE)						
	(20)	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**
SIZE	-0.16***	-0.16***	-0.11*	-0.12**	-0.11*	-0.12**
	(0.052)	(0.053)	(0.058)	(0.058)	(0.058)	(0.057)
ETA	-0.25**	-0.26**	-0.17	-0.19	-0.18	-0.18
	(0.127)	(0.128)	(0.114)	(0.115)	(0.114)	(0.113)
INF	0.43	0.30	-0.072	-0.13	0.54	-0.50
	(0.775)	(0.758)	(0.508)	(0.626)	(0.773)	(0.799)
PD	0.0038	0.0038	0.00056	0.0011	0.0023	-0.00050
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)

Dependent variable: NPLS Panel corrected standard errors (PCSE)						
	(20)	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**
FB	0.016***	0.015***	0.014***	0.013***	0.016***	0.0098*
	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)
PS*ROL	-0.091*					
	(0.052)					
PS*GE		-0.11				
		(0.069)				
PS*GOIX			-0.017*			
			(0.009)			
PS*RQ				-0.049		
				(0.041)		
PS*VA					-0.13*	
					(0.074)	
PS*CO						-0.027
						(0.088)
Constant	0.21**	0.21**	0.16*	0.21**	0.22***	0.24**
	(0.089)	(0.092)	(0.094)	(0.089)	(0.083)	(0.093)
Number of groups	13	13	13	13	13	13
Autocorrelation (p value)	0.668	0.688	0.678	0.724	0.690	0.693
Heterogeneity test (p value)	0.001	0.000	0.133	0.390	0.119	0.178
Bank dummies	YES	YES	NO	NO	NO	NO
Prob c^2	0.000	0.000	0.000	0.000	0.000	0.001
R^2	0.614	0.618	0.300	0.296	0.304	0.309

Notes: See methodology for definitions of variables. Standard errors are in parenthesis. Levels of significance: (***) 1%, (**) 5%, and (*) 10%.

On a different note, the study expected that there could be a direct relationship between public debt and NPLs. However, we observed that the variable is statistically insignificant in all models, save for model 9. According to our main findings, changes in public debt do not cause NPLs to rise or fall in Zimbabwe. Similarly, in their short-run model, Karadima and Louri (2021) find that public debt exerts a positive but insignificant influence on NPLs.

The effect of fiscal balance on NPLs is positive in all models except in models 6, 12 and 13. According to most of the results, save for models 6, 12 and 13, an increase in the fiscal balance causes NPLs to increase in Zimbabwe. The probable explanation for the positive interaction between fiscal balance and NPLs is the implementation of budgetary consolidation measures that adversely affect borrowers' income levels, which could also reduce their capacity to repay bank loans, thus ultimately causing NPLs to rise. Our results align with those of Anastasiou et al. (2016a) and Roman and Bilian (2015).

Regarding the control variables, we noted that bank size is negative and statistically significant in most models, save for models 4, 7, 10, 13 and 14. This shows that big banks experience lower NPLs than smaller banks, in line with the findings of Anastasiou et al. (2019). This can be interpreted in two ways. Firstly, the results provide evidence that large banks are more cautious in lending and exercised maximum scrutiny and borrower screening. Secondly, smaller banks had higher NPLs, indicating that they need more cautious lending and might require tighter regulation from authorities.

The equity-to-asset ratio is another bank-level variable considered here. The results show that the variable is negative and statistically significant in most models in Tables 6, 8, and 9. Regression results in all models where the variable is statistically significant show that an increase in equity ratio (capitalisation) causes NPLs to decrease. These results show that well-capitalised banks are not incentivised to issue risky loans, unlike low-capitalised banks. Makri et al. (2014) conclude that the equity ratio is inversely related to NPLs. Our findings suggest that low-capitalised banks require higher regulatory scrutiny than well-capitalised banks. This is paramount since the findings indicate that less-capitalised banks have high NPLs, proving that they participate in risky lending.

The influence of inflation is ambiguous and statistically insignificant in most models, save for models 6 and 13. Several studies concluded that inflation insignificantly influences NPLs (Kasselaki & Tagkalakis, 2013; Makri et al., 2014). The effect of inflation was insignificant in most models because the variable was stable during the dollarization era in Zimbabwe.

5. Conclusions

This study examines the influence of governance quality and fiscal space on NPLs in Zimbabwe. We used a dataset for the formal dollarisation period from 2009 to 2017. Our research adds to the governance-finance literature by investigating how governance quality and fiscal space influence the creation of NPLs in Zimbabwe. The present paper further introduces several techniques in the literature to solicit the influence of governance quality on NPLs. We first constructed a governance index called GOIX using PCA. The novelty of this study lies in its determination of the turning points for the improvement of governance indicators, critical for reduction in NPLs, as well as its examination of the impact of interaction terms between corruption, political stability, government effectiveness, rule of law, voice and accountability, regulatory quality and governance index on NPLs.

Descriptive statistics show that all the governance indicators are on average negative, revealing the dominance of bad governance in Zimbabwe. Pooled OLS estimation techniques with panel-corrected and Driscoll-Kraay standard errors were employed to analyse the nature of relationships among study variables. The findings show that improvement in governance indicators, such as the rule of law, political stability and control of corruption would reduce NPLs when the indicators improve beyond -1.654, -0.876 and -1.361, respectively. Furthermore, the results reveal that an improvement in the interaction indices of political stability/corruption, rule of law, governance index and voice and accountability significantly reduces NPLs, which is new empirical evidence in the literature. Therefore, the study recommends that the Zimbabwean government improve control of corruption, rule of law and political stability to promote the reduction in NPLs.

Regression results indicate that bank size and equity ratio are significant and negative in most models. This implies that regulatory authorities should introduce policies encouraging mergers and capitalisation within the Zimbabwean banking industry. The study shows that public debt has no effect on NPLs, but fiscal balance has a positive and significant influence in all of our models.

From the present study, we note some practical implications for macroprudential policy. We observe that to get crucial insights into the loan portfolio quality of the banking sector, the regulatory authorities should

concentrate not only on bank-level characteristics but also on the governance and fiscal measures implemented in the economy. The study's main limitation is an inconsistent currency regime for periods beyond the entire dollarisation period. As a result, future research in this field could broaden its scope by analysing the effect of governance and fiscal space variables on NPLs using different loan classes.

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