# Determinants of Transparency, Accountability, and Corruption in Sub-Saharan African Countries

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## ABSTRACT

Transparency, accountability, and corruption are critical componenets of a government to demonstrate good governance. This study aims to identify determinants of transparency, accountability, and corruption in Sub-Saharan African countries in terms of institutions, macroeconomic management, and public sector accounting. This study used Panel Vector Error Correction Model (VECM) and Panel Fully Modified Least Squares (FMOLS) to determine the short-term and long-term effects. We found that all factors in terms of institutions, macroeconomic management, and public sector accounting have significant roles in affecting transparency, accountability, and corruption. Furthermore, in the short run, the macroeconomic management and budgetary quality can promote transparency, accountability, and anti-corruption. However, in the long run, improvements in the macroeconomic management, environmental sustainability, budgetary quality, and public administration quality will be followed by improved transparency, accountability, and corruption. This study highlights the importance of improving the institutions, macroeconomic management, and public sector accounting in promoting Good Government Governance (GGG), which may be utilized to increase transparency and accountability and to minimize corruption in Sub-Saharan African countries.

## 1. INTRODUCTION

Transparency, accountability, and anti-corruption are three interconnected and vital components of government administration; they are also the components for achieving Good Government Governance (GGG). Transparency remains an intriguing topic that offers vital insights into organizational studies (Albu and Flyverbom, 2019) and a topic of debate in contemporary political economy and public administration studies (Alt, 2019). Transparency reveals information derived from social processes, which influences the quality and quantity of the information presented. In addition, it improves the effectiveness, efficiency, and public trust in the government administration (Albu and Flyverbom, 2019). However, duplication can occur in several reports made by

certain institutions, reducing the effectiveness and efficiency (Setyaningrum and Kisworo, 2020).

Transparency may help strengthen legitimacy and trust in the government administration, increase community involvement, and reduce corruption and maladministration concerns (da Cruz *et al*., 2016). The public always responds positively to government measures that improve the transparency if it is associated with transparent government administration (Bouder *et al*., 2015). Transparency also encourages innovation, and quality policies, as well as allow critical interactions and accountability (Elliott, 2020).

Accountability has a direct relationship with the quality and consistency of decisions, and if it is good, it will improve the quality and consistency of decisions and vice versa (Aleksovska *et al*., 2019; Hall *et al*., 2017). It can be utilized to achieve clean, effective, and reliable governance (Setyaningrum, 2021).

Furthermore, accountability, like these two factors, has a favorable impact on the performance. Clear and well-implemented accountability will boost the performance, and otherwise, ambiguity about the accountability will diminish the performance (Christensen and Lægreid, 2015). The complexity of accountability recognizes the importance of strength for operational accountability relationships and their application in a descriptive and normative manner, providing a framework to assist in the specification of accountability systems and stakeholder networks of responsibilities (Dillard and Vinnari, 2019).

Transparency and corruption control in government are critical factors in lowering income disparity (Adams and Klobodu, 2016; Lassoued, 2021). The public sector consistently supports governance principles, such as the government effectiveness and corruption control. These two have a positive relationship where the better the government effectiveness, the better the corruption control (Chen and Aklikokou, 2021; Chong *et al*., 2020). Controlling corruption can boost the economic growth and investment, so that countries with strong corruption control will have rapid economic growth and easy access to international financing (Cieślik and Goczek, 2018).

The government is expected to make policies related to eradicating the corruption by taking regulatory issues, trustworthiness, and flexibility into account. The government must focus on controlling the corruption and government efficiency to have an impact on increasing entrepreneurship (Mohamadi *et al*., 2017). Transparent fiscal practices and a strong legal system will positively influence perceptions of corruption control. In addition, enhancing transparent fiscal practices will strengthen the positive influence of the rule of law on perceptions of corruption control (Montes and Luna, 2021). The corruption can be overcome through compliance with ethical regulations, government effectiveness, political stability, and attention to the public voice (Muktiyanto *et al*., 2019). The quality of public administration, budget transparency, social accountability, journalistic freedom, and judicial independenceare all factors that can be used to combat the corruption (Mungiu-Pippidi and Dadašov, 2016).

Based on the above description, we assume that transparency, accountability, and corruption control are critical in a country since they affect many things. Therefore, it is necessary to conduct a research discussing factors that can affect the transparency, accountability, and corruption control.

This study highlights the factors in promoting GGG that can affect transparency, accountability, and corruption control in terms of institutions, macroeconomy and public sector accounting, such as the financial sector, fiscal policy, macroeconomic

management, environmental sustainability, budgetary quality, and public administration quality, especially in Sub-Saharan African countries.

This study can be used by the government as a reference in making decisions related to transparency, accountability, and corruption control. South African and Angolan governments, for example, have had substantial issues in terms of corruption and good governance. During the state capture episode, specific groups took a control over various sectors of the South African government and its institutions. Similarly, Angola lost control of billions of funds from its sovereign wealth fundwhich was illegally transferred through complex financial transactions involving offshore financial centers and invested in ventures of personal interest by a rogue fund manager and accomplices (Sobrinho and Thakoor, 2019). Countries can use various elements discussed in this study to overcome the corruption and good governance problems, including the financial sector, fiscal policy, and macroeconomic management.

This present research focuses on the Sub-Saharan African countries, because we believe that the opportunities for development in these countries will improve in the future and it is based on the significance of the world's attention to the Sub-Saharan African countries.

## 2. LITERATURE REVIEW

Entrepreneurship can be affected by the development of the financial sector in collaboration with the quality of government. A good governance as a policy can enhance formal entrepreneurship while decreasing informal entrepreneurship (Omri, 2020). Financial liberalization, together with greater governance and macroeconomic stability, boosts the economic growth (Otchere *et al*., 2017). Governments with good financial sector development are more likely to reduce corruption than those with poor development (Cooray and Schneider, 2018).

The fiscal policy can be detrimental to the industry. Several earlier empirical studies found that when the fiscal policy was tighter, the industry experienced a decline (Alola *et al*., 2021). The corruption undermines the fiscal capacity, especially in taxation (Dimakou, 2015).

The transparency on fiscal standing and risks might help to reduce uncertainty about fiscal policies and outcomes (Arbatli and Escolano, 2015). The corruption control and fiscal policy effectiveness have a positive relationship, and improved corruption control will increase the fiscal policy effectiveness (Canh, 2018). The higher the level of fiscal transparency in a country, the lower the level of corruption. Fiscal transparency is an important factor in the budget process since it improves information disclosure (Chen and Neshkova, 2020). In addition, the fiscal transparency is inextricably related to the budget quality and governance. The fiscal transparecy is also linked to lower levels of corruption (De Renzio and Wehner, 2017). It can improve the government effectiveness and efficiency in government spending (Montes *et al*., 2019).

Strong macroeconomic management in financial institutions and budget frameworks can increase the transparency and accountability (Gaspar *et al*., 2016). Achieving stability without compromising development plans is challenging for the macroeconomic management, especially in developing countries (Nissanke, 2019). To promote the transparency and accountability, an organizational structure that supports monetary policy-making, including the macroeconomic management, is required (Alichi *et al*., 2015).

Transparency, accountability, and public participation are needed to achieve sustainable development and environmental preservation (Chemutai, 2009) as cited in Asongu *et al*. (2018). Corruption has a strong relationship with environmental dimensions, especially greenhouse gas emissions, and improving the corruption control can result in a decrease in the greenhouse gas emissions (Vasylieva *et al*., 2019). In addition, when it comes to disclosure issues, numerous countries, especially in the European Union, have revised tools and instruments for financial and non-financial reporting, such as Environmental, Social, and Governance (ESG) for disclosure (Camilleri, 2015).

Accountability and transparency in the budgeting and financial management might have a distorted relationship if greater accountability is not necessarily followed by increasing the transparency (Agustin and Arza, 2020). The disclosure of fiscal information included in the fiscal transparency benefits the government by increasing the effectiveness and efficiency of government spending effectiveness and minimizing the corruption (De Simone *et al*., 2017; Montes *et al*., 2019).

As part of the financial management in public services, increased information transparency involves the disclosure of budget information (Bolívar *et al*., 2015). Considering that the budget transparency and corruption are inversely related, improving the budget transparency can assist a country in minimizing the corruption (Cimpoeru and Cimpoeru, 2015).

Fraud, inefficiency, corruption, poor internal control and financial management, and even the incapacity to adopt governance have all become worldwide challenges in the public administration. An integrated structure, internal control, and leadership characteristics can all have an impact on the government accountability (Abd Aziz *et al*., 2015).

There is a relationship between audit and public administration (Reichborn-Kjennerud and Johnsen, 2015; Reichborn-Kjennerud and Vabo, 2017). The audit has the potential to ensure that the public administration functions efficiently and with a minimal level of corruption (Gustavson and Sundström, 2018). The government can use policy integration to improve the quality of public services and prevent corruption (Janenova and Kim, 2016).

One of the most important aspects of the growth of public administration is the creation and implementation of e-government, which can improve the efficacy and efficiency while also improving the public transparency and, as a result, reducing the corruption (Lupu and Lazăr, 2015). Lower levels of corruption, accountability, and transparency are associated with better quality public services in terms of bureaucratic procedures (Nguyen *et al*., 2017).

## 3.    RESEARCH METHOD

### 3.1    Data
This present study used secondary data, time-series data from 2005 to 2019, and cross-sections from 35 Sub-Saharan African countries. The following is a list of 35 Sub-Saharan African countries studied:

Table 1. Sub-Saharan African Countries Studied

| No. | Country | No. | Country | No. | Country |
|---|---|---|---|---|---|
| 1 | Burundi | 13 | Ghana | 25 | Nigeria |
| 2 | Benin | 14 | Guinea | 26 | Rwanda |
| 3 | Burkina Faso | 15 | Gambia, The | 27 | Senegal |
| 4 | Central African Republic | 16 | Guinea-Bissau | 28 | Sierra Leone |
| 5 | Cote d'Ivoire | 17 | Kenya | 29 | Sao Tome and Principe |
| 6 | Cameroon | 18 | Lesotho | 30 | Chad |
| 7 | Congo, Dem. Rep. | 19 | Madagascar | 31 | Togo |
| 8 | Congo, Rep. | 20 | Mali | 32 | Tanzania |
| 9 | Comoros | 21 | Mozambique | 33 | Uganda |
| 10 | Cabo Verde | 22 | Mauritania | 34 | Zambia |
| 11 | Eritrea | 23 | Malawi | 35 | Zimbabwe |
| 12 | Ethiopia | 24 | Niger | | |

The World Bank's Country Policy and Institutional Assessment (CPIA) was used in this study. Variables employed in this study are explained in brief below:

Table 2. Variable Measurement and Source

| Variable | Abb. | Variable Measure | Source |
|---|---|---|---|
| Financial Sector | FS | 1=low to 6=high | World Bank |
| Fiscal Policy | FP | 1=low to 6=high | World Bank |
| Macroeconomic Management | MM | 1=low to 6=high | World Bank |
| Environmental Sustainability | ES | 1=low to 6=high | World Bank |
| Quality of Budgetary | QB | 1=low to 6=high | World Bank |
| Quality of Public Administration | QPA | 1=low to 6=high | World Bank |
| Transparency, Accountability, and Corruption in The Public Sector | TAC | 1=low to 6=high | World Bank |

### 3.2 Model

Vector Error Correction Model (VECM) was used in this study to determine the short-term effect of the independent variable on the dependent variable in this study. The VECM models are as follows:

$$\Delta TAC_{it} = \theta_{1i} + \sum_{k=1}^{n} \theta_{11ik}\Delta TAC_{it-k} + \sum_{k=1}^{n} \theta_{12ik}\Delta FS_{it-k} + \sum_{k=1}^{n} \theta_{13ik}\Delta FP_{it-k} + \sum_{k=1}^{n} \theta_{14ik}\Delta MM_{it-k} + \sum_{k=1}^{n} \theta_{15ik}\Delta ES_{it-k} + \sum_{k=1}^{n} \theta_{16ik}\Delta QB_{it-k} + \sum_{k=1}^{n} \theta_{17ik}\Delta QPA_{it-k} + \lambda_{1i}ECT_{it-1} + \varepsilon_{it} \qquad (2)$$

$\Delta$ represents the first difference of data level, while k is the lag length that is the object of observation in this study, and n is the optimal lag length.

In addition, this study used an empirical model of Ordinary Least Square (OLS) and the Fully Modified Least Square (FMOLS) panel. The FMOLS was used to determine the long-term effect. The OLS models are as follows:

$$TAC_{it} = \beta_1 FS_{it} + \beta_2 FP_{it} + \beta_3 MM_{it} + \beta_4 ES_{it} + \beta_5 QB_{it} + \beta_6 QPA_{it} + \varepsilon_{it} \qquad (1)$$

The β1, β2, β3, β4, β5, and β6 represent the estimated coefficient of the independent variables included in this study. Meanwhile, i represents the cross-section term (1, 2, 3, …, 35), and t represents the time series term (1, 2, 3, …, 15).

### 3.3    Methods

The unit root test was performed to determine the stationary level of the data. The Levin, Lin & Chu t*, ADF, and PP-Fisher Chi-Square methods could be used to perform the unit root test. However, the ADF-Fisher Chi-Square was the one used in this study. The ADF test ub tgus case entails computing the following regression:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t \quad (3)$$

The εt, Yt – 1 = (Yt-1 – Yt-2), Yt – 2 = (Yt-2 – Yt-3), and so on are pure white noise error terms. The number of lagged difference terms to include is frequently determined empirically to include enough terms to make the error term serially uncorrelated, allowing this study to generate an unbiased estimate of δ, the lagged Yt-1 coefficient (Gujarati & Porter, 2008).

Cointegration referred to a key new idea learned which influenced the choice of regression model (Hill *et al*., 2018). The cointegration test was conducted to determine whether the independent variables have a cointegration relationship with the dependent variable. The cointegration test was performed by using the Pedroni Residual Within/Between Dimension and Kao Residual method.

The capacity of lags from one variable to contribute to the forecast of another variable was referred to as Granger causality (Hill *et al*., 2018). The Granger causality was employed in this study to determine the causal relationship of each variable, especially between the independent and dependent variables.

The VECM panel was used to investigate the short-term impact of the independent variable on the dependent variable. The FMOLS panel was used to examine the lng-term impact of the independent variable on the dependent variable. However, since the FMOLS panel data lacked constants and F-statistics, the wald test was utilized to examine the joint effect of the concurrent effects in this study.

### 4.    RESULTS AND DISCUSSION

Descriptive statistics were presented to provide a brief overview of the state of the data used in this study. A table of desciptive statistics is as follows:

Table 3. Descriptive Statistics

| Variable | Mean | Median | Std. Dev. | Min. | Max. | Obs. |
|---|---|---|---|---|---|---|
| FS | 2.9390 | 3.0000 | 0.5612 | 1.0000 | 4.0000 | 525 |
| FP | 3.2733 | 3.5000 | 0.7051 | 1.0000 | 4.5000 | 525 |
| MM | 3.5524 | 3.5000 | 0.7281 | 1.0000 | 5.0000 | 525 |
| ES | 3.1629 | 3.5000 | 0.5257 | 2.0000 | 4.5000 | 525 |
| QB | 3.1095 | 3.0000 | 0.5989 | 1.5000 | 4.5000 | 525 |
| QPA | 2.9248 | 3.0000 | 0.4791 | 1.0000 | 4.0000 | 525 |
| TAC | 2.7781 | 3.0000 | 0.6306 | 1.0000 | 4.5000 | 525 |

Table 3 shows that the level of transparency, accountability, and corruption in Sub-Saharan African countries have the smallest average value (2.7781) compared to the value of other variables in this study. In addition, there are still countries with a level of transparency, accountability, and corruption value of 1.000.

The Sub-Saharan African countries have a higher level of macroeconomics management than other variables in this study, such as the level of fiscal policy, environmental sustainability, and others in that country. The macroeconomics management has the highest average value of 3.5524, followed by the fiscal policy at 3.2733. This indicates that the fiscal policy in the Sub-Saharan African countries outperformed the country's environmental sustainability, budgetary quality, and other aspects. Furthermore, the average values for environmental sustainability and budgetary quality are 3.1629 and 3.1095, respectively. In addition, the level of quality of public administration in the Sub-Saharan African countries has an average of 2.9248. A number of Sub-Saharan African countries still have low levels of the financial sector, fiscal policy, macroeconomics management, and quality of public administration (1.000).

In Sub-Saharan Africa, the financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality are all in the medium range. This implied that there was still a great deal of room for improvement.

Besides, in this study, the covariance matrix coefficient was used to determine the possibility of multicollinearity between the independent variables. The following Table 4 presents the covariance matrix coefficient:

Table 4. Covariance Matrix Coefficient

|      | FS        | FP      | MM        | ES        | QB      | QPA     |
|------|-----------|---------|-----------|-----------|---------|---------|
| FS   | 0.0016    | -0.0003 | -0.0003   | -2.70E-05 | -0.0002 | -0.0007 |
| FP   | -0.0003   | 0.0019  | -0.0006   | -0.0005   | -0.0003 | -0.0003 |
| MM   | -0.0003   | -0.0006 | 0.0011    | -5.64E-05 | -0.0003 | -0.0002 |
| ES   | -2.70E-05 | -0.0005 | -5.64E-05 | 0.0017    | -0.0004 | -0.0007 |
| FM   | -0.0002   | -0.0003 | -0.0003   | -0.0004   | 0.0015  | -0.0003 |
| QPA  | -0.0007   | -0.0003 | -0.0002   | -0.0007   | -0.0003 | 0.0023  |

Table 4 shows that the value of the covariance coefficient of each independent variable in this study is very small. Therefore, it could be concluded that the likelihood of multicollinearity in this study can be ignored.

## 4.1 Unit Root Test

The unit root test was performed to determine the level of stationarity in the data. The following Table 5 presents the results of the unit root test:

Table 5. Results of Unit Root Test

| Variable | Method | Level | | First Difference | |
|----------|--------|-----------|-----------|-----------|-----------|
|          |        | Statistic | Prob.     | Statistic | Prob.     |
| FS       | t*     | -2.74019  | 0.0031*** | -9.37982  | 0.0000*** |
|          | ADF    | 41.6538   | 0.4860    | 111.124   | 0.0000*** |
|          | PP     | 45.5827   | 0.3254    | 115.237   | 0.0000*** |

| | | | | | |
|---|---|---|---|---|---|
| FP | t* | -3.16450 | 0.0008*** | -13.5170 | 0.0000*** |
| | ADF | 63.2425 | 0.5033 | 224.412 | 0.0000*** |
| | PP | 81.4596 | 0.0695* | 252.829 | 0.0000*** |
| MM | t* | -2.26237 | 0.0118** | -12.3519 | 0.0000*** |
| | ADF | 47.0112 | 0.8485 | 197.652 | 0.0000*** |
| | PP | 51.6138 | 0.7101 | 218.114 | 0.0000*** |
| ES | t* | 1.76265 | 0.9610 | -15.2023 | 0.0000*** |
| | ADF | 26.4531 | 0.9997 | 244.280 | 0.0000*** |
| | PP | 33.2271 | 0.9934 | 243.085 | 0.0000*** |
| QB | t* | -1.36849 | 0.0856 | -14.6681 | 0.0000*** |
| | ADF | 35.0099 | 0.9467 | 229.789 | 0.0000*** |
| | PP | 39.2585 | 0.8631 | 221.954 | 0.0000*** |
| QPA | t* | -0.61016 | 0.2709 | -8.05369 | 0.0000*** |
| | ADF | 21.9014 | 0.8576 | 68.0687 | 0.0000*** |
| | PP | 26.8489 | 0.6312 | 65.5175 | 0.0000*** |
| TAC | t* | -0.97991 | 0.1636 | -12.2489 | 0.0000*** |
| | ADF | 40.1460 | 0.7826 | 136.674 | 0.0000*** |
| | PP | 43.8967 | 0.6416 | 125.062 | 0.0000*** |

Based on the unit root test results using the Levin, Lin & Chu t*, ADF and PP-Fisher Chi-Square methods, at the data level, all variables in this study have a probability value greater than $\alpha = 0.01$, 0.05, and 0.1 except for the financial sector variable, fiscal policy and macroeconomic management. In the Levin, Lin & Chu method, the financial sector and fiscal policy has a t* probability value smaller or significant at the level of $\alpha = 0.01$. While the macroeconomic management variable is significant at the level of $\alpha = 0.05$. Implied that in general, at the data level, all research variables have a unit root or are not stationary.

In contrast, at the first difference data level, all variables in this study have a probability value lower than $\alpha = 0.01$ or significant at the level $\alpha = 0.01$ with the three methods used. Thus, it could be concluded that all variables do not have a unit root or are stationary at the first difference data level.

## 4.2 Cointegration Test
The cointegration test was performed to determine the cointegration relationship of the independent variable to the dependent variable. The following Table 6 presents the results of cointegration test:

Table 6. Results of Cointegration Test

| Method | Notation | Statistic | Prob. | Weighted Statistic | Prob. |
|---|---|---|---|---|---|
| Pedroni | V | -233.2830 | 1.0000 | -4.377005 | 1.0000 |
| Residual | Rho | 1.776845 | 0.9622 | 3.004600 | 0.9987 |
| (Within) | PP | -2.352725 | 0.0093*** | -7.515730 | 0.0000*** |
| | ADF | -2.582968 | 0.0049*** | -3.451062 | 0.0003*** |
| Pedroni | Rho | 3.603723 | 0.9998 | | |
| Residual | PP | -2.930724 | 0.0017*** | | |
| (Between) | ADF | -2.154903 | 0.0156** | | |
| Kao | ADF | -4.696197 | 0.0000*** | | |

| Residual | Residual | 0.031202 |
|----------|----------|----------|
|          | HAC      | 0.024686 |

Using the residual pedronic method, especially within-dimension, Table 6 presents the results of cointegration test and shows that the statistical probability and weighted statistics on the PP and ADF-Statistic panels are significant at the level $\alpha = 0.01$. Meanwhile, in the between-dimension residual Pedronic method, the statistical probability values in the PP and ADF-Statistic groups are significant at the level of $\alpha = 0.01$ and $\alpha = 0.05$, respectively.

On the other hand, the results of the residual Kao method show that the ADF statistical probability value is significant at the level of $\alpha = 0.01$. Therefore, it could be concluded that there is a cointegration relationship between the independent and dependent variable.

## 4.3    Granger Causality

The Granger causality test identified whether there is a causal relationship between the variables in this study. The following Table 7 presents the results of Granger causality test:

Table 7. Results of Granger Causality Test

| Null Hypothesis | F-Stat |
|-----------------|--------|
| $\Delta FS \rightarrow \Delta TAC$ | 0.84223 |
| $\Delta TAC \rightarrow \Delta FS$ | 2.09698 |
| $\Delta FP \rightarrow \Delta TAC$ | 0.93869 |
| $\Delta TAC \rightarrow \Delta FP$ | 0.08387 |
| $\Delta MM \rightarrow \Delta TAC$ | 1.13680 |
| $\Delta TAC \rightarrow \Delta MM$ | 1.04013 |
| $\Delta ES \rightarrow \Delta TAC$ | 0.67662 |
| $\Delta TAC \rightarrow \Delta ES$ | 5.14188*** |
| $\Delta QB \rightarrow \Delta TAC$ | 5.73629*** |
| $\Delta TAC \rightarrow \Delta QB$ | 4.65183*** |
| $\Delta QPA \rightarrow \Delta TAC$ | 1.16609 |
| $\Delta TAC \rightarrow \Delta QPA$ | 5.99449*** |

The results presented in Table 7 above concludes that the financial sector, fiscal policy, and macroeconomics management do not have a causal relationship with transparency, accountability, and corruption. Meanwhile, environmental sustainability and quality of public administration have a one-way causal relationship with transparency, accountability, and corruption. This implied that transparency, accountability, and corruption could have an impact on environmental sustainability and quality public administration.

This study finds that transparency, accountability, and corruption all have a two-way causal relationship with the budgetary quality. This underlined that the quality of a budget could have an impact on transparency, accountability, and corruption. Likewise, transparency, accountability, and corruption could have an impact on budgetary quality.

## 4.4    Panel Vector Error Correction Model (VECM)

The VECM was employed to determine the short-term effect of the independent variable on the dependent variable. The following Table 8 presents the results of VECM:

Table 8. Results of Panel Vector Error Correction Model (VECM)

| Variable | Notation | Value |
|---|---|---|
| | | ΔTAC |
| ΔTAC (-1) | Coefficient | -0.1760*** |
| | t-Statistic | -3.5216 |
| ΔTAC (-2) | Coefficient | -0.0385 |
| | t-Statistic | -0.7544 |
| ΔFS (-1) | Coefficient | 0.0355 |
| | t-Statistic | 0.7049 |
| ΔFS (-2) | Coefficient | -0.0106 |
| | t-Statistic | -0.2139 |
| ΔFP (-1) | Coefficient | 0.0252 |
| | t-Statistic | 0.6588 |
| ΔFP (-2) | Coefficient | 0.0415 |
| | t-Statistic | 1.0889 |
| ΔMM (-1) | Coefficient | 0.0130 |
| | t-Statistic | 0.3200 |
| ΔMM (-2) | Coefficient | 0.0666* |
| | t-Statistic | 1.7283 |
| ΔES (-1) | Coefficient | 0.0313 |
| | t-Statistic | 0.7158 |
| ΔES (-2) | Coefficient | -0.0017 |
| | t-Statistic | -0.04211 |
| ΔQB (-1) | Coefficient | 0.0709* |
| | t-Statistic | 1.6481 |
| ΔQB (-2) | Coefficient | -0.0305 |
| | t-Statistic | -0.7445 |
| ΔQPA (-1) | Coefficient | -0.0617 |
| | t-Statistic | -1.0271 |
| ΔQPA (-2) | Coefficient | 0.0236 |
| | t-Statistic | 0.3868 |
| Constant | Coefficient | 0.0023 |
| | t-Statistic | 0.2491 |
| ECT (-1) | Coefficient | -0.0053 |
| | t-Statistic | -1.9809** |
| | R-squared | 0.0740 |
| | Adjusted R-squared | 0.0396 |
| | F-statistic | 2.1527 |

Table 8 shows that the lagged error term, or ECT (-1) has a negative and significant coefficient at the level of $\alpha = 1\%$. The financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality all played important roles in influencing the transparency, accountability, and corruption.

Based on lag one and lag two at the first difference data level from the independent variables, it is found that only macroeconomics management and budgetary quality have a positive and significant coefficient at the level α = 10%. The macroeconomic management and budgetary quality have a favorable and considerable impact on the transparency, accountability, and corruption in the short run.

In Angola, billions of dollars from the sovereign wealth fund were not managed effectively due to the illegal transfer of funds by a fraudulent fund manager and accomplices through complex financial transactions involving offshore financial centers. The newly elected government of Angola in 2017 canceled the old management team and launched an investigation of the previous administration. Consequently, the fund's assets were returned and currently being reinvested to benefit the Angolans (Sobrinho & Thakoor, 2019).

## 4.5　Panel Fully Modified Least Squares (FMOLS)

The FMOLS was employed to examine the long-term impact of the independent variable on the dependent variable. The following Table 9 presents the results:

Table 9. Results of Panel Fully Modified Least Squares (FMOLS)

| Variable | Notation | Value |
|---|---|---|
|  |  | TAC |
| FS | Coefficient | -0.0035 |
|  | t-Statistic | -0.0868 |
| FP | Coefficient | -0.0258 |
|  | t-Statistic | -0.5845 |
| MM | Coefficient | 0.1881*** |
|  | t-Statistic | 5.5607 |
| ES | Coefficient | 0.2616*** |
|  | t-Statistic | 6.4246 |
| QB | Coefficient | 0.1536*** |
|  | t-Statistic | 3.9147 |
| QPA | Coefficient | 0.2390*** |
|  | t-Statistic | 4.9711 |
|  | R-squared | 0.4747 |
|  | Adjusted R-squared | 0.4569 |
|  | S.E. of regression | 0.4028 |

Table 9 shows that the financial sector and fiscal policy have a negative but not significant relationship. Meanwhile, at α = 1% level, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality all have positive and significant coefficients. Macroeconomic management, environmental sustainability, budgetary quality, and public administration quality all have a positive and significant impact on transparency, accountability, and corruption in the long run.

In the long run, environmental sustainability has the biggest impact on transparency, accountability, and corruption. Transparency, accountability, and corruption would rise by 0.26% for every 1% increase in the environmental sustainability, followed by public administration quality which has a significant impact by boosting transparency, accountability, and corruption by 0.24% for every 1% increase in the public administration quality. Then, for every 1% increase in these two

variables, macroeconomic management and budgetary quality can increase transparency, accountability, and corruption by 0.19% and 0.15%, respectively.

### 4.6    Wald Test

The Wald test was employed to determine whether the independent variable has a simultaneous or joint influence on the dependent variable. The following Table 10 presents the results of Wald test:

Table 10. Results of Wald Test

| Test Statistic | Value | Prob. |
|---|---|---|
| F-statistic | 3354.943 | 0.0000*** |
| Chi-square | 20129.66 | 0.0000*** |
| Normalized Restriction | Value | Std. Err. |
| $\beta 1$ | -0.003460 | 0.039869 |
| $\beta 2$ | -0.025790 | 0.044125 |
| $\beta 3$ | 0.188112 | 0.033829 |
| $\beta 4$ | 0.261588 | 0.040717 |
| $\beta 5$ | 0.153582 | 0.039232 |
| $\beta 6$ | 0.238999 | 0.048078 |

Table 10 shows that the F-statistic value is significant at the 1% level for the joint hypothesis on the FMOLS. This implies that the financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality all have a long-term beneficial and significant impact on the transparency, accountability, and corruption.

Several African governments had demonstrated a great determination to eliminate the corruption and strengthen the governance. During the state capture incident, for example, particular individuals exercised control over various sectors of the South African government and institutions. However, since 2018, the government had taken decisive measures to mitigate the damage caused by enhancing procurement policies, reducing smuggling activities, and improving the effectiveness of crucial institutions, such as the revenue authority and the anti-corruption agency (Sobrinho & Thakoor, 2019).

Botswana, Chile, Estonia, and Georgia had effectively decreased the corruption by establishing measures that limited corrupt practices through enhanced fiscal institutions with greater transparency and control. Effective outcomes could be linked to the establishment of stronger regulations and policies that assisted constraining the corrupt behavior. Furthermore, several African nations had used digitalization as a solution to address the corruption and governance issues (Sobrinho & Thakoor, 2019). Digitalization could aid in enhancing the quality of public administration and budgetary practices, resulting in a significant improvement in the transparency and accountability of government operations.

## 5.    CONCLUSION

In this study, the data is stationary at the first difference level, according to the unit root test results. The financial sector, fiscal policy, macroeconomic management,

environmental sustainability, budgetary quality, and public administration quality on transparency, accountability, and corruption all have a cointegration relationship.

Furthermore, environmental sustainability, financial quality, public administration, transparency, accountability, and corruption all have a causal relationship. As a result, the transparency, accountability, and corruption could assist in promoting the environmental sustainability and public administration quality. Besides, transparency, accountability, and corruption could also increase budgetary quality and vice versa.

In addition, the financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality all played a significant role in influencing the transparency, accountability, and corruption. Furthermore, in the short run, the macroeconomic management and budgetary quality could promote the transparency, accountability, and corruption.

Long-term improvements in the macroeconomic management, environmental sustainability, budgetary quality, and public administration quality would be followed by increased transparency, accountability, and corruption. Furthermore, increasing the transparency, accountability, and corruption in the financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality at the same time could also increase the transparency, accountability, and corruption in the long run.

This study highlights the factors in promoting GGG that can affect the transparency, accountability, and control of corruption in terms of institutions, macroeconomy, and public sector accounting, such as the financial sector, fiscal policy, macroeconomic management, environmental sustainability, budgetary quality, and public administration quality, especially in Sub-Saharan African countries. The results of this study can be used as a reference for the government in making decisions related to the transparency, accountability, and controlling the corruption in the future.

## ACKNOWLEDGEMENT

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