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Original Article

Role of Fiscal Environment Dynamics in Tax Buoyancy in Togo: The Moderating Effect of Control of Corruption

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Abstract: *Despite reforms, tax buoyancy in Togo remains weak. The tax-to-GDP ratio has risen from 11.0% in 2022 to 14.4% in 2024, but this is still below the ECOWAS benchmark of 20%. Despite reforms, corruption, tax evasion, and institutional inefficiencies continue to undermine revenues. This study examines how fiscal environment dynamics (GDP, tax policy changes, and digitalization) affect tax revenue, with corruption control acting as a moderating factor. Using time-series data from 1995 to 2024 and regression analysis, the results show that GDP has a strong positive effect, while policy changes and digitalization only matter when corruption is effectively controlled. The findings highlight that good governance and effective anti-corruption measures are critical for reforms to yield results. The study recommends strengthening institutional integrity, embedding digitalization in transparent systems, simplifying the tax regime, and ensuring macroeconomic stability. Further research should assess tax-specific buoyancy, the effects of delayed reform, and broader governance indicators.*

Keywords*: Tax Buoyancy; Fiscal Environment Dynamics; Economic Growth; Tax Policy Reforms; Digitalization; Corruption Control.*

I. INTRODUCTION

In the current global context, developing countries face an urgent need to strengthen domestic revenue mobilization in response to rising debt vulnerabilities and uncertain international financial conditions. Consequently, fiscal sustainability has become a central policy priority, with tax revenues playing a critical role in financing government expenditure and promoting economic development. However, structural weaknesses, ineffective tax policies, and governance limitations continue to hinder revenue growth. Moreover, these challenges were further amplified by the COVID-19 pandemic, which exposed the fragility of existing fiscal systems and underscored the importance of building resilience.

Within this broader debate, a useful indicator of fiscal performance is tax buoyancy, defined as the responsiveness of tax revenues to changes in Gross Domestic Product (GDP) (Parthasarathi, 1998). Indeed, a buoyant tax system allows revenues to expand automatically with the economy, thereby reducing reliance on external borrowing and contributing to macroeconomic stability. Furthermore, buoyancy captures not only the efficiency of tax collection but also the adaptability of fiscal systems to macroeconomic fluctuations (Hill et al., 2022). Yet, the performance gap between developed and developing countries is striking: while OECD economies maintain an average tax-to-GDP ratio of 34% (with the United States at 25.2% in 2023), Sub-Saharan Africa averages only 12.6% in fragile states and 16.8% in Kenya (OECD, 2024). In West Africa, despite reforms guided by ECOWAS, the regional tax-to-GDP ratio stood at a modest 14.4% in 2021 (OURO-ADOI, 2022).

Turning to Togo, revenue performance has improved over the past decade but remains insufficient to meet development financing needs. The creation of the Togolese Revenue Authority (OTR) in 2012 marked a turning point in administrative modernization, combining tax and customs functions under a semi-autonomous structure and later expanding to land registry services. In addition, complementary reforms, including the General Tax Code and the National Customs Code, were adopted to simplify procedures, broaden the base, and increase transparency. As a result, tax revenues rose from 11.4% of GDP in 2012 to 14.8% in 2023. Nevertheless, this level remains significantly below the WAEMU benchmark of 20% and far from OECD standards. Despite the introduction of digital tools such as e-filing and mobile payments, revenue responsiveness continues to be weak due to limited enforcement, low taxpayer compliance, and persistent governance challenges, particularly corruption.

Against this backdrop, the problem this study addresses is the disconnect between reforms and outcomes. While GDP growth, tax policy adjustments, and digitalization initiatives are expected to strengthen buoyancy, their effects in Togo have been inconsistent. Existing literature has generally examined these determinants in isolation, without fully accounting for the institutional environment that shapes their effectiveness. Yet evidence demonstrates that the success of growth, reforms, and digital innovations depends heavily on governance quality, particularly the control of corruption, which directly affects compliance, resource allocation, and the credibility of reforms. The central research question is therefore why tax buoyancy in

Togo remains weak despite successive reforms, and what role control of corruption plays in moderating the relationship between economic growth, policy measures, digitalization, and revenue performance.

To respond to this question, the study pursues the general objective of investigating the role of fiscal environment dynamics on tax revenue in Togo. More specifically, it seeks to evaluate the effects of GDP growth, changes in tax policy measures, and digitalization on revenue responsiveness, while establishing the moderating influence of corruption control on each of these relationships. Accordingly, the study tests four sets of hypotheses: that GDP, tax policy changes, and digitalization have no significant effect on tax revenue, and that corruption control does not significantly moderate these effects.

Beyond its analytical contribution, this study is also motivated by its practical relevance. For policymakers, it provides evidence-based insights into the determinants of tax responsiveness, helping to design more effective strategies for revenue mobilization, improve taxpayer services, and strengthen fiscal sustainability. Likewise, for practitioners, it highlights the importance of governance and institutional integrity in ensuring the success of tax reforms and digitalization initiatives. For the academic community, it fills a research gap by integrating macroeconomic, policy, digital, and institutional dimensions into a unified framework for analyzing buoyancy in a low-income country context. Ultimately, the findings are expected to inform strategies that enhance compliance, reduce inequality, and create a more favorable investment climate in Togo.

Finally, the study is defined by its focus on Togo, where domestic revenue mobilization is crucial for fiscal consolidation and development financing. The analysis relies exclusively on secondary annual data covering the period 1995–2024, thereby capturing the long-term dynamics of revenue growth and reform implementation. Methodologically, it adopts a quantitative approach, using descriptive and inferential statistical techniques, including time-series regression and correlation analysis, to identify and test the determinants of buoyancy. Special attention is given to the role of digital tax administration tools, such as e-filing, e-payments, and mobile platforms, which have been central to OTR reforms. Although the findings are context-specific, they carry broader implications for other developing economies facing similar fiscal challenges.

By situating Togo's experience within the wider debate on tax reform, digitalization, and governance in Sub-Saharan Africa, this study demonstrates that sustainable revenue mobilization requires not only sound economic growth and effective tax policies but also strong institutions capable of enforcing compliance and building trust between the state and its citizens.

II. LITERATURE REVIEW

The examination of tax buoyancy was based on various taxation theories that connected fiscal policy, economic activity, and revenue responsiveness. First, the Keynesian theory (Keynes, 1936) stressed the stabilizing effects of taxes and government spending. It called for counter-cyclical policies to increase overall demand and keep tax revenue growing during times of economic trouble. Following this, the Neokeynesian view (Samuelson, 1947; Solow, 1956; Tobin, 1972; Modigliani, 1963) improved the balance between automatic stabilizers and discretionary measures, pointing out that progressive taxation and redistribution can be used to achieve stability and fairness. The Dynamic Theory of Taxation (Poterba, 1987; Stantcheva, 2020) emphasized the necessity for tax systems to be adaptable, evolving in response to economic, demographic, and technological changes, thereby guaranteeing efficiency and sustainability. The Automatic and Discretionary Taxation framework (Mansfield, 1972; Bernoth et al., 2015; Barrios et al., 2022) differentiated between inherent fiscal responses and intentional policy reforms, underscoring the necessity of equilibrium to improve predictability and resilience. Lastly, the Laffer Curve theory (Laffer, 1974; Laffer, 2004) showed that there is an ideal tax rate. If taxes are too high, they can hurt the economy and lower revenue. This shows how important it is to make taxes as efficient as possible. These theories collectively offered a multifaceted framework for examining tax buoyancy, emphasizing that enduring revenue generation relies on economic growth, prudent policy, flexibility, equity, and taxpayer conduct.

Additionally, empirical studies elucidated the factors influencing tax buoyancy. Studies conducted in South Asia (Audi et al., 2021), Sub-Saharan Africa (Gupta et al., 2022), South Africa (Naape, 2019), and Ethiopia (Bayu, 2015) indicated that income and sales taxes were typically more buoyant than excise or trade taxes. Conversely, institutional deficiencies, elevated debt levels, and substantial informal sectors diminished revenue responsiveness. Thus, enhancing buoyancy necessitated the fortification of tax administration, the expansion of the tax base, and the augmentation of institutional efficiency as primary strategies. Tax reforms and robust institutional frameworks influenced revenue performance, as demonstrated in Togo (Bayale et al., 2023), Ghana (Kamasa et al., 2022), and Nepal (Timsina, 2008). Concurrently, digitalization initiatives such as e-filing, e-payment, and mobile platforms enhanced efficiency, compliance, and transparency (Ofori et al., 2022; Adegboye et al., 2022; Lawin, 2023).

Corruption also had a very important effect on how well tax policy worked. Research (Baum et al., 2017; Ajaz & Ahmad, 2010; Zallé, 2022) demonstrated that corruption typically compromised compliance and revenue collection, although selective enforcement occasionally yielded unintended beneficial outcomes. So, strong anti-corruption measures and making institutions stronger were necessary for good tax administration. Also, macroeconomic control variables like inflation (Tanzi et al., 1987),

sectoral composition (Bird & Zolt, 2005; Fenochietto & Pessino, 2013), and trade openness (Rodrik, 1998; Baunsgaard & Keen, 2010) had a big effect on tax buoyancy by changing the real value of revenues, the predictability of the tax base, and how well taxes on imports worked.

Extensive literature exists on tax buoyancy worldwide and throughout Africa; however, significant gaps persist regarding the context of Togo. There were not many empirical studies that looked into how digitization affects tax buoyancy and elasticity (Bayale et al., 2023). Also, not much research has been done on how corruption affects the relationship between GDP, changes in tax policy, digitalization, and tax revenue responsiveness (Nose & Mengistu, 2023). Addressing these gaps was essential for the formulation of evidence-based policies designed to enhance revenue generation and foster sustainable economic development in Togo.

III. CONCEPTUAL FRAMEWORK

This research amalgamated theoretical and empirical insights. Tax buoyancy was the dependent variable, with independent variables comprising tax policy alterations, digitalization, and GDP. Macroeconomic conditions encompassing inflation, sectoral composition, and trade openness were incorporated as control variables, while control of corruption served as a moderating variable. Consequently, this framework enabled a systematic examination of the determinants affecting tax revenue performance, facilitating an in-depth exploration of tax buoyancy dynamics in Togo and underpinning evidence-based fiscal policy formulation.

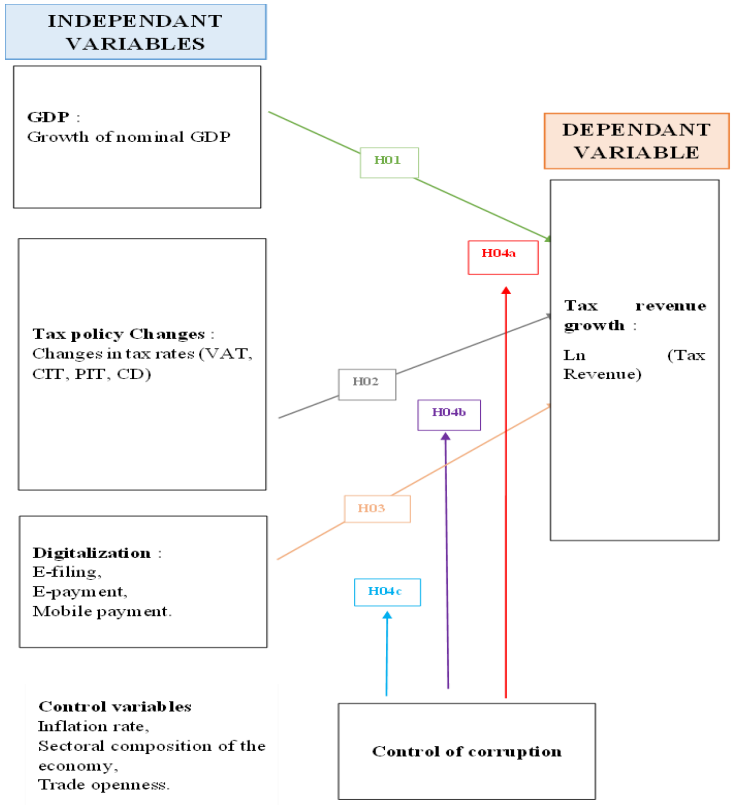

Figure 1: Conceptual framework of the study

Source: *Researcher (2025)*

IV. RESEARCH METHODOLOGY

A) Research Design

This study utilized a longitudinal quantitative approach to examine tax buoyancy in Togo from 1995 to 2024. A time-series econometric model was used to look at how GDP, changes in tax policy, and digitalization affect tax revenue, while taking into account macroeconomic factors like inflation, sectoral composition, and trade openness. An explanatory methodology was utilized to discern causal relationships, and multiple regression analysis was applied to evaluate the aggregate impact of these factors. Interaction terms were incorporated to assess the moderating effect of corruption control on the responsiveness of tax revenue to fiscal and digital changes.

B) Data and Sources

The study utilized secondary data from 1995 to 2024, comprising 30 annual observations on tax revenue, GDP, tax policy changes, digitalization, and control of corruption. Data were drawn from Togo's financial bills, the World Bank (WDI and WGI), and the OTR database. Tax policy and digitalization measures were extracted from financial bills, while missing values in the corruption index were estimated using established methods. Economic variables such as tax revenue, GDP, inflation, sectoral composition, and trade openness were obtained from the WDI.

The period was selected to capture key reforms, including the 2015 introduction of VAT, the largest revenue contributor, and to reflect recent developments in tax digitization and anti-corruption measures. Covering three decades enabled a robust analysis of long-term trends, the effectiveness of fiscal reform, and the interaction between tax policies and socio-economic factors.

C) Regression Assumptions

To guarantee the robustness and validity of the regression outcomes, several fundamental statistical assumptions were methodically scrutinized. Initially, the linearity assumption was evaluated to confirm that the correlation between the logarithm of tax revenue and the explanatory variables was proportional. Furthermore, log-log transformations and interaction terms were incorporated to capture potential non-linear effects and asymmetries in tax responsiveness.

Second, the stationarity of the time-series data was evaluated using the Augmented Dickey-Fuller (ADF) test. In instances where variables were found to be non-stationary, cointegration tests were subsequently conducted to determine whether stable long-term relationships existed among the variables. Consequently, this step ensured that spurious regression results were avoided.

Third, multicollinearity among the explanatory variables was assessed using the Variance Inflation Factor (VIF). As a result, the study confirmed that the predictors were not excessively correlated, thereby preserving the reliability and interpretability of the regression coefficients.

Fourth, the assumption of homoscedasticity, or constant variance of residuals, was tested using the Breusch-Pagan/Cook-Weisberg test. Whenever heteroscedasticity was detected, robust standard errors were applied, thereby maintaining valid inference despite variance heterogeneity.

Fifth, the normality of residuals was examined both visually, using histograms and Q-Q plots, and statistically, through the Jarque-Bera test. This step was essential, as normally distributed errors are required for valid hypothesis testing and confidence interval estimation.

Finally, autocorrelation in residuals was checked using the Durbin-Watson statistic for first-order correlation and the Breusch-Godfrey LM test for higher-order correlations. Where significant autocorrelation was observed, appropriate model adjustments, including the introduction of lagged variables, were implemented to ensure the independence of residuals.

Overall, by systematically performing these diagnostic checks and applying corrective measures where necessary, the study ensured that the regression estimates were unbiased, efficient, and reliable. Consequently, the empirical examination of tax buoyancy in Togo was enhanced, establishing a robust basis for policy-relevant inferences.

D) Estimation Technique

Time-series properties guided the choice of econometric model. Stationarity was assessed using graphical inspections and unit root tests (ADF, Phillips-Perron). Lag length for dynamic models (VAR or VECM) was selected via AIC, SBIC, and HQIC criteria. For I(1) variables, Johansen or Engle-Granger cointegration tests evaluated long-run relationships.

Although ARDL and VECM models are typically suitable for mixed integration orders or cointegrated I(1) series, they were deemed inappropriate due to the small sample size and focus on tax buoyancy with well-defined exogenous predictors. Therefore, Ordinary Least Squares (OLS) regression was applied to stationary (differenced) series to estimate short-run effects.

E) Model Specification

Tax buoyancy was modeled as:

$$lnTR_t = \beta_0 + \beta_1 lnGDP_t + \varepsilon_t$$

Where β_1 represents tax buoyancy.

Building on Baron & Kenny (1986), the base OLS model incorporated lagged series and key predictors:

$$lnTR_t = \beta_0 + \beta_1 lnTR_{t-1} + \beta_2 lnGDP_t + \beta_3 lnGDP_{t-1} + \beta_4 TPM_t + \beta_5 DM_t + \beta_6 CC_t + \beta_7 SC_t + \beta_8 TO_t + \beta_9 Infl_t + \varepsilon_t \quad (1)$$

where TR is the nominal tax revenue, GDP is the nominal level of GDP, TPM is Tax Policy Measures, DM is Digitization Measures, CC is the Control of Corruption, SC is Sectoral Composition, TO is Trade, and ε is the error term.

The extended model introduced interaction terms to evaluate the moderating effect of corruption control:

$$lnTR_t = \alpha_0 + \alpha_1 \ln(TR_{t-1} * CC_t) + \alpha_2 ln(GDP_t * CC_t) + \alpha_3 \ln(GDP_{t-1} * CC_t) + \alpha_4(TPM_t * CC_t) + \alpha_5(DM_t * CC_t) + \alpha_6 CC_t + \alpha_7 SC_t + \alpha_8 TO_t + \alpha_9 Infl_t + \mu_t \quad (2)$$

All models were estimated using STATA 18**.**

F) Measurement of Variables

This study operationalized theoretical constructs into measurable indicators for empirical analysis.

Dependent Variable: Tax revenue growth, reflecting changes in tax revenue due to variations in the effective tax rate and tax base, capturing responsiveness to economic activity and discretionary policy changes.

Independent Variables: Lagged tax revenue (TRt−1) captures collection persistence, while current and lagged GDP measure short- and long-term effects of economic activity. Tax policy changes in VAT, CIT, PIT, and customs duties are represented by dummies and aggregated using Principal Component Analysis (PCA) to form a single tax policy indicator. Digitalization, encompassing e-filing, e-payment, and mobile payment adoption, is also combined via PCA to form a single indicator, assessing its effect on revenue performance.

Moderating Variable: Control of corruption, sourced from the World Bank's Worldwide Governance Indicators (WGI, -2.5 to +2.5), evaluates how governance quality influences the effectiveness of GDP, tax policy changes, and digitalization on tax buoyancy. Higher values indicate strong governance, fostering compliance and revenue collection; lower values reflect weak governance, promoting evasion and inefficiency.

Control Variables: Inflation, sectoral composition, and trade openness account for macroeconomic and structural factors affecting revenue. Moderate inflation and formal sector dominance enhance revenue, whereas excessive inflation, informal sector prevalence, or over-liberalized trade may reduce collection efficiency.

This measurement framework enables a comprehensive analysis of policy, institutional, and structural determinants of tax buoyancy in Togo, capturing both direct and moderating effects while mitigating multicollinearity and omitted variable bias.

V. DIAGNOSTIC TEST RESULTS

A) Augmented Dickey-Fuller (ADF) Test

Time series data are frequently non-stationary; as a result, we applied the ADF test to identify unit roots and guarantee the integrity of the regression results. The results showed that LnTRt, LnTRt-1, LnGDPt, LnGDPt-1, CCt, SCt, and Inflt were non-stationary at levels. To address this, first-order differencing was applied to remove trends and seasonality. Subsequent ADF tests then confirmed that all the series became stationary.

After carrying out the stationarity analysis, we created a model for the differenced data so that we could deal with any potential non-stationarity. Our main focus was to examine the causal effects of independent variables on tax buoyancy, rather than explore dynamic interdependencies among endogenous variables. As a result, Vector Autoregressive and Vector Error Correction Models were considered unsuitable, as they were better suited to jointly endogenous variables and short-run dynamics in the presence of long-run equilibrium relationships.

While cointegration analysis is important to identify long-run relationships, the limited sample size meant that the reliability of Johansen or Engle-Granger tests was compromised, and VECM estimation was at risk of over-parameterization and instability. The Autoregressive Distributed Lag model, which is suitable for mixed integration orders, was also constrained by the limited sample size required for robust long- and short-run coefficient estimation.

Therefore, to avoid spurious results, we adopted Ordinary Least Squares regression on stationary (differenced) series. While this approach does not capture long-run equilibrium effects, it is suitable for estimating short-run relationships and policy effects in contexts with small samples. To ensure robustness, we applied diagnostic tests for autocorrelation, heteroskedasticity, and multicollinearity, using robust standard errors where necessary.

B) Test of Multicollinearity

The presence of multicollinearity among the explanatory variables was evaluated using the Variance Inflation Factor for both the Basic and Extended models. VIF values greater than 10 generally indicate high multicollinearity, while values between 5 and 10 suggest moderate concern, which requires careful interpretation, especially in models with small sample sizes or interaction terms.

The mean VIF for the Basic model was 2.92, with a range of 1.2 to 5.2. The highest VIF of 5.2 was observed for D.lnGDPt-1, indicating moderate multicollinearity. While this did not compromise the model's validity, it does highlight a notable correlation with other regressors that should be taken account when interpreting the results.

In the Extended model, the VIF values ranged from 1.4 to 5.2, with an average VIF of 2.95 (appendix 4). The interaction term between control of corruption and lagged GDP (D.CClnGDPt-1) had the highest VIF of 5.2. Despite the inclusion of interaction variables, multicollinearity remained at a moderate and manageable level, suggesting that the model estimates were unlikely to be severely distorted.

Although no VIF values exceeded the conventional threshold of 10, several variables, especially those related to GDP, showed VIFs above 5. This indicates a moderate level of multicollinearity that requires careful interpretation. Overall, however, neither the Basic nor the Extended model displayed severe multicollinearity. Nonetheless, caution should be exercised when interpreting variables with VIFs above 5, and future research may consider additional model selection techniques to further ensure the robustness of the results.

C) Serial Correlation Test

The presence of autocorrelation in the residuals was tested using the Breusch-Godfrey Serial Correlation LM Test, which is suitable for detecting higher-order serial correlation in time-series regressions. The presence of autocorrelation can bias standard errors and compromise the reliability of statistical inferences. The Breusch-Godfrey test produced a Chi-squared statistic of 3.22 with a p-value of 0.0728 for the Basic Model. This is more than 5% significant, but less than 10%, which means that there is weak or marginal evidence of first-order autocorrelation. This means that you should be careful when interpreting the results. The Extended Model, on the other hand, gave a Chi-squared statistic of 0.13 and a p-value of 0.7189, which means there was no proof of serial correlation. Consequently, the null hypothesis of no autocorrelation must be dismissed, and the remainders in the Extended Model fulfill the independence expectation.

D) Test of Heteroskedasticity

This study performed a heteroskedasticity test to ascertain if the variance of the residuals varies among observations. We used the Breusch-Pagan test on both the Basic and Extended models to check the assumption that the error variance stays the same. For the Basic Model, the Chi-squared statistic was 0.43 with a p-value of 0.51, while the Extended Model reported a Chi-squared statistic of 0.26 with a p-value of 0.6087. In both cases, the p-values exceed the 0.05 significance level, indicating no evidence of heteroskedasticity. This supports the validity of the OLS estimators under classical linear regression assumptions.

E) Normality test

A Shapiro-Wilk test was performed to evaluate the normality of residuals in both the Basic and Extended models. For both models, the test statistic was W = 0.92 with a p-value of 0.552, based on 29 observations. As the p-value exceeded the 0.05 significance level, the null hypothesis of normality cannot be rejected. This indicates that the residuals are normally distributed, satisfying a key assumption of the classical linear regression model and supporting the validity of statistical inferences from the regression results.

VI. INFERENTIAL RESULTS

A) Model Summary

We did a regression analysis to see how the independent and dependent variables are related. The results showed a good fit for both the Basic and Extended specifications, suggesting that the chosen predictors effectively explain variations in the dependent variable.

The Basic Model explained approximately 97% of the variation in tax buoyancy ($R^2 = 0.9696$; Adjusted $R^2 = 0.9551$) with a standard error of 0.05806. The Extended Model performed slightly better ($R^2 = 0.9778$; Adjusted $R^2 = 0.9673$; standard error = 0.04953) due to the inclusion of interaction terms with control of corruption.

While both models showed high explanatory power, caution is needed given the small sample, as very high R^2 values can sometimes reflect overfitting. Overall, both models provide a strong basis for analyzing the impact of fiscal dynamics on tax buoyancy in Togo.

B) ANOVA

The ANOVA was conducted to assess the overall statistical significance of the regression models.

The F-statistic was 67.22, with a p-value (Sig.) of 0.0000, indicating that the basic model was statistically significant at the 1% level. This means that the set of explanatory variables jointly explained a significant portion of the variation in tax buoyancy in Togo. The regression sum of squares (2.0396) accounted for the vast majority of the total variation (2.1036), while the residual sum of squares remained very low (0.0641), suggesting a good model fit.

In the Extended Model, the F-statistic increased to 93.15, again with a p-value of 0.0000, confirming the joint statistical significance of the model. The regression mean square (0.2286) improved, and importantly, the residual sum of squares decreased to 0.04662, indicating an even better fit than the Basic Model. This reduction in unexplained variance highlighted the added explanatory value of incorporating interaction terms, particularly those involving control of corruption.

Both models were statistically robust, but the Extended Model outperformed the Basic Model, as demonstrated by a higher F-ratio and a lower residual error. These results confirmed that the explanatory variables, especially when combined with institutional quality measures, have a substantial and statistically significant effect on tax buoyancy in Togo.

C) Regression Coefficients

Multiple regression analysis was conducted to determine the relationship between tax buoyancy and the independent variables being studied. Based on the above results, the following basic regression model was established:

Table 1: Basic model regression results

Dependent variable: $LnTR_t$

VARIABLES	Coefficient	Std errors
$D.lnTR_{t-1}$	0.468**	0.214
D.lnGDP	0.726**	0.294
$D.lnGDP_{t-1}$	0.357**	0.144
TPM	0.0312	0.0292
DM	0.125*	0.0656
$D.CC_t$	0.354*	0.188
TO	0.00281	0.00173
D.SC	0.00527	0.00441
D.Infl	-0.00714**	0.00293
Constant	-0.150	0.0987
Observations	29	
R squared	0.970	

Source: *Author estimation (2025)*

[1] ****, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*

The Basic Model regression revealed several key insights into tax buoyancy in Togo. Lagged tax revenue (0.468, $p < 0.05$) showed a positive and significant effect, indicating persistence in tax collection. Current GDP (0.726, $p < 0.05$) and lagged GDP (0.357, $p < 0.05$) also had positive and significant impacts, confirming that economic growth drives both immediate and delayed increases in tax revenue, leading to the rejection of H01.

Tax Policy Measures (TPM, 0.0312) were positive but not statistically significant, suggesting no measurable effect within the sample period and supporting the non-rejection of H02, though this may reflect lagged impacts, limited variation, or institutional constraints. Digitalization (0.125) showed a marginally positive effect at the 10% level, hinting at a potential but inconclusive influence of e-filing, e-payment, and mobile systems on tax buoyancy.

Trade openness (TO) and sectoral composition (D.SC) were positive but insignificant. Lagged inflation (D.Infl, −0.00714) had a negative and significant effect, highlighting its adverse impact on real tax collections. Overall, the results emphasize the importance of economic growth and inflation control, while suggesting that the effects of tax policy and digitalization may depend on institutional and contextual factors.

In order to measure the moderating effect of control of corruption, we estimated the extended model. The findings are summarized in the table below.

Table 2: Extended model regression results

Dependent variable: $LnTR_t$

VARIABLES	Coefficient	Std error
D.lnCC*TRt-1	0.451***	0.117
D.lnCC*GDP	1.268***	0.293
D.lnCC*GDPt-1	0.763**	0.300
CC*TPM	0.152**	0.0534
CC*DM	0.232***	0.0794
D.CC	4.248*	2.061
TO	0.00293**	0.00136
D.SC	0.0214***	0.00320

D.infl	-0.00858***	0.00246
Constant	-0.160*	0.0767
Observations	29	
R-squared	0.978	

Source: *Author estimation (2025)*

The Extended Model, incorporating Control of Corruption (CC) as a moderating variable, highlighted the crucial role of governance in tax buoyancy in Togo. The interactions between CC and GDP (current and lagged) were positive and significant (1.268 and 0.763, at 1% and 5%), indicating that economic growth more effectively translates into higher tax revenues under strong corruption control, rejecting H04a.

Similarly, the interaction of CC with Tax Policy Measures (0.152, 5%) showed that policy reforms are more effective within a robust governance framework, rejecting H04b. Digitalization, when moderated by CC, was highly significant (0.232, 1%), confirming that digital tools improve tax buoyancy only in a transparent and accountable environment, rejecting H04c. Overall, H04 was rejected at 5%.

Other findings included positive and significant effects of trade openness (5%) and sectoral composition (1%) on tax buoyancy, while lagged inflation had a negative effect (−0.00858, 1%). The model demonstrated strong explanatory power (R^2 = 0.978), emphasizing that governance quality critically enhances the effectiveness of economic growth, policy reforms, and digitalization in boosting tax revenue.

VII. DISCUSSION OF THE KEY FINDINGS

The basic model showed that GDP (current and lagged) strongly drives tax buoyancy in Togo (R^2 = 0.97), while tax policy changes and digitalization had limited direct effects. This aligns with Timsina (2008), who found Nepal's tax system largely inelastic, and Bayale et al. (2023), who emphasized the need for institutional reinforcement in Togo. Both findings also echo Audi et al. (2021), who observed similar GDP-driven patterns in SAARC countries.

The extended model introduced Control of Corruption (CC) as a moderating factor, revealing that stronger governance significantly amplified the effects of GDP (1.268), tax policy reforms (0.152), and digitalization (0.232) on tax revenue. This supports Gupta et al. (2022), who highlighted institutional weaknesses as limiting short-term buoyancy in SSA, and aligns with Ofori et al. (2022), McCluskey et al. (2019), and Adegboye et al. (2022), who noted that digitalization improves tax performance only under strong institutional integrity. Trade openness and sectoral composition became significant when moderated by CC, consistent with Bayu (2015) and contrasting with Naape (2019). Lagged inflation remained negatively significant, confirming its eroding effect on tax revenue as reported by Naape (2019) and Bayu (2015).

Overall, the findings confirm that tax reforms and digital innovations are effective only when embedded in a strong institutional framework. This is in line with what Baum et al. (2017), Ajaz & Ahmad (2010), and Zallé (2022) say about how corruption makes it harder to pay taxes and collect money. The results show that Togo needs a full plan that includes macroeconomic stability, governance reforms, technological modernization, and an aimed monetary policy in order to improve tax buoyancy.

VIII. CONCLUSION

This study aimed to examine the impact of fiscal environment dynamics on tax buoyancy in Togo, focusing on the ongoing challenge of inadequate revenue responsiveness despite numerous reforms, such as alterations in tax policy and the adoption of digitalization. The study utilized annual data from 1995 to 2024 and employed a regression framework incorporating interaction terms to analyze the influence of macroeconomic and institutional factors on tax buoyancy.

The analysis demonstrated that economic growth, indicated by both current and lagged GDP, exerted a beneficial and statistically significant impact on tax buoyancy, thereby validating that growth serves as a fundamental catalyst for revenue mobilization. Conversely, alterations in tax policy measures and digitalization exhibited minimal effects when evaluated independently, indicating that reforms are inadequate without conducive institutional conditions. Crucially, the incorporation of Control of Corruption (CC) as a moderating variable substantially modified these relationships. The interaction of CC with GDP, changes in tax policy, and digitalization showed that only when governance is strong and corruption is low do economic growth, fiscal reforms, and technological innovations lead to higher tax revenues. Trade openness and sectoral composition emerged as significant determinants of tax buoyancy when institutional quality was considered, highlighting the essential role of governance in enhancing policy and structural effects. Also, inflation was shown to have a bad effect on tax buoyancy, which shows how important macroeconomic stability is for collecting taxes effectively.

As a result, the policy and administrative consequences of these findings are complex. To make reforms and digital tools work better, the first step is to improve governance and anti-corruption measures. This includes making institutional oversight stronger, enforcing anti-corruption laws, making risk assessments a normal part of the tax administration, and encouraging a culture of honesty. Second, tax policy changes should be made and carried out within strong institutional frameworks, along with being ready for administration, reaching out to taxpayers, and making the tax code easier to understand. Furthermore, economic policies should prioritize the facilitation of inclusive growth, especially in sectors with significant formalization potential, including services, manufacturing, and value-added agriculture. Also, it is important to keep the real value of tax revenues safe by keeping the economy stable through good fiscal and monetary policies. To improve compliance and efficiency in tax administration, digitalization should be expanded with integrated, interoperable platforms, targeted awareness campaigns, and strong data management.

The theoretical implications of this study bolster governance-centered models of fiscal performance, demonstrating that corruption control serves as a pivotal moderator in elucidating tax responsiveness. Consequently, institutional quality ought to be regarded as a fundamental structural element in theoretical frameworks of tax buoyancy, rather than as an external variable.

For subsequent research, it is advised to disaggregate tax categories to analyze varying responsiveness. Longer time series or dynamic models could also be used to show how reforms and economic shocks have effects that take a long time to show up. In addition, using broader governance indicators like government effectiveness, the rule of law, and political stability could help us understand things better. Finally, applying advanced econometric methods would help address endogeneity and improve robustness.

The study demonstrates that tax buoyancy in Togo is determined by the interplay of economic growth, policy reforms, digitalization, and institutional quality. Thus, effective revenue mobilization requires a comprehensive strategy that combines macroeconomic stability, strong governance, technological innovation, and well-designed fiscal reforms, highlighting that corruption control and institutional integrity are indispensable for sustaining tax performance.

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