



Unveiling the Green Tapestry: Exploring the Influence of Green Budget Tagging on the Nexus of Fiscal Policy Sustainability and Green Budgeting Practices in Metropolitan Municipal and District Assemblies in Ghana

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Abstract. The study explores the impact of green budget tagging on the relationship between green budgeting practices and fiscal policy sustainability in Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana. This research used a quantitative approach and a descriptive survey design, with participants from the budgeting, finance, and environmental departments. The study found that climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation positively influenced fiscal policy sustainability. However, sustainable transport did not have a significant effect on fiscal policy sustainability. The study also found negative interaction effects between green budget labeling and climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation, suggesting that the combined effects of these variables with green budget tagging are detrimental to fiscal policy sustainability. The net effects of climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation positively contributed to fiscal policy sustainability. The study is expected to provide insights for policymakers and practitioners in Ghana and similar contexts.

Keywords: Green Budget Practices, Green Budget Tagging, Sustainable Fiscal Policy.

1 INTRODUCTION

The study focuses on the urgent issue of fiscal policy sustainability in the context of environmental challenges [1]. The incorporation of green practices into fiscal policy is a potent strategy for achieving sustainable development objectives and mitigating climate change [2]. This paper contends that there is an inherent correlation between the financial viability of public finances and environmental sustainability.

The primary challenge addressed by this research resides in understanding the impact of green budget labeling on the intricate relationship between fiscal policy sustainability and environmental sustainability within Metropolitan Municipal and District Assemblies (MMDAs) in Ghana. To investigate this issue, quantitative data such as financial records and environmental impact assessments were employed in the examination of the study variables [3].

This study recognizes the fundamental connection between the fiscal health of public finances and the maintenance of environmental sustainability as its theoretical foundation [4,5]. While prior research has examined various aspects of environmental factors and their impact on the fiscal policy's sustainability, this study distinguishes itself by concentrating on the specific impact of green budget tagging on this intricate relationship [6–8]. This emphasis represents a significant departure from previous research endeavors [9].

There are two purposes of the study. First, it seeks to close a substantial knowledge gap by investigating the moderating effect of green budget labeling on the association between fiscal policy and environmental sustainability. Second, theoretical and empirical contributions are made to the incorporation of environmental considerations into fiscal policy frameworks. Through a pragmatic examination of the practical application of green budget tagging within Ghana's MMDAs, valuable insights for the improvement of the nation's implementation of sustainable fiscal policies are provided.

2 METHODS

The study employed a quantitative approach and descriptive survey design to investigate the moderating effect of green budget tagging on the relationship between green budgeting practices and fiscal policy. Ghana's 260 MMDAs comprised the population of the study [10]. Officers from the MMDAs' budgeting departments, finance departments, and environmental departments participated in the investigation. These departments were included due to their participation in fiscal policy decision-making, budget allocation, and environmental initiative implementation [11]. The OLS (Ordinary Least Squares) model for the study specified as follows:

$$FSP = \alpha_0 + \beta_1(CCAM) + \beta_2(WMG) + \beta_3(RED) + \beta_4(STR) + \beta_5(NRC) + \beta_6(GBT) \quad (1)$$

Where FSP is the dependent variable, which represents a measure of fiscal policy sustainability, the independent variables include Climate Change Adaptation and Mitigation (CCAM), Waste Management (WMG), Renewable Energy Development (RED), Sustainable Transport (STR), and Natural Resource Conservation (NRC), which represent different dimensions of green budgeting practices. The moderating variable is Green Budget Tagging (GBT), which captures the extent to which budget allocations are specifically tagged for environmental objectives. The coefficients β_1 to β_5 represent the effects of each independent variable (CCAM, WMG, RED, STR, NRC) on the dependent variable FSP, while β_6 represents the moderating effect of GBT on the relationship between the independent variables and FSP. The error term ε accounts for unexplained variation in the model.

3 RESULTS AND DISCUSSION

The results and discussions cover reliability, descriptive statistics, and regression analysis. The findings of the reliability analysis reveal that the measurement items about each construct exhibited internal consistency levels ranging from strong to acceptable.

3.1 Descriptive Analysis

The results presented in Table 1 show that most constructs score above the median, indicating positive ratings or higher agreement. The standard deviations show greater variability in waste management and natural resource conservation compared to green budget tagging and renewable energy development. Skewness and kurtosis values indicate skewed distributions, with negative values indicating greater ratings. The results suggest that respondents held positive attitudes or exhibited higher levels of agreement, but variance and skewness varied across constructs, indicating differences in agreement levels and distribution structures.

Table 1. Descriptive Statistics.

	N	Min	Max	Mean	SD	Skewness		Kurtosis	
						Stat	Std. Err	Stat	Std. Err
FSP	453	1	7	5.36	1.28	-1.79	0.12	2.23	0.23
GBT	453	3	7	5.65	0.69	-0.84	0.12	1.16	0.23
CCAM	453	1	7	5.28	1.27	-1.33	0.12	1.70	0.23
WMG	453	1	7	5.27	1.47	-1.43	0.12	1.25	0.23
RED	453	1	7	5.30	1.18	-1.48	0.12	2.60	0.23
STR	453	1	7	5.49	1.25	-1.79	0.12	2.05	0.23
NRC	453	1	7	5.48	1.27	-2.01	0.12	2.34	0.23

FSP: Fiscal policy sustainability, GBT: Green budget tagging, CCAM: Climate change adaptation and mitigation, WMG: Waste management, RED: Renewable energy development, STR: Sustainable transport, NRC: Natural resource conservation.

3.2 Regression Analysis

The OLS regression findings presented in Table 2 and the diagnostic test and the model fits show that the OLS regression model is reliable. The discussion of the findings is done on two levels. The first discussion was done without interaction consideration, and the second was with interaction using conditional and unconditional effects. For example, the net effect of climate change adaptation and mitigation is $0.134[(-0.094 \times 5.65) + (0.665)]$, where the conditional effect of the interaction between green budget tagging and climate change adaptation and mitigation is -0.094 , the unconditional effect of climate change adaptation and mitigation is 0.667 and the mean of the moderating variable green budget tagging is 5.65 .

Table 2. Green Budgeting Practices, Green Budget Tagging, and Fiscal Policy Sustainability

	Dependent Variable: Fiscal Policy Sustainability				
	1	2	3	4	5
Constant	-3.527** (0.005)	-3.544*** (0.000)	-3.931** (0.001)	-0.340 (0.532)	-5.059*** (0.000)
CCAM	0.665** (0.007)				
WMG		0.794*** (0.000)			
RED			0.858*** (0.000)		
STR				0.103 (0.122)	
NRC					0.998*** (0.000)
GBT	1.453*** (0.000)	1.358*** (0.000)	1.381*** (0.000)	0.696*** (0.000)	1.681*** (0.000)
GBT×CCAM	-.094* (0.039)				
GBT×WMG		-0.097** (0,006)			
GBT×RED			-0.101* (0.023)		
GBT×STR				0.039** (0.005)	
GBT×NRC					-0.145*** (0.000)
Net Effects	0.134	0.246	0.287	na	0.179
Observation	453	453	453	453	453
R ²	0.389	0.456	0.444	0.431	0.431
Adjusted R ²	0.389	0.452	0.441	0.427	0.427
F-Statistics	97.09***	125.42***	119.61***	113.37***	113.30***

***,**, * $P < 0.001, P < 0.05, P < 0.01$ respectively. *GBT*: Green budget tagging, *CCAM*: Climate change adaptation and mitigation, *WMG*: Waste management, *RED*: Renewable energy development, *STR*: Sustainable transport, *NRC*: Natural resource conservation. *na*: not applicable because at least an unconditional or a conditional effect needed for the computation of net effects is not significant.

The study reveals that a rise in climate change adaptation and mitigation leads to a rise in fiscal policy sustainability. Waste management practices positively impact the long-term viability of fiscal policy, while promoting renewable energy contributes to

sustainability. Sustainable transport practices have no significant effect on fiscal policy sustainability. On the other hand, natural resource conservation positively affects fiscal policy sustainability. However, the interaction between green budget labeling and other variables is detrimental to fiscal policy sustainability. The net effects of these variables are significant, with climate change adaptation and mitigation having a net effect of 0.134 units, waste management and renewable energy development having net effects of 0.246 and 0.287 units respectively, and natural resource conservation increasing fiscal policy sustainability by 0.179 units. The study underscores the importance of addressing climate change, waste management, and renewable energy in promoting fiscal policy sustainability.

This study demonstrates the positive impact of climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation on fiscal policy sustainability. It supports the hypothesis proposed by [3], which emphasizes the importance of implementing climate change adaptation and mitigation measures to maintain economic stability. The study also shows that improvements in waste management practices have a positive impact on the long-term viability of fiscal policy, consistent with the findings of [4]. The development of renewable energy is also positively significant, suggesting that promoting renewable energy contributes to the sustainability of fiscal policy. This is consistent with [12]'s findings, which emphasize the financial implications of expanding renewable energy. The positive correlation between renewable energy development and fiscal policy sustainability lends credence to the notion that incorporating sustainable energy projects in financial strategies improves financial stability and contributes to the achievement of sustainable development goals.

However, sustainable transport is not statistically significant, contradicting the [5] hypothesis, which emphasizes the financial benefits of sustainable transportation initiatives. Natural resource conservation is also positively significant, indicating that efforts to conserve natural resources have a positive influence on the sustainability of fiscal policy. This finding is consistent with research conducted by Klousakou et al. (2018) [6], which emphasized the interconnectedness of natural resource preservation, fiscal policy sustainability, and environmental sustainability. The study found negative interaction effects between green budget tagging and climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation, indicating that the combined effect of these environmental dimensions is detrimental to fiscal policy's long-term viability.

4 CONCLUSIONS

This study investigated the effect of green budget labeling on the relationship between green budgeting practices and fiscal policy sustainability in Ghana's Metropolitan Municipal and District Assemblies (MMDAs). Using OLS estimation techniques, this study revealed significant positive correlations between fiscal policy sustainability and key environmental dimensions, including climate change adaptation and mitigation, waste management, renewable energy development, and natural resource conservation.

These findings hold multifarious implications for practical policymaking, theoretical advancements, and societal considerations, advocating for the integration of environmental factors into fiscal policy frameworks. However, limitations, such as the study's regional focus and cross-sectional data, necessitate future longitudinal studies and broader comparative analyses in a variety of contexts. In addition, a thorough examination of the mechanisms underpinning the impact of green budget labeling on the interaction between environmental dimensions and fiscal policy sustainability is required. In conclusion, this study highlights the necessity of incorporating environmental sustainability into fiscal policy frameworks to improve their long-term viability.

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