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Strengthening state effectiveness through fiscal decentralisation: Insights from Ghana's DACF

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Abstract

Despite decades of fiscal decentralisation, questions remain about whether intergovernmental transfers strengthen local state effectiveness or weaken incentives for local fiscal effort. This study examines Ghana's decentralisation framework—anchored in the District Assemblies Common Fund (DACF)—by analysing how transfers interact with internally generated funds (IGF), expenditure execution, and accountability at the district level. Using district-level panel data, digitised Auditor-General reports, and a newly constructed DACF Mismanagement Index, the analysis combines fixed-effects and spatial econometric approaches to assess fiscal behaviour in practice. The results show that districts with stronger IGF capacity consistently record higher levels of actual expenditure than districts that rely more heavily on DACF transfers, highlighting the importance of fiscal autonomy and revenue predictability for budget execution. Fiscal mismanagement emerges as a robust constraint on IGF performance, while its association with aggregate expenditure is weaker and more heterogeneous, suggesting that governance failures primarily affect spending quality rather than volume. The study's findings support a conditional view of fiscal decentralisation, in which transfers are necessary but insufficient for enhancing local state effectiveness without strong local revenue mobilisation and credible accountability mechanisms.

1 Introduction

Imagine a bustling market town in a typical Ghanaian locality, where potholed roads turn to mud during the rainy season, schools lack basic textbooks, and health clinics struggle with unreliable supplies. For the residents here, these everyday frustrations are not just inconveniences—they reflect the deeper struggles of local governments to deliver essential services. Across many developing countries, the quality of life for millions hinges on how effectively local government authorities can raise and spend money. Yet, all too often, these local systems are caught in a cycle of dependency on central government transfers, weak accountability, and wasted resources. This is not unique but a common thread in nations pushing for decentralization to make governance more responsive and efficient (Ayee, 2003; Rugeiyamu and Msendo, 2025).

In Ghana, one of Africa's decentralization pioneers, this challenge plays out vividly through the District Assemblies Common Fund (DACF). Established under the 1992 Constitution, the DACF channels at least 5% of national revenues directly to local governments, known as Metropolitan, Municipal, and District Assemblies (MMDAs), to fund roads, schools, sanitation, and other vital projects (Ayee, 1995). Over three decades, it has poured billions into local development, aiming to bridge urban-rural gaps and empower districts to bring governance closer to the people and to meet citizens' needs (Abbey et al., 2010; Gilbert et al.,

2013). On paper, it's a bold step toward fiscal decentralization, giving local leaders the tools to build stronger communities from the ground up.

But reality tells a more complicated tale. While the DACF has boosted infrastructure in many areas, it has also sparked worries about unintended side effects. Districts often rely heavily on these transfers, collecting only a tiny share of their potential own revenues—like property taxes or market fees—leaving them vulnerable if central funds dry up (Mogues and Benin, 2012; Delali, 2019). This dependency raises a key question: do government transfers like the DACF discourage local governments from building their own revenue muscles, or do they provide the breathing room needed to invest in better administration and services? Studies have shown mixed results. Where sometimes transfers "stick" and boost spending without harming local efforts (the flypaper effect), other times they crowd out incentives, creating a soft budget trap where districts slack on collecting their own funds (Dick-Sagoe and Tingum, 2021; Adanu, 2024; Dick-Sagoe et al., 2025).

Adding to the challenges of fiscal decentralisation and state effectiveness are persistent financial slip-ups. Annual audits reports from the Auditor General on the management and utilization of the DACF reveal a pattern of irregularities in how DACF money is handled: cash misused, contracts bungled, assets poorly tracked, and taxes not properly collected (Antwi et al., 2024; Darko et al., 2025). These aren't just minor errors but rather they erode trust, waste public money, and weaken the very state effectiveness that decentralization promises.

Yet most research treats these issues in silos, without a clear way to measure and compare them across districts or link them to broader fiscal behaviors. Knowing that districts don't exist in bubbles either; what happens in one can spill over to neighbours through shared politics, economies, or even bad habits, this spatial angle remains underexplored as well, unfortunately (Fumey and Egwaikhide, 2018; Brunnschweiler and Obeng, 2026).

This study dives into these questions and gaps, asking how Ghana's DACF shapes local government strength or undermines it. We hypothesize that while DACF transfers may initially crowd out local revenue efforts (H1: Higher DACF reliance leads to lower internally generated funds, or IGF), stronger IGF performance could flip the script by improving expenditure efficiency and reducing mismanagement (H2: Districts with better IGF efficiency show higher expenditure efficiency and fewer irregularities). We also expect DACF mismanagement to worsen these dynamics (H3: High financial irregularities drive crowding-out effects and weaken fiscal discipline).

To achieve this, we build a district-level dataset covering budgets, actuals, and audits from 2020–2023. The DACF Mismanagement Index (DMI), our key innovation, —a new tool that integrates audit data on cash, contract, store, and tax irregularities into a single, comparable score. This index lets us spotlight how mismanagement acts as a hidden barrier to effective decentralization, filling a gap in fragmented studies (Darko et al., 2025). By these integrated approaches we aim to offer practical insights for policymakers among many things on how to tweak the DACF to spark better local revenue drives, tighten accountability, and turn fiscal decentralization into real gains for Ghanaians.

The report is structured in 6 sections. The first section is on introduction. In the second section, we present evidence from empirically related literature, on how government transfers like the DACF as well as other factors, may affect local revenues mobilisation efforts. This is followed by section 3 which describes the method of study including empirical model for determining the effect intergovernmental transfer (DACF) and DACF mismanagement (irregularities) have on districts' incentives for generating own revenues, followed by the empirical results in Section 4. The final sections 5 and 6 discusses, summarizes the findings in discussion and conclusion, and offering policy implication for the study.

2 Related literature review

The literature on fiscal decentralization has long emphasized its potential to enhance state effectiveness by aligning public spending more closely with local preferences and strengthening accountability mechanisms (Ayee, 2003; Volden, 2007). Early theoretical contributions suggest that decentralization can improve allocative efficiency and service delivery when local governments receive meaningful fiscal authority. However, subsequent empirical work highlights that the effectiveness of decentralization depends critically on the design of intergovernmental fiscal systems, particularly the balance between central transfers and local revenue mobilization (Smart, 2007; Lago-Peñas et al., 2024). This balance becomes especially pertinent in developing contexts like Ghana, where constitutional mandates guarantee central transfers such as the District Assemblies Common Fund (DACF) while internally generated funds (IGF) remain persistently low.

A substantial body of research have examined whether intergovernmental transfers crowd out or complement own-source revenue mobilization. Courant et al. (1979) first articulated the "flypaper effect," whereby grants tend to increase public spending more than equivalent rises in local income, potentially softening budget constraints and weakening local taxation

incentives (Sobel and Crowley, 2014; Kjaergaard, 2015). In Ghana, Mogues and Benin (2012) provide influential evidence from district-level panel data, demonstrating that external grants are associated with reduced own-revenue effort, consistent with crowding-out. Similar patterns emerge in studies highlighting political and administrative barriers to local taxation (Delali, 2019; Dick-Sagoe and Tingum, 2021). By contrast, Adanu (2024) revisits the Ghanaian case and finds evidence that transfers can coexist with improved revenue mobilization under certain institutional conditions, suggesting a more nuanced relationship mediated by fiscal rules and administrative capacity. This heterogeneity aligns with broader international findings, where effects vary across OECD and middle-income settings depending on political institutions and enforcement mechanisms (Dahlby and Ferede, 2016; Lago-Peñas et al., 2024).

Beyond revenue levels, recent scholarship has shifted toward fiscal efficiency and budget credibility. Otoo and Danquah (2021) argue that decentralization's success hinges not only on revenue raised but on effective budget execution and service translation. In Ghana, persistent discrepancies between budgeted and actual revenues/expenditures reflect weaknesses in planning, enforcement, and financial controls (Ayikwei, 2016; Antwi et al., 2024). These gaps complicate revenue performance assessments and underscore the need to distinguish fiscal intent from realized outcomes, particularly when transfers dominate local budgets.

Closely linked to efficiency concerns is the literature on financial accountability and mismanagement. Audit-based analyses reveal widespread irregularities in cash management, procurement, asset control, and revenue administration across decentralized systems (Abbey et al., 2010; Musah et al., 2025). Darko et al. (2025) offer recent threshold-based evidence from Ghana, showing that financial irregularities systematically erode fiscal autonomy and performance among local entities, with critical tipping points beyond which autonomy declines sharply. However, much of this work relies on descriptive indicators or isolated cases, limiting cross-district comparability and temporal analysis.

Another clarification has been attributed to political economy factors that further shape these dynamics. Banful (2011) demonstrates that even formula-based transfers can be vulnerable to political influence, while Fumey and Egwaikhide (2018) highlight rural-urban divides in transfer allocation and effectiveness in Ghana. More recently, Brunnschweiler and Obeng (2026) find that political alignment between local and central governments significantly influences fiscal outcomes, implying that political incentives may condition transfer impacts and fiscal discipline.

An emerging strand explores spatial dimensions of local public finance. Razin and Obirih-Opareh (2000) document substantial spatial variation in fiscal capacity across Ghanaian districts pre- and post-decentralization. International evidence suggests fiscal behavior may exhibit spatial spillovers via policy diffusion, competition, or shared institutions (Jia et al., 2021). Yet spatial dependence remains underexplored in Ghana's decentralization literature, despite its implications for coordinated policy design.

Following from the ongoing evidence review, the literature provides robust insights into intergovernmental transfers, revenue mobilization, expenditure performance, and accountability. Methodologically, approaches have ranged from cross-country regressions and subnational panels to audit-data analyses and experimental designs (Asatryan et al., 2015; Neyapti, 2010; Porto et al., 2025; Antwi et al., 2024). Nevertheless, important gaps persist. First, evidence on crowding-out versus complementarity in Ghana remains inconclusive, particularly when incorporating fiscal efficiency rather than revenue levels alone. Second, systematic, comparable measures of financial mismanagement across districts and time are scarce. Third, spatial interdependencies in fiscal behaviour have received limited attention in the Ghanaian context.

This study addresses these gaps through a comprehensive district-level panel analysis that integrates budgeted/actual fiscal data, constructs a novel audit-based DACF Mismanagement Index (DMI) via min-max normalization of irregularities approach, and applies spatial econometric techniques to capture spillovers. By doing so, it advances understanding of fiscal decentralization's practical operation and offers policy-relevant evidence on designing transfers to enhance local state effectiveness in Ghana.

3 Methodology

The study employs a district-level panel data framework to examine the relationship between District Assemblies Common Fund (DACF) transfers and internally generated funds (IGF). The baseline empirical specification relates IGF mobilization to DACF transfers in per capita terms to capture transfer intensity, demographic characteristics, political alignment, and measures of fiscal mismanagement, while accounting for unobserved district-specific heterogeneity.

3.1 Data

This section presents a description of the data sources that were used in the analysis. The study used administrative data on district assembly common fund (budget and actuals), internally

generated funds (budgeted and actuals), irregularities (cash, contract, store and tax irregularities), and expenditure (budget and actuals). This information, according to data availability, was collected on 257 districts out of 261 districts as of 1st February 2026. Specifically, data on district expenditure (budget and actuals), DACF (budget and actuals) and internally generated funds (IGF) were sourced from the District Composite Budget[1] by the Ministry of Finance and Economic Planning (MOFEP). Data on each district's irregularities (cash, contract, stores and tax) was also sourced from the Report of the Auditor-General [2]on the Management and Utilization of the DACF.

The data was collected year-on-year from 2020 to 2023. This was to ensure consistency in representing districts, as well budget and actual data. The study adopted as start year because Ghana had increased its regions from 10 to 16 in 2018/2019 and so new districts were created. Although the length of is somewhat short, it additionally moves beyond case studies and provides a nationally representative assessment of fiscal behavior within a given political season. Hence the decision to capture periods from 2020 to capture all new and old districts. Also, the data year was truncated at 2023 because at the time of data collection, most of the reports from which data on DAFC, IGF, and expenditure had not provided actual figures for 2024: there were only budget values which would not help the course of the study actual values. Therefore, a panel dataset of 257 districts over four years was used for the analysis.

3.2 Model estimation

Fixed effects (FE) estimation is first applied to control for time-invariant district characteristics by exploiting within-district variation over time. Although FE provides consistent estimates under minimal assumptions, its identifying power depends on sufficient temporal variation in the regressors (Wooldridge, 2010). Given the short time dimension of the panel (four years) and the slow-moving nature of key fiscal and demographic variables, district fixed effects

[1] District Composite Budget: they are produced and published by the MOFEP for all of Ghana's Metropolitan, Municipal and District Assemblies (MMDAs) to support fiscal decentralization. They contain several data including compensation, goods and services, revenue sources, and expenditure (total expenditure of compensation, goods and services and capital or assets). These budgets integrate local government fiscal plans into the national budget framework and are a key instrument for monitoring fiscal decentralization outcomes (Gilbert et al., 2013; Otoo and Danquah, 2021). Combining these sources allows for a consistent comparison between budgeted and actual fiscal performance, which is central to the study's analytical approach.

[2] The Auditor-General's Report on the Management and Utilization of the of the DACF is an annual document reporting on the use of the DACF. The report publishes all financial mismanagement including overspending on administrative costs, non-compliance with procurement laws, and failure to recover loans amongst others. This reported on districts in Ghana, for each year ending.

absorb a substantial share of the variation, resulting in imprecise FE estimates for several covariates (Baltagi, 2021).

Random effects (RE) estimation is also considered, as it combines within- and between-district variation and yields more efficient estimates when regressors are uncorrelated with unobserved district effects (Greene, 2018). However, in the context of intergovernmental fiscal transfers, this assumption is unlikely to hold, as DACF allocations, IGF capacity, governance quality, and political alignment are plausibly correlated with persistent district characteristics. This concern is supported empirically by a correlated random effects test, which rejects the RE assumption. To address this trade-off between consistency and efficiency, the analysis adopts a correlated random effects (CRE) specification following Mundlak (1978) and Chamberlain (1984).

The CRE model augments the RE specification by including district-level means of all time-varying regressors, thereby allowing for correlation between observed covariates and unobserved district effects. This approach yields FE-consistent estimates of within-district effects while improving estimation efficiency and retaining information on between-district variation (Wooldridge, 2019). Given the short panel structure and the near time-invariant nature of district effects, the CRE specification is used as the preferred framework for inference. Additionally, the standard errors are clustered at the district level to account for possible serial correlation where previous IGF can influence present IGF, for instance. The study admits such possibility and many of such studies rather assumed previous values of regressors rather explain current values of IGFs (Mosgues et al., 2009). However, our study used current values of IGFs against current values of DACF and expenditure. DACFs are received each year to be spent in the same year. Therefore, capturing actual values at the end of the year helps to establish how actual DACFs are spent to raise IGFs and otherwise. For robustness and to account of possible association between lag and present values of DACFs, expenditure and IGFs, the study allows the standard errors to be clustered at the district level to account for such possible serial correlation.

To answer the prime research question of whether DACF crowds-out IGF, the study follows the panel estimation strategy of Mosgues et al., (2009) but modified to be specified as:

$$\ln\left(IGF_{actual_{it}}\right) = \alpha_{it} + \beta_{it}\ln\left(DACF_{PC_{it}}\right) + \gamma_{it}\ln\left(DACF_{actual_{it}}\right) + \delta_{it}DMI_{it} + \theta_{it}X_{it} + \eta_i + \varepsilon_{it} \qquad (1)$$

Whereby $IGF_{actual_{it}}$ represents actual IGF by district i at time t; $DACF_{PC_{it}}$ represents DACF per capita by district i at time t; $DACF_{actual_{it}}$represents actual DACF received by district i at time t; X_{it}consists of control variables including population density, political alignment, and type of district; DMI_{it} captures extent of DACF mismanagement by district i at time t; $\eta_i + \varepsilon_{it}$ represents the combined error made up of district specific unobserved effects (η_i) and idiosyncratic disturbances (ε_{it}) that are iid;$\beta, \gamma, \delta, and\ \theta$, parameters to be determined. All times varying variables described above are all naturally logged except DMI and political alignment (which is a dummy variable).

Equation one captures only Fixed and Random effect of the panel regression approach under the assumption that district specific effects are correlated with the regressors. As indicated earlier, our data period presents that situation that district specific features are exhibit near time-invariant effects on the regressors. This explains why the FE model coefficients are exploding (Table X). Again, since our study is concerned with between-district effects to answer the question of whether high DACF receiving districts are unable to generate enough IGF compared to low DACF receiving ones, it becomes appropriate to consider the random effect. That said, Correlated Random Effects allowed the inclusion district specific characters in the model. Equation 2, which is the main model for analysis, combines FE and RE. According to Mundlak (1978), the CRE model for the study is specified as:

$$\ln\left(IGF_{actual_{it}}\right) = \alpha_{it} + \beta_{it}\ln\left(DACF_{PC_{it}}\right) + \gamma_{it}\ln\left(DACF_{actual_{it}}\right) + \delta_{it}DMI_{it} + \lambda_i K_i + \theta_{it}\, X_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

$$\ln(Exp\_actual_{it}) = \alpha_{it} + \beta_{it}(HDACF_{it}) + \gamma_{it}(HIGF_{it}) + \delta_{it}DMI_{it} + \lambda_i K_i + \theta_{it}\, X_{it} + \eta_i + \varepsilon_{it} \quad (3)$$

From the CRE model of interest, the district respective means of the time-varying regressors are also included in the usual panel regression of equation 1. In the CRE model, $K_i$contains the district means of DACF per capita, DACF actual, population density, and DMI (DACF Mismanagement Index). Model 3 additionally captures the second question of whether districts with high DACFs are associated with higher actual expenditure than districts with higher IGFs. Details on variable definition and description are presented in Table 1.

Table 1: Variable definition and description

Variable	Definition	Description
IGF_PC	IGF per capita	Ratio of actual IGF to district population
IGF_actual	Actual IGF	Actual disbursement of IGF that was generated
IGF_perf	IGF performance	Ratio of actual IGF to budgeted IGF
IGFperf_inc	IGF performance increase	Binary (1 if actual IGF > IGF budget; 0 otherwise)
DACF_actual	Actual DACF	Actual DACF that was received by a district in a financial year
Exp_actual	Actual expenditure	Total expenditure accrued in a financial year
Exp_perf	Expenditure performance	Ratio of actual expenditure to budgeted expenditure
Exp_dec	Decrease in expenditure	Binary (1 if actual Expenditure < Expenditure budget; 0 otherwise)
Controls		
Popdensity	Population density	Ratio of district population to district are (population per sq. km)
Polalign	Political alignment	Binary (1 if the political of the member of parliament for the district is same as the ruling party, 0 otherwise)
DMI (winsall)	DACF Mismanagement Index - Winsorised	Equal weighted index of normalized irregularity components after Winsorising raw values of irregularities
DMI (unwinsall)	DACF Mismanagement Index – Un-winsorised	Equal weighted index of normalized irregularity components without Winsorising raw values of irregularities
Distype	District type	Categorical variable of the type of district being Metropolitan, Municipal or District
m_DACF_PC	District mean (DACF per capita)	District average of DACF per capita over study period disentangle district unobserved characters from correlating with time-varying regressors
m_DACF_actual	District mean (actual DACF)	District average of actual DACF over study period
m_Population density	District mean (Population density)	District average population density over study period
m_DMI (winsall)	District mean (DMI winsorised)	District average of DMI (Winsorised) over study period
m_DMI (unwinsall)	District mean (DMI unwinsorised)	District average of DMI (unwinsorised) over study period

Source: Author's construct

3.3 DACF Mismanagement Index (DMI) creation

The DACF Mismanagement Index, key innovation to the study on local public finance, is constructed in several steps. First, raw values for each category of irregularity — cash, contract,

store, and tax — are harmonized across districts and years. Given the wide variation in the scale of irregularities across districts, the study employs a min–max normalization procedure to rescale each component to a common range between zero and one, where higher values indicate greater levels of mismanagement.

Two normalization approaches are implemented. The first normalizes irregularities across all districts nationally, allowing for comparison of mismanagement levels at the country level. The second normalizes irregularities within regions, which accounts for regional heterogeneity and reduces the influence of extreme outliers in highly urbanized or fiscally large districts. Empirical studies like Asatryan et al., (2015) and Jia et al., (2021) had adopted similar dual-scaling approaches to improve comparability and robustness of composite governance indices.

For normalisations within region (equation 4), and across districts (equation 5) let i denote a district and r denote its region. For each raw irregularity component X ∈ {irr_cash, irr_contract, irr_store, irr_tax}, region-specific min-max normalization rescales the component to the [0, 1] interval using the minimum and maximum observed within the same region.

$$X_{ir}^{*} = [X_{ir} - min_{i\epsilon r}(X_{ir})]/[\, max_{i\epsilon r}(X_{ir}) - \, min_{i\epsilon r}(X_{ir})] \text{ ---- (4)}$$

$$X_{i}^{*} = [X_{i} - min_{i}(X_{i})]/[\, max_{i}(X_{i}) - \, min_{i}(X_{i})] \text{ ---- (5)}$$

where X_{ir}^{*} is the normalized irregularity for district i in region r (using region specific minimum and maximum irregularities) and X_{i}^{*} is the normalized irregularity for district i across districts (using district maximum and minimum). The transformation preserves directionality: higher values indicate higher irregularities (greater mismanagement).

Following normalization, the four components are aggregated into a single index using an equally weighted average. Equal weighting is adopted to avoid imposing subjective judgments about the relative importance of different irregularities and is consistent with common practice in the construction of composite governance and public financial management indices (Lago-Peñas et al., 2024; Darko et al., 2025). The final DMI generation is determined as:

$$DMI_{ir} = \left(\frac{1}{4}\right) * irr_{cash}{}_{ir}^{*} + irr_{contract}{}_{ir}^{*} + irr_{stores}{}_{ir}^{*} + irr\_tax_{ir}^{*} \text{----(6)}$$

$$DMI_{i} = \left(\frac{1}{4}\right) * irr_{cash}{}_{i}^{*} + irr_{contract}{}_{i}^{*} + irr_{stores}{}_{i}^{*} + irr\_tax_{i}^{*} \text{----(7)}$$

Where equation 6 refers to within-region DMI and equation 7 refers to across districts DMI respectfully. The resulting DACF Mismanagement Index ranges from zero, indicating relatively well-managed districts with low levels of irregularities, to one, indicating districts

with high levels of DACF-related mismanagement. This index, hence, provides a systematic and comparable measure of financial mismanagement that was integrated in the study's models (equations 1, 2 and 3).

4 Results

4.1 Descriptive and diagnostic results

This section of the report details a snapshot of the diagnostic and descriptive statistics on key variables including IGF, DACF, Expenditure and DACF mismanagement (DMI) across Ghana. It presents levels, variations, patterns and associations for context. Table 2 reports summary statistics for the main fiscal, demographic, and political variables used in the analysis. Several features are highlighted. First, average IGF actual collections are substantially lower than IGF budgeted amounts, indicating persistent shortfalls in own-source revenue mobilisation across districts. The large standard deviation relative to the mean further highlight wide heterogeneity in revenue capacity across local governments.

Second, actual expenditure is markedly lower than budgeted expenditure, suggesting that districts frequently fail to execute planned spending fully within the fiscal year. This gap underscores the importance of distinguishing between planned and realised fiscal outcomes when assessing decentralisation performance. Measures of "efficiency," defined here as the difference between actual and budgeted values, show large dispersion and extreme values, reflecting both under-execution and, in some cases, overshooting of budget targets

Third, the demographic variables reveal substantial variation in population size and population density across districts, reinforcing the need to control for structural heterogeneity in subsequent analysis. Political alignment is approximately evenly split, indicating that roughly half of district parliamentary constituencies are aligned with the ruling party at the national level over the study period.

Table 2: Descriptive statistics

Variable	N	Mean	SD	Min	Max
IGF budget	940	2022340	3599496.417	0	30900000
IGF actual	940	1562902.7	2938261.996	0	26098516
DACF actual	860	1718206.8	6017286.224	0	175,353,295.0
IGF efficient	940	-45943727	152951640.266	-1482919040.0	1,858,882,432.0
DACF budget	860	4612404.9	2265842.409	-5223598	39361546
Expenditure budget	943	13530878	12343864.516	45130	147,134,904.9
Expenditure actual	951	8517132.3	8707175.299	69010	154,393,488.1
Expenditure	910	-499,066,946.2	1103531588.025	-13324509184.0	13649607680.0

Variable	N	Mean	SD	Min	Max
efficient					
Population	1014	116750.56	72395.204	16598	902724
Population density	1014	1089.321	3835.747	.164	57176.816
Political alignment	811	.502	0.500	0	1

Source: Author's construct

4.2 Trends in DACF and IGF

Table 3 presents average trends in IGF, DACF, and actual expenditure over the period 2020–2023. The data show that IGF and DACF do not move in tandem over time. IGF per capita rises sharply between 2020 and 2022 before declining in 2023, while DACF per capita exhibits greater volatility, including a pronounced increase in 2022 followed by a substantial decline in 2023.

Actual expenditure follows a different trajectory, increasing steadily over the period despite fluctuations in both IGF and DACF. This divergence suggests that expenditure execution is influenced by a combination of revenue sources, and timing of transfers.

Table 3: Trend of average IGF, DACF and Expenditure (actual)

Year	IGF Actual	DACF Actual	IGF PC	DACF PC	Expenditure Actual
2020	831,464.4	1,357,933.7	8.273	13.300	8,423,114.7
2021	1,763,239.6	1,380,538.0	16.741	15.328	7,497,687.2
2022	2,078,860.4	3,011,997.7	18.805	29.239	8,424,566.0
2023	1,478,932.1	953,017.7	11.830	10.694	9,665,166.2

Source: Author's construct; See extended table in Appendix 1

4.2.1 Pairwise Correlation matrix

Table 4 reports pairwise correlations among key fiscal and control variables. Actual IGF is positively correlated with actual expenditure, while its correlation with DACF is weak, suggesting that own-source revenues and transfers play distinct roles in shaping expenditure outcomes. IGF efficiency is negatively correlated with both IGF actual and population size, indicating that districts with larger revenue bases may still face challenges in meeting ambitious revenue targets.

Expenditure efficiency exhibits a positive correlation with actual expenditure but weak associations with revenue variables, highlighting the importance of treating expenditure execution as a distinct fiscal dimension. Population and population density are positively correlated with both IGF and expenditure, consistent with scale and urbanisation effects.

Political alignment displays weak correlations with most fiscal variables, suggesting that any political effects are unlikely to be visible in raw associations alone.

Table 4: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) IGF_Actual	1.000							
(2) DACF_Actual	0.121	1.000						
	(0.000)							
(3) Efficient_IGF	-0.221	0.016	1.000					
	(0.000)	(0.645)						
(4) Expenditure_actual	0.519	0.024	-0.331	1.000				
	(0.000)	(0.488)	(0.000)					
(5) Efficient_Expenditure	-0.032	0.013	0.030	0.235	1.000			
	(0.347)	(0.709)	(0.381)	(0.000)				
(6) Population	0.349	0.072	-0.218	0.382	-0.049	1.000		
	(0.000)	(0.035)	(0.000)	(0.000)	(0.144)			
(7) Population density	0.177	0.065	-0.099	0.135	-0.009	0.224	1.000	
	(0.000)	(0.056)	(0.002)	(0.000)	(0.782)	(0.000)		
(8) Political alignment	0.039	0.014	-0.065	0.122	-0.059	0.035	0.037	1.000
	(0.282)	(0.718)	(0.077)	(0.001)	(0.114)	(0.314)	(0.299)	

Source: Author's construct

4.2.3 Regional and district level ranking

To illustrate spatial and institutional heterogeneity, Tables 5 and Appendix 2 rank regions and districts by IGF per capita, DACF per capita, and expenditure per capita. The regional rankings reveal a clear concentration of high IGF and expenditure intensity in Greater Accra, followed by selected middle-income regions such as Bono and Ashanti. In contrast, northern and newly created regions consistently rank lower in IGF per capita, reflecting structural constraints in revenue mobilisation.

At the district level, Appendix 2 shows that top IGF-performing districts are predominantly urban or peri-urban, while high DACF intensity is more common among sparsely populated or structurally constrained districts. Expenditure per capita rankings further reveal that high spending is not confined to metropolitan areas, suggesting variation in expenditure needs and project intensity across districts.

Table 5: Rank Regions by IGF, DACF Expenditure (per capita terms – thus intensity)

IGF per capita		DACF per capita		Expenditure per capita	
Region	Mean	Region	Mean	Region	Mean
Greater Accra	44.45	Greater Accra	26.16	Greater Accra	112.826
Bono	22.428	Ashanti	19.329	Bono	110.988
Ahafo	21.44	Savannah	19.028	Ashanti	95.817

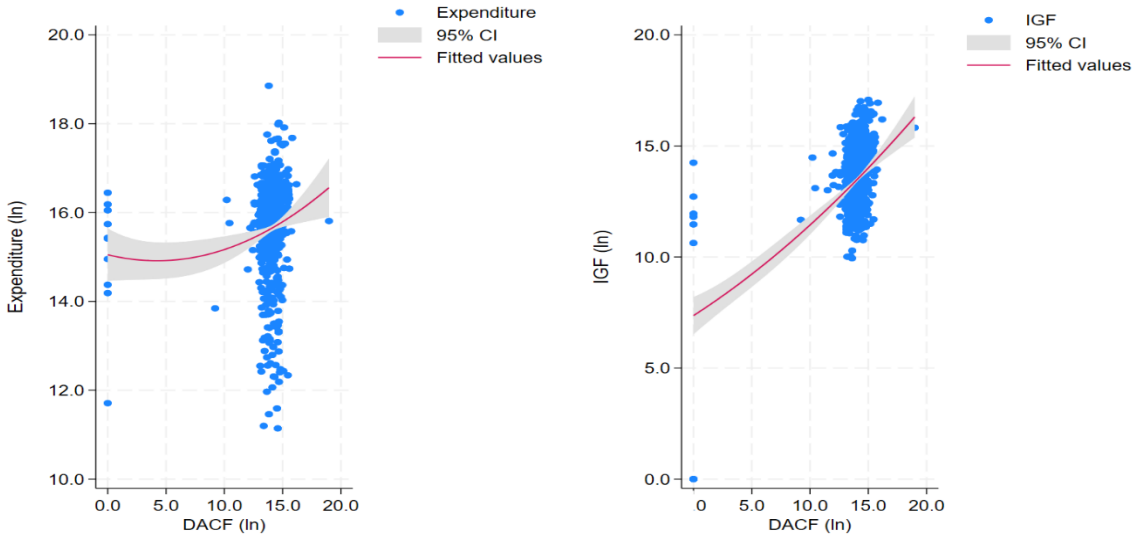
IGF per capita		DACF per capita		Expenditure per capita	
Region	Mean	Region	Mean	Region	Mean
Western	16.759	Volta	18.205	Ahafo	93.335
Eastern	14.392	Oti	18.131	Eastern	90.882
Upper East	11.437	Eastern	17.158	Upper West	85.051
Ashanti	11.435	Central	16.768	Upper East	80.923
Central	9.113	North East	16.066	Central	79.848
Western North	7.964	Upper East	15.719	Volta	74.596
Bono East	6.543	Bono	14.625	Western North	72.317
Volta	6.157	Upper West	14.414	Bono East	71.394
Upper West	4.007	Western North	14.284	Savannah	69.895
Oti	3.339	Bono East	13.977	Western	65.014
Savannah	3.247	Ahafo	13.607	Northern	59.889
Northern	2.532	Western	13.413	North East	54.846
North East	1.101	Northern	11.42	Oti	30.918

Source: Author's construct

4.2.3 Joint distribution of IGF, DACF and Expenditure

Figure 1 presents a scatter plot illustrating the relationship between DACF, IGF, and actual expenditure. The figure highlights a stronger positive association between IGF and expenditure than between DACF and expenditure, while also revealing substantial dispersion across districts. This visual evidence reinforces the need for multivariate analysis to disentangle the relative roles of transfers and own-source revenues.

Figure 1: Scatter plot between DAC, IGF, and Expenditure



Source: Author's construct

4.3 Patterns of Mismanagement

Table 6 presents average values of the DACF Mismanagement Index over time. Mismanagement exhibits notable variation across years, with a pronounced spike in 2022 followed by a decline in 2023. This temporal variation suggests that fiscal mismanagement is not a static district characteristic but may respond to institutional, fiscal, or administrative shocks.

Table 6: DACF Mismanagement Index over time

Year	Mean DMI
2020	0.049
2021	0.043
2022	0.233
2023	0.056

Source: Author's construct

Tables 7 and Appendix 3 document regional and district-level variation in mismanagement. Considerable heterogeneity is observed across regions, with northern regions generally exhibiting lower average DMI values, while several coastal and forest regions record higher levels of mismanagement. At the district level, the contrast between the least and most mismanaging districts is stark, underscoring the value of a continuous index in capturing accountability differences.

Table 7: Ranking DMI by region (less mismanaging to more mismanaging regions)

	Region	(count) DMI_winsall	(mean) DMI_winsall	(min) DMI_winsall	(max) DMI_winsall
Northern		57	0.01	0	0.026
Eastern		131	0.049	0	0.129
Greater Accra		114	0.056	0	0.138
Oti		34	0.061	0	0.159
Ashanti		172	0.065	0	0.178
Upper East		60	0.074	0	0.195
Volta		72	0.078	0	0.177
Western		48	0.08	0	0.175
Savannah		28	0.09	0	0.218
Upper West		40	0.112	0	0.281
Bono East		41	0.113	0	0.255
Ahafo		24	0.124	0	0.312
North East		27	0.13	0	0.339
Bono		48	0.157	0	0.423
Western North		34	0.233	0	0.463

Region	(count) DMI_winsall	(mean) DMI_winsall	(min) DMI_winsall	(max) DMI_winsall
Central	88	0.261	0	0.616

Source: Author's construct

4.4 ECONOMETRIC RESULTS

4.4.1 Do DACF transfers crowd out local governments 'internally generated revenues?

Table 8 reports fixed effects (FE), random effects (RE), and correlated random effects (CRE) estimates of the relationship between DACF transfers and district-level IGF performance. The results provide support for the hypothesis that DACF transfer intensity, DACF per capita, systematically crowds out local revenue mobilisation. In the preferred CRE specification, DACF per capita is negative and statistically significant, indicating that higher per capita transfers are associated with lower IGF, consistent with a partial crowding-out effect hence becoming effort-substituting in nature. Whereas DACF systematically reduces IGF, it has no significant correlation with the districts' performance with IGF (see Appendix 1). Except that increase in DACF per capita increases performance measured as the probability that a district could raise more actual IGF than budgeted IGF.

However, DACF actual disbursements are positive and strongly significant (Table 8), suggesting that in absolute terms, higher transfers are associated with improved IGF outcomes. This pattern implies that while DACF may weaken revenue effort when measured relative to population size, it simultaneously enhances local revenue capacity through scale effects, institutional support, or complementary spending. Actual DACF realisation therefore becomes capacity complementing. But then from year-on-year IGF generations, actual disbursement reduces the probability of generating more actual IGF than budgeted IGF (see Appendix 4).

Population density exhibits a negative effect under CRE, indicating that within-district increases in density are associated with lower IGF performance, possibly reflecting congestion effects or administrative strain. Political alignment remains positive and statistically significant across all models, pointing to the relevance of political economy factors in local revenue mobilisation. Importantly, the mismanagement index (winsorised) is negative and statistically significant in both FE and CRE models, indicating that worsening fiscal mismanagement within a district robustly undermines IGF performance. These findings highlight governance quality as a key mechanism shaping the fiscal interaction between intergovernmental transfers and local revenue outcomes

Table 8: Effect of DACF on IGF

	(FE) IGF	(RE) IGF	(CRE) IGF
DACF_PC	-10.04	-0.216	-0.776**
	(-1.20)	(-1.26)	(-2.58)
DACF_actual	10.21	0.437*	0.912***
	(1.22)	(2.34)	(3.29)
Population density	-10.30	0.194***	-0.997*
	(-1.20)	(4.97)	(-2.57)
Political alignment	0.576*	0.260*	0.258*
	(2.38)	(2.03)	(2.04)
DMI (winsall)	-2.234*	-1.638	-2.201*
	(-2.17)	(-1.62)	(-2.25)
DMI (unwinsall)	1.726	2.411	1.604
	(0.79)	(1.04)	(0.78)
Municipal		0.428**	0.361**
		(3.29)	(2.91)
Metropolitan		1.503***	1.117***
		(5.61)	(3.93)
m_DACF_PC			0.232
			(1.07)
m_DACF_actual			0.00144
			(0.04)
m_Population density			1.161**
			(3.10)
m_DMI (winsall)			2.546*
			(2.52)
m_DMI (unwinsall)			3.984
			(1.23)
Constant	-51.24	6.019**	0.135
	(-1.00)	(2.81)	(0.04)
Observations	435	435	435

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4.2 Are districts with higher IGF more likely to spend compared to DACF-dependent districts?

Table 9 reports panel regression estimates comparing actual expenditure outcomes across high-IGF and high-DACF districts. Across all specifications, the coefficient on High_IGF is positive and statistically significant, and remains robust to the inclusion of governance controls, political alignment, population density, district type, and district fixed effects. Although the magnitude of the coefficient declines as additional controls are introduced, its statistical significance is preserved throughout, indicating a stable association between stronger IGF capacity and higher realized expenditure.

Table 9: Expenditure relations with IGF and DACF

	(1) Expenditure	(2) Expenditure	(3) Expenditure	(4) Expenditure	(5) Expenditure	(6) Expenditure	(7) Expenditure	(8) Expenditure
High_IGF	0.608***	0.608***		0.550***	0.546***	0.484***	0.484***	0.360***
	(0.0768)	(0.0768)		(0.0828)	(0.0832)	(0.0903)	(0.0903)	(0.103)
High_DACF			0.148*	0.0636	0.0636	0.000920	0.000920	-0.00193
			(0.0776)	(0.0739)	(0.0744)	(0.0891)	(0.0891)	(0.111)
DMI (winsall)					-0.377	-0.377	-0.377	-0.414
					(0.319)	(0.318)	(0.318)	(0.409)
High_DACFIFG						0.122	0.122	0.142
						(0.0998)	(0.0998)	(0.115)
Population density								0.208
								(0.305)
Political alignment								0.0811
								(0.1000)
Municipal								0.209**
								(0.101)
Metropolotan								0.723***
								(0.221)
m_DACF_PC								-0.103
								(0.0896)
m_DACF_actual								0.00264
								(0.0421)
m_Population density								-0.126
								(0.306)
m_DMI (winsall)l								0.295
								(0.755)
_cons	15.45***	15.45***	15.56***	15.41***	15.43***	15.46***	15.46***	15.01***
	(0.0706)	(0.0706)	(0.0982)	(0.0962)	(0.0973)	(0.0959)	(0.0959)	(0.587)
Obs.	888	888	823	823	823	823	823	659

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

By contrast, High_DACF exhibits a weaker and less stable relationship with actual expenditure. While the coefficient is positive and marginally significant in the baseline specification, it becomes statistically insignificant once district characteristics and governance variables are introduced (Table 9, columns 4–8). In the fully specified models, DACF dependence is not systematically associated with higher levels of actual expenditure.

This pattern is consistent with earlier evidence from Ghana showing that reliance on intergovernmental transfers does not necessarily translate into stronger fiscal outcomes once institutional and structural differences are accounted for (Mogues and Benin, 2012; Delali,

2019). Adanu (2024) similarly finds that transfers alone are insufficient to explain variation in local fiscal performance, particularly when execution constraints are present.

Further insight is provided by the subgroup analysis in Table 10. Among high-IGF districts, IGF per capita enters positively and significantly, suggesting that districts with greater own-source revenue capacity tend to spend more in absolute terms. Population density is also positively associated with expenditure in this group, consistent with lower per-unit costs of service delivery in more densely populated districts (Razin and Obirih-Opareh, 2000; Fiagbe, 2023). In contrast, among high-DACF districts, DACF per capita is weakly negative or statistically insignificant, and expenditure outcomes appear more closely linked to district type.

Table 10: Expenditure relations with IGF and DACF (Subgroup analysis)

Expenditure (Actual)	High IGF	Low IGF	High DACF	Low DACF
IGF PC	.387***	.261	-	-
	(.14)			
DACF PC	-	-	-.264	.107
			(.245)	(.149)
DMI (winsall)	-.011	2.347**	.283	.899
	(.641)		(.746)	(1.386)
Population density	1.471***	-.375	-.025	-.108
	(.406)		(.443)	(.467)
Political alignment	.051	-.208	-.078	.239
	(.217)		(.252)	(.205)
Municipal	.309	.138	.614**	.296
	(.188)		(.272)	(.218)
Metropolitan	.607	.56	.532	1.034*
	(.433)		(.831)	(.555)
m_DACF_PC	-.163	-.034	.105	-.361
	(.174)		(.304)	(.238)
m_DACF_actual	-.018	.035	-.046	.04
	(.075)			(.167)
m_Population density	-1.401***	.396	.113	.148
	(.403)		(.44)	(.487)
m_DMI_(winsall)	-.341	.658	.267	1.554
	(1.268)		(1.868)	(1.416)
Constant	15.185***	14.615***	15.915***	14.681***

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The evidence from the results indicates that districts with stronger internally generated revenues tend to record higher levels of actual expenditure than DACF-dependent districts. This finding aligns with the broader literature emphasizing the role of fiscal autonomy and

revenue predictability in shaping subnational spending outcomes (Otoo and Danquah, 2021; Lago-Peñas et al., 2024).

4.4.3 Role of quality DACF management

As was revealed in Table 8, DMI (winsorised) is negatively and statistically significantly associated with internally generated revenues in both fixed effects and correlated random effects specifications. This relationship remains robust after controlling for DACF transfers, population density, political alignment, and district type. The result suggests that higher levels of financial mismanagement are associated with weaker local revenue mobilisation. Similar findings are reported by Darko et al. (2025), who document a negative relationship between audit-identified irregularities and fiscal autonomy among local government entities in Ghana.

By contrast, the unwinsorised DMI is not statistically significant, indicating that extreme values account for a substantial share of the variation and that the adverse association between mismanagement and IGF is most evident within the central distribution of districts. This pattern is consistent with the view that persistent, rather than episodic, governance weaknesses undermine local revenue capacity.

On the expenditure side, the relationship between mismanagement and actual expenditure is less precisely estimated. As reported in Table 9, the coefficient on DMI (winsall) is generally negative but statistically insignificant once district fixed effects and interaction terms are included. This suggests that mismanagement does not uniformly reduce the level of actual spending, even though it may affect the quality or effectiveness of that spending. Similar ambiguity has been noted in the broader literature, where governance failures are often found to affect spending composition and outcomes more than aggregate expenditure levels (Kalb, 2010; Musah et al., 2025).

Subgroup estimates in Table 10 provide additional nuance. Among High-IGF districts, mismanagement does not exhibit a statistically significant association with actual expenditure, whereas among High-DACF districts, the point estimates are larger in magnitude but imprecisely estimated. This pattern is consistent with arguments that districts with stronger own-source revenue capacity may be better able to absorb or offset governance weaknesses, while DACF-dependent districts are more exposed to institutional fragilities (Asatryan et al., 2015; Obeng and Aazam, 2025).

These results suggest that fiscal mismanagement is a robust constraint on local revenue mobilisation, while its association with actual expenditure levels is more context-specific and

heterogeneous. These findings are in line with recent work emphasizing the conditional role of governance quality in shaping the fiscal outcomes of decentralization reforms (Brunnschweiler and Obeng, 2026; Lago-Peñas et al., 2024).

5 Discussion

Own-source revenues, as revealed in the analysis, afford districts flexibility to adapt to local needs and administrative realities, whereas DACF transfers—despite their equalizing intent—are frequently undermined by delays, partial releases, and earmarking (Banful, 2011; Adanu, 2024). This aligns with earlier Ghanaian evidence showing that heavy transfer dependence does not reliably translate into robust fiscal outcomes (Mogues and Benin, 2012; Delali, 2019).

In addition, the descriptive rankings further highlight this heterogeneity: High-IGF districts (often metropolitan or urban) dominate expenditure rankings, while high-DACF districts exhibit more variable performance. Transfers thus appear to provide a stabilizing floor in constrained districts but fall short of substituting for local fiscal effort (Smart, 2007; Dahlby and Ferede, 2016). The pattern reinforces broader decentralization arguments that own-source revenue mobilization is essential for functional autonomy (Asatryan et al., 2015; Lago-Peñas et al., 2024).

Concerning fiscal mismanagement, as measured by the DMI, higher DMI scores—driven by recurring audit irregularities in cash, contracts, sanitation, tax, and other areas—are robustly associated with weaker IGF performance across specifications. The link strengthens when extreme values are trimmed, indicating that chronic governance weaknesses, rather than isolated lapses, erode revenue mobilization. This echoes recent threshold-based evidence linking financial irregularities to diminished fiscal autonomy in Ghanaian local entities (Darko et al., 2025). The association with actual expenditure is weaker and less consistent, particularly after district fixed effects and interactions are included. Point estimates suggest a negative direction, but imprecision implies mismanagement more often distorts spending quality and composition than aggregate levels (Kalb, 2010; Musah et al., 2025).

Subgroup analysis adds nuance: mismanagement shows no strong link to expenditure in high-IGF districts, but DACF-dependent districts appear more vulnerable, albeit with notable variation. This supports claims that robust own-source capacity can buffer governance weaknesses—perhaps by bolstering administrative systems or heightening local accountability pressures (Asatryan et al., 2015)—while transfer reliance may soften incentives for reform where enforcement remains uneven.

Collectively, the results advance the crowding-out debate by highlighting conditionality rather than a binary outcome. DACF transfers remain essential for minimum fiscal capacity in structurally constrained districts, yet they risk reinforcing soft budget constraints where IGF effort is weak and mismanagement high (Courant et al., 1979; Sobel and Crowley, 2014). Strong local revenue mobilization and effective accountability mechanisms appear critical to translating transfers into enhanced state effectiveness. By combining budgeted/actual fiscal data, a novel DMI, and spatial models, this study provides granular, policy-relevant evidence on the institutional conditions under which fiscal decentralization supports local governance in Ghana.

6 Conclusion and Policy Implications

This study examined whether Ghana's fiscal decentralisation framework, centred on the District Assemblies Common Fund (DACF), strengthens local state effectiveness by shaping revenue mobilisation, expenditure execution, and accountability at the district level. Using district-level panel data, digitised Auditor-General reports, a newly constructed DACF Mismanagement Index (DMI), and panel econometric techniques, the analysis provides evidence on how decentralisation functions in practice rather than in design.

The findings point to a conditional and differentiated relationship between transfers, local revenue effort, and fiscal performance. Evidence suggests that higher reliance on DACF transfers is associated with weaker internally generated funds (IGF), indicating elements of fiscal crowding-out in districts that depend heavily on intergovernmental transfers. By contrast, districts with stronger own-source revenue capacity consistently record higher levels of actual expenditure. This pattern highlights the importance of fiscal autonomy and revenue predictability in enabling districts to execute spending plans. While DACF transfers remain essential for equalising fiscal capacity, institutional features—including delays, partial releases, and earmarking—limit their ability to substitute for sustained local fiscal effort (Banful, 2011; Adanu, 2024).

Fiscal mismanagement further conditions these relationships. Higher levels of recurring audit irregularities are robustly associated with weaker IGF performance, suggesting that persistent governance weaknesses undermine local revenue mobilisation. In contrast, the relationship between mismanagement and aggregate expenditure is weaker and more heterogeneous, indicating that governance failures are more likely to distort the composition and quality of spending than its overall level (Darko et al., 2025; Kalb, 2010). Spatial clustering in fiscal

performance and mismanagement underscores the role of regional spillovers and shared institutional environments in shaping decentralisation outcomes.

These results results advance the crowding-out debate beyond a binary framing. Transfers provide a necessary fiscal floor for structurally constrained districts, but where IGF effort remains weak and accountability mechanisms are fragile, they risk reinforcing soft budget constraints rather than strengthening local state effectiveness (Courant et al., 1979; Sobel and Crowley, 2014). The effectiveness of fiscal decentralisation therefore depends not only on the volume of transfers, but on the interaction between transfer dependence, local revenue mobilisation, and governance quality.

These findings carry important policy implications. Strengthening local revenue mobilisation, particularly through improved property tax administration, valuation systems, billing, and enforcement, should be central to decentralisation reform. Enhancing the predictability and timeliness of DACF releases would improve budget credibility and execution. Introducing carefully designed performance-sensitive elements linked to revenue effort or reductions in persistent audit irregularities could reinforce incentives without undermining the equalisation function of the Fund. Finally, audit findings should be used more systematically to guide corrective action and targeted institutional support, especially in districts exhibiting chronic mismanagement.

Fiscal decentralisation in Ghana therefore retains significant potential to enhance local state effectiveness. Realising that potential requires aligning intergovernmental transfers with stronger local revenue effort and credible accountability mechanisms, ensuring that transfers complement, rather than displace, local fiscal responsibility.

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Appendices

Appendix 1: Full table Trend of DACF, IGF, and Expenditure

DACF and IGF full table

year	(count) igf_actual	IGF Actual	(min) igf_actual	(max) igf_actual
2020	210	831,464.4	37700.200	14,753,751.3
2021	241	1,763,239.6	0	24,450,112.9
2022	244	2,078,860.4	0	26,098,515.9
2023	245	1,478,932.1	0	18,583,265.1

Table: List of Variables

year	(count) dacf_actual	(mean) dacf_actual	(min) dacf_actual	(max) dacf_actual
2020	130	1.36e+06	0	3.76e+06
2021	241	1.38e+06	0	1.08e+07
2022	244	3.01e+06	0	175353295
2023	245	9.53e+05	0	5.50e+06

Table: List of Variables

year	(count) pc_igf	(mean) pc_igf	(min) pc_igf	(max) pc_igf
2020	209	8.273	0.316	199.308
2021	240	16.741	0	666.702
2022	243	18.805	0	438.580
2023	244	11.830	0	233.174

Table: List of Variables

year	(count) pc_dacf	(mean) pc_dacf	(min) pc_dacf	(max) pc_dacf
2020	130	13.300	0	44.807
2021	240	15.328	0	76.959
2022	243	29.239	0	770.638
2023	244	10.694	0	111.593

Table: List of Variables

year	(count) exp_act	(mean) exp_act	(min) exp_act	(max) exp_act
2020	204	8,423,114.7	120,891.6	154,393,488.1
2021	242	7,497,687.2	121,820.5	66,998,563.3
2022	253	8,424,566.0	69,010.0	47,751,510.6

2023	252	9,665,166.2	72909.530	64802869

Appendix 2: Rank of DACF, IGF and Expenditure by Region and District

Ranking IGFs by Region

Region	(count) pc_igf	(mean) pc_igf	(min) pc_igf	(max) pc_igf
Greater Accra	104	44.45	0.415	382.53
Bono	48	22.428	1.007	666.702
Ahafo	21	21.44	1.825	112.47
Western	39	16.759	1.824	116.877
Eastern	120	14.392	0	138.961
Upper East	56	11.437	0.279	438.58
Ashanti	171	11.435	0.648	76.94
Central	87	9.113	0.316	44.208
Western North	23	7.964	0.95	38.961
Bono East	33	6.543	1.017	33.785
Volta	64	6.157	0.531	22.086
Upper West	37	4.007	0.354	11.72
Oti	28	3.339	0	5.786
Savannah	25	3.247	0.738	9.341
Northern	56	2.532	0.577	23.916
North East	24	1.101	0.352	2.741

Ranking DACF by region

Region	(count) pc_dacf	(mean) pc_dacf	(min) pc_dacf	(max) pc_dacf
Greater Accra	97	26.16	1.746	770.638
Ashanti	171	19.329	0	197.915
Savannah	21	19.028	2.334	66.077
Volta	48	18.205	3.845	73.649
Oti	22	18.131	0	57.24
Eastern	120	17.158	0	104.499
Central	87	16.768	0.268	111.593
North East	18	16.066	4.705	60.465
Upper East	45	15.719	0	58.13
Bono	48	14.625	0	70.25
Upper West	27	14.414	0	47.097

Western North	19	14.284	3.465	55.289
Bono East	33	13.977	2.126	39.595
Ahafo	21	13.607	5.112	31.346
Western	35	13.413	1.253	60.193
Northern	45	11.42	0.531	33.102

Ranking expenditure by Regions

Region	(count) pc_exp	(mean) pc_exp	(min) pc_exp	(max) pc_exp
Greater Accra	101	112.826	11.023	635.595
Bono	48	110.988	3.283	1553.661
Ashanti	154	95.817	0.816	518.538
Ahafo	23	93.335	9.51	272.581
Eastern	124	90.882	5.475	253.57
Upper West	38	85.051	2.383	241.135
Upper East	58	80.923	1.55	349.765
Central	84	79.848	5.396	212.795
Volta	63	74.596	5.153	224.011
Western North	32	72.317	3.622	205.463
Bono East	39	71.394	2.456	184.795
Savannah	24	69.895	21.275	157.661
Western	46	65.014	2.007	200.776
Northern	57	59.889	7.924	299.792
North East	26	54.846	0.828	199.054
Oti	30	30.918	2.806	97.868

Ranking top 10 districts by IGF, DACF and Expenditure per capita

IGF per capita		DACF per capita		Expenditure per capita	
District	Mean)	District	Mean	District	Mean
Tema	246.679	La_Nkwantanang	258.85	Denkyembour	462.474
Banda	227.363	Sekyere_Afram_Plains	90.896	Tema	446.926
Korley_Klottey	152.698	Ayawaso_East	65.822	Sekyere_Afram_Plains	324.886
Builsa_South	147.759	Akatsi_North	51.753	Korley_Klottey	271.497

Ayawaso_West	123.865	Assin_Fosu	51.358	Banda	228.37
Fanteakwa_North	64.642	Korley_Klottey	50.012	Sekyere_Kumawu	207.355
New_Juaben_North	59.746	Banda	49.81	Obuasi	199.946
Asutifi_North	58.466	Bolga_East	46.027	Suame	199.436
Brim_North	53.577	North_East_Gonja	45.154	Suaman	186.904
La_Dadekotopon	52.061	Sekyere_Kumawu	43.763	Sekyere_East	184.301

Bottom 10 Districts in terms of IGF, DACF and Expenditure per capita

District	Mean IGF	District	Mean DACF
Bibiani_Anhwiaso_Bekwai	1.394	Yendi	5.285
Sagnarigu	1.343	Atwima_Mponua	5.147
Chereponi	1.303	Nkwanta_South	4.963
East_Gonja	1.271	Ga_West	4.802
Mion	1.088	Sagnarigu	4.334
Karaga	0.997	Nsawam	3.93
Tatale	0.973	Kpone_Katamanso	3.917
East_Mamprusi	0.81	Techiman	3.836
Yunyoo_Nasuan	0.669	Prestea_Huni_Vally	3.625
Binduri	0.632	Sunyani	3.04

Appendix 3: DACF Mismanagement Index over time (DMI)

Mismanagement by year: across districts and within region

year	(count) DMI_winsall	(mean) DMI_winsall	(min) DMI_winsall	(max) DMI_winsall
2020	251	0.049	0	0.444
2021	255	0.043	0	0.430
2022	256	0.233	0.026	0.616
2023	256	0.056	0	0.463

Ranking DMI by Districts: top 10 less mismanaging and top 10 most mismanaging

Less Mismanaging	More Mismanaging

District	(mean) DMI_winsall	Disctrict	(mean) DMI_winsall
Mion	0.007	Sefwi_Akontombra	0.259
Saboba	0.007	Assin_North	0.271
Gushegu	0.009	Agona_East	0.278
Karaga	0.009	Gomoa_West	0.281
Nanumba_South	0.009	Suaman	0.284
Yendi	0.009	Cape_Coast	0.303
Zabzugu	0.009	Twifo_Ati_Morkwa	0.304
Savelugu	0.01	Gomoa_East	0.33
Nanton	0.011	Gomoa	0.379
Nanumba_North	0.011	Awutu_Senya	0.403

Appendix 4: Effect of DACF on district assemblies' performance with IGF. Performance measured as ration of IGF actual to IGF budget and probability of increasing IGF actual over IGF budget.

	DACF on IGF - Performance			
	(Fe) IGF Actual/Budget	(RE) IGF Actual/Budget	(CRE) IGF Actual/Budget	(Probit) IGF_actual > Budget
DACF_PC	7.083	0.010	-0.031	5.563**
	(5.843)	(0.068)	(0.122)	(2.467)
DACF_actual	-7.030	0.074	0.108	-5.195**
	(5.840)	(0.070)	(0.101)	(2.461)
Population density	6.945	-0.005	-0.074	5.351**
	(5.883)	(0.013)	(0.174)	(2.365)
Political alignment	-0.137*	-0.008	-0.005	0.207
	(0.082)	(0.050)	(0.047)	(0.214)
DMI (winsall)	-0.216	0.049	-0.163	-3.191
	(0.533)	(0.284)	(0.447)	(2.306)
DMI (unwinsall)	0.899	0.114	-0.002	1.798
	(0.819)	(0.500)	(0.911)	(4.080)
Municipal			-0.021	-0.039
			(0.047)	(0.252)
Metropolitan			-0.044	-0.694
			(0.084)	(0.634)
m_DACF_PC			0.024	-5.658**
			(0.068)	(2.425)
m_DACF_actual			-0.005	5.993**
			(0.013)	(2.548)
m_Population density			0.069	-5.394**
			(0.171)	(2.363)
m_DMI (winsall)			0.329	3.523*
			(0.477)	(1.889)

m_DMI (unwinsall)			0.652	6.798
			(1.929)	(4.775)
Constant	48.488	3.065***	2.678**	-13.395**
	(36.350)	(0.859)	(1.212)	(6.371)
Observations	435	435	435	435

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix 5: Whether High IGF are efficient in spending that High IGF districts (FE Model)

	(1) Expenditure	(2) Expenditure	(3) Expenditure	(4) Expenditure	(5) Expenditure	(6) Expenditure	(7) Expenditure	(8) Expenditure
High_IGF	0.500***	0.500***		0.380***	0.371***	0.306**	0.306**	0.219*
	(0.0961)	(0.0961)		(0.107)	(0.109)	(0.122)	(0.122)	(0.129)
High_DACF			0.0749	0.0220	0.0254	-0.0352	-0.0352	-0.0212
			(0.0897)	(0.0880)	(0.0889)	(0.103)	(0.103)	(0.125)
DMI (winsall)					-0.440	-0.444	-0.444	-0.540
					(0.363)	(0.362)	(0.362)	(0.398)
High DACFIFG						0.123	0.123	0.207*
						(0.108)	(0.108)	(0.124)
Population density								0.329
								(0.308)
Political alignment								0.0624
								(0.203)
_cons	15.48***	15.48***	15.57***	15.47***	15.50***	15.53***	15.53***	13.65***
	(0.0767)	(0.0767)	(0.101)	(0.102)	(0.103)	(0.103)	(0.103)	(1.654)
Obs.	888	888	823	823	823	823	823	659
Within R^2								
Between R^2								
Overall R^2								

Appendix 6: Whether High IGF are efficient in spending that High IGF districts (RE Model)

	(1) Expenditure	(2) Expenditure	(3) Expenditure	(4) Expenditure	(5) Expenditure	(6) Expenditure	(7) Expenditure	(8) Expenditure
High_IGF	0.608***	0.608***		0.550***	0.546***	0.484***	0.484***	0.370***
	(0.0768)	(0.0768)		(0.0828)	(0.0832)	(0.0903)	(0.0903)	(0.0998)
High_DACF			0.148*	0.0636	0.0636	0.000920	0.000920	-0.0226
			(0.0776)	(0.0739)	(0.0744)	(0.0891)	(0.0891)	(0.107)
DMI (winsall)					-0.377	-0.377	-0.377	-0.345
					(0.319)	(0.318)	(0.318)	(0.340)
High_DACFI						0.122	0.122	0.132

GF								
						(0.0998)	(0.0998)	(0.114)
Population density								0.0879***
								(0.0286)
Political alignment								0.0729
								(0.102)
Municipal								0.220**
								(0.102)
Metropolitan								0.760***
								(0.216)
_cons	15.45***	15.45***	15.56***	15.41***	15.43***	15.46***	15.46***	14.79***
	(0.0706)	(0.0706)	(0.0982)	(0.0962)	(0.0973)	(0.0959)	(0.0959)	(0.193)
Obs.	888	888	823	823	823	823	823	659
Within R^2								
Between R^2								
Overall R^2								

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