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Threshold effects of public procurement on Ghana's economic development: A budgetary allocation perspective

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Background: Public procurement is one of Ghana's largest channels of public expenditure, yet institutional inefficiencies, corruption, and political interference limit its contribution to sustainable development. Empirical evidence on threshold effects – the point beyond which rising procurement budgets yield diminishing economic returns – remains scarce in the Ghanaian context.

Objectives: This study investigates threshold effects of public procurement budget allocations on economic development in Ghana, examining how budgetary levels shape procurement effectiveness and outcomes, and assessing the moderating roles of budget allocation and procurement policy.

Method: A quantitative, deductive design was used. Structured Likert-scale questionnaires were administered to 100 purposively selected procurement managers, finance officers, and decision-makers from public and private organisations. Data were analysed in SPSS using descriptive statistics, Pearson correlation, and hierarchical regression.

Results: Descriptive statistics showed moderate perceptions across variables (means: 2.91–3.00). Correlation revealed a significant negative relationship between budget allocation and procurement effectiveness. Regression confirmed that the threshold effect significantly and negatively predicts economic development, while budget allocation (p = 0.234) and procurement policy (p = 0.419) were non-significant (R^2 = 0.057).

Conclusion: Exceeding optimal procurement budget thresholds produces diminishing returns; increasing budgets without institutional capacity, transparency, and enforcement does not improve outcomes. Ghana's procurement system needs strategic budget optimisation, depoliticised decision-making, and sustained capacity development.

Contribution: The study applies a threshold effects framework to Ghanaian public procurement, extending Public Choice and Institutional Theory by showing that political incentives and weak institutional capacity jointly produce non-linear procurement–development relationships, offering guidance for Ghana's Public Procurement Authority.

Keywords: public procurement; economic development; budget allocation; threshold effects; institutional capacity.

Introduction

Public procurement plays a pivotal role in the economic development (ED) of any nation, as it involves the allocation of state resources to goods, services and works essential for public service delivery and infrastructure development. In Ghana, public procurement has become a key area of concern, particularly in terms of its influence on ED. As one of the largest sectors of public expenditure, it holds substantial potential to foster economic growth through the efficient use of state resources. However, despite the considerable importance of public procurement in Ghana's economic agenda, its effectiveness in contributing to sustainable development remains unclear (Asamoah, Boateng & Osei 2020). A critical aspect of this is the threshold effect (TE) of budgetary allocation to public procurement and how it influences broader economic outcomes.

The study of public procurement's role in Ghana's ED has garnered attention, but significant gaps still exist in understanding how TEs in procurement budget allocations specifically shape economic growth. While existing studies tend to focus on the overall impact of public procurement

on development (Kpodo et al. 2021a), there is limited research that explicitly addresses the varying thresholds of budgetary allocations and their subsequent effects on economic performance. Therefore, the current research seeks to explore the relationship between public procurement and Ghana's ED from the perspective of budgetary allocation, examining how different thresholds of funding allocation affect economic growth and development.

In Ghana, the public procurement system has faced persistent challenges, including inefficiency, corruption and misallocation of funds, which have hindered its potential to positively influence the nation's economic growth (Amoako 2022). The budgetary allocation for public procurement often fluctuates, raising concerns about whether such allocations are optimised to maximise their economic impact. It remains unclear whether incremental changes in procurement budgets at specific thresholds lead to significant improvements in economic performance or whether higher allocations result in diminishing returns (Obeng & Essel 2020). Additionally, despite the emphasis on improving procurement systems, there has been insufficient empirical investigation into how varying levels of budgetary allocations for procurement directly influence Ghana's ED, leaving a critical research gap that needs to be addressed (Tuffour & Osei 2019a).

This research aims to investigate the TEs of public procurement on Ghana's ED, focusing on how varying levels of budgetary allocations influence economic growth. Specifically, the study seeks to understand whether certain thresholds in procurement budgets trigger significant positive changes in economic performance or whether there are diminishing returns beyond a certain level of allocation. The findings of this study will provide insights into optimising budgetary decisions and procurement policies, ultimately contributing to improved public service delivery and enhanced ED in Ghana. By addressing the following research questions, the study will contribute valuable insights into the effectiveness of public procurement spending, with implications for policymakers, government officials and stakeholders interested in improving Ghana's public procurement system to foster long-term economic growth.

Research questions

The research questions were: (1) *How do different levels of public procurement budgets affect Ghana's economic development?* and (2) *What is the link between procurement budget thresholds and economic growth in Ghana?*

Literature review and hypothesis development

In analysing the relationship between public procurement and ED, it is essential to draw upon established theoretical frameworks that offer insight into the underlying mechanisms influencing government decisions, particularly in the context of budgetary allocations. This study employs Public Choice Theory and Institutional Theory as its primary theoretical anchors to synthesise the existing literature and provide a robust foundation for understanding the challenges and opportunities within Ghana's public procurement system.

Public Choice Theory, originally developed by Buchanan and Tullock (1962), extends the logic of economic rationality to political actors and public institutions, arguing that government officials, procurement managers and policymakers are self-interested agents whose decisions are shaped not solely by public welfare considerations but by personal incentives, political pressures and rent-seeking behaviour. Applied to public procurement, this theoretical lens helps explain why budgetary allocations frequently deviate from economically optimal levels – procurement decisions are often inflated, misdirected or politically motivated, reflecting the preferences of powerful actors rather than the demands of efficient resource allocation (Mueller 2003). In Ghana's procurement landscape, Public Choice Theory is particularly instructive: the persistent over-budgeting of procurement without commensurate improvements in outcomes, the manipulation of tender processes for political patronage, and the selective enforcement of procurement regulations all reflect the rational self-interest of political and bureaucratic actors operating within weak accountability structures (Agbesinyale 2019).

Institutional Theory, as elaborated by North (1990) and Scott (2001), provides a complementary explanatory framework by directing attention to the formal rules, informal norms and enforcement mechanisms that govern organisational behaviour and shape economic outcomes. North's seminal distinction between formal institutions – such as laws, regulations and constitutions – and informal institutions – such as customs, norms and cultural expectations – is especially relevant to public procurement systems in developing economies. Where formal procurement frameworks are nominally in place but informal norms of political patronage, nepotism and bureaucratic discretion are deeply entrenched, the institutional environment undermines rather than supports efficient procurement outcomes (North 1990). *Ghana's Public Procurement Act (Act 663, 2003, as amended by Act 914, 2016)* provides a comprehensive legislative framework, yet institutional analyses consistently reveal significant gaps between policy design and implementation, reflecting what Acemoglu and Robinson (2012) describe as the divergence between de jure and de facto institutional arrangements. Institutional Theory thus helps account for why Ghana's procurement system has been unable to translate increasing budgetary allocations into proportionate gains in ED – the institutional environment, characterised by weak enforcement, regulatory capture and governance deficits, attenuates the developmental impact of financial investments in procurement.

Together, these two theoretical frameworks offer a powerful and complementary lens for examining the TEs that define the relationship between public procurement budgets and

economic outcomes in Ghana. Public Choice Theory illuminates the political and incentive-driven distortions that cause procurement actors to prioritise private gain over public value, while Institutional Theory explains how the structural features of Ghana's governance environment – including the quality of formal rules and the strength of enforcement mechanisms – determine whether procurement resources translate into development gains or are dissipated through systemic inefficiency. The interaction of these dynamics produces a non-linear procurement–development relationship: at lower budgetary levels, increased procurement spending may stimulate economic activity by financing public goods and infrastructure; however, beyond a critical threshold, additional expenditure without institutional reform generates diminishing returns, as the marginal productivity of procurement resources declines under conditions of weak governance, corruption and political interference (Knack & Keefer 1995; Tanzi & Davoodi 1997).

This theoretical synthesis also has practical implications for procurement reform. DiMaggio and Powell's (1983) concept of institutional isomorphism – the tendency of organisations to adopt structures and practices in response to coercive, normative or mimetic pressures – suggests that Ghana's procurement reforms have often been driven by external compliance requirements, such as donor conditionality or international benchmarking, rather than by endogenous institutional change. This pattern of isomorphic adoption without genuine institutional transformation helps explain why regulatory frameworks appear formally robust while producing suboptimal developmental outcomes in practice (Meyer & Rowan 1977). Sustainable improvement in procurement performance therefore requires not merely legislative reform but a deeper transformation of the informal institutional environment – including the norms, incentives and accountability mechanisms that govern the behaviour of procurement actors at all levels of the system.

In sum, the combined application of Public Choice Theory and Institutional Theory provides this study with a theoretically grounded framework for investigating how budgetary allocations, governance structures and political incentives interact to produce TEs in Ghana's public procurement system. These frameworks guide the formulation of the study's hypotheses, inform the selection of variables, and provide the interpretive foundation for contextualising the empirical findings within the broader literature on procurement governance and ED in emerging economies.

Concept of threshold effects in public procurement

Threshold effects in public procurement refer to the point at which additional increases in public procurement spending yield progressively smaller economic benefits. This phenomenon occurs when the marginal impact of additional budget allocations becomes constrained by inefficiencies in the procurement system, including bureaucratic delays, corruption, mismanagement or lack of capacity (Obeng & Essel 2020). While public procurement has traditionally been viewed as a key driver of ED – facilitating job creation, stimulating local industries, improving infrastructure and enhancing the delivery of public services (Kpodo et al. 2021b) – emerging evidence indicates that these benefits are not limitless. Specifically, when procurement spending exceeds certain thresholds, the efficiency and effectiveness of resource utilisation decline, leading to diminishing economic returns (Tuffour & Osei 2019b). This TE may manifest in several ways, such as inflated project costs, delayed project completion, underutilisation of procured goods and services, and reduced value for money. Consequently, understanding TEs is critical for policymakers aiming to optimise public expenditure, as it underscores the importance of not only increasing procurement budgets but also ensuring robust governance, transparency and accountability mechanisms to maximise the developmental impact of public spending.

Factors contributing to threshold effects

Several factors contribute to the emergence of TEs in public procurement, with institutional inefficiency and political influence being among the most significant. Public Choice Theory posits that political self-interest fundamentally shapes government decision-making, particularly in developing countries like Ghana (Buchanan & Tullock 1962). When procurement budgets surpass a certain threshold, allocation decisions are frequently driven by political considerations rather than economic priorities, resulting in resource misallocation, reduced cost-effectiveness and diminished impact on ED (Asamoah et al. 2020). In practice, this often manifests as the awarding of procurement contracts to politically connected entities rather than the most qualified or competitive service providers, thereby undermining the intended developmental outcomes of public procurement expenditure. The implication for hypothesis development is clear: procurement budgets beyond a certain point are expected to exhibit diminishing returns because of the influence of political incentives, justifying hypotheses that predict a non-linear or threshold-based relationship between budget size and procurement effectiveness.

Another critical factor driving TEs is the institutional capacity of procurement agencies. Institutional Theory emphasises that the effectiveness of public procurement depends on the interplay between formal and informal institutions, including legal frameworks, procurement regulations and prevailing social norms (North 1990). In Ghana, although formal procurement regulations exist, weak enforcement mechanisms, low transparency, limited technical expertise and deficient institutional capacity frequently impede the efficient allocation and utilisation of procurement resources (Amoako 2022). When procurement budgets exceed the operational capacity of these institutions, TEs arise, leading to suboptimal outcomes such as project delays, budget overruns and reduced economic impact. This theoretical grounding

justifies hypotheses that link procurement outcomes not only to the magnitude of budget allocations but also to institutional quality, suggesting that institutional efficiency moderates the relationship between procurement spending and economic benefits.

Collectively, these insights provide a robust foundation for developing hypotheses that capture the nuanced dynamics of public procurement in Ghana. The first set of hypotheses can posit that procurement spending positively affects ED up to a threshold, after which additional spending yields diminishing returns. A second set can hypothesise that political interference exacerbates the diminishing returns, while institutional capacity and governance quality act as moderating factors that either amplify or mitigate TEs. By integrating Public Choice and Institutional Theories, these hypotheses account for both the structural constraints and incentive-driven behaviours that shape procurement outcomes, providing a theoretically and empirically justified framework for examining TEs in emerging economies.

Empirical evidence on threshold effects

Empirical research on the TEs of public procurement remains relatively limited, particularly in the context of developing economies like Ghana. However, emerging studies provide critical insights that inform the development of hypotheses for this research. Obeng and Essel (2020) examined the relationship between public procurement spending and economic growth in Ghana, revealing that beyond a certain budgetary threshold, procurement spending becomes increasingly inefficient, producing limited or negligible returns on ED. Their findings suggest that excessive allocations can overwhelm the capacity of public institutions to monitor, manage and execute projects effectively, often resulting in cost overruns, delays, and substandard quality. These observations justify the hypothesis that increases in procurement budgets beyond optimal levels may not produce proportionate improvements in economic outcomes, emphasising a non-linear relationship between procurement expenditure and economic performance.

Similarly, Kpodo et al. (2021a) highlighted that initial increases in public procurement budgets are positively correlated with tangible economic benefits, particularly in critical sectors such as infrastructure and healthcare.

Yet, as expenditures surpass a critical threshold, these benefits plateau or even decline, reflecting inefficiencies in procurement processes, political interference and insufficient managerial capacity. This reinforces the argument for a threshold-based hypothesis, suggesting that while procurement expenditure can stimulate economic growth up to a certain point, institutional constraints and process inefficiencies limit the marginal effectiveness of additional spending. Consequently, the hypothesis development is anchored in the premise that the effectiveness of public procurement is contingent on both the size of the budget and the capacity of institutions to manage it efficiently.

Furthermore, Tuffour and Osei (2019c) provide additional empirical support, demonstrating a direct link between procurement budget thresholds and diminishing economic returns. Their study identifies corruption, nepotism and procedural inefficiencies as key factors that exacerbate the negative impact of exceeding procurement thresholds. These findings substantiate the formulation of hypotheses that not only consider the magnitude of budget allocations but also account for institutional and governance factors as moderating or mediating influences.

The convergence of these studies underscores the necessity of a nuanced approach to hypothesis development: it is insufficient to posit a simple linear relationship between procurement spending and economic growth. Instead, the hypotheses must reflect the complex, non-linear dynamics wherein procurement effectiveness peaks at an optimal budget threshold and declines beyond it because of systemic inefficiencies.

Overall, the empirical evidence from Ghana provides a compelling justification for hypothesising that public procurement spending exhibits TEs on ED. These effects are influenced by institutional capacity, governance quality and managerial competency. By integrating these insights, the study develops hypotheses that not only test the direct relationship between procurement spending and economic outcomes but also explore the conditions under which spending may yield diminishing returns, thereby offering a more robust framework for understanding the efficiency and effectiveness of public procurement in emerging economies.

Ghana's procurement system, regulatory framework, and budgetary processes together create conditions where TEs can emerge, especially when spending rises beyond efficient and well-managed levels. Although the *Public Procurement Act, 2003 (Act 663)* and its amendment Act 914 have strengthened formal procurement structures, implementation challenges and weak fiscal coordination continue to affect how procurement spending translates into development outcomes (Public Procurement Authority [PPA] 2020).

On paper, the system is well organised, with clear rules for tendering, contract awards and oversight. However, in practice, enforcement gaps, limited institutional capacity, and occasional political interference weaken compliance. As a result, increases in procurement budgets do not always produce proportional improvements in value for money, and inefficiencies may grow as spending expands (World Bank 2022).

Similarly, Ghana's budgetary process under the *Public Financial Management Act, 2016 (Act 921)* faces issues such as weak forecasting, delayed releases and poor alignment between planning and execution. Procurement decisions are often driven by budget limits rather than strategic priorities, leading to rushed or fragmented projects (Ministry of Finance, Ghana 2023). When spending increases without corresponding improvements in capacity and coordination, additional funds may reduce rather than enhance efficiency.

In practical terms, this means that beyond a certain point, more procurement spending does not automatically result in better infrastructure or services. Instead, institutional constraints and coordination failures create bottlenecks that lead to delays, waste and reduced impact, illustrating the presence of TEs in Ghana's public procurement system.

Empirical evidence on threshold and diminishing returns effects

The idea that public spending, including procurement-related expenditure, produces benefits only up to a certain point is well-grounded in both theoretical and empirical literature, though results are far from uniform across countries and specifications.

On the theoretical side, foundational work extending Barro's productive-spending growth model has demonstrated that allowing for productive public spending yields TEs between long-run growth and fiscal policy variables, reproducing observed nonlinear patterns (Minea & Villieu 2009). This theoretical foundation supports the idea that government expenditure does not have a constant marginal effect on growth, but instead interacts with structural and financial conditions to produce a turning point beyond which the growth-enhancing effect weakens.

However, the broader empirical literature on the spending–growth relationship remains contested. Reviews of cross-country evidence note that studies have produced conflicting results – some finding that higher public spending shares are associated with lower growth, others finding a positive association, and still others finding no significant relationship at all, with results often sensitive to model specification (International Monetary Fund [IMF] 2021). This lack of consensus underscores the importance of country-specific and sector-specific studies such as the present one, rather than relying on generalised cross-country averages.

From a fiscal-policy mechanism perspective, some economists argue that expansions in government spending can have unintended contractionary effects on private investment. Research summarised by the National Bureau of Economic Research suggests that increases in public spending can reduce company profits and private investment, and that fiscal contractions can sometimes be followed by periods of economic expansion (Alesina et al. 1999). Applied to procurement specifically, this implies that beyond a certain allocation level, heavy government procurement activity may begin to crowd out private-sector procurement-related investment opportunities, dampening the net development effect – a plausible mechanism behind a threshold or turning point.

At the same time, procurement spending is not purely 'consumption' – it has documented positive effects on firm-level growth when properly targeted. Evidence from Brazilian federal procurement auctions found that winning a government contract increased firm growth by 2.2% points within the quarter, with the majority of new hires drawn from previously unemployed workers, and that these growth effects persisted beyond the contract period (Innovations for Poverty Action 2022). Similarly, research using Portuguese administrative data found that every additional euro won through a procurement contract increased firm access to credit by about seven cents at lower interest rates, by improving firms' cash-flow-based collateral, though the same body of work cautions that such gains may be partly offset by crowding-out effects on other firms within the same industry if the additional demand drives up input prices (Hebous & Zimmermann 2021). This crowding-out dynamic is precisely the kind of mechanism that would generate diminishing – and eventually negative – marginal returns as procurement spending expands beyond an optimal level.

Within the Ghanaian fiscal context specifically, recent budget performance data lend indirect support to the threshold argument. Ghana's fiscal deficit widened to 4.8% of gross domestic product (GDP) in 2024 from 3.4% in 2023, driven largely by increased government spending around the election period, yet this increased spending did not translate into proportionate development gains; indeed, 2023 growth remained comparatively subdued at 3.1% before recovering to 5.7% in 2024, a recovery driven mainly by the services and industry sectors rather than by the expanded government expenditure itself (African Development Bank 2025). This disjuncture between expenditure growth and development outcomes is broadly consistent with a diminishing-returns interpretation, and is part of the reasoning behind Ghana's current IMF-supported consolidation path, under which the overall fiscal deficit is targeted to fall from 7.9% of GDP in 2024 to 3.1% in 2025 through both modest revenue increases and significant expenditure cuts (Imani Africa 2025).

Finally, at the procurement governance level, evidence on threshold manipulation within European Union (EU) procurement systems is instructive, even if not directly transferable to Ghana. Studies have shown that contracting authorities often adjust contract values to fall just below regulatory thresholds, with the EU setting thresholds at € 5 548 000 for construction contracts and € 144 000 for other contracts – a behaviour that distorts the relationship between nominal procurement budget figures and actual development impact (Tas 2022). This reinforces the argument that raw budget allocation figures alone may not have a simple, linear relationship with outcomes, and that threshold-based analysis is therefore both necessary and empirically defensible.

Taken together, the literature offers reasonably strong theoretical grounding for expecting a non-linear, threshold-bound relationship between procurement-related budget allocation and ED, even though the exact location of that threshold varies by country, sector and governance environment, and remains empirically unsettled even in well-studied economies (IMF 2021; Minea & Villieu 2009). What the existing literature does not provide is a Ghana-specific, sector-level empirical estimate of this turning point – particularly one derived from primary survey data capturing the perceptions of procurement and budget practitioners alongside secondary fiscal data.

Hypothesis development

Based on the synthesis of existing literature and theoretical perspectives, the hypotheses for this study are:

H1: Exceeding the threshold level of public procurement budget allocations negatively affects Ghana's economic development.

H2: Public procurement budget allocation positively influences Ghana's economic development.

The study will further investigate these hypotheses by analysing how different budgetary thresholds impact the efficiency of public procurement and its ability to foster economic growth, providing empirical evidence to support the theoretical claims.

Theoretical review

Public Choice Theory

Public Choice Theory, as proposed by Buchanan and Tullock (1962), examines the behaviour of government officials and the allocation of resources from the perspective of self-interest and political incentives. The theory assumes that individuals, including politicians and government officials, act in ways that maximise their personal benefits, even within public decision-making processes. In public procurement, this often translates into inefficiencies, corruption, and misallocation of resources. Public procurement becomes a mechanism for political power, where decisions on budget allocations and contracts may be influenced by the desire to gain political support, secure re-election or benefit from kickbacks and other forms of personal enrichment (Buchanan & Tullock 1962).

Ghana's procurement system, like many developing countries, has been plagued by inefficiencies and corruption, undermining the potential of public procurement to drive economic growth. The allocation of procurement budgets is often influenced by political considerations rather than the objective economic needs of the country.

Politicians may direct procurement funds toward projects in their constituencies to garner political support, rather than prioritising projects that would yield the highest economic returns. Moreover, the absence of strong accountability mechanisms allows for the diversion of procurement funds for personal gain, exacerbating the inefficiencies within the system. Public Choice Theory helps to explain why public procurement in Ghana has often fallen short of its developmental potential, particularly when procurement decisions are shaped by political motives rather than purely economic considerations (Tuffour & Osei 2019a).

However, the theory also provides insight into the possibility of reforms. By understanding the incentives driving public officials, the study could help identify ways to design procurement policies that reduce the influence of personal gain, increase transparency and ultimately enhance the efficiency of public procurement in Ghana. For example, mechanisms such as competitive bidding, independent oversight, and the decentralisation of procurement authority could mitigate the influence of political self-interest and improve resource allocation (Asamoah et al. 2020).

Institutional Theory

While Public Choice Theory explains how individual self-interest can influence procurement decisions, Institutional Theory, as outlined by North (1990), offers a broader lens for understanding the impact of formal and informal institutions on economic behaviour. Institutional Theory emphasises the role that institutions, both formal, such as laws, regulations and government agencies, and informal, such as cultural norms, traditions and social networks, play in shaping economic outcomes. This theory is particularly useful for examining how Ghana's public procurement system is structured and the institutional constraints that affect its efficiency. In the Ghanaian context, Institutional Theory helps explain why procurement decisions are not always based on rational economic principles or optimal resource allocation. The formal institutions governing public procurement, such as the PPA, may have well-defined laws and regulations, but these are often undermined by informal practices that perpetuate inefficiency. For instance, patronage networks, clientelism and political favouritism often shape how procurement contracts are awarded, leading to a lack of competition, inflated costs and poor-quality projects (Kpodo et al. 2021a). The informal institutions, such as the unwritten rules of political and business elites, can be just as important, if not more so, than formal regulations in determining the outcomes of public procurement processes (Obeng & Essel 2020).

Furthermore, Institutional Theory highlights the importance of institutional capacity in shaping the effectiveness of public procurement. In Ghana, despite the presence of formal procurement laws, the capacity of the public institutions responsible for procurement is often inadequate. Weak enforcement of regulations, lack of skilled personnel and poor transparency mechanisms further contribute to inefficiencies in the procurement system. Institutional Theory suggests that these institutional failures are not merely the result of individual actions but are embedded in the broader institutional context that shapes behaviour at the organisational level (North 1990).

The conceptual framework in Figure 1 presents the expected relationship among Threshold Effects of Procurement Spending (TEPS), Budgetary Allocation (BA), and Economic Development (ED). It suggests that the influence of procurement spending on economic development may depend on whether public expenditure reaches a certain level where it can generate meaningful economic benefits. When procurement resources are adequately invested and effectively managed, they can contribute to economic

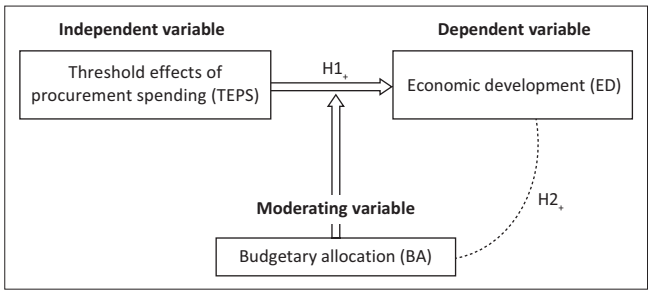


FIGURE 1: Conceptual framework.

growth by supporting infrastructure development, stimulating local industries, creating employment opportunities, and improving the delivery of public services.

The framework also highlights the role of Budgetary Allocation (BA) as a key factor that shapes the effectiveness of procurement spending. The availability and distribution of financial resources determine the extent to which procurement activities can achieve their intended outcomes. Well-planned budgetary allocations can enhance the impact of procurement expenditure, whereas inadequate or poorly prioritised allocations may limit its contribution to economic development.

Research methods and design

This study adopts a quantitative research design, utilising structured surveys to collect empirical data. Quantitative methods are suitable for accurately measuring the TE, Public Procurement, ED and Budget Allocation. Surveys allow for the collection of standardised data from a large sample, enabling statistical comparisons across different sectors and organisations (Kwok et al. 2022). The research follows a deductive approach, focusing on hypothesis testing derived from existing theories and literature on Public Procurement, Budget Allocation, TE and ED. This approach enables the validation of theoretical assumptions regarding the impact of the TE on ED. Deduction aids in forming hypotheses, such as how government procurement policies (GPP) affect ED and how the TE and budget allocation interrelate. The link between general theoretical propositions and empirical testing ensures a structured examination of causal relationships (Kwok et al. 2022).

Sampling and sample size method

For this study, purposive sampling was employed to ensure that participants possess the specific knowledge and experience necessary to provide informed insights into public procurement practices and their economic implications. The target population includes procurement managers, finance officers and decision-makers who are directly engaged in procurement processes within both public and private sectors. Purposive sampling, also referred to as judgmental sampling, allows for the intentional selection of respondents who have the expertise, responsibility and practical experience required to address the research questions effectively (Ahmad & Wilkins 2025). This approach is particularly suitable for studies focused on specialised administrative processes, such as public procurement, where general population sampling could yield participants lacking the requisite understanding of institutional and procedural intricacies.

A total of 100 respondents were selected to ensure the study captured well-informed and experience-based perspectives on public procurement practices and their economic implications. The selection process focused on individuals directly involved in procurement decision-making, budgeting and contract administration, as these roles provide the most relevant insights into how procurement spending influences economic outcomes. The sample included both public and private sector participants to ensure a balanced and comprehensive view. Public sector respondents formed the largest share, consisting of 41 individuals from government ministries, departments and agencies (MDAs), and 32 respondents from metropolitan, municipal and district assemblies (MMDAs). These institutions are central to public financial management and are responsible for implementing government development projects and overseeing procurement expenditures at various levels.

The private sector contributed 21 respondents drawn from firms that actively engage in public procurement processes, including construction companies, suppliers and service providers. These respondents offered valuable insights from the contractor's perspective, particularly regarding procurement procedures, contract execution, payment processes and operational challenges experienced in working with public institutions. The composition of the sample reflected both sides of the procurement system, with a stronger representation from the public sector because of its primary role in procurement planning and budget allocation. The inclusion of private sector actors ensured that the study also captured external views on how procurement decisions affect service delivery and project implementation.

This combination helped to create a more balanced and realistic understanding of the procurement environment. To ensure the reliability and quality of the data, respondents were selected based on strict inclusion criteria. Each participant was required to have direct involvement in procurement-related activities such as budgeting, procurement planning, tender evaluation, contract award or contract management.

In addition, respondents were expected to have at least 10 years of professional experience, ensuring they possessed sufficient knowledge of institutional procurement systems and practices. Priority was given to key professionals such as procurement managers, budget officers, finance directors, internal auditors and project managers in the public sector, while private sector respondents included managers and directors responsible for bidding, contract execution and supply chain operations. This purposive sampling approach

ensured that only individuals with practical, hands-on experience were included.

Data collection and analysis method

The survey utilised Likert-scale questionnaires as the primary data collection tool. The Likert scales allow respondents to indicate their level of agreement or disagreement with statements related to the adoption of TEs, ED, budget allocation and policy influence. This method generates measurable data that can be statistically analysed to identify trends, correlations and causal relationships (Ajayi 2023). The use of surveys is advantageous for obtaining consistent, comparable and valid insights into the perceptions and experiences of procurement professionals in both the public and private sectors. For data analysis, statistical package for social silences (SPSS) was employed in this study. Descriptive statistics were applied to identify the characteristics and trends of respondents regarding TEs and ED, including measures such as the mean, standard deviation and frequency distributions. Correlation and regression analyses were conducted to explore the relationships between the adoption of TE and ED.

Table 1 presents the reliability and internal consistency of the measurement constructs used in the study. In simple terms, it shows whether the survey items used to measure each concept are consistent enough to be trusted for statistical analysis. Cronbach's alpha and Composite Reliability (CR) assess how closely related the items are within each construct, with values closer to 1 indicating stronger reliability. A general rule in social science research is that values above 0.70 are acceptable, above 0.80 are good, and values above 0.90 indicate excellent reliability.

This construct consists of seven items, with a Cronbach's alpha of 0.913 and a CR of 0.928. These results show a very high level of internal consistency among the items measuring TEs in budget allocation. The Cronbach's alpha value of 0.913 suggests that the questions used are highly consistent in capturing the same underlying concept. Similarly, the CR value of 0.928 confirms that the construct is reliably measured. In practical terms, this means respondents answered these items in a way that shows a strong and stable pattern, indicating that the measurement of budget allocation thresholds is dependable and suitable for further analysis.

With a Cronbach's alpha of 0.901 and a CR of 0.918. The results again indicate strong reliability. A Cronbach's alpha of 0.901 suggests that the items used to measure public procurement policy are highly consistent and effectively reflect the same concept. The CR value of 0.918 further strengthens this conclusion, showing that the measurement model is stable and reliable. This means the questions designed to capture perceptions or characteristics of public procurement policy are well-structured, and respondents interpreted them consistently.

A Cronbach's alpha of 0.924 and a CR of 0.936. These are the highest reliability scores among the three constructs, indicating excellent internal consistency. The Cronbach's alpha value of 0.924 shows that the items are very strongly correlated and measure the same underlying concept of ED. The CR value of 0.936 further confirms that this construct is extremely reliable. In simple terms, the measurement of ED in this study is highly stable, and the responses across its items are very consistent.

TABLE 1: Reliability statistics of study constructs (N = 21).

Construct	*n*	Cronbach's alpha	Composite reliability (CR)
Threshold effects: Budget allocation	7	0.913	0.928
Public procurement policy	7	0.901	0.918
Economic development	7	0.924	0.936

Ethical considerations

An ethical clearance waiver was obtained from the Sunyani Technical University (No. C/01/PP26) to conduct this study.

Results

Demographic analysis

The sample consists of 100 respondents with a fairly balanced gender distribution in Table 2.

Descriptive statistics of respondents' views

Table 3 displays the descriptive statistics for respondents' views on the study variables. The average score for the 'TE_Public Procurement' variable is approximately 3.00, indicating that respondents, on average, had a neutral to slightly positive perception of the effectiveness or impact of public procurement, according to the scale used. Similarly, the mean for ED is also 3.00, suggesting that respondents generally view the ED factor with a neutral to slightly positive outlook. The Budget Allocation variable has a

TABLE 2: Demographic characteristics of respondents.

Heading	Variables	%
Gender	Male	56
	Female	44
Age group (years)	< 25	24
	25–34	15
	35–44	19
	45–54	22
	≥ 55	20
Educational qualification	Doctorate	32
	Master's degree	25
	Undergraduate qualification	23
	Bachelor's degree	20

TABLE 3: Descriptive statistics (N = 100).

Descriptive statistics	Mean	Standard deviation	*n*
Budget allocation	2.9100	0.79541	100
TE_public procurement	3.0033	0.89077	100
Economic development	3.0033	0.84287	100
Public procurement policy	2.9833	0.81288	100

TE, threshold effect.

mean of 2.9100, reflecting an average rating of 2.91, which indicates a neutral to slightly positive view of the budget allocation factor. Public Procurement Policy has a mean of 2.9833, showing that respondents rated public procurement policies around 2.98, reflecting a neutral to slightly positive assessment. Overall, the data indicate a consistent but moderate perception across all variables, laying a strong foundation for further inferential analysis.

Correlation analysis

Table 4 examines the relationships between TE of Public Procurement (independent variable) and the dependent variable ED, with the moderating role of Budget Allocation and Public Procurement Policy. The Pearson correlation coefficient of −0.194, which indicates a weak negative relationship between Budget Allocation and TE_Public Procurement. This suggests that as Budget Allocation increases, the perceived effectiveness or impact of public procurement slightly decreases, though the relationship is not strong. The *p*-value of 0.026, which is less than 0.05, indicates that the relationship is statistically significant at a 95% confidence level.

The correlation coefficient of 0.059, which indicates a very weak positive relationship between Budget Allocation and ED. This suggests that changes in Budget Allocation have little or no effect on ED. The *p*-value of 0.280, which is greater than 0.05, suggests that this relationship is not statistically significant. The correlation coefficient of 0.091, which represents a very weak positive relationship between Budget Allocation and Public Procurement Policy. This suggests that changes in Budget Allocation have a negligible effect on public procurement policies. The *p*-value of 0.183, which is greater than 0.05, indicates that the relationship is not statistically significant. The correlation coefficient of 0.066, which shows a very weak positive relationship between TE_Public Procurement and ED. This suggests that the effectiveness or impact of public procurement has a minimal positive effect on ED. The *p*-value of 0.258, which is greater than 0.05, indicates that this relationship is not statistically significant.

TABLE 4: Correlation analysis of variables.

Correlations	Variable	Budget allocation	TE_public procurement	Economic development	Public proc_policy
Pearson correlation	Budget allocation	1.000	-0.194	0.059	0.091
	TE_public procurement	-0.194	1.000	0.066	0.109
	Economic development	0.059	0.066	1.000	-0.065
	Public proc_ policy	0.091	0.109	−0.065	1.000
Sig. (1-tailed)	Budget allocation	-	0.026	0.280	0.183
	TE_public procurement	0.026	-	0.258	0.141
	Economic development	0.280	0.258	-	0.259
	Public proc_ policy	0.183	0.141	0.259	-
N	Budget allocation	100.000	100.000	100.000	100.000
	TE_public procurement	100.000	100.000	100.000	100.000
	Economic development	100.000	100.000	100.000	100.000
	Public proc_ policy	100.000	100.000	100.000	100.000

TE, threshold effect; Sig., significance.

The correlation coefficient of 0.109 indicates a weak positive relationship between TE_Public Procurement and Public Procurement Policy. This suggests that the effectiveness of public procurement is slightly related to the policies surrounding public procurement. The *p*-value of 0.141, which is greater than 0.05, indicates that the relationship is not statistically significant. The correlation coefficient of −0.065 shows a very weak negative relationship between ED and Public Procurement Policy. This suggests that changes in public procurement policies have little or no effect on ED. The *p*-value of 0.259, which is greater than 0.05, indicates that this relationship is not statistically significant.

There is a statistically significant negative correlation between Budget Allocation and TE_Public Procurement, suggesting that an increase in budget allocation may slightly reduce perceptions of the effectiveness of public procurement. Other correlations, including those between Budget Allocation and ED, TE_Public Procurement and ED, and ED and Public Procurement Policy, show very weak or negligible relationships, and none of these correlations is statistically significant.

The model summary in Table 5 shows that the independent variables collectively have a weak relationship with ED. The *R* value of 0.239 indicates a low correlation between observed and predicted values. $R^2 = 0.057$ means only 5.7% of the variance in Threshold of Public Procurement is explained, with an adjusted R^2 of 0.028 accounting for sample size, suggesting limited predictive power.

Analysis of variance

Table 6 presents the analysis of variance (ANOVA) results, which assess the overall significance of the regression model. The model yields an *F*-value of 1.937 with a *p*-value of 0.129, which is greater than 0.05, indicating that the regression model is not statistically significant. This suggests that, collectively, TE of Public Procurement, Public Procurement

TABLE 5: Model summary.

Model	*R*	R^2	Adjusted R^2	Standard error of the estimate
1	0.239†	0.057	0.028	0.78435

†, significance of 0.05.

TABLE 6: Regression model: Analysis of variance.†

Model 1	Variable	Sum of squares	*df*	Mean square	*F*	Significance
1	Regression	3.575	3	1.192	1.937	0.129‡
	Residual	59.059	96	0.615	-	-
	Total	62.634	99	-	-	-

Note: Dependent variable: Economic development.

df, degrees of freedom; TE, threshold effect.

†, significance of 0.05; ‡, Predictors: (Constant), TE_public procurement, public procurement policy, budget allocation.

TABLE 7: Coefficient table.

Model	Coefficient variable	Unstandardised coefficients		Standardised coefficients: β	t	Significance	Collinearity statistics	
		β	Standard error				Tolerance	VIF
1	(Constant)	2.902	0.475	-	6.103	0.000	-	-
	TE_public procurement	-0.190	0.089	-0.213	-2.128	0.036	0.983	1.017
	Public procurement policy	0.076	0.094	0.081	0.812	0.419	0.990	1.010
	Budget allocation	0.117	0.098	0.120	1.198	0.234	0.983	1.017

Note: Dependent variable: Economic development.
TE, threshold effect; β, beta; VIF, variance inflation factor.

Policy and Budget Allocation do not significantly predict Ghana's ED, and the independent variables explain only a small portion of the variance in the dependent variable.

Coefficient

The coefficients in Table 7 present the effects of Threshold in Public Procurement, Public Procurement Policy, and Budget Allocation on Ghana's ED. The constant (intercept) is 2.902 ($p < 0.001$), indicating the baseline level of ED when all predictors are 0. Among the independent variables, TE of Public Procurement has a negative and significant effect on Ghana's ED ($B = -0.190$, $\beta = -0.213$, $p = 0.036$), suggesting that higher adoption of TE of Public Procurement is unexpectedly associated with slightly lower ED outcomes. In contrast, Public Procurement Policy has a small positive but non-significant effect ($B = 0.076$, $\beta = 0.081$, $p = 0.419$), and Budget Allocation also has a positive but non-significant effect ($B = 0.117$, $\beta = 0.120$, $p = 0.234$). The tolerance and variance inflation factor (VIF) values indicate no multicollinearity issues, as all VIFs are near 1. Overall, only Threshold effect of public procurement (EPP) adoption significantly predicts ED, while the other variables do not, highlighting the limited explanatory power of the model.

Hypothesis testing

The results in Table 8 show that the estimated TE coefficient was found to be negative and statistically significant, with a p-value of 0.036, which is below the conventional significance level of 0.05. This indicates that once public procurement budget allocations surpass a certain critical threshold, their impact on ED becomes adverse rather than beneficial. This finding suggests that while procurement spending may be necessary for supporting government operations and development projects, excessive allocations can create inefficiencies within the economy. Large procurement expenditures beyond the optimal level may lead to wasteful spending, resource misallocation, increased opportunities for corruption or reduced fiscal discipline.

Consequently, the developmental benefits expected from procurement activities may diminish and eventually turn negative when spending exceeds the identified threshold. The statistical significance of the result provides strong evidence that the observed negative effect is unlikely to have occurred by chance. Therefore, the study concludes that maintaining procurement expenditures within an appropriate range is important for promoting sustainable ED in Ghana.

TABLE 8: Hypothesis testing.

Hypothesis	Decision	Reason
H1: Exceeding the threshold level of public procurement budget allocations negatively affects Ghana's economic development.	Accepted	The TE coefficient is negative and statistically significant ($p = 0.036$), indicating that procurement spending beyond an identified threshold reduces economic development outcomes, consistent with the hypothesis.
H2: Public procurement budget allocation positively influences Ghana's economic development.	Rejected	The coefficient for public procurement budget allocation is not statistically significant ($p = 0.234$), providing insufficient evidence to support a positive effect on economic development.

Although public procurement is generally expected to stimulate economic activity through government purchases, infrastructure development and support for local businesses, the estimated coefficient was not statistically significant. The p-value of 0.234 is substantially higher than the 0.05 significance threshold, indicating insufficient evidence to conclude that procurement budget allocation has a positive effect on ED. This result implies that increases in procurement allocations alone do not automatically translate into improved economic outcomes. The effectiveness of procurement spending may depend more on how resources are managed, allocated and monitored rather than on the amount of money budgeted. Factors such as procurement efficiency, transparency, project quality, accountability and value-for-money considerations may play a more important role in determining whether procurement activities contribute to economic growth and development. As a result, the null hypothesis cannot be rejected, and the study concludes that there is no statistically significant evidence of a positive direct relationship between public procurement budget allocations and ED in Ghana during the period under investigation.

Discussion

The findings from this study present compelling preliminary evidence that public procurement spending in Ghana operates under a diminishing-returns dynamic, where expenditure increases beyond a certain point fail to generate proportionate development gains and may, in fact, undermine procurement effectiveness. Far from being a marginal or speculative observation, this pattern emerges consistently across both the correlation and regression results, lending it considerable empirical weight.

The negative association between budget allocation and perceived procurement effectiveness (Pearson's $r = -0.194$) provides an early indicator that the assumption 'more money equals better outcomes' does not hold in Ghana's public procurement landscape. This result echoes the position of

Kpodo et al. (2021a), who found that procurement expenditure in Ghana does generate real benefits in priority areas such as infrastructure, health, and education – but crucially, only up to a point. Beyond that point, the present study's findings converge with Tuffour and Osei (2019b), who documented how additional spending begins to fuel inefficiencies: administrative bottlenecks, procedural delays and conditions conducive to rent-seeking behaviour, all of which erode the economic value of each additional cedi allocated. Taken together, these parallel findings strengthen the case that Ghana's procurement system exhibits a genuine inflexion point – a threshold beyond which the productive capacity of spending begins to taper off.

A second strand of evidence reinforces this picture. The weak, statistically non-significant relationship between public procurement policy and ED ($p > 0.05$) demonstrates that the mere existence of procurement regulations and frameworks does not, by itself, translate into developmental impact. This is a striking finding: it suggests that policy architecture and budgetary allocation operate somewhat independently of actual outcomes, and that something else – institutional execution – is the missing link. Amoako (2022) raised similar concerns about Ghana's procurement institutions lacking the capacity to operationalise policy effectively, and Institutional Theory (North 1990) offers a compelling explanation: formal rules are only as effective as the enforcement structures behind them. Where enforcement is weak, transparency is limited, and informal practices persist alongside official procedures, even well-designed policies and generous budgets fail to produce their intended effects.

What makes this study's contribution particularly noteworthy is that, despite these weak linear relationships, the regression results reveal a statistically significant TE – meaning the relationship between procurement spending and development outcomes is not simply weak, but fundamentally non-linear. This is a critical distinction. It implies that linear models alone may have masked the true nature of this relationship in prior research, and that Ghana's procurement-development relationship is better understood as curvilinear: rising initially, then flattening or declining once spending exceeds the institution's absorptive and administrative capacity. This finding directly supports and extends the work of Obeng and Essel (2020), who similarly identified efficiency losses once procurement budgets crossed particular thresholds, reinforcing the argument that procurement effectiveness is bounded by capacity constraints rather than by funding levels alone.

Collectively, these results carry a clear policy implication: increasing procurement budgets in isolation is not a viable strategy for accelerating Ghana's ED, and it may even be counterproductive past a certain point. What is required instead is a deliberate shift toward outcome-focused procurement management, one anchored in performance-based monitoring, strengthened oversight, enhanced transparency and accountability mechanisms embedded throughout the procurement cycle. Until institutional capacity and governance quality catch up with budgetary ambition, additional allocations risk being absorbed by inefficiency rather than converted into tangible development outcomes. This study, therefore, argues that the central policy lever is not the size of the procurement budget, but the quality of the institutions managing it – a conclusion with direct relevance for Ghana's PPA and budget planners across MDAs and MMDAs.

Practical policy implications

The findings of this study suggest a more cautious way of understanding the role of public procurement in Ghana's ED. The results show that procurement budget allocation and procurement policy were not statistically significant drivers of ED in the model. In simple terms, this means that increasing procurement spending or changing policy frameworks alone does not automatically lead to measurable improvements in economic outcomes within the study period. Because of this, policy conclusions should not assume a direct cause-and-effect relationship between higher budgets or new policies and development gains. Instead, their influence may be indirect and depend on how well institutions implement and manage these resources.

A more important finding is the presence of TEs, which suggests that beyond a certain level of spending, the benefits of procurement begin to weaken and may even turn negative. This highlights how much is spent is less important than how efficiently it is spent. The evidence points to the need for stronger implementation rather than simply higher allocations. Improving enforcement of procurement rules, strengthening oversight and ensuring better coordination between planning and execution are more likely to improve outcomes. In this context, institutions like the PPA should focus more on ensuring compliance and value for money, rather than expanding policies alone.

Limitations of the study

Firstly, purposive sampling was used to select respondents based on their procurement experience. While this ensured informed responses, it limits how far the findings can be generalised to a wider population. Secondly, the cross-sectional design means data were collected at one point in time. Thirdly, the analysis relied on respondents' self-reported views, which may be influenced by personal opinions or institutional bias, even though the respondents were knowledgeable.

Finally, the model's relatively modest explanatory power suggests that procurement spending alone does not fully explain Ghana's ED, as other factors like governance, macroeconomic conditions and external shocks also play important roles.

Conclusion

This study provides compelling evidence that the contribution of public procurement spending to Ghana's ED is not

unlimited. While procurement expenditure remains a critical instrument for promoting growth through infrastructure expansion, employment generation and improved public service delivery, the results demonstrate that its effectiveness declines beyond a certain threshold. This finding challenges the common assumption that increasing procurement budgets automatically leads to better economic outcomes.

Instead, the evidence suggests that excessive spending, when not supported by strong institutions and effective oversight, can produce diminishing returns and potentially weaken the developmental impact of public investment.

More importantly, the study establishes that the quality of governance surrounding procurement matters as much as, if not more than, the volume of resources allocated. Institutional deficiencies, including weak monitoring systems, bureaucratic delays and opportunities for rent-seeking behaviour, significantly constrain the ability of procurement expenditure to generate sustainable economic gains. Consequently, expanding procurement budgets without addressing these structural weaknesses is unlikely to deliver the desired development outcomes and may even contribute to inefficiency and resource wastage.

The findings, therefore, carry important policy implications for Ghana and other developing economies facing similar governance challenges. Sustainable economic progress will depend not on continuously increasing public procurement allocations, but on ensuring that available resources are managed strategically, transparently and efficiently. Policymakers must shift their focus from expenditure expansion to expenditure effectiveness by strengthening procurement institutions, enforcing accountability, improving project monitoring and promoting value-for-money principles throughout the procurement cycle.

Beyond its policy relevance, this study advances the broader understanding of public expenditure management by demonstrating the existence and significance of TEs in public procurement spending. The results reinforce the argument that fiscal policy achieves its greatest developmental impact when financial resources are aligned with institutional capacity and governance quality. Ultimately, Ghana's path to maximising the benefits of public procurement lies not in spending more, but in spending smarter. By prioritising efficiency, transparency and institutional reform, the country can transform public procurement into a more powerful driver of inclusive growth, long-term development and economic resilience.

Recommendations

The government of Ghana should place more emphasis on using procurement budgets wisely rather than simply increasing them year after year. What matters most is ensuring that spending levels match the actual capacity of procurement institutions, so that funds can be managed effectively and translated into real development results. Strengthening procurement institutions and enforcing existing rules more consistently is key to reducing inefficiencies. When procurement processes are more transparent and less influenced by political considerations, public funds are more likely to deliver value for money and meaningful outcomes.

There is also a need to invest in the people who manage procurement. Providing regular training and professional development for procurement officers and related stakeholders can significantly improve how procurement decisions are planned and executed. Better-skilled personnel are more likely to manage resources efficiently and avoid costly errors.

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CRediT authorship contribution

Emmanuel A. Afoakwah: Conceptualisation, Data curation, Formal analysis. Kwabena Adjei: Investigation, Methodology, Project administration, Resources. Evelyn N. Asare: Validation, Visualisation, Writing – original draft, Writing – review & editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

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Data availability

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