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## The Impact of Supplier Selection and Monitoring on the Effectiveness of Public Procurement in Ghana: Cost Reduction Point of View

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### Abstract

The aim of this study is to examine the role of supplier selection and monitoring on the effectiveness of public procurement in terms of cost reduction in Ghana. Procurement effectiveness as an element of public performance management can contribute to achieving Value for Money by reducing administrative overhead costs and directing resources to support more complex procurement processes. Procurement adds value by reducing costs, without the compromise of quality, product failures, assuring the operational efficiency to enable better quality without any additional cost with an aim to achieve the best objectives, output at a reduced cost in the supply chain. This study provides procurement practitioners with insights into selecting the proper suppliers and embracing supplier monitoring to achieve procurement efficiency in terms of cost reduction.

This study examines the effects of supplier selection and supplier monitoring on procurement cost reduction as a measure of public procurement efficiency in the Ghanaian context. Consequently, it provides empirical evidence of supplier management practices in the public procurement context. A structured questionnaire was used to collect cross-sectional survey data from 170 public procuring entities in Ghana. Structural equation modelling (SEM) was used to analyse the collected data.

**Keywords:** *Supplier selection, Supplier monitoring, Procurement effectiveness, Public procurement, Cost reduction.*

### 1.0 Introduction

Government procurement is the function that government performs through its public organizations by acquiring items necessary to improve the operations of public organizations. (Changalima *et al.*, 2022). So, the goods, works and services purchased facilitate the primary goals of governments and offer development to their responsible citizens. According to the Organization for Economic Co-operation and Development (OECD) (2019), government procurement accounts for about 29.1% of general government spending in most OECD countries. Also, most governments worldwide spend about US\$10.5 trillion on public procurement activities (The World Bank, 2018) and more than 70% of total government spending in Ghana (Changalima *et al.*, 2021b). In addition, the feature improves private companies, considered suppliers, service providers and contractors, through access to potential markets, as most of them participate in public procurement opportunities.

Also, most governments worldwide spend about US\$9.5 trillion on public procurement activities (The World Bank, 2018) and more than 70% of total government spending in Ghana (Changalima *et al.*, 2021b). In addition, the feature improves private companies, considered suppliers, service providers and contractors, through access to potential markets, as most of them participate in public procurement opportunities. Also, lack of competition, unethical behavior, bureaucracy and over-reliance on the lowest price criteria for selecting winning bids all contribute to inefficiencies in the Slovak public procurement process (Grega *et al.*, 2019).

Likewise, inefficiencies in the procurement process have been observed in Ghana. This led to conscious efforts through government procurement reforms that resulted in the establishment and modification of a legal framework and institutional arrangement for government procurement activities. The literature shows that public procurement has an impact on the operations of suppliers in the form of private companies (Dal Molin and Previtali, 2019). On the other hand, suppliers are also important to deliver the requested goods and services to buyers (Changalima *et al.*, 2022). In this

case, the interaction between subcontractors and public procurement is important (Dal Molin and Previtali, 2019).

Efforts should therefore be made for effective supplier management in purchasing organizations. Supplier selection is the first significant activity for supplier management and remains one of the most important decision-making problems (Nikou and Moschuris, 2016; Prior et al., 2022; Taherdoost and Brard, 2019). Choosing potential suppliers to do business with is considered one of the most important decisions public buyers make. Supplier monitoring is also seen as a necessary activity for purchasing organizations (Maestrini et al., 2018; Shaq et al., 2022) as monitoring can be used to mitigate the risk of late delivery (Dixit, 2022). Therefore, the current study examines the role of supplier selection and monitoring for the efficiency of public procurement in Ghana.

To achieve this goal, we address the following questions:

*RQ1. Does supplier selection affect the effectiveness of public procurement in Ghana?*

*RQ2. Does supplier monitoring affect the effectiveness of public procurement in Ghana?*

Although the first research question has been addressed in previous studies, the current study context differs from previous studies. For example, research focused on supplier selection and business performance (vander Westhuizen and Ntshingila, 2020) and restaurant performance (Cho et al., 2021), while our study focuses on public procurement organizations. In addition, results from Essien et al. (2019) show that supplier selection decisions by public sector organizations would not have a significant impact on their performance in achieving the goals set for such decisions, which require further empirical investigation. The second research question has also been taken up in manufacturing companies and other industries with conflicting results (Akamp and Mller, 2013; Maestrini et al., 2018; Shaq et al., 2022; Yang and Zhang, 2017). There is little evidence of the role of supplier monitoring in improving procurement efficiency in the public sector. Our research is based on data collected in the context of public procurement, so the results are likely to provide more insight into the impact of supplier selection and supplier monitoring on public procurement effectiveness in terms of cost reduction in Ghana. The remainder of this paper is divided into five sections. The following section is a literature review. The methodology is then presented in the following section, and the results and discussion are presented in the fourth section. The fifth section contains the conclusions and the last section discusses the tuition and limitations.

## **2.0 Literature research and development of hypotheses**

### ***Rational Choice Theory***

The rational choice theory relies on the idea that people usually choose the course of action that they believe will result in the best overall outcome when confronted with a difficult situation or choosing between possible courses of action (Elster, 1989). It is believed that the behavioural revolution in American political science, which took place in the 1950s and 1960s and objectively investigated human behaviour, was responsible for the development of rational choice (Ogu, 2013). The rational choice perspective relates to human behavior (Bouffard and Wolf, 2007) and assumes that an individual's behavior is related to psychological actions. It is often interpreted in psychology as directing agents to maximize their overall preferences (Satz and Ferejohn, 1994). For this reason, rational theory focuses on the preferences that individuals choose in the face of alternatives when making decisions. It should be noted that the environmental constraints imposed on agents, and not their personality, are responsible for their behavior (Satz and Ferejohn, 1994). It is relevant and very popular in modeling organizational purchasing decisions (Essien et al., 2019).

Individuals involved in organizational functions make decisions related to the day-to-day activities in their respective organizations. Supplier selection is one of the most important and risky decisions purchasing organizations make during the purchasing process. Accordingly, supplier selection decisions are shaped by rationality (Igarashi et al., 2017; Kaufmann et al., 2012). Given that rational action is results-oriented (Elster, 1989), our study suggests that the perceived benefits that the selected suppliers provide to the buyers with the required goods and services depend on the good decisions of the procurement professionals, to select the best suppliers and effective monitoring. When contracting

authorities decide to select and monitor potential suppliers, they are constrained by the legal and regulatory framework for procurement processes. Rational choice theory is expected to provide a theoretical understanding of why and how procurement practitioners select suppliers when purchasing goods, services and works. This allows sourcing functions to become more efficient in making decisions about which suppliers to select.

### ***Supplier Selection***

Supplier selection is an important activity in procurement and supply chain management. This is because successful supplier selection can have a major impact on company performance (Taherdoost and Brard, 2019). There is a body of literature linking cost reduction as a measure of performance (Changalima and Ismail, 2019; Chomchaiya and Esichaikul, 2016; Wachiuri, 2018). The premise of the study is that it may be necessary to select a supplier to reduce procurement costs. Efficiency has been linked to the outcome of cost reduction and can be used as a performance measure for procurement (Kakwezi and Nyeko, 2019; Kumar and Ganguly, 2021). Supplier selection criteria are most commonly used when purchasing organizations decide to engage potential suppliers (Krop and Iravo, 2016; Meena et al., 2022), and these suppliers play a significant role in improving procurement performance (Changalima et al., 2022). Therefore, it is necessary to examine the role of supplier selection in the context of public procurement. While there is no generally accepted criterion for supplier selection, it should be applied as appropriate to the situation (Taherdoost and Brard, 2019). In addition, the literature provides a methodological guideline for managers to select suitable suppliers. For most of the decision issues that need to be addressed in procurement and supply chain management (Aouadni et al., 2019; Taherdoost and Brard, 2019) and the role of supplier selection in procurement activities, we propose the following:

*H1 Supplier selection has a significant impact on cost reduction in government procurement.*

### ***Supplier monitoring***

Supplier monitoring allows companies to track the current performance of their suppliers while promoting continuous improvement (Chin et al., 2006; Subramaniam et al., 2020). Supplier monitoring is linked to the function of keeping track of available suppliers to ensure they potentially meet the needs of purchasing organizations (Maestrini et al., 2018). The available literature has linked the role of supplier monitoring with performance in different literature streams. Some have found that supplier monitoring has no impact on performance (Subramaniam et al., 2020; Yang and Zhang, 2017), while monitoring has been found to positively impact performance in other ways (Maestrini et al., 2018). Therefore, supplier monitoring is an important function in organizations and linked to performance. There are studies that have used cost reduction to measure procurement performance (Chomchaiya and Esichaikul, 2016; Wachiuri, 2018). Similarly, procurement operational efficiency is a company's ability to ensure the most cost-effective way of delivering goods and services (Kakwezi and Nyeko, 2019). Our current study focuses on the efficiency of public procurement through cost reduction. Then we suggest the following:

*H2. Supplier monitoring has a significant impact on cost reduction in government procurement.*

## **3.0 Methodology**

### ***Study area, research approach and design***

This study was conducted in Ghana in five regions: Ashanti, Greater Accra, Western, Northern and Eastern Region. Study regions were selected based on procurement volume and number of poor and good procurement performers as reported in audit reports (Public Procurement Authority 2020, 2021). The regions involved have a total of 224 public procurement bodies subject to the Public Procurement Act (PPA) and its regulations (Mwagike and Changalima, 2022). In Ghana, the PPA provides a guiding framework for procurement activities in public bodies that receive state funds. It defines the procedures for selecting and monitoring suppliers in the context of public procurement. This study took a quantitative research approach as the focus of the study was to examine the cause-effect relationships. A cross-sectional research design was used, with data collected only once. This design

was appropriate as the aim of the study is not to track changes over time. Instead, the design allows the researcher to capture a snapshot of the variables under study.

*Sampling and data collection procedures*

A questionnaire collection tool was used to collect data from heads of procurement departments or their representatives from interviewed public procurement agencies in Ghana. The comprehensive data collection was carried out between October 2021 and February 2022 for 183 companies in five regions examined. Therefore, self-report questionnaires were distributed to 183 public procurement bodies and only 179 were returned and included in the analysis. This corresponds to a response rate of 97.81%.

*Measurements, reliability and validity*

Variables in this study include supplier selection, supplier monitoring, and procurement cost reduction. The design of the questionnaire was based on the measurement items from previous studies, whereby the variable selection of suppliers was measured by items adapted from Akamp and Miller (2013) and Nyaberi (2019). Supplier monitoring was measured using measurement points reported by Maestrini et al. (2018). In this study, the efficiency of public procurement was measured in terms of cost reduction through customized measurement items as proposed by Patrucco et al. (2021) and Wachiuri (2018).

The results in Table 1 show that all values of Cronbach alpha ( $\alpha$ ) are greater than 0.7, which is an acceptable value for internal consistency confidence. Likewise, composite reliability values are greater than 0.7, which is also acceptable as recommended values should be greater than 0.7 (Tavakol and Dennick, 2011). Convergent validity was ensured by assessing the value of the extracted mean variance (AVE). AVE values in the range of 0.5 and above are considered acceptable. Discriminant validity was achieved because the square root of AVE was greater than the value of the intercorrelation between the variables and other variables (Fornell and Larcker, 1981).

**4.0 Data Analysis**

SEM (Standard Error of the Mean) was used to analyze the collected data. It is considered to be the best multivariate statistical model for analyzing latent variables (Hooper et al., 2008). It is considered a good multivariate statistical model for studies with multiple constructs, each of which is defined or measured by a set of measurement items.

*Common method variance*

We used the Harman single-factor test to determine if there was a common method bias. Uncoated factor analysis was conducted to determine if the majority of the variance could be explained by a single factor. The results indicated that approximately 37.68% of the variance can be explained by a single factor. Because the value was less than 50%, common method variance was not a concern (Podsakoff et al., 2003).

Variables	$\alpha$	CR	AVE	MSV	Max R <sup>2</sup>	ASV	Supplier selection	Supplier monitoring	Cost reduction
Supplier selection	0.871	0.872	0.631	0.154	0.875	0.139	0.794		
Supplier	0.941	0.942	0.845	0.246	0.949	0.200	0.392	0.919	
Cost reduction	0.908	0.909	0.770	0.246	0.927	0.185	0.353	0.496	0.877

Table 1. Reliability and validity

## 5.0 Results and discussion

### *Confirmatory factor analysis*

The discriminability of variables was determined by confirmatory factor analysis (CFA) and measurement model properties (Tahiry and Ekmekcioglu, 2022). Results show that the model fit indices for CFA are goodness-of-fit index = 0.955, adjusted goodness-of-fit index = 0.923, normed fit index = 0.967, relative fit index = 0.953, incremental fit index = 0.991, Tucker-Lewis index = 0.987 and comparative fit index = 0.991. The value of  $\chi^2/df = 1.369$  and root mean square error of approximation = 0.046, which are within the acceptable thresholds (Hooper *et al.*, 2008).

### *Structural model and hypothesis testing*

The model fit indices for the structural model are presented in Table 2 and are within the recommended range (Hooper *et al.*, 2008). So, the results validate the proposed structural model. Then we performed a path analysis to see how supplier selection and monitoring affect cost reduction.

#### *Supplier selection and cost reduction in government procurement*

To answer Question 1, the study developed H1, and the results in Table 2 support H1 ( $p=0.009$  and  $b=0.272$ ). These results imply that an improvement in supplier selection unit results in a 27.2% cost reduction. Hence, supplier selection is a positive and significant predictor of cost reductions and therefore a necessary tool to ensure efficiency of public procurement. The plausible reason for the association stems from the fact that purchasing organizations are more likely to incur costs when selecting poor suppliers. For example, costs associated with supplier re-evaluation may outweigh the cost if supplier selection is not conducted effectively. In addition, supplier selection enables purchasing organizations to be aware of current prices through market analysis. This allows purchasing organizations to reduce procurement costs by purchasing goods at reasonable market prices. These results are consistent with those of Krop and Iravo (2016). Their studies revealed that supplier selection is related to procurement performance. Hosseini *et al.* (2022) emphasized the role of supplier selection in improving supplier availability and reducing uncertainties associated with increased costs.

Regressed variables		Estimate	S.E.	C.R.	<i>p</i>
Cost reduction	/ Supplier selection	0.272	0.104	2.615	0.009
Cost reduction	/ Supplier monitoring	0.373	0.062	5.988	***

Notes: Model fit indices: GFI = 0.933, NFI = 0.948; RFI = 0.930; IFI = 0.973; TLI = 0.963 and CFI 0.973;  $\chi^2/df = 2.064$ ; RMSEA = 0.077

Table 2. Regression weights for the study variables

#### *Supplier monitoring and cost reduction in government procurement*

As assumed for RQ2 (H2), the results show that supplier monitoring has a significant impact on cost reduction ( $p < 0.001$  and  $b = 0.373$ ). The results suggest that Supplier monitoring is a positive and important indicator for reducing procurement costs and thus determines the efficiency of public procurement. In this aspect, the study finds that supplier monitoring affects the efficiency of public procurement in terms of cost reduction. The plausible explanation for this is the fact that supplier monitoring enables organizations to identify and control costly suppliers. Supplier costs relate to the expenses that purchasing organizations incur when purchasing products from available suppliers. Thus, through supplier monitoring, purchasing organizations can improve procurement efficiency by controlling procurement costs. These results are reported by Maestrini *et al.* (2018) who found a significant link between supplier monitoring and performance. Our study suggests that surveillance reduces procurement costs. This is because monitoring identifies anomalies in supplier engagements.

Although the need to correct these anomalies can result in higher costs, purchasing organizations are more likely to improve cost reduction over the long term if they are corrected sooner

## 6.0 Conclusion

This study analyzed the role of supplier selection and supplier monitoring in the efficiency of government procurement through cost reduction. With a focus on the research questions and hypothetical relationships, the study results give the concluding remark that supplier selection and supplier monitoring play an essential role in cost reduction as a measure of the efficiency of public procurement in Ghana. The literature shows that an efficient procurement process can improve the quality of services provided to citizens (Patrucco et al., 2021). Therefore, this current study focuses on cost reduction as an indicator of public procurement efficiency. Findings from this study suggest that procurement practitioners are more likely to keep public procurement costs down and achieve procurement efficiency if they do a good job of selecting and monitoring the engaged suppliers.

## 7.0 Contributions and limitations of the study

### *Theoretical contributions*

Our results complement the currently available knowledge about the efficiency of public procurement through cost reduction. Despite the fact that the role of suppliers in public procurement has been emphasized in the literature (Changalima et al., 2021a; Krop and Iravo, 2016), supplier selection and supplier monitoring has helped reduce procurement costs in Ghana's public sector has remained relatively unexplored. Therefore, our study contributes to the development of a new conceptualization perspective with the conclusion that supplier selection and monitoring contribute positively to the reduction of procurement costs in the public sector. Efficiency of public procurement through cost reduction. Since supplier selection is one of the important decisions in purchasing and supply chain management (Essien et al., 2019; Olanrewaju et al., 2020; Taherdoost and Brard, 2019), the current study supports the rational choice theory with regard to the important ones Decision – to make problems in procurement and supply chain management context. Finally, Akamp and Miller (2013) and Yang and Zhang (2017) examined supplier selection and supplier monitoring as supplier management practices. By focusing on these practices, this study contributes to the discussion about supplier management and public procurement in general.

## 8.0 Practical contributions

This study has practical implications for public sector procurement practitioners. It provides insights into supplier selection decisions that can be made more effective by considering the circumstances under which the decisions are made. Procurement practitioners can use our results because the function of government procurement is high depending on the decision-making process. Therefore, before hiring suppliers, it is important to consider the selection criteria and any other factors that may influence the decision. In this way, organizations can ensure that the criteria and other factors influencing supplier selection decisions are thoroughly thought out, leading to the selection of suppliers who can do business with the purchasing entities and reducing the likelihood of anomalies during monitoring.

The literature unequivocally identifies dominant performance factors in the supplier selection process, including quality, productivity, technological capabilities and human resource management, among others (Haeri and Rezaei, 2019; Parthiban *et al.*, 2012). As a result, the study emphasises the importance of using proper selection criteria when looking for reliable suppliers with whom to do business. This can be accomplished with considerable effort in determining the quality of suppliers in terms of the required requirements. Managerial efforts, such as encouraging training for procurement practitioners involved in supplier selection and evaluation, may play a role in improving procurement efficiency by lowering costs. This can be enhanced further through supplier monitoring, which includes tracking major suppliers' delivery schedules, potential suppliers' timeliness and their costs in relation to what they offer to public procuring entities.

### 9.0 Limitations and suggestions for future studies

The scope of this study is limited by the circumstances in which it was carried out. This study concentrated primarily on public procuring entities in Ghana, governed and regulated by the country's legal procurement framework. Thus, the results should be generalized with caution because each country has a unique procurement structure and regulatory framework that governs public procurement endeavors.

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