

An Empirical Evaluation of Factors That Affect Efficiency in Public Procurement

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Abstract

Numerous projects study the factors that have an impact on the efficiency of public procurement systems. The main objective of this research is to use the South African context to identify some of the factors that are critical for better performance and efficiency of public procurement. The research then used Structural Equation Modelling to test the relationships between the identified factors and efficiency, as well as the strength of those relationships. Structured questionnaires were sent to selected respondents in public organisations in South Africa and the responses obtained were utilised to test the research hypotheses developed. The research found that excessive bureaucracy, compliance, and supplier relationship management have a strong influence on efficiency in public procurement. This study contributes to the understanding of various factors that influence public procurement and the impact of that influence. Understanding such factors will assist entities with controlling such factors and improving the efficiency public procurement processes.

Keywords: Quality Management, Structural Equation Modelling, Public Procurement, Supplier Relations Management

Introduction.

Public procurement is a process through which public authorities acquire all services, goods, and works. Public procurement is regarded as one of the critical undertakings in any country's economy. It is for this reason that Grega et al. (2019) believe that public procurement warrants the sustained attention it receives from academia and the public at large. Significantly improving the effectiveness of public procurement can result in savings, or even increase the quality and quantity of procurement. Eyaa and Oluka (2011) credit the intense scrutiny, that public procurement is under, to political and public expectations for service improvements, program reviews, and technological advances. With regards to political expectations and due to South Africa's political history, public procurement is used as a policy tool address some of the socio-economic imbalances of the country. Cane (2004) noted that procurement is critical to the state's service delivery mechanisms and is used to promote objectives that may be secondary to the fundamental objectives of procurement. The example of secondary aims that public procurement is used to promote are environmental, social, and industrial goals.

Kumar et al. (2015) posited that public procurement functions under significant political pressure and has to manoeuvre in a space of friction between compliance and performance. This makes the task of fulfilling public expectations of efficiency and transparency more difficult. If one focuses more on compliance in transactions, it can lead to a distraction from paying the necessary attention to outcomes and containing fraud and corruption. Measures to reduce transaction cost must be traded off with the requirements for accountability and transparency. Kloot and Martin (2000) emphasise the demand for consistency in public administration as well as the obligation to create a balance between accountability and service delivery and

acquiring goods in a cost-effective and high-quality manner. Numerous reforms to public procurement policies in South Africa have been instituted over the years as a result of inconsistencies in the application, fragmented processes, and lack of supportive structures accountability. Despite the reforms in procurement policies and the implementation of Supply Chain Management, as a strategic tool, McCue, Prier, and Swanson (2015), observed that various dilemmas still exist within public procurement space. The paper cited failure to comply with SCM procurement-related policies and legislation as well as tender irregularities as examples of such predicaments. This study looks at the factors that contribute to the existence of these dilemmas, thereby influencing the efficiency of South Africa's public procurement processes. This is achieved by evaluating the nature of the relationship between the different factors, identified from literature, and efficiency.

Literature Review

The literature on public procurement is vast and traverse various domains. This section briefly reviews the literature on the topics that this paper aims to highlight.

Management of public procurement in South Africa

A report by OGC (2005:11) posit that, SCM is utilised as the main apparatus for the administration of public procurement in South Africa. It is also an essential cog of judicious financial administration in the country's public sector. Hanks, Davies, and Perera (2008), posit that SCM functions under the auspices of a regulatory structure that is established by the state and expanded by local authorities and provinces to specific regulations, legislation, and policies. The objective of Supply Chain Management is to improve value throughout the various stages of the procurement process – starting from the demand side of the chain through to the acquisition side, the management of the logistics process, and lastly, post utilisation and disposal. In executing these processes, SCM attempts to confront the inadequacies currently observed the procurement practices, asset and inventory control, contract management, and obsolescence planning.

The adoption and implementation of SCM policies therefore ensures consistency in bidding and contract documents and bidding and awarding procedures (National Treasury 2003). To some extent, there is decentralisation of public procurement to national departments, municipalities, and provinces. This decentralised structure resulted in the National Treasury regulation stipulating that state organs must have three kinds of committees: bid specification, bid adjudication, and bid award committees. This process ensures the separation of tasks, improved efficiency and promotes risk management. As much as SCM is used to try and improve efficiency in public procurement, Saussier and Tirole (2015) posit that public procurement inefficiencies are regularly highlighted and that significant gains can be attained by using more efficient administrative systems.

2.2 Factors affecting public procurement.

It is critical to observe that SCM is a pivotal feature of procurement within South Africa's public sector. It is mainly utilised as an apparatus for strategic administration of public procurement operations. Despite the adoption of SCM, major predicaments still engulf the country's public procurement processes. Various studies examine factors that are the sources of inefficiencies within public procurement and this study follows a similar route and provides a discussion of the predicaments observed in public procurement.

Managing the quality of supplies

Afonso et al. (2010) posit that one of the core problems in public procurement is the utilisation of the lowest price adjudication criterion for works and services, in particular. The lowest price approach usually results in unacceptably inferior quality of deliveries. In South Africa, the 2011 Preferential Procurement Regulations, published in terms of the PPPFA, provide the criteria for evaluating tenders where the quality of the product or service may have a decisive influence on the outcome of the contract. However, Money (2012) notes that quality is then introduced in the procurement documentation as pre-qualification/eligibility criteria which serves as a method of gatekeeping to guarantee that only bidders who

have the capacity to deliver the requisite quality proceed to the next stage of bidding. The effect of this is that smaller contractors may be excluded from competing for contracts, thus, compromising the fairness of the procurement process. Various studies analyse procurement data to illustrate the savings achieved, but generally disregard the quality of deliveries. Grega et al. (2019) warn against just checking transactions for probity, stating that it is also very critical to assess the quality of deliveries. In essence, one should exercise performance control over the procurement process.

Hemsworth, Sanchez-Rodriguez, and Bidgood (2004) posit that little is known about the effect of Quality Management Practices in procurement and on purchasing performance. What is usually observed in public procurement spaces is that price, cost, and quality trade-offs are prevalent and often culminate in preferences triumphing over objectivity in procurement decisions. This also results in accountability being compromised because procurement personnel end up applying discretion when faced with these situations. EL Wardani et al. (2006) posit that, in public procurement, there are usually three methods used in selecting suppliers, namely, lowest price, highest quality or performance or a combination of the two. This indicates that, at times, there are trade-offs made between quality and price. Quinot, (2014) wrote about the ambiguities in the way quality is utilised in the adjudication of public tenders in South Africa. These ambiguities have even led to litigations as can be observed in the judgement in the Rainbow Civils CC v Minister of Transport and Public Works, Western Cape, and Others. The implications of the judgement offer more insight into the difficulties in understanding the evaluation of quality in South Africa's public procurement systems. To circumvent the identified ambiguities, the procurement system of South Africa developed guidelines through which quality can be managed. These guidelines are very useful but do not eliminate the challenges that are inherent in the system.

Compliance to Procurement Regulations

Failure to comply with procurement regulations has been cited as one of the core factors that hinder efficiency in public procurement. Many government policies require public procurement to be carried -out in a manner that is not only compliant to established laws and regulations, but also strategic in approach to ensure higher levels of efficiency and effectiveness. Sebola, Zitha, and Mamabolo (2016) deliberated on compliance challenges experienced by procurement officials when executing procurement tasks and responsibilities while Fourie and Poggenpoel (2017) posit that compliance issues remain a constant challenge in South Africa's public procurement because there is little or no consequences when regulations were contravened which result in the recurrence of non-compliance findings. The root causes of these problems are never addressed and the risk of non-compliance becoming a norm in the public sector is a possibility. Policies are necessary in any institution because policies provide guidelines and principles that must be followed when performing certain duties. The role of policies, though prone to being restrictive, is very pivotal and should not be diminished. Compliance to regulation must be encouraged as those leads to better implementation and facilitates discussions around policy amendments and/or improvements. The challenge of balancing the regulations with allowing flexibility and innovation remains. Mrope, Namusonge, and Iravo (2017) evaluated the effect of compliance with procurement rules and regulations on the effectiveness and efficiency of public procurement and found that there was a significant correlation between the two which clearly indicates that compliance to regulations effects the efficiency of public procurement. This study follows a similar route using the case of South Africa's public entities.

Ethics

The South African Constitution, Chapter 10, stipulates that high standard of professional ethics must be promoted and maintained. However, Fourie (2015) observed that the ethical standards and integrity in the public sector of South Africa were not congruent with the standards required by the constitution. Fourie and Poggenpoel (2017) also illuminate the point of maintaining a higher level of professional ethics featured as one of the most recurring themes in causes of public sector inefficiencies. A finding of particular concern was the senior officials' reluctance to disclose financial interests as it does not only suggest public officials' disregard for ethics; it chronicles an environment that may be susceptible to misuse, fraud, and corruption.

Ferreira (2008) posit that ethics go further than just preventing, misconduct, and corruption, they also provide a firm foundation to execute public duty in a professional and ethical manner. Hondeghe (1998) posit that ethics and ethical behaviour are essential for an effective and stable political-administrative authority as well as social and economic structures. Corruption can disturb economic competition, endanger free trade and stability on which the free-market economy is based. The important role of ethics was also recognised by the policymakers in South Africa as they made ethics and fair dealing one of the five pillars of public procurement.

Excessive Bureaucracy

Meyer-Bonde (2018) posit that discussions regarding bureaucracy, in the context of businesses, often takes the form and meaning of inefficiency, slowness, and almost always of a burden. Public procurement officials must abide by a litany of regulations, laws, policies, rules, and frameworks when executing the duty to acquire services and goods that adhere to agency needs, advance public policy goals, and preserve the public's trust. Changes in legislation are a real issue in South Africa's public procurement. Self-evidently, such changes impose additional complexities which result in increased transactions costs on bidders and on contractors / procurers. Pavel and Sičáková-Beblavá (2013) connected such changes in legislation to what was termed: "administrative-legislative regional characteristic". This is described as the habit of trying to resolve implementation problems, not only by improving processes, but also by enshrining the changes in ever more detailed and complex legislation. Some of the changes in public procurement legislation in South Africa has been brought about by litigation, clearly indicating that additional laws do not necessarily eliminate the inefficiencies within the system. In some instances, the additional laws may even exacerbate the inefficiencies.

More time is spent in understanding, interpreting, and correctly implementing the regulations and monitoring compliance. Strand, Ramada, and Canton (2011) posit that excessive bureaucracy in public procurement often result in increased administrative costs and may discourage healthy competition amongst suppliers. Both outcomes impact negatively on the procurement process. For instance, higher administrative costs limit the amount of savings that can be achieved by a more efficient procurement process. To participate in public procurement processes, potential bidders need to cope with increased bureaucracy. Most companies may be required to provide multiple forms of materials to prove competence, qualification, and compliance with requirements. These generate additional costs and create barriers to entry for smaller entities, which discourages competition and leads to higher contract costs.

Supplier Relationship Management

Emanating from the Public Service Commission of South Africa's report (2008:45) that the necessities of public procurement policy are a good ethics and transparency, and even more emphasis placed on treating all suppliers evenly, the importance of strong supplier relations was made evident. Unfortunately, due to the questionable conduct of some public officials, developing relationships with certain suppliers, which is encouraged in private organisations, is usually forbidden in the public sector. A report by the Independent Commission Against Corruption (ICAC) (2011:27) confirmed that it is the opportunity for unprincipled behaviour that generally inhibits the relationship between the state and the supplier. Wang and Bunn (2004) zoom in on the supplier-buyer relationships, that differ through procedures and rules that are enforced upon the public sector, and state that business-to-business buying has dramatically shifted from a transactional to "relational" while government-business relationships are yet to reform the pure transaction-based purchasing and attempt to explore the benefits of partnering with commercial entities. Contracts given to suppliers have a fixed completion date, which means that their relationships end on that specified date and a fresh tendering process will be triggered where potential suppliers are prompted to compete amongst themselves again (Christopher and Juttner 2000). There is no attempt to engage into mutually beneficial long-term relationship with a selected number of suppliers. This increases procurement costs such as multiple contracts administration, monitoring many suppliers' performance, continuous education of suppliers on an institutions' processes and requirements. Upon realising that there is a need for improved

supplier relationship management in South Africa, Naude et al. (2013), developed and recommended a supplier relationship management framework but to date, that there is no evidence of that framework being utilised and as a result, it's efficiency cannot be determined.

Hypotheses Development and Conceptual Model

Presented on Figure 1 is a conceptual framework based on structural equation modelling (SEM). The framework depicts latent variables that consist of different constructs. Quality management consists of four constructs, namely, quality specification, quality evaluation, quality monitoring and role of quality in supplier selection. Each construct has related measurement items.

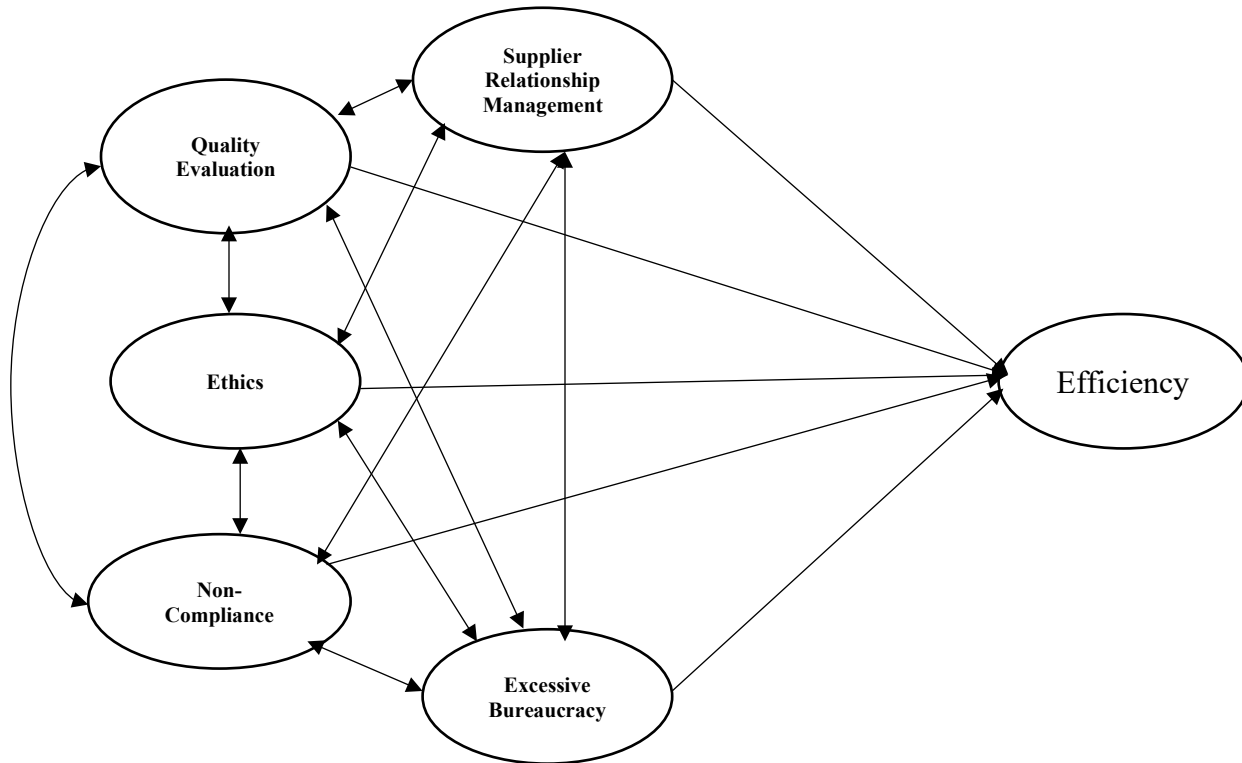


Figure 1. Conceptual framework of the factors that influence efficiency

Excessive bureaucracy also consists of four constructs. These constructs are well-defined systems and processes, hierarchy of authority, regulations and rules, and interpersonal behaviours. Ethics was also operationalised as a four-dimensional construct, consisting of conflict of interest, professionalism, transparency, legality. Non-compliance consisted of four constructs, namely, organisational culture, corrupt behaviour, familiarity with rules and regulations, and competency. Lastly, supplier relationship management was operationalised as a four-dimension construct. These constructs were trust, satisfaction, commitment, and communication. Table 1 presents the variables, constructs, and the associated measurement items.

Table 1. Summary of constructs and variables

Variables	Constructs	Description	No. of Items	Code
Quality Management	Quality Specification	Dimensions of quality of product/service clearly specified	5	QM1
	Quality Evaluation	Product/service evaluated against agreed upon criteria	4	QM2
	Quality Monitoring	Monitoring the product/service over time to ensure performance	4	QM3
	Role of quality in the procurement process	Clearly define how quality/functionality is used in adjudicating procurement bids	4	QM4
Excessive Bureaucracy	Systems and processes	Well-defined systems and process flows	4	EB1
	Hierarchy of authority	Decision-making chains not too long	4	EB2
	Regulation and rules	Integrated and consistent set of rules/guidelines	4	EB3
	Interpersonal behaviours	User-oriented behaviour from procurement personnel	4	EB4
Ethics	Conflict of interest	Declaring any perceived conflicting interests	3	E1
	Professionalism	Procurement personnel conducting themselves professionally	5	E2
	Transparency	Making information on procurement readily available to all interested parties	2	E3
	Legality	Understanding and conforming to all legal requirements		E4
Noncompliance	Organisational Culture	Creating a culture within the organisation that thrives on following the rules and regulation	2	NC1
	Corrupt Behaviour	Reporting and punishing deviant behaviour.	4	NC2
	Familiarity with rules and regulations	Knowledgeable procurement teams		NC3
Supplier Relationship Management	Competence	Well-trained and competent procurement personnel		NC4
	Trust	Trust between the procuring entity and suppliers		SRM1
	Satisfaction	Both the procuring entity and supplier are satisfied with each other's conduct		SRM2
	Commitment	All parties are committed to the well-being of the relationship		SRM3
	Communication	Open communication channels between the parties		SRM4

Efficiency	Transaction Costs	Maintaining low transaction costs	EF1
	Procurement Lead time	The taken to complete the procurement process.	EF2

All the dimensions were developed from literature and literature support was used in developing the hypotheses. In this study, quality management, supplier relationship management, and ethics, noncompliance and excessive bureaucracy were considered as latent-independent (exogenous) variables, while efficiency is considered as latent-dependent (endogenous) variable. From the conceptual model on Figure 1, the following of hypotheses were developed.

Cebekhulu et al. (2018) posit that high quality process inputs produce high quality results/outputs, which makes the management of the quality of supplies/service a vital cog for efficiency in public organisations. The regulation of public procurement emphasises that attention must be given to the role of functionality/quality in the adjudication of public tenders and the final award decision. Wang, Zhao, Yin and Zhang (2015) state that numerous countries around the world consider the quality of government procurement of services as a very critical task. Subsequently, countries have introduced related regulations and policies on government procurement of services and require departments to operate in accordance with standardized procedures and also established stringent monitoring systems to guarantee the quality and effectiveness of government procurement of services. Based on the assertions above, this study proposes this hypothesis:

H1: Quality management has a significant impact on efficiency.

Ndolo and Njagi (2014) wrote on the role of ethics on the efficiency of the procurement process. They concluded that procurement ethics are critical for efficiency in public procurement for the following reasons: procurement personnel represent the organisation in handling suppliers, as such, sound ethical conduct is required when dealing with suppliers as it helps in establishing long-term relationships and maintenance of trust between the supplier procuring entity. The same study concluded that procurement ethics result in improved quality of purchases and a shorter procurement process. De George (1999) emphasised that ethics improve the procuring entities efficiency and reputation in the market. This, in turn, develops trust and promotes positive alliances among business partners. This resulted in the formulation of the following hypothesis:

H2: Ethics have a positive impact on procurement process efficiency.

Sebola, et al. (2016) posited that the impact of non-compliance to procurement regulations has multiplier effect on efficiency and it manifests itself in various shapes and forms. Pillay (2021) noted that non-compliance with procurement processes erodes accountability, undermines the rule of law, wastes taxpayers' money, and erodes the state's credibility. Deloitte Tohmatsu (2003) non-compliance to procurement processes contains an element of inefficiency as that it has direct financial loss and the lost time spent to rectify such inefficiencies. Moreover, the resources that the organisation could be using for achieving its objectives are diverted to the areas they were not initially intended for. Thus, the following hypothesis is also proposed:

H3: Non-compliance to procurement processes has a negative influence on efficiency.

Internal controls are the protocols that ensure effective and efficient operations (Vaidya, Sajeev, Johnston and Cox 2008), and they are typically maintained through reliable financial reporting; compliance with applicable statutes; and adherence to administrative directives, rules, policies, and procedures (Schiele & McCue, 2010). In terms of purchasing functions, controls are maintained to reduce risks which are uncertainties "about whether potentially significant and/or disappointing outcomes of decisions will be realized. Sitkin and Pablo (1992, p. 10). However, in trying to close the gap between agency outcomes and

expectations through monitoring and purchasing controls, more bureaucracy is required which can lead to reduced productivity, increased complexity, and a reduction in marginal value additivity. On the other hand, allowing excessive purchasing risks may lead to a loss of assets, economic inefficiency due to poor business decisions, increased instances of non-compliance, and loss of public confidence.

H4: Bureaucracy has a negative impact on efficiency.

Kelman (1990) posits that Governmental agencies and suppliers are now advocating partnerships between governmental buyers and business sellers to facilitate the implementation of contracts. Thus, public sector solutions to dealing with turbulent environments have been to shift policy towards greater competitiveness in the public sector and to apply private-sector style management practice to the public domain. Laurent (2000) concurs with the above-mentioned views citing that with the increasing procurement of high-tech systems and services, collaborative and relational exchanges will be required to realize the strategic goals for both government agencies and private business. Ondieki and Oteki (2015) posit that supplier collaboration affect the effectiveness of supply chain management practices. As stated before, SCM is one of the main tools that the public sector in South Africa uses to manage public procurement processes.

H5: Supplier Relationship Management positively affects efficiency.

Empirical Examination of constructs

This study sought to empirically examine the relationship between public procurement efficiency and factors that have an influence on the efficiency of the public procurement process. These factors are bureaucracy, quality management, ethics, noncompliance, and supplier relationship management. The research process began by developing the constructs' domain using a literature review and proceeded with the identification of the different items that were used to measure those constructs that form the research model. Data was collected through a questionnaire survey that was developed on google forms.

Sampling, Measures, and Construct Development

To test the hypotheses stated in section three above, this study used multi-item scales adopted from previous research. All of the items were measured using a 5-point Likert Scale, where one indicated "strongly disagree" and five indicated "strongly agree". The respondents for the study were extracted from public sector organisations in South Africa. To narrow down the sample, this study utilised the report by Fuzile (2015) which stated that ERP systems are generally found in Schedule Two Public Entities in South Africa. Using the list of Schedule 2 public entities, as provided by the National Treasury (2019), employees from twenty-one public entities were requested to participate. To get a representative sample, employees in different roles, with varying qualifications were sent the survey. Of the 378 employees contacted, 162 potential respondents agreed to participate in the survey but only 117 returned usable questionnaires. The other questionnaires were deleted for being incomplete. A response rate of 30,95% was achieved.

Reliability and Validity

Following the completion of the data collection, reliability and validity of the measures were assessed by subjecting them to a data purification process. Confirmatory factor analysis was performed for the measured items and variables, utilising principal axis factoring with a varimax rotation and using an eigen value of one as a cut-off point. For sampling adequacy test, the study measured the Kaiser-Meyer-Olkin (KMO), which was found to be 0.62. Reliability was tested by calculating Cronbach's Alpha coefficient. The generally accepted criteria for classifying Cronbach's alpha coefficients is that coefficients of 0.90 indicate high reliability, coefficients between 0.50 and 0.70 indicate moderate reliability. To confirm reliability, the study also calculated composite reliability. Composite Reliability considers actual factor loadings as opposed to assuming equal loadings for all items. The composite reliability values calculated were higher than 0.60 (Fornell and Larcker, 1981). This confirmed that the measures used were reliable. Average Variance Extracted (AVE) is used to measure the amount of variance that a variable extract from the associated items. AVE values should be higher than 0.5. The results of the factor loadings and Cronbach's Alpha values are presented in Table 2.

Table 2. Results of the assessment of reliability of the constructs

Variables	Cronbach's α	N	Composite Reliability	Loading Range	AVE
Quality Management	.725	4	.623	.592 - .670	.718
Bureaucracy	.891	4	.786	.609 - .897	.869
Ethics	.739	4	.642	.522 - .770	.739
Noncompliance	.800	5	.653	.431 - .847	.794
Supplier Relationship Management	.767	4	.649	.573 - .689	.745
Efficiency	.885	2	.885	.864 - .906	.879

Note: N = No. Of items

Discriminant validity test was also conducted by calculating the square root of AVE for each latent variable. Fornell and Lacker (1981) posit that discriminant validity is achieved if the square root of AVE for each latent variable is higher than the correlations among all latent variables. The study also tested multicollinearity. Multicollinearity deals with research variables being highly correlated. A higher level of multicollinearity affects the variance explained by each variable (Hair et al., 2006). Tabachnick and Fidell (2007) recommended two common techniques to test for multicollinearity; the first, which was utilised in this study, is variance inflation factors (VIF) and the second is tolerance level. VIF is defined by Pallant (2007) as the inverse of the tolerance effect. A variance inflation factor (VIF) greater than 5 is usually considered problematic in multicollinearity. The VIF values attained in this study ranged between 1,260 and 1,094 which proved that multicollinearity was not a concern.

Structural Model Assessment

To test the conceptual model, Analysis of Moment Structures (Amos) was used. Barnidge and Zuniga (2017) define Amos as an IBM SPSS Statistics module that was developed to analyse covariance structure models, including path analysis, structural equation modelling (SEM), and confirmatory factor analysis (CFA). This study analysed both the measurement and structural models to ensure that the results were acceptable and that the results were consistent with the fundamental theory.

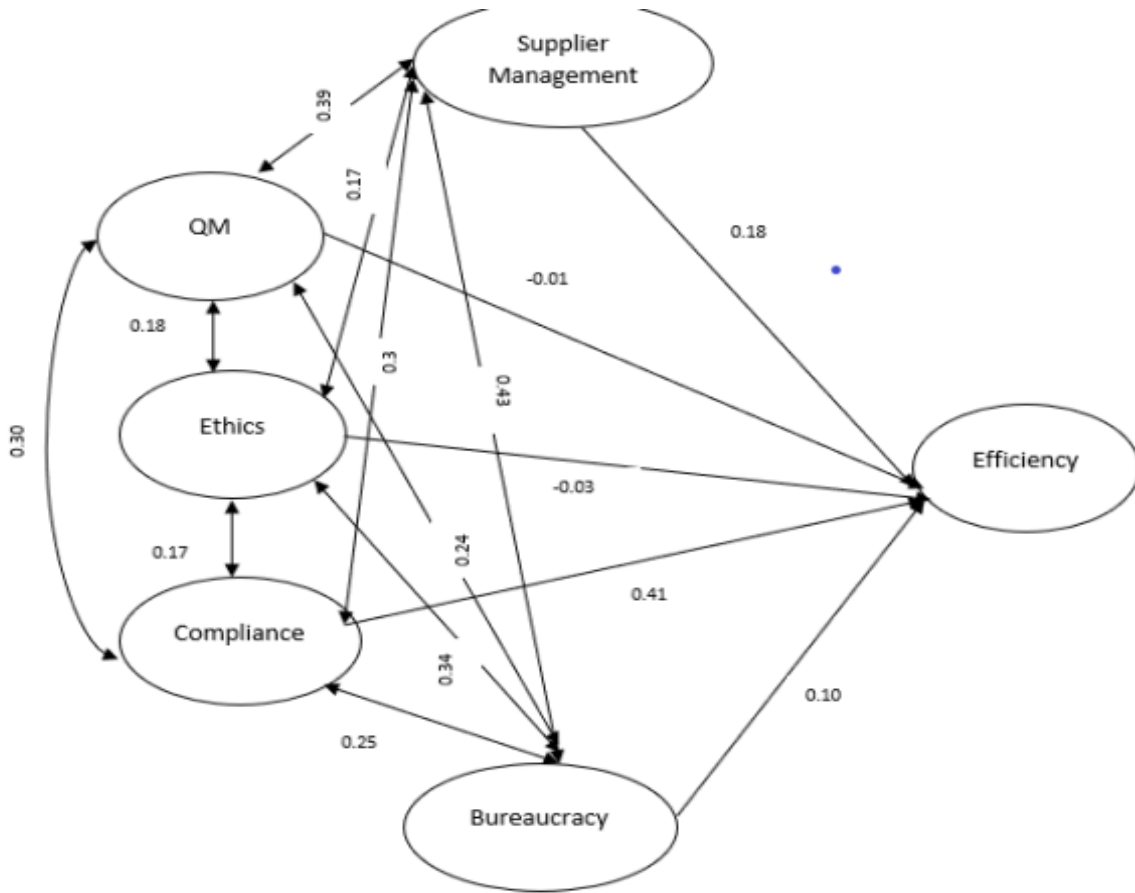


Figure 2. Path analysis

Tan (2001) stated that measurement models deal with the reliability and validity of the constructs in quantifying the latent variables, whereas the structural model is concerned with the relationships, whether direct or indirect, among the latent variables. SEM contains the measurement model and the structural model. The measurement model describes the latent variables in the model and allocates the observed variables accordingly. A structural model or path analysis investigates the hypothetical relationship among the latent variables. This made the SEM method appropriate for this research.

Table 3. Summary of the structural model result

Path	Hypothesis	Coefficient	Decision
QM -> Efficiency	H1	-0.01	Not Supported
E -> Efficiency	H2	-0.03	Not Supported
C -> Efficiency	H3	0.30	Supported
B -> Efficiency	H4	0.10	Supported
SRM -> Efficiency	H5	0.18	Supported

Murti (2020) provided guidelines for interpreting path coefficients, stating that standardised path coefficients with absolute values of less than 0,10 indicate a small effect, those with values around 0.30, indicate moderate effect and those with values of 0,50 and above, indicate a significant effect. This study utilised these criteria to evaluate the path coefficients. As can be observed from the model, compliance, bureaucracy, and supplier relationship management demonstrated small to moderate effect on efficiency, while the effect of quality management and ethics was found to be insignificant. The correlations among the variables were also found to be positive but were not very strong. The quality of the SEM analysis was then assessed, and the results show that most of the measurements possess significant loadings to their corresponding second order constructs. The model fit indices computed were root mean square error of approximation (RMSEA) = 0,062, comparative fit index (CFI) = 0,899, Tucker-Lewis Index (TLI) = 0,871 and the incremental fit index (IFI) = 0,905. Based on these results, the model was deemed acceptable.

Discussion of Results

Several observations were made from the results of this study. The proposed hypothesis, H2, is not supported. The data revealed that ethics have an insignificant influence on procurement efficiency. These results are contrary to the findings by Akaninyene and Mark (2015). In their study, they found that a significant relationship exists between ethics and efficient procurement. Other studies observe an indirect influence of ethics on efficient public procurement processes. The result of this study confirmed the indirect effect of ethics. This implies that ethics plays a role as a mediator for other factors. For instance, Sarawa and Mas'ud (2020), concluded that ethics play the role of mediator on the influence of professionalism and compliance with public procurement regulations.

Hemsworth, Sanchez-Rodriguez and Bidgood (2004) found a strong and significant effect of quality management on procurement efficiency, this is also contrary to the findings of this study. The findings in this study do not support H1, as quality management has an insignificant direct effect on procurement efficiency. However, the results support the assertion that quality management has a significant indirect influence on procurement performance and efficiency. Komora and Kavale (2020) found that supplier relationship management has a significant impact of procurement efficiency, which is congruent to what was found in this study. Several studies assert that the indirect and direct effects of these variables on procurement efficiency is also amplified in the presence of various mediators. Further research on the mediator factors and how they affect the different variables' correlation with procurement efficiency need to be conducted. Finally, the effect of compliance on procurement efficiency is direct and significant which means that H3 is supported. This study's findings on compliance agrees with Amayi and Ngugi (2013) and Gelderman et al. (2006).

Conclusion

This research aimed to evaluate the influence of various factors on efficiency in public procurement. The study empirically tested the relationship among bureaucracy, compliance, ethics, quality management, supplier relationship management and procurement efficiency. The primary objective of the study was to assess the effect of the above-mentioned variables on efficiency. Literature on the influence of these factors on efficiency is inconsistent and some scholars recommend testing them under different settings and introducing other variables into the setting being examined. The study proposed a conceptual framework, using literature, and the resulting hypotheses were then tested using Amos 27. The findings partially support the conceptual framework, and this has some implications for public procurement personnel. Firstly, this provides a tool for policymakers to use when initiating performance improvement activities within public procurement. Secondly, the study proves that authorities need to be aware of the other factors that indirectly affect efficiency in procurement and enable the mediating factors to play their role effectively. One of the objectives of good public procurement systems is efficiency and several factors contribute to it. It was therefore important to assess some of the factors that affect efficiency in public procurement and evaluate the type of influence each factor has.

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