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Keywords: Forensic Accounting, Fraud Prevention, Public Procurement
The effect of Forensic Accounting on Public Procurement: A new Perspective to Fraud Prevention in Ethiopia

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Abstract
As forensic accounting is the application of the laws of nature to the laws of man, this study was about asserting the applicability of forensic accounting on public procurement as a fraud prevention tool. It examined deterrence, government performance and attitude on the policy fairness in ten selected Ethiopian public Universities in the 2022. 109 questionnaires were administered to procurement officers of the selected universities with a simple random sampling. The collected data was analyzed via EVIEWS software package through a multiple linear regression analysis. The study revealed that forensic accounting couldn’t deter procurement fraud. Also, it discovered that the current government performance of exploiting forensic accounting is minimal. Ipso facto, the study recommends that governments from all level shall develop interest in forensic accounting & accountants for monitoring & investigation of suspected and confirmed fraud cases. The management of procurement authority shall better train accountants and auditors in; criminology, specifically oriented to the dynamics & scope of financial crimes, fraud prevention, ethical issues, investigation and remediation, alongside, giving prominent emphases to rationality, neutrality and independence of courts, if, forensic science is to be used as a driving engine of fraud prevention.

Key words: Forensic Accounting, Fraud Prevention, Public Procurement

1. Introduction
Forensic accounting also known investigatory accounting is the application of financial and investigative skills to unresolved issues within the context of the rules of evidence [1]. Forensic accounting is the application of forensic sciences and accounting the application of the laws of nature to the laws of man [2]. However, many people do not understand the crucial role of forensic
accounting in many of countries and have been intentionally and unintentionally finding ways to fraud [3]. Consequently, policy attention to forensic accounting was spotlighted in the 1930s Frank Wilson as a CPA was assigned to investigate the transactions of the infamous gangster Al Capone [4].

As a result, numerous studies have been conducted on the issue of forensic accounting by various researchers across the globe, yet, it come up with inconclusive and contradictory judgments on the actual effect of forensic accounting in developing countries like Ethiopia. Besides, most existing studies have focused on the role of forensic accounting for fraud detection than its prevention role. And, it’s mostly studied on organized stock markets with little attention to sectors other than the well-organized stock markets and banking industries. Therefore, it is plausible to empirically examine the effect of forensic accounting on public procurement as a new perspective of fraud prevention in the Ethiopian public Universities.

2. Related Literature Reviews

2.1 Introduction

Public procurement is an essential government system for spending public money on gaining of goods, works, and services needed for public programs and projects. [5, pp. 1-37] It is all about the process of procuring goods and services for the public sector. It can also be defined as the buying of goods and services by government organizations. [6]. The Ethiopian Procurement Proclamation also defines procurement as a means of obtaining goods, works, consultancy or other services through purchasing, hiring or obtaining by any other contractual means. [7]. At the same, time Public Procurement is defined as a means of procurement by a public body using public fund. [7]. Hence, procurement could be goods or services and the procurement of goods are the central points of this paper.

2.2 Theoretical Reviews

2.2.1 Deterrence effects of the Procurement laws and Forensic Accounting

The existing procurement laws must have a deterrence effect on the people. Deterrence is the practice of discouraging or restraining someone in world politics, usually a nation-state from taking unwanted actions. [8]. It is creating fear on individuals, groups, and states not to do or repeat a prohibited act.

One of the objectives of the Ethiopian criminal law is creating a deterrence effect on the subjects. [9]. As per this provision, deterrence might be general or special. The general deterrence effect is
all about deterring the public from committing further crimes while the special deterrence effect is preventing a commission of further crime by the individual person. Therefore, the Ethiopian procurement laws should have been enacted in such a way.

2.2.2 Expected roles of Government in Fraud Prevention

Public procurement is one of the government activities most vulnerable to corruption. In addition to the volume of transactions and the financial interests at stake, corruption risks are exacerbated by the complexity of the process, the close interaction between public officials and businesses, and the multitude of stakeholders. [10]. The direct costs of corruption include loss of public funds through misallocations or higher expenses and lower quality of goods, services and works. A government is expected to curve fraud and corruption through the principle of integrity, transparency, stakeholder participation, accessibility, e-procurement, and oversight and control. [10]. Hence, the government has a duty to provide adequate information to the public, creating awareness about public procurement, capacitate the procurement professionals, promulgate clear laws and directives, and follow up the procurement system. Creating the system of accountability and transparency are also the key conditions for ensuring integrity and preventing corruption [11]

2.2.3 The current Procurement laws of Ethiopia

The basic and the most relevant laws on procurement is the Ethiopian Federal Government Procurement and Property Administration Proclamation number 649/2009 and its directive promulgated in 2010. The current Ethiopian public procurement system takes a long period of time. [12] Besides, the system failed to incorporate clear accountability issues for those who violate the rules and regulations. The procurement system is complex, cumbersome, time taking, and implemented manually (the procurement is not supported by electronic based).

The government has to reform the existing procurement laws and directives for different purposes. Among others, it ought to be amended for government as well as social accountability, and for effective service delivery. [13, pp. 1-18].

2.3 Empirical Reviews

Enofe (2019) commenting on the application of forensic accounting in developing economies like Nigeria, notes that forensic accounting is faced with so many bottlenecks. In contrary, Indian stock companies, through data mining techniques and computer tools of forensic accounting, failure of internal auditing system of the organization has been dismissed [3]. Moreover, Muhammad Aminu Isa and Shafi’u Abubakar Kurf (2020) who show the effectiveness of forensic accounting in fraud
control and internal control quality of the Nigerian firms. Bassey Eyo, Ahonkhai, Ohimai Ebahi (2017) found that forensic accounting and litigation supports do not have significant effect on fraud detection in Nigerian companies.

2.4 Conceptual framework of the study
Therefore, after going through tremendous literatures (journals, articles, books and etc.), we tried to build a conceptual framework of this study in three pieces. Since the objective of the study is examining the effect of forensic accounting in fraud prevention comprehensively, three hypotheses were developed through thorough understanding and articulation of numerous literatures (theoretical and empirical) that finally are tested. Accordingly, this section presents the formulated hypotheses and conceptual framework based on what is understood from the literature review about the real effect of forensic accounting as follows.

Hypothesizes

H1: Forensic accounting can deter procurement fraud.
H2: Government is exploiting forensic accounting as fraud prevention tool.
H3: The policy welcomes the application of forensic accounting as fraud prevention.

Table 1: Conceptual Framework

<table>
<thead>
<tr>
<th>Deterrence</th>
<th>Government Performance</th>
<th>Attitude on Policy Fairness</th>
<th>Public Procurement Fraud</th>
</tr>
</thead>
</table>

*Source: Deterrence theory, Social psychology, theory of planned behavior and prior studies.*

3. Methodology
This research applied quantitative research approach with an explanatory research design to offer a new insight in measuring the effect of forensic accounting on public procurement. It was conducted on 151 procurement officers who are working in ten selected Ethiopian public universities in the year 2022 which are the oldest by their establishment date to get better information from their long-lasting experience they behave.
A proportionate simple random cluster sampling technique was applied to select sampling units from the ten public universities. This was because, the universities themselves are mutually exclusive and this made the study to divide them as cluster. It enhanced a representativeness of samples since they were selected from each stratum to conduct the study [14] conjointly it made the study to be economically efficient and effective.

Accordingly, Yamane’s (1967) formula was employed to select respondents from the total population as shown below.

\[ n = \frac{N}{1 + N(Ne)^2} = \frac{151}{1 + 151(0.05)^2} = 109 \]

Where: \( n = \) required sample size, \( N = \) total population and \( Ne = \) margin of error

Problem solving research design are followed by the selection of the data collection technique [15]. Ipso facto, the data were collected through a total of sixteen (16) items five point Likert scaled structured closed ended questionnaire. The questionnaire was distributed with exactly with the same phrasing and in the same order for all respondents. Additionally, in order to assure questions quality and to ensure quality of data collected by questionnaire, the researcher had pay attention to the questionnaire sequence to prepare questionnaire and a trained research assistants were used to help respondents aware each question.

In this study, a quantitative data analysis technique was applied to explain the population from the sample via descriptive and inferential statistics tools in order to organize, summarize, analyze and explain the data. Hence, up on completion of data collection, data were edited, coded and entered into EVIEWS and a series of Likert type item that represent similar feature were combined into single composite variable by using mean index and it was analyzed through a multiple linear regression model to determine the effect of independent variables on procurement fraud.

Accordingly, the study employed the analytical model presented as follows.

\[ PF = \beta_0 + \beta_1D + \beta_2GP + \beta_3 POF + \varepsilon; \]

\[ PF = 4.907087 - 0.094366D - 0.257403GP - 0.097726POF + \varepsilon, \]

Where; \( PF = \) Procurement Fraud \( \beta_0 = \) constant term \( \beta_1, 2 & 3 = \) beta coefficients \( \varepsilon = \) statistical discrepancy

\( D = \) Deterrence
\( GP = \) Government Performance
\( POF = \) Policy Fairness
Before the basic regression, all the necessary diagnostic tests of the model have been dully undertaken which led the study to proceed to the regression process. Moreover, to avoid the doubt of questions and to know understanding of the sampling units, Chronbach’s alpha was used to measure internal consistency of the instrument before conducting the actual study and to assure its reliability and 0.918 was scored.

4. Results and Discussion
The study administered 109 questionnaires for procurement officers of the selected ten public universities and used for further analysis.

All the required diagnostic tests for the assumptions of classical linear regression model namely; the error have zero mean, heteroskedasticity, auto correlation, normality and multi-collinearity [16] were tested and the model was robust and fitted for further regression.

**Table 1: Regression Result**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4.907087</td>
<td>0.106928</td>
<td>45.89130</td>
<td>0.0000</td>
</tr>
<tr>
<td>D</td>
<td>-0.094366</td>
<td>0.045836</td>
<td>-2.058764</td>
<td>0.0404</td>
</tr>
<tr>
<td>GP</td>
<td>-0.257403</td>
<td>0.092754</td>
<td>-2.775125</td>
<td>0.0059</td>
</tr>
<tr>
<td>POF</td>
<td>-0.097726</td>
<td>0.068121</td>
<td>-1.434594</td>
<td>0.1525</td>
</tr>
</tbody>
</table>

R-squared          0.537703  Durbin-Watson stat  1.816171
Adjusted R-squared 0.529732
Prob. (F-statistic) 0.230310

*Source: Survey of sampling units and own computation, 2022*

Based on the above table, the regression results revealed the effect of explanatory variables on the dependent variable, because, the R-squared values measure how well the regression model explains the actual variations in the dependent variable [17].

The adjusted R² value in the table indicates that 52.97% of the total variability of public procurement fraud was explained by the variables of the forensic accounting in the model. The
regression F-statistic (23.03) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable. This study was hypothesized that forensic accounting can deter procurement fraud. However, the result is in contrary to the hypothesis since the coefficient of deterrence stood negative and statistically significant at 5% level with a p-value of 0.0404. This shows that forensic accounting couldn’t deter procurement fraud in the selected public universities. The study is congruent with the work of Alabdullah, Alfadhl, Yahya and Rabi (2013) who find significant relationship between the forensic accounting and effectiveness of the control and auditing bodies. It’s confronted to the work of Muhammad Aminu Isa and Shafi’u Abubakar Kurf (2020) who show the effectiveness of forensic accounting in fraud control and internal control quality of the Nigerian firms. This paper find the same with the work of Bassey Eyo, Ahonkhai, Ohimai Ebahi (2017) who proved that forensic accounting and litigation supports do not have significant effect on fraud prevention in Nigerian companies.

Also, it was hypothesized that government is exploiting forensic accounting as fraud prevention tool. Still, the result is in antagonistic to the hypothesis since the coefficient of government performance remained negative and statistically significant at 5% level with a p-value of 0.0059. Hence, it infers that the government utilization of forensic accounting as a fraud prevention tool in the procurement system seems minimal in the selected public universities. It’s typically congruent with the study of Enofe (2019) who noted on the application of forensic accounting in developing economies like Nigeria is faced with so many bottlenecks. On the other hand, this study is confronted with the work of Ashwin R. et al., (2018) who found that in Indian stock markets, through data mining techniques and computer tools of forensic accounting, failure of internal auditing system of the organization has been dismissed.

In addition, the study was hypothesized that the policy of the Ethiopian procurement system welcomes the application of forensic accounting as fraud prevention. Meanwhile, the result is in nonconforming to the hypothesis since the coefficient of policy fairness remained negative yet statistically insignificant at 5% level with a p-value of 0.1525. Henceforward, it infers that the system responsiveness to the application of forensic accounting as fraud prevention is still questionable yet it’s not at all.

5. Conclusion and Policy Implications
From the analyses done, the results are robust to infer many conclusions including the government performance of exploiting the forensic accounting to be suspicious or minimal. In addition, forensic accounting is find couldn’t deter procurement fraud.

Accordingly, we recommend that; governments from all level shall develop interest in forensic accounting and accountants for monitoring and investigation of suspected and confirmed fraud cases. The management of procurement authority should train accountants and auditors in; criminology, specifically oriented to the dynamics and scope of financial crimes, fraud prevention, ethical issues, deterrence, detection, investigation and remediation, alongside, giving great emphases to rationality, neutrality and independence of courts.

**Invitations for further research**

Future researches might be directed towards investigating the effect of forensic accounting on procurement fraud in other public sectors on political affiliation and religiosity perspectives.

**Data availability:** The data used to support the findings of this study are available from the corresponding author upon request.

**Conflict of Interest:** The authors declare that they have no conflicts of interest.

**Authors Contribution:** This article has been reviewed by all authors thoroughly.

**References**

References


