Philippine Management Review 2024, Vol. 31, 49-64.

A Preliminary Study on the Role of Audit Opinions on Annual Budget Appropriation Outcomes for National Government Agencies (NGAs) in the Philippines

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Annual audit reports from the Commission on Audit (COA) provide information on a government agency's compliance with financial reporting standards that may be valuable to government budget legislators and decision makers. Using Chi-square test of independence and logistic regression analysis on the available empirical data, we test whether COA audit reports, as represented by COA audit opinions, have a statistically significant association with government budget appropriation decisions, represented by year-on-year movements on the new general appropriations for National Government Agencies (NGAs). Based on the results, majority of the COA audit opinions issued for fiscal periods within the Duterte Administration (2016-2022) do not display a statistically significant association with the year-on-year movements of the budget appropriations. For the audit opinion years that showed a statistically significant association from the Chi-square test of independence, the correlation between COA audit opinions and year-on-year movements of the budget appropriations were found to be weak. Insights from an audit report should somehow, to a certain degree, affect the increases or decreases in budget allocation. Particularly, much attention should be given to government agencies who receive negative audit reports as these reports may point out misstatements in the financial statement that could potentially be instances of misappropriation of government assets.

1 Introduction

In a clarificatory statement published on June 22, 2022, the Commission on Audit (COA) (2022) warned the public on the misleading use of the phrase "highest COA audit rating" by some local government units (LGUs) and government agencies. This clarification was issued by COA after noting numerous accounts of public officials using the phrase to refute criticisms of alleged unsound or corrupt spending (Seares, 2022). Generally, public officials are only able to claim the "highest COA audit rating" if their agencies received an unmodified audit opinion from COA's annual financial audit. Seeing that an unmodified audit opinion may potentially influence public perception when it is presented as the "highest audit rating", the COA (2022) emphasized in its clarificatory statement that an audit opinion only pertains "to the financial audit conducted regularly by COA auditors on the agencies within its jurisdiction" and that it "should not be viewed as a rating, score or grade, with ranking of lowest to highest". However, this does not erase the fact that the unmodified audit opinion is the most ideal audit opinion from COA.

An "unmodified opinion", also called an "unqualified opinion", is an opinion issued by COA to government agencies when, based on audit evidence gathered through financial audit procedures, the financial statements of the agency are "prepared, in all material respects, in accordance with the applicable financial reporting framework" (COA, 2022). This means that an unmodified audit opinion from COA relates mainly on the reliability of the financial reporting of a government agency and is not a conclusive indication of the agency's faithful execution of budget appropriations. Despite this, Masyitoh et al. (2015, as cited in Kurniawati & Pratama, 2021) believed that, at some level, a good audit opinion issued to a government suggests that the local government has performed well, and thus, there is little to no potential for misappropriation of state funds. Kurniawati & Pratama (2021) further argued that "[i]f the fairness of the financial statements is good, it can be believed that a good accountability process has been implemented to reduce corruption, and vice versa" (p. 57).

Conversely, if COA concludes from audit evidence that the financial statements of the government agency are not free from material misstatement, whether caused by error or fraud, or if COA is unable to obtain sufficient appropriate evidence to make a conclusion, then a "modified opinion" (includes

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qualified, adverse, and disclaimer of opinion) is issued (COA, 2022). For purposes of providing an audit opinion, a misstatement, based on the Financial Audit Manual of COA (n.d.-b), pertains to:

> *"a difference between the reported amount, classification, presentation, or disclosure of a financial statement item and the amount, classification, presentation, or disclosure that is required for the item to be in accordance with the applicable financial reporting framework (p. 104)."*

Moreover, although the detection of fraud is not a primary responsibility of COA when conducting financial audit of government agencies, the audit findings from their modified opinions may help point out leads of potential misuse of public funds. COA's audit findings from a modified opinion report do not only cover material misstatements from error, but they may also include findings related to misstatements from fraud such as misstatements resulting from fraudulent financial reporting or misstatements resulting from misappropriation of assets. In the Financial Audit Manual of COA (n.d.-b), the COA mentioned that finding discrepancies in the accounting records and discovering conflicting or missing audit evidence are some examples of circumstances encountered in a financial audit that may indicate the possibility of a material misstatement resulting from fraud.

Given that COA's audit report may give some insights on an NGA's budget accountability, such reports should be considered, to a certain degree, in the Philippine government's budget preparation and legislation. Factoring in COA audit reports in the Philippine government budget process would enable legislators to make more informed and data-driven decisions on which NGA appropriations to allow and disallow since they would have an idea on which expenditures have been flagged by COA as misstatements in the financial reports. Such consideration might even serve as an ex-ante budget control to possibly prevent further misuse of funds for identified suspicious activities. In relation to this, according to the Department of Budget and Management (DBM) (n.d.-b) document on the government's budget cycle, COA's audit reports are used by DBM in "confirming agency performance, determining budgetary levels for agencies, and addressing issues in fund usage" (p.290). However, aside from this DBM document, there are only a few other documents or resources that gives us an idea on whether audit reports affect budget legislations (Blöndal, 2010). The lack of such documents and reports may entail less public assurance that COA's audit reports were considered in the preparation and legislation of the national budget. Additionally, in its 2021 Open Budget Survey (OBS), the International Budget Partnership (IBP) (2021) recommended to the Congress of the Philippines that "[a] legislative committee should examine the Audit Report and publish a report with their findings online" (p.9). Despite the Philippines getting relatively high score on the Budget Oversight category of the 2021 OBS, the above recommendation by the IBP may have been because of the seemingly weak link between budget accountability assessments and budget legislation decisions.

Given this perceived gap between budget accountability reports and budget decision-making, this study aims to deduce, from empirical data, whether assessments on budget accountability are considered in the government's budget preparation and budget legislation processes. Particularly, this study aims to determine whether COA audit opinions have any significant influence on the year-on-year movement of new general appropriations enacted by legislators in the annual General Appropriations Act (GAA). In the next section, we explore related literature on government budget processes and audit opinions. Section 3 discusses the research hypothesis and methodology. Section 4 explains the process of data collection. Section 5 and 6 details the process of hypothesis testing and presents the empirical results. Finally, Section 7 concludes the research paper and Section 8 provides the limitations of the study and recommendations for future study.

2 Related Literature on Government Budgeting Processes and Audit Opinions

The government budget is a financial plan for a given period which shows what the government's resources are and how they will be generated and used over the said given period, usually for a fiscal year (DBM, n.d.-a). It is a key instrument that guides the government on how it plans to spend its resources to achieve its socio-economic objectives.

In the Philippines, the process of government budgeting is composed of four (4) main phases: (1) budget preparation, (2) budget legislation, (3) budget execution, and (4) budget accountability (DBM, n.d.-b). Based on the profile of Blöndal (2010) on the budget process in the Philippines, the budget

preparation starts with the government determining its budget parameters through developing economic assumptions and revenue forecasts, assessing continuing costs of existing programs, and combing both of these information to determine the fiscal space available for the upcoming budget. After determining the sustainable level of available resource for government expenditures, the government then proceeds to allocate the resources to departments and agencies.

Directly quoting (Blöndal, 2010), "To guide the government in the allocation of resources, the DBM issues a budget call that contains the following: (1) overall direction on economic goals and fiscal target, (2) priority areas of government activity, programs, and projects, (3) budget ceilings to departments and agencies, (4) guidelines in formulation of agency budget proposals given prescribed forms, and (5) calendar of budget preparation activities". Although the government determines the available fiscal space, the allocation of the resources is derived from the proposals of the government agencies which are guided by the overall direction and priority areas provided in the budget call.

After budget preparation, the proposed budget now goes through the budget authorization process where it is deliberated in Congress until it is approved and signed into law by the President (DBM, n.d.-b). Afterwards, the budget is then signed into law and the government agencies are then allowed to use their respective budget appropriations upon complying with the necessary processes under the budget execution phase (DBM, n.d.-b). At the end of the government's fiscal year, the execution of the budget, as evidenced by the NGA's financial statements and other reports, goes through reviews and audits to evaluate the governments' budget accountability. COA audits the accounts of each agency to ascertain if public funds are used properly (financial audit), according to the law and standards (compliance audit), and with value-for-money (performance audit) (DBM, n.d.-b). In conducting such audits, the COA, as the external auditor of the government, follows audit manuals, such as the Financial Audit Manual and the Compliance Audit Manual, that are based on the International Standards of Supreme Audit Institutions, the authoritative international standards on public sector auditing (COA, n.d.-b). Ideally, COA is expected to finish its audits of a particular period within the following fiscal year (DBM, n.d.-b).

COA's audit reports, particularly the audit opinions in the financial statements of the NGAs, ideally increase stakeholder confidence (i.e., the citizens) towards public sector financial statements and allow better oversight on the government's use of taxpayers' money (COA, n.d.-b). Hay & Cordery (2018) discussed that, under the agency theory of principal-agent relationships, citizens should see the value of government audits because they are in the principals who have entrusted assets to managers as agents, and as such, would need a way to monitor how these entrusted assets are used. However, unlike principals in the private sector, citizens do not have the option of withdrawing the assets that they have entrusted to the government, but the effect of the audit reports may still manifest on their voting pattern for government elections. Further, as Puntillo (2013) pointed out, "[t]he role of [budget] accountability is that of bridging the gap between the choices made by politico-institutional bodies and stakeholders' expectations, promoting the latter's participation in the processes of planning and reporting on institutional activities" (p.243). Ideally, using government audit reports, the general public is expected to participate in the process of government budget decision-making. Hence, government audit reports are expected to indirectly influence the government budget process through the active participation of citizens.

Additionally, government audit reports are also deemed valuable for budget legislators under agency theory. As Streim (1994) pointed out, the principal-agent relationship in the public sector is not only present between the citizens and the legislature or politicians but also between the legislature and the government. Since the legislature cannot be sure whether the government agencies will spend the public funds according to the legislature's budget appropriations, then the government must be held accountable to legislature (Streim, 1994). Such assessment of the government's accountability on its budget execution is embodied in government audit reports. For budget legislators, the audit reports may influence their budget decision-making.

Given the studies mentioned above, insights from an audit report should somehow, to a certain degree, affect the increases or decreases in budget allocation. Particularly, much attention should be given to government agencies who receive negative audit reports as these reports may point out misstatements in the financial statement that could potentially be instances of misuse of government funds, thereby necessitating further investigation. However, the effectiveness of audit reports in

demanding accountability from government agencies is still questionable in the context of the public sector. As argued by Streim (1994, p.187):

> *"[t]he legislature's interest in financial and regularity audits is diminished because of the minimal influence on the budget-preparing process. The legislators of the majority party are not interested in a public discussion of negative results of economy, efficiency, and effectiveness audits because they do not want to blame the government and thus members of their own party. Opposite parties are supposed to have an interest in a broad discussion of negative audit results, but in reality, they use only those few results that can be favorably advertised in the political market. Due to the lack of interest of legislators and governmental members in audit reports, proposals have been made to make the audit reports publicly available for all citizens. (see, for example, Arnim, 1988; Kisker, 1983; Korff, 1981; Wenger I976). The underlying rationale is that politicians not paying attention to the recommendations of the audit should be penalized by a negative voters' reaction. However, it is questionable whether an audit report as complex as currently prepared is really suitable to attract the citizens' interest. This argument is strengthened by the fact that the audit report does not contain the information basically relevant for making voting decisions."*

Several other studies have also noticed this seemingly weak link between audit reports and allocation decisions in the government budget processes. As observed by Santiso (2015):

> *"Audit agencies are critical partners and advisers of parliaments in the oversight of the budget and the enforcement of accountability on government. Nevertheless, the linkages between them [audit agencies and government budget] are not as effective as they could be due to a combination of technical capacity constraints and political economy disincentives." (p. 605)*

Hence, there seems to be a disconnect between the expected influence of audit reports on the government budget decision-making and how the audit reports are considered in the government's budget decision-making. As observed by He (2023) from the budget of the United States government, politicians allocate a higher budget to an agency despite the agency having a lower accounting quality if the politicians' priority is to ensure sufficient delivery of policy outcomes to constituencies. However, He (2023) elaborated further that if the quality of accounting is lower, then this increases information asymmetry, which may then result to the agency not utilizing their budget fully as intended, thereby producing a huge gap between the expected outcome from the given audit report versus the budget allocation outcome.

In the Philippines, the COA audit reports are also expected to be considered in the budgeting process of the government (Blöndal, 2010). However, such expectations are only seen in writing on government documents and academic articles. Research on empirical evidence regarding the use of COA audit reports on government budget decision-making in the Philippines is not yet prevalent.

3 Research Hypothesis and Methodology

To determine whether a relationship exists between COA audit opinions and budget appropriation decisions for NGAs in the Philippines, we use the Chi-square test of independence. The Chi-square test of independence is utilized on tests of association between categorical variables (McHugh, 2013). For this study, the two categorical variables of interest are (1) the COA audit opinions and (2) the movement of budget appropriations for NGAs. Given these two variables, we define our null hypothesis (H_0) as follows:

H_0: The movement of budget appropriations for NGAs are independent of the COA audit opinion that they receive.

In determining whether to reject or accept the null hypothesis, we use 0.05 as the value of alpha. This means that we reject the null hypothesis when the resulting p-value from the Chi-square test is less than 0.05. According to Franke et al. (2012), a significant test rejecting the null hypothesis in a Chi-square test of independence would suggest that within the sample, one variable of interest is associated with a second variable of interest.

Moreover, to further check the significance of the COA audit opinions when other variables are added as control variables, we apply logistic regression to our dataset. The logistic regression analysis is an appropriate regression model for dichotomous categorical outcome variable and may be used as

a statistical test of the significance of individual predictors based on their resulting p-value (Peng et al., 2002). In determining whether the audit opinion variable from the logistic regression results is significant in determining whether to increase or decrease an agency's budget appropriation, we also use 0.05 as the value of alpha. This means that, when the p-value of the audit opinion variable from the logistic regression is less than 0.05, then the audit opinion variable is considered to have a significant relationship with budget decision-making.

4 Data Sampling and Collection

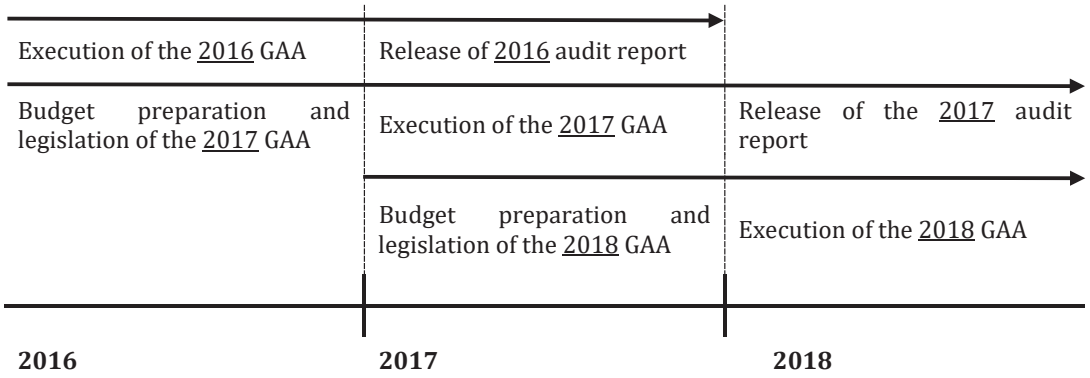
For this study, empirical data on the COA audit opinions issued for the fiscal periods within the Duterte Administration (2016 to 2022) were gathered from the annual audit reports published by COA on its official website (https://www.coa.gov.ph/reports/annual-audit-reports/aar-ngs). Since the Cloudflare in COA's website blocks Python web scraping, the ".zip" file of the annual report of each NGA for each year in the covered period of the study was manually downloaded. From this process, 314 files were downloaded for the 2016 audit reports, 316 files for the 2017 audit reports, 312 files for the 2018 audit reports, 311 files for the 2019 audit reports, 336 files for the 2020 audit reports, 340 files for the 2021 audit reports, and 347 for the 2022 audit reports.

To extract the audit opinion from the downloaded files, all Executive Summary documents from each ".zip" file was extracted using the "zipfile" library in Python. Remarkably, some NGAs do not have an Executive Summary, hence, for such NGAs, the entire Auditor's Report were extracted instead. Also, some NGAs were not issued an Auditor's Report because of their non-compliance with the requirements and deadlines set by COA. For such NGAs, only the management letter indicating the reasons for the NGA's non-compliance were available for extraction. According to COA (n.d.-a), a management letter is "an audit report on agencies with complete set of books of accounts but no financial statements submitted as of the deadline set by COA". As of January 20, 2024, the last day of data gathering from the COA website, there were no subsequent auditor's report released for such NGAs who only had management letters in their audit report files.

After compiling the relevant documents for determining COA's audit opinion, the said documents were then processed through a self-coded Python algorithm that recognizes texts from ".doc" files, searches for audit opinion keywords from the recognized text, and extracts the keywords from the text. The extracted audit opinion keywords were then categorized as "Unqualified", "Qualified", "Adverse", and "Disclaimer" depending on the content of the opinion. NGA's that only had management letter documents were categorized as "Management Letter". However, since some of the files are scanned copies of the audit report saved as a .pdf file, an optical character recognition algorithm was added in the process. Files that were not successfully recognized by optical character recognition were manually opened to extract the audit opinions.

On the other hand, to represent budget decision outcomes for NGAs, the year-on-year movements of new appropriations from the annual GAA were collected. As shown in Figure 1, since COA audit reports for each calendar year are released within a year after the subject calendar year and the GAA to be implemented for a specific calendar year is prepared a year prior to the subject calendar year, it was noted that the COA audit reports for a given calendar year will only be able to influence the preparation of a budget for two (2) years after (i.e., if the COA audit report is for the NGA's budget execution in 2016, the 2016 audit report will only be released in 2017 and such report may only be used starting 2017, the year when the GAA for 2018 is being prepared). Hence, considering the covered periods for the COA audit reports, the year-on-year movements of new general appropriations were compiled starting from 2018 to 2024. Moreover, to determine the year-on-year movement for 2018, the new general appropriations for 2017 were also collected. The relevant GAA files, in ".xls" and ".xlsx" formats, were downloaded from the DBM website (https://www.dbm.gov.ph/index.php/budget). However, since the 2019 GAA was only available in the .pdf file format, the amounts were encoded manually in the dataset.

Figure 1. Timeline of the government budget process in the Philippines



Upon compiling the GAA amounts for each year, the year-on-year movements for each year were determined by getting the percentage change of GAA amounts from prior year to current year. These movements are then categorized into the following categories: (1) "increase" if the percentage change of GAA is positive, (2) "decrease" if the percentage change of GAA is negative, and (3) "zero" if the percentage change is zero.

The dataset of the COA audit opinions was then combined with the dataset of the GAA amounts to create the sample dataset that we used for the study. From the combined dataset, only NGAs that were present in both the COA and GAA datasets were retained to enable the testing of the relationship between the NGA's audit opinion and budget movement. The final sample, after combining the datasets, consisted of 307 unique NGAs.[1]

From the sample, the respective year-on-year budget movements were paired with the relevant audit opinion years based on the timeline of the government budget process. Since the audit report available during the budget preparation for a specific year is the audit report two (2) years prior to the fiscal year for which the budget preparation is for, then each year-on-year budget movements were paired with audit opinions issued for financial statements that were two (2) years prior to the respective year-on-year budget movements. The following year-on-year budget movement and audit opinion pairs established for the study were as follows: (1) 2016 audit opinion to 2018 budget, (2) 2017 audit opinion to 2019 budget, (3) 2019 audit opinion to 2021 budget, (4) 2020 audit opinion to 2022 budget, (5) 2021 audit opinion to 2023 budget, and (6) 2022 audit opinion to 2024 budget. The count of sampled NGAs for each audit opinion and budget movement pairs established is shown on Table 1 *(See Table 1: Count of NGAs for Each Audit Opinion-Budget Movement Pair)*.

Table 1. Count of NGAs for Each Audit Opinion-Budget Movement Pair

Audit opinion and budget year pairs	Count of unique NGAs
2016 audit opinion – 2018 GAA	283
2017 audit opinion – 2019 GAA	288
2018 audit opinion – 2020 GAA	290
2019 audit opinion – 2021 GAA	287
2020 audit opinion – 2022 GAA	294
2021 audit opinion – 2023 GAA	300
2022 audit opinion – 2024 GAA	302

[1] The details of the data used in this study far exceeds the page and word count restrictions of the Philippine Management Review. For a copy of the complete summary of the extracted audit opinions and the processed data for budget appropriation decisions of each of the 307 NGAs, please get in touch with the author.

Furthermore, before applying the Chi-square test, preliminary assumptions for Chi-square *(See Table 2: Chi-square Assumptions)* were checked first to make sure that the datasets are fit for the test. Using the notes from Table 2, the combined dataset was transformed to satisfy the Chi-square assumptions. From this, we get seven (7) datasets fit for Chi-square test of independence *(See Table 3: Chi-square Contingency Tables for COA Audit Opinions and Budget Appropriation Decisions)*.

Table 2. Chi-square Assumptions

Assumption[a]	Note
The data in the cells should be frequencies, or counts of cases, rather than percentages or some other transformation of the data.	The counts of the data from COA audit opinions and the budget appropriation decisions for NGAs based on the defined categories above were generated
The levels (or categories) of the variables are mutually exclusive.	Each sample in the dataset fits into one and only one category of each of the COA audit opinions and the budget appropriation decisions for NGAs.
Each subject may contribute data to one and only one cell in the Chi-square contingency table.	The dataset will be grouped and separated according to the audit opinion year to ensure that each NGA contributes data on one and only one cell in the Chi-square table. The Chi-square test will be applied to each audit opinion year.
The study groups must be independent.	The audit opinion given to an NGA is independent of the audit opinion given on other NGAs. Also, the year-on-year movements of new general appropriations for each NGA is independent of that of other NGAs since the budget appropriations are based on the overall economic direction and priority areas determined by DBM and other relevant agencies.
There are 2 variables, and both are measured as categories, usually at the nominal level. However, data may be ordinal data.	The variables to be tested, COA audit opinions and budget appropriation decisions, are both categorical.
The value of the cell *expecteds* should be 5 or more in at least 80% of the cells, and no cell should have an expected of less than one.	The categories of each variable are further collapsed into 2 categories each to ensure that no cell expected has a value of less than 5. COA audit opinions are collapsed into (1) unmodified and (2) non-unmodified (includes Qualified, Adverse, Disclaimer of Opinion, and Management Letter), while budget appropriation decisions are collapsed into (1) Decrease and (2) Non-decrease (includes "increase" and "zero"). The choice of which variables to collapse into stemmed from a hypothesized behavior that when an audit report does not contain an unmodified opinion, a consequence, such as a decrease in budget, is expected.

[a] List of Chi-square assumptions from McHugh (2013, p.144).

Table 3. Chi-square Contingency Tables for COA Audit Opinions and Budget Appropriation Decisions

Unmodified opinion?	Decrease in appropriation?	
	Yes	*No*
2016 audit opinion – 2018 GAA		
Yes	10	45
No	79	149
2017 audit opinion – 2019 GAA		
Yes	14	32
No	107	135
2018 audit opinion – 2020 GAA		
Yes	23	50
No	84	133
2019 audit opinion – 2021 GAA		
Yes	33	51
No	53	150
2020 audit opinion – 2022 GAA		
Yes	37	60
No	55	142

Unmodified opinion?	Decrease in appropriation?	
	Yes	*No*
2021 audit opinion – 2023 GAA		
Yes	42	81
No	81	96
2022 audit opinion – 2024 GAA		
Yes	26	103
No	35	138

Lastly, to further isolate the effect of the audit opinion on the government budget decision-making, control variables were determined for the logistic regression analysis. Due to the scarcity of studies on the usual determinants on the government budget in the Philippines, we resorted to utilizing the normative control variables being used in similar research. According to Atinc et al. (2012), firm size is one of the most popular control variables used in the field of macro management research. We attempted to create a counterpart of firm size for the several NGAs of the Philippine government through the use of prior year budget appropriation and NGA categories as control variables. The prior year budget appropriation in the GAA may substitute for firm size as it provides insight on the size of projects and activities of the respective NGAs. Moreover, the NGA categories, as enumerated in the Memorandum Circular 2023-1 of the Department of Budget and Management (DBM) (2023), may also provide insights on the size of an NGA's projects and activities since these categories classify NGAs into the following groups based on function: (1) Departments, (2) Constitutional Offices and Others, (3) Other Executive Offices, and (4) State Colleges and Universities. The NGAs in our final dataset that were not in DAP's circular were classified under a separate category "Others".

5 Chi-square Test of Independence

Using the final datasets in Table 2, we apply the Chi-square test of independence on each year group using the Stats subpackage of the Scipy library in Python (Virtanen, et al., 2020). The Stats subpackage in Scipy uses the following formula to compute for the Chi-square statistic:

$$\text{Chi} - \text{square statistic} = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i} \tag{1}$$

where n = number of cells in the chi-square contingency table
O = observed value in the chi-square contingency table
E = expected value in the chi-square contingency table

The Chi-square statistic and p-value for each year group from the conducted Chi-square test of independence between COA audit opinions and the movements in budget appropriations for NGAs are summarized in Table 4 *(See Table 4: Chi-square Test Results)*.

Table 4. Chi-square Test Results

Year Pairs	Chi-square statistic	p-value
2016 audit opinion – 2018 GAA	5.5736	0.0182*
2017 audit opinion – 2019 GAA	3.0128	0.0826
2018 audit opinion – 2020 GAA	1.2172	0.2699
2019 audit opinion – 2021 GAA	4.9161	0.0266*
2020 audit opinion – 2022 GAA	3.1610	0.0754
2021 audit opinion – 2023 GAA	4.0482	0.0442*
2022 audit opinion – 2024 GAA	0.0003	0.9870

* p-value < 0.05

Considering the results and the established alpha of 0.05, we reject the null hypothesis for the audit opinion years 2016 (p-value = 0.0182), 2019 (p-value = 0.0266), and 2021 (p-value = 0.0442). This means that, for the audit opinion years mentioned, there is a statistically significant association between the NGAs' COA audit opinions and the year-on-year movements of the NGAs' subsequent budget appropriation in the GAA. This suggests that the COA audit opinions for years 2016, 2019, and 2021 may have been considered in the preparation of the budget of NGAs in the GAA two (2) years after.

However, for audit opinion years 2017, 2018, 2020, and 2022, we do not reject the null hypothesis. Hence, there is no sufficient evidence to conclude that an NGA's COA audit opinion, for the aforementioned years, is correlated with the movement of its budget appropriation in the GAA. Altogether, these findings suggest that majority of the audit opinions issued for the fiscal periods under the Duterte Administration, particularly, four (4) out of the seven (7) audit opinion years considered in this research (2017, 2018, 2020, and 2022), do not have a significant influence in the movement of budget appropriations. We can also conclude that, for the said audit opinion years, there is no sufficient evidence to believe that the COA audit opinions were considered, to some degree, in the budget appropriation decisions for NGAs.

Further analysis on the three (3) isolated audit opinion years were done by computing for the Cramer's V coefficient. The Cramer's V coefficient is a measure of the strength of the association of variables in a Chi-square test, computed using the following formula:

$$\text{Cramer's V coefficient} = \sqrt{\frac{\chi^2}{n(K-1)}} \tag{2}$$

where χ^2= Chi-square statistic
n = sample size
K = the smaller number between the number of rows and the number of columns

The Cramer's V coefficient should result to a correlation coefficient value that ranges from 0 to 1 (McHugh, 2013). If the correlation coefficient is close to 0, then the association of the tested categorical variables is deemed weak. On the other hand, if the correlation coefficient is close to 1 then the association of the tested categorical variables is deemed strong.

Applying the Cramer's V coefficient formula, we arrive at a correlation coefficient of 0.1403 for the 2016 audit opinion year, 0.13088 for the 2017 audit opinion year, and 0.1161 for the 2021 audit opinion year. These results show that, despite having statistically significant associations, the correlation between COA audit opinions and budget appropriation movements in the GAA for the three (3) audit opinion years mentioned above are weak. Additionally, the resulting Cramer's V correlation coefficients suggest that the movements in the budget appropriation of NGAs are only partially dependent on the COA audit opinions that the NGAs receive.

To gain more insights the three (3) audit opinion years with statistically significant chi-square test results, we further studied their respective Chi-square contingency tables. Sharpe (2015) suggests that a statistically significant omnibus chi-square test result may be explored through the calculation of residuals. The calculation of residuals, or residual analysis, helps in identifying the specific cells in the Chi-square contingency table that make the greatest contribution to the Chi-square test result (Sharpe, 2015). As such, conducting a residual analysis for the audit opinion years 2016, 2019, and 2021 would allow us to determine the specific categorical variable relationship contributed most on the measure that led us to conclude that a statistically significant association exists. We then calculated the residuals for each cell in the Chi-square contingency table using the Pearson residual formula:

$$\text{Standardized residual or Pearson residual} = \sum \frac{(O-E)}{\sqrt{E}} \tag{3}$$

where O = observed value in the chi-square contingency table
E = expected value in the chi-square contingency table

A summary of the resulting Pearson residuals for the Chi-square contingency tables for years 2016, 2019, and 2021 are summarized in Table 5 *(See Table 5: Observed Values, Expected Values, and Pearson Residuals of the Chi-square Contingency Tables)*.

Table 5. Observed Values, Expected Values, and Pearson Residuals of the Chi-square Contingency Tables

Unmodified opinion in auditor's report?		Decrease in appropriation?	
		Yes	No
2016 audit opinion – 2018 GAA			
Yes	*Observed value*	10	45
	Expected value	17.29682	37.70318
	Pearson residual	-1.75449	1.188351
No	*Observed value*	79	149
	Expected value	71.70318	156.2968
	Pearson residual	0.861717	-0.58366
2019 audit opinion – 2021 GAA			
Yes	*Observed value*	33	51
	Expected value	25.17073	58.82927
	Pearson residual	1.560534	-1.02076
No	*Observed value*	53	150
	Expected value	60.82927	142.1707
	Pearson residual	-1.00384	0.656623
2021 audit opinion – 2023 GAA			
Yes	*Observed value*	42	81
	Expected value	50.43	72.57
	Pearson residual	-1.18709	0.989576
No	*Observed value*	81	96
	Expected value	72.57	104.43
	Pearson residual	0.989576	-0.82493

Sharpe (2015) notes that, the larger the residual of a cell is in a Chi-square contingency table, the greater the contribution of that cell in the magnitude of the resulting Chi-square obtained value. Given the results of this research, the biggest contributor in the magnitude of the Chi-square statistic for all the three (3) audit opinion years is the frequency of NGAs who received unmodified audit opinion but experienced a decrease in the budget appropriated in the GAA. This suggests that the said frequency for the three (3) isolated audit opinion years were significantly different from what is expected from chance alone. To further understand the nature of this significant difference, we conduct a cell-by-cell comparison of observed and estimated expected frequencies of NGAs who received unmodified audit opinion but experienced a decrease in the budget appropriated in the GAA (Agresti, 2013).

For the audit opinion years 2016 and 2021, the observed number of NGAs who received unmodified audit opinions but experienced a decrease in the budget appropriated in the GAA (10 for 2016 and 42 for 2021) were significantly lower than expected (17.29682 for 2016 and 50.43 for 2021). We can infer from these results that, for the 2017 (2016 audit opinion – 2018 GAA) and 2022 (2021 audit opinion – 2023 GAA) budget preparations, fewer NGAs who received an unmodified opinion experienced a decrease in budget appropriation than if the variables were truly independent.

However, for audit opinion year 2019, the observed number of NGAs who received unmodified audit opinions but experienced a decrease in the budget appropriated in the GAA (33) was significantly higher than expected (25.17073). This tells us that, for the 2020 budget preparation (2019 audit opinion – 2021 GAA) more NGAs who received an unmodified opinion experienced a decrease in budget appropriation than if the variables were truly independent.

6 Logistic Regression Analysis

Using the established control variables and logistic regression, we next determined the significance of audit opinions in the government budget appropriation decisions when other determinants of budget appropriations are considered. For our dependent variable, we used the budget appropriation movements in the GAA (GAA movement_decrease), a categorical variable that contains the value "True" when the NGA's budget appropriations decreased for the particular year and "False" if otherwise.

For our predictor variables, we used the relevant variables, described in Table 6, that we determined earlier in Section 4 of this research *(See Table 6: Predictor Variables for the Logistic Regression Model)*. After running the logistic regression in our dataset using the selected variables and the "statsmodels" library in Python, we arrive at the following results shown in Table 7 *(See Table 7: Logistic Regression Results)*.

Table 6. Predictor Variables for the Logistic Regression Model

Variable	Description
Prior year budget appropriation in GAA (*Prior GAA*)	A nominal variable that represents the amount of budget appropriation received by an NGA from the prior fiscal year.
Audit opinion (*Audit opinion_Unqualified*)	A categorical variable representing the audit opinion received by an NGA 2 years prior to the budget being prepared. The variable contains the value "True" when the audit opinion is unqualified and "False" when the audit opinion is not unqualified (i.e., qualified, adverse, disclaimer of opinion, management letter).
NGA categories: Departments (*Categories_Departments*)	A categorical variable representing whether the NGA is classified as a "Department" under DAP Memorandum Circular 2023-1. The variable contains the value "True" when the NGA is classified as "Department" and "False" if otherwise.
NGA categories: Constitutional Offices and Others (*Categories_ Constitutional Offices and Others*)	A categorical variable representing whether the NGA is classified as a "Constitutional Offices and Others" under DAP Memorandum Circular 2023-1. The variable contains the value "True" when the NGA is classified as "Constitutional Offices and Others" and "False" if otherwise.
NGA categories: Other Executive Offices (*Categories_Other Executive Offices*)	A categorical variable representing whether the NGA is classified as a "Other Executive Offices" under DAP Memorandum Circular 2023-1. The variable contains the value "True" when the NGA is classified as "Other Executive Offices" and "False" if otherwise.
NGA categories: State Universities and Colleges (*Categories_State Universities and Colleges*)	A categorical variable representing whether the NGA is classified as a "State Universities and Colleges" under DAP Memorandum Circular 2023-1. The variable contains the value "True" when the NGA is classified as "State Universities and Colleges" and "False" if otherwise.

Table 7. Logistic Regression Results

Variables	Coef	Std Err	z	P>|z|
2016 audit opinion – 2018 GAA				
Prior GAA	-2.61E-08	2.28E-08	-1.146	0.252
Audit opinion_Unqualified	-0.9081	0.378	-2.404	**0.016**
Categories_Departments	-0.7933	0.219	-3.623	0
Categories_Constitutional Offices and Others	0.0338	1.001	0.034	0.973
Categories_Other Executive Offices	-1.0419	0.519	-2.008	0.045
Categories_State Universities and Colleges	-0.1865	0.195	-0.954	0.34
2017 audit opinion – 2019 GAA				
Prior GAA	5.83E-09	4.78E-09	1.219	0.223

Variables	Coef	Std Err	z	P>|z|
Audit opinion_Unqualified	-0.696	0.358	-1.944	**0.052**
Categories_Departments	-0.4092	0.192	-2.136	0.033
Categories_Constitutional Offices and Others	-1.641	1.096	-1.497	0.134
Categories_Other Executive Offices	0.3443	0.432	0.798	0.425
Categories_State Universities and Colleges	-0.0879	0.192	-0.458	0.647
2018 audit opinion – 2020 GAA				
Prior GAA	-4.69E-08	2.51E-08	-1.872	0.061
Audit opinion_Unqualified	-0.5203	0.306	-1.703	**0.089**
Categories_Departments	-0.1627	0.22	-0.74	0.46
Categories_Constitutional Offices and Others	0.93	0.88	1.056	0.291
Categories_Other Executive Offices	-0.0627	0.441	-0.142	0.887
Categories_State Universities and Colleges	-0.4503	0.197	-2.285	0.022
2019 audit opinion – 2021 GAA				
Prior GAA	-1.61E-08	1.18E-08	-1.364	0.173
Audit opinion_Unqualified	0.1071	0.29	0.369	**0.712**
Categories_Departments	-0.35	0.221	-1.584	0.113
Categories_Constitutional Offices and Others	-0.896	0.843	-1.063	0.288
Categories_Other Executive Offices	-0.5998	0.451	-1.331	0.183
Categories_State Universities and Colleges	-1.6888	0.265	-6.371	0
2020 audit opinion – 2022 GAA				
Prior GAA	-4.05E-09	4.62E-09	-0.876	0.381
Audit opinion_Unqualified	0.107	0.271	0.394	**0.693**
Categories_Departments	-0.6561	0.221	-2.963	0.003
Categories_Constitutional Offices and Others	-0.9273	0.841	-1.102	0.27
Categories_Other Executive Offices	0.3338	0.413	0.808	0.419
Categories_State Universities and Colleges	-1.2624	0.232	-5.451	0
2021 audit opinion – 2023 GAA				
Prior GAA	-5.10E-09	4.32E-09	-1.181	0.238
Audit opinion_Unqualified	-0.6566	0.255	-2.574	**0.01**
Categories_Departments	0.0997	0.221	0.452	0.651
Categories_Constitutional Offices and Others	0.0209	0.781	0.027	0.979
Categories_Other Executive Offices	-0.1203	0.435	-0.276	0.782
Categories_State Universities and Colleges	-0.1328	0.194	-0.684	0.494
2022 audit opinion – 2024 GAA				
Prior GAA	-1.62E-08	1.48E-08	-1.095	0.274
Audit opinion_Unqualified	-0.6211	0.314	-1.979	**0.048**
Categories_Departments	-0.9221	0.268	-3.435	0.001
Categories_Constitutional Offices and Others	-0.5226	0.862	-0.606	0.544
Categories_Other Executive Offices	0.246	0.435	0.565	0.572
Categories_State Universities and Colleges	-1.727	0.272	-6.35	0

Based on the results of the logistic regression models above for each year pairs, we determined that, after controlling for size using prior year budget levels and NGA categories, the audit opinion for years 2016 (p-value = 0.016), 2021 (p-value = 0.01), and 2022 (p-value = 0.048) are considered to have a significant relationship with their respective year-on-year budget appropriation movements. Similar to our Chi-square test of significance, 2016 and 2021 audit opinions may have been considered in their respective budget preparation periods. However, unlike the results from our Chi-square test of independence, after considering other predictor variables through logistic regression, audit opinion year 2019 did not appear to have a statistically significant influence towards its year-on-year budget appropriation movements while 2022 appeared to have statistically significant influence towards its year-on-year budget appropriation movements based on empirical data.

Nonetheless, consistent with our Chi-square test of independence, majority of the audit opinions issued for the fiscal periods under the Duterte Administration, particularly four (4) out of the seven (7) audit opinion years considered in this research (2017, 2018, 2019, and 2020), do not have a significant influence in the movement of budget appropriations. This shows that, even if audit opinions are actually being considered in budget appropriation decisions of the Philippine government, there is empirical evidence suggesting that the application of this practice is not consistent across all years during the Duterte Administration.

7 Conclusion

Using the Chi-square test of independence and logistic regression analysis on the empirical data from 2016 to 2024, we determined whether the year-on-year movement of budget appropriations for NGAs are influenced by the COA audit opinion that NGAs receive. Based on the results, most of the audit opinions issued to NGAs during the Duterte Administration (2016-2022) do not have a significant influence on the year-on-year movement of budget appropriations for NGAs. Specifically, out of the seven (7) audit opinion years that we tested, only three (3) audit opinion years, for both tests, consistently showed statistically significant empirical evidence on the existence of an association between COA audit opinions and year-on-year movements of budget appropriations for NGAs. This shows that, in the majority of the audit periods included in our sample, the COA audit opinions did not have a significant influence in the budget appropriation decisions for NGAs.

Moreover, after subsequently applying Cramer's V coefficient on the three (3) audit opinion years that showed statistically significant association in our Chi-square test of independence (2016, 2019, and 2021), results showed that all of them have correlation coefficients that are close to 0. This suggests that, despite the association between audit opinion and budget appropriation decisions being statistically significant for the three (3) remaining years, statistical evidence shows that this correlation between COA audit opinions and year-on-year movement of budget appropriations on NGAs is weak.

Furthermore, conducting a residual analysis on the statistically significant associations concluded for audit opinion years 2016, 2019, and 2021, under the Chi-square test of independence, shows that, in all audit opinion years mentioned, the number of NGAs who received unmodified audit opinion but experienced a decrease in the budget appropriated in the GAA was significantly different from what was expected if both variables were independent. Specifically, for audit opinion years 2016 and 2021, the number of NGAs who received unmodified audit opinion but experienced a decrease in the budget appropriated in the GAA was lower than expected. This observation is consistent with the general idea where compliance on financial reporting is not expected to be associated with budget consequences. However, for audit opinion year 2019, the number of NGAs who received unmodified audit opinion but experienced a decrease in the budget appropriated in the GAA was higher than expected. This raises a cause of concern as compliance on financial reporting is not expected to significantly be associated with decreases in budget appropriations. Moreover, not having the frequency of NGAs who received modified audit opinions but experienced a decrease in the budget appropriated in the GAA as the biggest contributor in the Chi-square statistic from the residual analysis poses a question on whether budget consequences are imposed on NGAs that are not compliant with government financial reporting standards. As mentioned earlier, when making budget appropriation decisions, attention

should be given to government agencies who receive negative audit reports as these reports may point out misstatements that could potentially be instances of misuse of government funds.

This study serves as a preliminary assessment on whether government audits serve their purpose in the principal-agent relationships in the government. The study was also able to gather and summarize empirical data on COA audit opinions that may be used in conducting further studies on government accounting and other related areas.

8 Limitations and Recommendations

For the audit opinion and year-on-year budget movement pairs for this study, it was assumed that the audit reports from COA were issued within one (1) fiscal year after the audited fiscal year based on DBM's budget cycle timeline. Hence, no further process was applied to determine which audit reports were released late by COA.

Moreover, due to the scarcity of studies on empirical data regarding government budgeting, this study was only able to consider prior GAA appropriations and NGA categories in isolating the effect of audit opinions on the outcome of budget appropriations for NGAs. Further studies may explore adding more factors and variables (e.g., categorical variables that determine whether the NGAs have programs and projects that are within the priority areas established during the budget preparation phase of government budgeting) to make the research model more robust. In any case, this study serves as preliminary research on whether legislators and decision makers in the Philippine government actually consider the information contained in audit reports when making budget appropriation decisions.

References

Agresti, A. (2013). *Categorical data analysis* (3rd ed.). John Wiley & Sons.

Atinc, G., Simmering, M. J., & Kroll, M. J. (2012). Control variable use and reporting in macro and micro management research. *Organizational Research Methods*, *15*(1), 57-74. https://doi.org/10.1177/109442811039777

Blöndal, J. (2010), Budgeting in the Philippines, *OECD Journal on Budgeting*, *10*(2). https://doi.org/10.1787/budget-10-5km7rqpf57hb

Commission on Audit. (2022, June 22). *Clarification on the use of the phrase 'Highest COA Audit Rating'*. https://www.coa.gov.ph/clarification-on-the-use-of-the-phrase-highest-coa-audit-rating

Commission on Audit. (n.d.-a). *Annual Audit Reports*. https://www.coa.gov.ph/reports/annual-audit-reports/

Commission on Audit. (n.d.-b). *Financial Audit Manual*. https://www.coa.gov.ph/download/2299/financial-audit-manual/467/financial-audit-manual.pdf

Department of Budget and Management (n.d.-a). *Basic Concepts in Budgeting*. https://www.dbm.gov.ph/wp-content/uploads/2012/03/PGB-B1.pdf

Department of Budget and Management (n.d.-b). *The Budget Cycle*. https://www.dbm.gov.ph/wp-content/uploads/Executive%20Summary/2016/Budget%20Cycle.pdf

Department of Budget and Management (2023). *Memorandum Circular 2023-1*. https://www.dbm.gov.ph/index.php?view=article&id=77:memorandum-circular-no-2023-1&catid=99

Franke, T. M., Ho, T., & Christie, C. A. (2012). The Chi-Square Test: Often Used and More Often Misinterpreted. *American Journal of Evaluation*, *33*(3), 448-458. https://doi.org/10.1177/1098214011426594

Hay, D., & Cordery, C. (2018). The value of public sector audit: Literature and history. *Journal of Accounting Literature*, *40*(1), 1-15. https://doi.org/10.1016/j.acclit.2017.11.001

He, J. (2023). *The Role of Federal Agency Accounting Quality in Federal Budget Allocation: Evidence from Audit Opinions* [Doctoral dissertation, The University Of Texas at Dallas]. https://utd-ir.tdl.org/server/api/core/bitstreams/aa92b300-98cc-403f-acae-635ae6df5d4c/content

International Budget Partnership. (2021). *Open Budget Survey 2021*. https://internationalbudget.org/open-budget-survey/country-results/2021/philippines

Kurniawati, A. D., & Pratama, Y. M. (2021). The role of government auditing in controlling the level of corruption in Indonesia. *Jurnal Akuntansi dan Auditing Indonesia*, *25*(1), 54-64. https://doi.org/10.20885/jaai.vol25.iss1.art6

McHugh, M. (2013). The Chi-square test of independence. *Biochemia Medica*, *23*(2), 143-149. http://dx.doi.org/10.11613/BM.2013.018

Peng, C. Y. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research*, *96*(1), 3-14. https://doi.org/10.1080/00220670209598786

Puntillo, P. (2013). Analyzing the potentiality of the government budget in the framework of public accountability. *Corporate Ownership & Control, 11*(1), 243-258.

Santiso, C. (2015). Why budget accountability fails? The elusive links between parliaments and audit agencies in the oversight of the budget. *Brazilian Journal of Political Economy*, *35*(3), 601-621. http://dx.doi.org/10.1590/0101-31572015v35n03a12

Seares, P.A. (2022, June 27). *EXPLAINER: COA clarifies 'highest rating' it gave Cebu City, other agencies in 2021. Late but still useful. Audited units may brag provided they don't change COA meaning, mislead the public*. SunStar. https://www.sunstar.com.ph/cebu/local-news/explainer-coa-clarifies-highest-rating-it-gave-cebu-city-other-agencies-in-2021-late-but-still-useful-audited-units-may-brag-provided-they-dont-change-coa-meaning-mislead-the-public

Sharpe, D. (2019). Chi-Square Test is Statistically Significant: Now What? *Practical Assessment, Research, and Evaluation*, *20*(1), 8. https://doi.org/10.7275/tbfa-x148

Streim, H. (1994). Agency problems in the legal political system and supreme auditing institutions. *European Journal of Law and Economics*, 1, 177-191. https://doi.org/10.1007/BF01552469

Virtanen, P., Gommers, R., Oliphant, T. E., Haberland, M., Reddy, T., Cournapeau, D., Burovski, E., Peterson, P., Weckesser, W. Bright, J., Van Der Walt, S., Brett, M., Wilson, J., Millman, K. J., Mayorov,

N., Nelson, A.R.J., Jones, E., Kern, R., Larson, E., Carey C.J., Polat İ., Feng Y., Moore, E.W., VanderPlas, J, Laxalde, D, Perktold, J, Cimrman, R, Henriksen, I, Quintero, E.A., Harris, C.R., Archibald, A.M., Ribeiro, A.H., Pedregosa, F, & Van Mulbregt, P. (2020). SciPy 1.0: fundamental algorithms for scientific computing in Python. *Nature methods*, *17*(3), 261-272. https://doi.org/10.1038/s41592-019-0686-2