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Do Government Audits Reduce Budgetary Non-Compliance?

—An Empirical Analysis of Budget Execution Audits in Central Government Departments in China

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Abstract

Over the years, audit reports released by audit departments have highlighted numerous instances of budgetary non-compliance during budget execution, involving substantial amounts of budget funds. Some of these non-compliance issues are closely related to budget adjustments. Although budget adjustments do not necessarily involve budgetary non-compliance, irregularities in budget adjustments undermine the legitimacy of the budget and the sustainability of public finances. To effectively regulate budget adjustments, reduce instances of budgetary non-compliance, and improve the standardization of budget execution, we established panel data on the budget execution audit of central departments from 2008 to 2017 to analyze the impact of government audit coverage, supervisory functions, and advisory functions on budgetary non-compliance. The results are as follows: Firstly, there is a significant negative correlation between budget adjustments and budgetary non-compliance, with the regulation of budget adjustments being effectively strengthened. Secondly, audit coverage is significantly negatively correlated with budgetary non-compliance, while audit supervision functions show a significant positive correlation with budgetary non-compliance. However, the advisory functions have yet to demonstrate their effectiveness. Thirdly, audit functions do not exhibit a relationship with budgetary non-compliance in the subsequent year, indicating that the deterrent effect of government audits requires further improvement.

Keywords

Budget Adjustment, Government Audits, Budgetary Non-Compliance

1. Introduction

Audits constitute an essential component of the oversight system of the Party and the nation. The 14th Five-Year Plan for National Audit Work Development, issued by China in 2021, emphasizes that audit efforts should focus on departmental budget execution to ensure the optimization of the fiscal expenditure structure and enhance financial support for major national strategic tasks. However, annual budget audit reports published by Chinese audit departments reveal that budgetary non-compliance remains widespread. Specific issues include low execution rates for expenditure items, failure to remit non-tax revenue to the treasury as required, and unauthorized adjustments to project budgets. Such budgetary non-compliance not only challenges the legitimacy of the budget but also threatens fiscal sustainability to some extent (Zheng & Sun, 2017).

To effectively address budgetary non-compliance, China has continuously improved the regulatory mechanisms and supervisory systems for budget execution. Notable measures include the implementation of the new *Budget Law of the People's Republic of China* (hereinafter referred to as the "New Budget Law") on January 1, 2015, and the promotion of comprehensive government audit coverage. The new Budget Law explicitly defines the circumstances and procedures for budget adjustments, stipulating that no budget adjustments may be made without approval, thereby enhancing budgetary compliance. Additionally, central government departments have implemented comprehensive audit coverage since 2018 and have gradually expanded the scope and intensity of audits. However, despite the gradual strengthening of government audits, budgetary non-compliance remains prevalent and even exhibits a recurring pattern of "non-compliance despite repeated audits". Therefore, this paper examines the effectiveness of government audits based on budget execution audits of central departments to determine whether government audits help reduce budgetary non-compliance.

2. Literature Review

Budgetary non-compliance is widespread during the execution due to its multi-faceted and complex causes. Existing research indicates that scholars, both domestically and internationally, have explored the root causes and influencing factors of budgetary non-compliance from macro, meso, and micro perspectives. Firstly, at the macro level, institutional factors include multi-party systems, electoral systems, and fiscal rules. The political budget cycle may lead some opportunistic politicians to seek votes through budget deficits or non-compliance (Gootjes et al., 2021), while strong fiscal rules can help mitigate this phenomenon, improving the budget balance and reducing non-compliance (Luechinger & Schaltegger, 2013). Secondly, at the meso level, the focus is on the limitations of the budgeting system itself, particularly the inadequacies in the budget execution audit system and its supporting mechanisms (Xue, 2012). Furthermore, the imbalance in the budgetary power structure and the absence of accountability and control mechanisms

are among the underlying causes of persistent budgetary non-compliance (Luo, 2010). Thirdly, at the micro level, factors such as budget transparency, the budgetary environment, and budget adjustments directly impact non-compliance. Improving budget transparency enhances the openness of fiscal information, strengthens accountability mechanisms, and fosters democratic oversight, thereby effectively curbing budgetary non-compliance (Li, 2007; Bellanca, 2014; Liu & Chen, 2019). Additionally, the availability of fiscal resources and the level of public attention also significantly influence non-compliance tendencies: when resources are abundant and public attention is low, the risk of budgetary non-compliance is higher (Zheng & Sun, 2015). Overall, the causes of budgetary non-compliance are diverse, encompassing multi-level factors related to institutions, power structures, and management aspects.

2.1. Budget Adjustments and Budgetary Non-Compliance

There is a significant correlation between budget adjustments and budgetary non-compliance, but existing research remains inconclusive. Firstly, one perspective posits that budget adjustments enhance the discretion of central departments and various levels of government during budget execution, thereby increasing the likelihood of budgetary non-compliance. This was particularly evident before the implementation of the new Budget Law in 2015 when budget adjustments lacked legal regulation and effective oversight (Liu & Hou, 2012). Furthermore, the ineffectiveness of the People's Congress in exercising budgetary oversight and the weakness of accountability mechanisms left budget execution inadequately safeguarded (Zhu & Li, 2012). As a result, budget adjustments were viewed as a contributing factor to budgetary non-compliance (Wang, 2011). In such circumstances, the absence of supervision and accountability led to adverse selection and moral hazard, further heightening the risk of budgetary non-compliance (Chen & Li, 2015).

Secondly, an alternative perspective suggests that budget adjustments do not necessarily lead to budgetary non-compliance. Budget adjustments can be classified into two types: reduction-oriented and supplementary. Reduction-oriented adjustments are typically associated with an increase in the rate of budgetary non-compliance, as reductions may lead to funding shortages that trigger violations. In contrast, supplementary adjustments are often accompanied by stricter budgetary accountability, which can help reduce instances of non-compliance (Zheng & Sun, 2017). In addition, budget adjustments are inherently rational, as they allow for responses to unexpected circumstances and changes beyond the initial budget plan, thereby enhancing budget execution efficiency. Although excessive supervision of budget adjustments may reduce the risk of non-compliance, it can also lead to financial losses (Ma & Miao, 2017). Therefore, it is crucial to emphasize the standardization and effectiveness of budget adjustments (Li, 2015), as well as to maintain an appropriate balance between flexibility and control during the adjustment process (Li, 2018).

2.2. Government Audit and Budgetary Non-Compliance

Government auditing is widely regarded as an institutional mechanism for supervising and constraining power (Zheng, 2015). With the evolution of the concept of public accountability, the function of government audit has extended beyond economic oversight to encompass multidimensional national governance functions, including promoting clean government construction, ensuring citizens' right to know, protecting the ecological environment, and improving people's livelihood (Liu & Liu, 2014). Government auditing not only performs economic oversight, evaluation, and defensive functions but also plays a significant advisory role (Zhang, 2010).

Within the national governance system, government auditing plays a latent role in governance through mechanisms such as protection, elimination, and remediation (Shi et al., 2009). However, existing research has not yet reached a consensus on this conclusion. On the one hand, some studies suggest that government auditing helps reduce budgetary non-compliance. By exposing, addressing, and penalizing budgetary non-compliance, government auditing promotes the standardization of budget management and advances the improvement of national governance. Research shows a significant negative correlation between government auditing and budgetary non-compliance: the higher the audit frequency, the fewer instances of budgetary non-compliance. This finding suggests that audits effectively correct budgetary deviations and reduce occurrences of non-compliance (Zheng & Sun, 2015). However, other studies argue that the role of government auditing is limited. Some research based on public choice theory suggests that the public sector weighs the benefits of non-compliance against the costs imposed by audits, thereby reducing the deterrent effect of auditing on budgetary non-compliance (Song & Zheng, 2014; Xie et al., 2019). Specifically, the impact of prior-year auditing activities on the current year's budgetary non-compliance rate is not insignificant (Tian & Zheng, 2016).

Given the ongoing debate regarding whether government auditing effectively constrains budgetary non-compliance, existing empirical studies have provided some valuable insights but remain relatively limited. Most studies focus narrowly on the accountability mechanisms within fiscal pathways, neglecting other functions of government auditing. Moreover, measurements of government auditing tend to be one-dimensional, emphasizing either inputs or outputs (Li et al., 2017). Meanwhile, most studies focus on the supervisory and accountability functions of government audits, with relatively little attention given to their advisory functions.

Building on these observations, this study analyzes the impact of government audit functions on budgetary non-compliance from a governance perspective. Specifically, using budget execution audit data from central government departments, it aims to address two key research questions: 1) How do budget adjustments influence budgetary non-compliance? 2) How can government audits mitigate budgetary non-compliance effectively? This study makes several notable contributions. Firstly, it extends the research on budget management behaviors. Furthermore, it examines the corrective effects of government audits on budget-

ary non-compliance, enriching existing studies on government audits. Finally, it provides significant policy implications for strengthening and advancing government audit practices.

3. Theoretical Analysis and Research Hypotheses

3.1. Budget Adjustment and Budgetary Non-Compliance

The existence of budget non-compliance indicates that departments do not comply with relevant financial regulations during the budget execution process. Theoretically, there exists a principal-agent relationship between the budget execution units and the public (Ma & Ye, 2016). However, as agents, budget execution units often aim to maximize their own interests, which may lead them to deviate from the budget formulated at the beginning of the year during the execution process. Meanwhile, the information asymmetry between the principal and the budget execution units may lead to moral hazard, which can, in turn, result in budgetary non-compliance.

At the execution level, budget adjustment refers to the legal revision of the originally approved budget due to unforeseen events during the budget execution process (Li & Liu, 2020). Budget adjustments typically occur mid-year and must be reviewed and approved by the National People's Congress and local People's Congresses at all levels. However, the information barrier between the executors and the commissioners may lead to arbitrariness in budget adjustments. In the absence of effective regulations, budget-executing entities may abuse their autonomy, using unreasonable adjustments to conceal violations. Moreover, the oversight of budget adjustments by the People's Congress may be insufficient, failing to effectively identify and prevent non-compliance, resulting in some budgetary non-compliance going undetected in audits (Zheng, 2014). Consequently, budget adjustments effectively create leeway for Budgetary non-compliance, thereby condoning such behavior to some extent.

The new Budget Law emphasizes the importance of regulating budget execution and budget adjustments, proposing that budget adjustment plans, procedures, and fund usage should be strictly regulated. When the budget adjustment process is subject to effective oversight and regulation, unexpected events during budget execution will be handled more cautiously. Therefore, to enhance the regularity of budget execution and reduce the likelihood of audit findings of violations by budget-executing units, although the scale of departmental budget adjustments may increase, the procedures will become more standardized. Based on the above analysis, the following research hypothesis is proposed:

Hypothesis 1: The greater the number of budget adjustments, the lower the degree of budgetary non-compliance.

3.2. The Impact of Government Audit Functions on Budgetary Non-Compliance

The impact of government audit functions on budgetary non-compliance is pri-

marily reflected in three aspects. Firstly, audit institutions uncover budgetary non-compliance by reviewing the budget execution process, thereby reducing information asymmetries in the principal-agent relationship. Specifically, audit institutions enhance transparency in budget execution through regular reviews and the disclosure of audit reports. This reduces informational disparities between agents and principals, enabling principals to more effectively oversee the budget execution of implementing departments, which increases the likelihood of detecting and ensuring accountability for budgetary non-compliance. Consequently, it enhances the deterrent effect of government audits and raises the cost of non-compliance. With the same objective of maximizing benefits, implementing departments will reduce instances of budgetary non-compliance in pursuit of profit maximization.

Secondly, after identifying issues, government audits take corrective actions that promote social accountability, horizontal accountability, and bureaucratic accountability (Ma, 2011), thereby serving the purpose of preventing and penalizing budgetary non-compliance (Zheng & Sun, 2017). Specifically, audit institutions require implementing departments to take corrective actions and reinforce a deterrent effect for the following year's budget execution, thus aligning the objectives of the implementing departments with those of the principals.

Finally, the advisory consultation function of government audits offers guidance for improving budget execution, playing a critical role in correcting and preventing budgetary non-compliance. Through continuous communication and improvement recommendations, government audits raise awareness of budgetary non-compliance among central departments. They also help these departments understand public expectations, clarify strategies for improving budget formulation and execution, and enhance the overall effectiveness of budget execution. As a result, government audits effectively curb instances of budgetary non-compliance. Moreover, the new Budget Law emphasizes the public disclosure of audit reports on budget execution and other fiscal expenditures, further strengthening the deterrent effect of government audits. Based on these insights, this study proposes the following research hypothesis:

Hypothesis 2: The stronger the functions of government audits, the lower the degree of budgetary non-compliance.

4. Empirical Research Design

4.1. Sample Selection and Data Sources

Since China's central government departments had not achieved comprehensive audit coverage prior to 2018, the number of departments audited each year varied, and it was uncertain whether a specific department was audited in a given year. Additionally, beginning in 2018, the audit reports published by the National Audit Office of China no longer included specific recommendations. To maintain the consistency and comparability of the data, this study constructs a panel database of budget execution audits for central government departments audited six times

or more between 2008 and 2017. The data are sourced from the annual audit reports on budget execution of central departments and other financial expenditures published by the National Audit Office. The statistical analysis reveals that 27 central government departments were audited six times or more during this ten-year period, as shown in Table 1. However, due to the extended time span and inconsistent levels of data disclosure across years, some variables have missing or untraceable data. To ensure the validity of the panel data, these incomplete observations were excluded, resulting in a final dataset comprising 26 departments and 164 valid samples.

Table 1. Statistics of audit frequency for central government departments in China from 2007 to 2018.

Audit Frequency	Departments	Number of Departments
Annually	Ministry of Foreign Affairs, National Development and Reform Commission, Ministry of Education, Ministry of Science and Technology, Ministry of Public Security, Ministry of Commerce, Ministry of Finance, People's Bank of China, China Securities Regulatory Commission	9
9 Times Accumulated	Ministry of Housing and Urban-Rural Development, Ministry of Civil Affairs, National Council for Social Security Fund, Ministry of Human Resources and Social Security, Ministry of Industry and Information Technology, State-Owned Assets Supervision and Administration Commission, Ministry of National Resources, Ministry of Agriculture and Rural Affairs, Ministry of Culture and Tourism	9
8 Times Accumulated	State Taxation Administration, Ministry of Transport, Chinese Academy of Sciences, Ministry of Ecology and Environmental	4
7 Times Accumulated	Ministry of Water Resources, National Ethnic Affairs Commission, Ministry of Justice	3
6 Times Accumulated	General Administration of Sport, China Meteorological Administration	2

Data on budgetary non-compliance, the number of key audit units per year, audit coverage, the number of audit reports, the number of audit recommendations, and departmental budget scales are sourced from audit announcements published on the National Audit Office's website. Budget and final accounts data are primarily retrieved from the information disclosure sections of official departmental websites and the official Chinese government website. Additionally, data on public attention, represented by the Baidu PC Index, is obtained from the "Baidu Index" platform. This diversified dataset ensures a comprehensive analysis of the factors influencing budgetary non-compliance.

4.2. Model Design and Indicator Selection

4.2.1. Dependent Variable

Based on the theoretical analysis presented earlier, a government audit model is constructed with specific settings as follows:

$$BNC_{it} = \alpha_i + \beta_1 BAM_{it} + \beta_2 ACR_{it} + \beta_3 ASF_{it} + \beta_4 AAF_{it} + \beta_5 BT_{it} + \beta_6 AI_{it} + \beta_7 FA_{it} + \beta_8 PA_{it} + \beta_9 DBS_{it} + u_{it} + \varepsilon_i$$

Budgetary Non-Compliance (BNC) is defined as the dependent variable in this study, representing the extent to which government budget practices deviate from financial regulations. Before 2018, due to the incomplete coverage of government audits, it was impossible to fully capture budget non-compliance across all departments. Information on budget non-compliance was limited to the audited departments in each specific year. According to Tian and Zheng (2016), the extent of budgetary non-compliance is quantified by the budget non-compliance rate. Specifically, the monetary value of major non-compliance disclosed in audit reports is aggregated to calculate this rate. The formula is as follows:

$$\text{Budget non-compliance rate (BNC)} = \frac{\text{Amount of budget non-compliance}}{\text{Total audited budget funds reported in the audit report}}$$

4.2.2. Independent Variables

1) Budget Adjustment

Annual budget adjustments must be submitted to the National People's Congress and local People's Congresses at all levels for approval. However, due to the lengthy approval process and the dispersed nature of budget adjustment proposals, it is challenging to collect accurate data on the exact amount of budget adjustments. Therefore, the extent of budget adjustments is reflected by the difference between the final account and the initial budget. The calculation formula is as follows:

$$\text{Budget Adjustment Magnitude (BAM)} = \frac{\text{Final approved fiscal appropriation expenditure in the final account draft}}{\text{Fiscal appropriation disclosed in the initial budget}} - \frac{\text{Fiscal appropriation expenditure disclosed in the initial budget}}{\text{Fiscal appropriation disclosed in the initial budget}}$$

2) Government Audit

The functions of government audits are categorized into audit inputs and outputs (Xie et al., 2019). Audit input refers to the extent of audit coverage, which is quantified using the audit coverage rate (ACR) disclosed in departmental audit announcements. A higher ACR for a department in a given year indicates a greater audit input in terms of coverage for that year. The calculation formula is as follows:

$$\text{Audit Coverage Rate (ACR)} = \frac{\text{Audited budget expenditure}}{\text{Total departmental budget expenditure approved by the Ministry of Finance}}$$

Secondly, regarding government audit outputs, audits primarily encompass the functions of audit supervision (ASF) and audit advisory consultation (AAF). After completing an audit, the audit agency submits audit reports, decisions on penal-

ties, and corresponding recommendations to the audited entity. Therefore, the supervisory function of the audit and the advisory consultation function can be measured by the number of audit reports, decisions, and recommendations listed in the audit announcements. However, since the audit announcements do not specifically enumerate the quantities of reports, decisions, and recommendations, this paper categorizes the content based on semicolons within the paragraphs, allowing for separate counting of the number of submitted reports and decisions, as well as the number of audit recommendations.

4.2.3. Control Variables

This study identifies the following control variables based on existing research: budget transparency (BT), fiscal slack (FS), public attention (PA), audit intensity (AI), and department budget size (DBS), as summarized in Table 2. These control variables are selected for their relevance to budget non-compliance.

Table 2. Summary of variable operationalization.

	Variables	Operationalization
Dependent Variable	Budgetary Non-Compliance (BNC)	Budgetary Non-Compliance Rate = Amount of Budgetary Non-Compliance/Total Budget Funds Audited as Reported in the Audit
Independent Variables	Budget Adjustment Magnitude (BAM)	Budget Adjustment Magnitude = (Final Fiscal Appropriation in the Final Accounts − Appropriations in the Initial Budget)/ Appropriations in the Initial Budget
	Audit Coverage Rate (ACR)	Audit Coverage Rate = Audited Budget Expenditure/Total Budget Expenditure Approved by the Ministry of Finance
	Audit Supervision Function (ASF)	Number of Reports and Decisions Submitted by the Audit
	Audit Advisory Function (AAF)	Number of Suggestions Provided by the National Audit Office in Response to Identified Issues
Control Variables	Budget Transparency (BT)	Based on the Budget Transparency Evaluation Criteria of Deng Shulian and Zheng Shiqiao
	Fiscal Slack (FS)	Department's Budgeted Expenditure for the Year/Department's Final Expenditure for the Year
	Public Attention (PA)	Average Baidu Index for the Year
	Audit Intensity (AI)	Number of Key Audit Units as Reported in the Audit Announcements
	Department Budget Size (DBS)	Number of Secondary Budget Units in Each Department, as Indicated in the Audit Announcements

Firstly, budget transparency (BT) is one of the key factors influencing budgetary non-compliance. The central departments with multiple hierarchical levels and lengthy principal-agent chains often experience information asymmetry. There-

fore, higher budget transparency tends to reduce the degree of budgetary non-compliance (Zheng & Sun, 2017). To control the influence of this variable, this study includes it as a control variable.

Regarding the quantification of budget transparency, the budget transparency scale developed by Deng (2012) has been widely recognized in the field of budget management. Thus, this study calculates budget transparency based on this scale and the adjustments made by Zheng and Sun (2017). Considering the availability of departmental budget data, this study makes some modifications to the scale by removing the "secondary departmental budget economic classification display in two columns". The adjusted scale has a total score of 108 points, as shown in **Table 3**.

Table 3. Quantification table for departmental budget transparency.

Indicators	Score	Indicators	Score
Responsibilities and Key Points of Department Budget	5	Department Budget Expenditure Function Classification to Level 2	14
Description of Organizational Structure within Department	5	Department Budget Expenditure Function Classification to Level 3	14
Total Number of Personnel and Personnel Structure	7	Department Budget Expenditure Economic Classification to Level 1	14
Department Budget Revenue Classified by Source	7	Department Budget Expenditure Economic Classification to Level 2	14
Total Amount of Department Budget Expenditure	7	Department Budget Income and Expenditure Summary	7
Department Budget Expenditure Function Classification to Level 1	14	Income Budget Table, Expenditure Budget Table, Fiscal Allocation Expenditure Budget Table, Government Fund Income and Expenditure Budget Table	3 Points per Table

Secondly, the budget environment significantly influences budgetary non-compliance. Budget non-compliance tends to increase under conditions of greater fiscal slack and lower public attention (Zheng & Sun, 2015). Consequently, fiscal slack (FS) and public attention (PA) are incorporated as control variables in this study.

Thirdly, audit intensity (AI) also significantly affects budgetary non-compliance. Greater audit intensity enhances budget scrutiny, increasing the likelihood of detecting budgetary non-compliance. This deters budget implementers from assuming they can evade audits, thereby effectively constraining budgetary non-compliance.

Additionally, this study includes the size of audited departments as a control variable. Larger departments typically have more secondary budget units and more

complex principal-agent relationships, making budget non-compliance both more likely and potentially more severe. Moreover, there are differences in organizational structure and responsibilities between ministerial-level and vice-ministerial-level central departments that may influence budgetary non-compliance during execution. Given that ministerial-level departments constitute the majority of the sample, this study incorporates department budget size (DBS) as a control variable to better capture the effect of scale. The data for this variable are sourced from audit announcements, as earlier budget reports did not disclose the number of secondary budget units. The transparency and authority of audit announcements provide a reliable basis for obtaining data on this control variable.

5. Empirical Analysis Result

5.1. Descriptive Statistical Analysis

Table 4 presents the descriptive statistics of each variable. The average rate of budgetary non-compliance over the past 10 years is 7%. Notably, the central departments exhibit substantial annual budget expenditures, indicating that budgetary non-compliance involving violations of fiscal laws and regulations constitutes a significant issue. This underscores the importance of addressing budgetary non-compliance.

Table 4. Descriptive statistics of variables.

Variables	Sample Size	Mean	Variance	Minimum	Maximum
Budgetary Non-Compliance (BNC)	164	0.070	0.17	0.0001	1.93
Budget Adjustment Magnitude (BAM)	164	0.30	0.48	0.02	3.98
Audit Coverage Rate (ACR)	164	0.50	0.29	0.05	1.00
Audit Supervision Function (ASF)	164	5.43	2.66	1.00	17.00
Audit Advisory Function (AAF)	164	1.60	0.91	0.00	6.00
Budget Transparency (BT)	164	91.66	21.74	52.00	120.00
Public Attention (PA)	164	1006.79	623.35	81.00	2700.00
Department Budget Size (DBS)	164	50.70	51.48	0.00	285.00
Fiscal Slack (FS)	164	0.75	0.17	0.08	1.05
Audit Intensity (AI)	164	8.36	10.85	1.00	134.00

The average magnitude of budget adjustments is 30%, exceeding one-quarter. This suggests that budget adjustments are not only prevalent across different departments each year but also involve substantial changes. The average audit coverage, which reflects the intensity of government audit efforts, is 50%, meaning that audits typically cover half of the total budget expenditures approved by the Ministry of Finance. However, audit coverage varies widely, ranging from 5% to

100%, indicating notable differences across departments and years before achieving full coverage.

Additionally, the average annual number of audit reports and decisions, which quantifies the government's supervisory function, is 5.43, while the average number of advisory suggestions is 1.6. This demonstrates that government audit outputs are primarily focused on reports and decisions, with relatively few advisory suggestions provided.

5.2. Empirical Analysis

This study utilizes panel data from 2008 to 2017 on central departments that have undergone budget execution audits six or more times. To examine the impact of government audits on budgetary non-compliance, as well as the constraining effect of the new Budget Law on budget adjustments and its influence on budgetary non-compliance, three models are constructed. In Model 1, the independent variables include the magnitude of budget adjustments, audit coverage, the audit supervision function, and the advisory consultation function. In Model 2, budget adjustment magnitude is combined with lagged audit coverage, the audit supervision function, and the advisory consultation function to test for potential lag effects of government audits. In Model 3, the independent variables include the interaction terms between budget adjustments and audit coverage, the audit supervision function, and the advisory consultation function. The control variables across all three models are budget transparency, fiscal affluence, public attention, budget size, and audit intensity.

To further assess whether multicollinearity exists among the variables, this study applies the Variance Inflation Factor (VIF) test, as shown in Table 5. According to the results, the highest VIF value is 2.31, with an average of 1.38, indicating that no multicollinearity is present.

Table 5. VIF analysis.

Variables	VIF	1/VIF	Variables	VIF	1/VIF
Budgetary Non-Compliance	2.31	0.43	Public Attention	1.09	0.92
Budget Transparency	1.16	0.86	Audit Supervision	1.2	0.83
Budget Adjustment	1.96	0.51	Budget Size	1.07	0.94
Fiscal Slack	1.14	0.88	Advisory Consultation	1.18	0.84
Audit Coverage	1.3	0.77			

In the model selection process, this study applies the Hausman test, which indicates that a random-effects model is appropriate for regression analysis. Robust standard errors are employed to enhance the robustness of the regression results and to mitigate heteroskedasticity. Additionally, to reduce the influence of outliers and extreme values on the results, the sample is winsorized at the 1% and

99% quantile levels. The regression results of Models 1, 2, and 3 are presented in Table 6.

The overall R-squared of Model 1 is 16.82%. Based on existing research experience, the model demonstrates a relatively good fit. The regression results demonstrate a statistically significant negative relationship between budget adjustments and budgetary non-compliance at the 5% level. Specifically, larger budget adjustments are associated with lower rates of budgetary non-compliance, supporting the prediction of Hypothesis 1. This finding implies that the standardization of budget adjustments has improved to some extent.

From the perspective of government audit input, audit coverage is significantly negatively correlated with budgetary non-compliance at the 1% significance level, indicating that increasing audit coverage can reduce non-compliance. However, from the perspective of audit output, audit supervision is positively correlated with budgetary non-compliance at the 1% significance level, which contradicts the original hypothesis. This finding suggests that audit supervision may not have curbed budgetary non-compliance but may have condoned such behavior to some extent. A possible explanation is that while audit supervision highlights budgetary non-compliance, the lack of effectiveness in subsequent actions and penalties fails to create sufficient deterrence. Therefore, although increased audit supervision reveals more budgetary non-compliance, the key variable determining whether government audits curb or induce budgetary non-compliance lies in the stringency of audit penalties. The current lack of stringent measures to address and penalize budgetary non-compliance has failed to provide an effective deterrent, potentially fostering non-compliance to some extent. Moreover, the strengthening of audit supervision may not directly lead to an increase in budgetary non-compliance but may more likely reflect the enhanced supervisory function revealing underlying noncompliant behavior. As audit supervision intensifies, issues and loopholes in budget execution become more readily identified, which could be a significant factor behind the observed positive correlation.

The audit advisory consultation function did not pass the significance test, indicating no significant relationship with budgetary non-compliance. This lack of significant impact may be attributed to several factors. One key factor is that the limited number of audit recommendations directly addressing budgetary non-compliance has constrained the effectiveness of this function in practice. Given the relatively small number of recommendations targeting non-compliance, their overall impact on addressing the issue is consequently minimal. Another important consideration is that, although audit suggestions have been made, their implementation is hindered by challenges such as insufficient support from management, resource constraints, and resistance within the organization, which further diminish their practical effectiveness. Lastly, the lack of adequate follow-up and monitoring mechanisms has weakened the impact of the audit function. Without effective supervision and timely tracking of the implementation process, the proposed recommendations often fail to be executed as intended, thus failing

to generate the anticipated deterrent effect. Therefore, the inability of the audit advisory consultation function to pass the significance test reflects its minimal impact on reducing budgetary non-compliance, primarily due to the limited number of relevant recommendations, difficulties in their implementation, and insufficient follow-up actions.

In Model 2, a one-year lag of the government audit function is included in the regression, revealing that the current audit function has no significant impact on budgetary non-compliance in the following year. The diminished effectiveness of audits can be attributed to two primary mechanisms: implementation dynamics and contextual factors. First, the impact of audits inherently manifests through a gradual process that depends critically on systematic follow-up and implementation. When monitoring mechanisms are inadequate, or enforcement protocols lack rigor, the intended deterrent effect of previous audits tends to weaken over time. Second, organizational compliance behaviors are shaped by a complex interplay of factors beyond audit influence, including budget execution patterns, policy reforms, and leadership transitions. These contextual elements can potentially override or diminish the lagged effects of audit interventions. Consequently, while theoretical frameworks suggest that audits should generate sustained behavioral changes, empirical evidence indicates that the combination of weak enforcement mechanisms and insufficient follow-up procedures has limited their long-term impact on organizational compliance.

The results from Models 1 - 3 show that fiscal slack, as a control variable, is significantly negatively correlated with budgetary non-compliance. This implies that surplus funds within government budgets can act as a buffer during budget execution, helping to address unforeseen expenditures or budget fluctuations, thus alleviating constraints related to funding shortages. Fiscal slack reduces the government's motivation to deviate from the approved budget and lessens the pressure that could lead to non-compliance. Further analysis indicates that higher levels of fiscal slack are associated with a lower likelihood of budgetary non-compliance. This finding suggests that fiscal slack not only alleviates the pressure caused by financial constraints but also enhances the flexibility and stability of budget execution, effectively reducing the risks of budgetary non-compliance.

Similarly, public attention, as an additional control variable, significantly reduces budgetary non-compliance in Models 1 - 3. Public interest in government fiscal transparency and budget management plays a crucial role in influencing budget compliance. When the public pays close attention to government fiscal transparency and budget execution, the government faces considerable external supervision pressure from society and the media. This pressure often prompts the government to focus more on the legality and compliance of its budget execution, ensuring adherence to budgeting rules and regulations. The findings of this study support this hypothesis, showing a significant negative correlation between public attention and budgetary non-compliance. This indicates that public scrutiny acts as a mechanism that encourages the government to strictly follow budgetary

guidelines. Furthermore, the role of public supervision may indirectly enhance the deterrent power of audit functions. Increased public attention typically leads to stronger enforcement of audit responsibilities, enhancing the audit's role in preventing and addressing budgetary non-compliance. Therefore, the increase in public attention not only drives the government to fulfill its fiscal responsibilities but also improves the effectiveness of audit functions, thereby further reducing the occurrence of budgetary non-compliance.

Model 3 introduces interaction terms (BAM × ACR, BAM × ASF, BAM × AAF) to test the moderating effect of the government audit function on the relationship between budget adjustments and budgetary non-compliance. The regression results show that all three interaction terms are insignificant. A possible explanation is that current government audits focus primarily on post-event auditing, with limited attention to budget adjustments and non-compliance during the execution, thereby weakening their impact.

To further ensure the reliability of the study's conclusions, the robustness test was performed by altering the calculation method for budget adjustment magnitude. After changing the method, the regression equations remained significant, confirming the robustness of the results (see Models 4, 5, and 6 in Table 6 for details). The formula for Budget Adjustment Magnitude is as follows:

$$\text{Budget Adjustment Magnitude (BAM)} = \frac{\text{Final approved budget}(\text{published in the audit report})}{\text{Fiscal appropriation expenditure budget}(\text{published at the beginning of the year})} - \frac{\text{Fiscal appropriation expenditure budget}(\text{published at the beginning of the year})}{\text{Fiscal appropriation expenditure budget}(\text{published at the beginning of the year})}$$

Table 6. Impact of government audit on budgetary non-compliance: random effects model and robustness test.

Variables	Random Effects Model			Robustness Test		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	BNC	BNC	BNC	BNC	BNC	BNC
Budget Adjustment Magnitude (BAM)	−0.0615**	−0.0509	−0.0660**	−0.0470*	−0.0072	−0.0345*
	(2.235)	(1.336)	(2.510)	(1.883)	(0.272)	(1.699)
Audit Coverage Rate (ACR)	−0.0670***		−0.0716**	−0.0746***		−0.0746***
	(2.748)		(2.470)	(2.952)		(3.031)
Audit Supervision Function (ASF)	0.0173***		0.0167***	0.0170***		0.0173***
	(3.771)		(3.925)	(3.693)		(3.467)
Audit Advisory Function (AAF)	0.0349		0.0387	0.0333		0.0337
	(0.993)		(0.999)	(0.963)		(0.952)
Budget Transparency (BT)	0.0012	0.0030**	0.0015	0.0008	0.0028*	0.0009
	(1.319)	(2.130)	(1.249)	(1.003)	(1.939)	(0.954)

Continued

Fiscal Slack (FS)	−0.2797**	−0.2854*	−0.3116**	−0.2498**	−0.2159	−0.2530**
	(2.407)	(1.946)	(2.260)	(2.097)	(1.606)	(2.066)
Public Attention (PA)	−0.00003**	−0.0001***	−0.00003**	−0.00003***	−0.0001***	−0.00003**
	(2.506)	(2.642)	(2.485)	(2.585)	(2.644)	(2.467)
Department Budget Size (DBS)	−0.0002	−0.0002	−0.0002	−0.0002	−0.0002	−0.0002
	(1.103)	(0.953)	(1.189)	(0.993)	(0.956)	(1.062)
Audit Intensity (AI)	−0.0021	−0.0054**	−0.0017	−0.0022	−0.0058**	−0.0022
	(0.914)	(2.006)	(0.751)	(1.010)	(2.190)	(1.005)
ACR L.1		0.0162			0.0127	
		(0.273)			−0.218	
ASF L.1		−0.0044			−0.0058	
		(−0.477)			(−0.613)	
AAF L.1		−0.0081			−0.0071	
		(−0.367)			(−0.322)	
BAM × ACR			−0.0843			−0.043
			(−0.539)			(−0.660)
BAM × ASF			−0.0140			−0.0034
			(−0.767)			(−0.540)
BAM × AAF			0.0474			0.0005
			(0.838)			−0.026
Constant	0.1321***	0.1964**	0.1319**	0.1645***	0.1646*	0.1461**
	(2.659)	(1.975)	(2.365)	(3.867)	(1.806)	(2.449)
R^2	0.168	0.115	0.177	0.161	0.113	0.163
N	164	130	164	165	130	165
No. of Groups	26	26	26	26	26	26

Notes: The values in parentheses are standard errors; ***, **, and *represent significance levels at 1%, 5%, and 10%, respectively.

6. Conclusion

This paper investigates the relationship between budget adjustments, government audit functions, and budgetary non-compliance, using panel data from the budget execution audits of central government departments from 2008 to 2017. The results show that budget adjustments have a significant impact on budgetary non-compliance, with arbitrary changes in the adjustment magnitude indicating potential issues of irregular budget adjustments, which in turn negatively affect

budgetary compliance. Secondly, regarding the relationship between government audit functions and budgetary non-compliance, audit input reveals a negative correlation between audit coverage and budgetary non-compliance, indicating that increased audit efforts may help reduce budgetary non-compliance to some extent. However, from the perspective of audit output, the audit supervisory function is positively correlated with budgetary non-compliance, which contradicts the research hypothesis. In other words, strengthening the audit supervisory function may reveal more instances of budgetary non-compliance but does not effectively deter or constrain such behavior. Moreover, the relationship between the audit advisory consultation function and budgetary non-compliance is not significant. Thirdly, the study finds that the current government audit functions do not have a significant impact on budgetary non-compliance in the following year, nor do they moderate the relationship between budget adjustments and budgetary non-compliance. This may be due to the increasing audit capacity not being accompanied by sufficient penalties for identified issues, particularly budget non-compliance, thus failing to create a strong deterrent effect.

Based on the above research conclusions, addressing budgetary non-compliance can be approached from two key aspects: standardizing budget adjustments and strengthening the supervisory and advisory roles of government audits. Firstly, budget adjustments are inevitable during the execution process due to environmental changes and other factors. While necessary, improper budget adjustments may contribute to budgetary non-compliance. Factors such as the high level of discretion in budget adjustments, the excessive autonomy of budget-executing entities, and insufficient oversight by the People's Congress exacerbate the risks of non-compliance. China has increasingly recognized the importance of regulating budget adjustments. The promulgation of the revised Budget Law has standardized the adjustment process to some extent and reinforced the supervisory role of the People's Congress. However, challenges still remain, such as difficulties in regulating budget adjustments under the budget balance standard and the absence of robust accountability mechanisms (Hu, 2014). To address these challenges, it is essential to enhance the scientific and rational basis of initial budget formulation, establish clear standards and procedures for budget adjustments, and strengthen the People's Congress's roles in reviewing, supervising, and holding entities accountable for budgetary adjustments.

Furthermore, increasing the intensity of audit input helps curb budgetary non-compliance. China has implemented full coverage of government audits, which helps to dismantle information barriers in the principal-agent relationship and enhance the effectiveness of government audit functions. However, from the perspective of audit output, if audits lack sufficient deterrent power and only expose problems without effectively curbing non-compliance, the phenomenon of 'repeated non-compliance despite repeated audits' will continue to occur frequently. Therefore, it is necessary to strengthen accountability measures to raise the costs of budgetary non-compliance and promote rectification by increasing the severity

of penalties. Upon identifying budgetary non-compliance, the government should impose stringent fiscal penalties, such as financial sanctions on the relevant departments or individuals or reductions in funding allocations. These measures will escalate the costs of non-compliance, thereby creating a robust deterrent. Additionally, enhancing the post-audit follow-up mechanism is crucial. A dedicated task force should be established to address identified issues and ensure the effective implementation of audit recommendations. Where necessary, a regular review mechanism should be instituted to guarantee the continuous and effective execution of corrective actions.

In addition to accountability mechanisms, fully leveraging the audit advisory and consultation functions is also a key means of curbing budgetary non-compliance. By providing proper guidance on budget execution, audit recommendations can effectively address non-compliance. However, the current emphasis on this function is insufficient, and it has not achieved its intended effect. Thus, while increasing audit coverage, it remains necessary to strengthen audit accountability measures further and place greater importance on the role of audit advisory and consultation functions.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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