

Difference Research on the Influence of Government Audit on the Performance of State-Owned Enterprises

-- A Case Study of A-Share Listed State-Owned Enterprises

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Abstract. After collecting the relevant literature on how the government audit impacts the performance of state-owned enterprises, this study compares the differences in the impact of government audit on the performance of state-owned enterprises in various regions and sizes, and collects 8090 data from a number of A-share listed state-owned enterprises for empirical analysis. According to the empirical results, government audits can promote the performance of state-owned enterprises, and such an influence is different in various regions and scales of state-owned enterprises. Further research shows that compared with the state-owned enterprises in the eastern region, the government audits can better promote the performance of the state-owned enterprises in the central and western regions. Compared with small-scale state-owned enterprises, government audits can better promote the performance of large-scale state-owned enterprises. Finally, this paper provides corresponding suggestions on how to conduct government audits in the central and western regions and small-scale state-owned enterprises.

Keywords: Government Audits; State-Owned Enterprises; Enterprise Performance; Difference.

1. Introduction

Government audits are increasingly vital to the national governance system. Since the 20th National Congress of the Communist Party of China, the CPC Central Committee has taken auditing as an indispensable part of the supervision system for the CPC and the state, and made a series of major decisions. According to the 14th Five-Year Plan for the development of government audits, it is necessary to adhere to and improve the audit system led by the CPC and the socialist audit system with Chinese characteristics. Meanwhile, the requirements of the CPC Central Committee for centralized and unified audit leadership should be fully implemented, so as to improve the ability and upgrading of new development concepts, thereby playing a good role in supervision and guarantee for a new development pattern and high-quality development.

As a critical pillar of China's economy, the performance of state-owned enterprises has attracted close attention.

In recent years, with the in-depth reform of state-owned enterprises, the status and role of government audits in state-owned enterprises have become more important. As an indispensable part of national supervision, government audits can supervise the economic activities of state-owned enterprises and evaluate their business performance and management. Therefore, it is of great significance to study the influence of government audits on the performance of state-owned enterprises.

The research on how government audits impact the performance of state-owned enterprises has vital theoretical and practical significance. Theoretically, they are beneficial to improving the governance structure and the governance of state-owned enterprises. Practically, these researches can provide a scientific basis for the government to formulate relevant policies and promote the operating performance and management of state-owned enterprises.

This study aims to explore the impact of government audits on the performance of state-owned enterprises and analyze the differences in their impact on the performance of state-owned enterprises

in different regions and scales. Taking empirical research methods, this study selects a number of listed state-owned enterprises from 2009 to 2020 as the objects, and collects their financial data and other related information. By establishing a multiple regression model, this paper analyzes how government audits impact the performance of state-owned enterprises, verifies the positive role of government audits on the performance of state-owned enterprises, and provides the basis for the government to formulate relevant policies and measures for enterprises.

2. Theoretical Analysis and Hypothesis

(1) Government Audits and Performance of State-Owned Enterprises

As an indispensable part of the national economy, state-owned enterprises have attracted much attention for their efficient operation and performance. As a means of supervising the financial and management performance of enterprises, government audit is widely used in monitoring and improving the performance of state-owned enterprises. Therefore, hypothesis H1 is proposed: government audits can improve the performance of state-owned enterprises.

(2) Regional Differences of Government Audits

The establishment and management of internal control and financial systems in the eastern region are relatively perfect, while there is still much room for improvement in the central and western regions, which requires the implementation of effective supervision measures. Hence, this paper proposes that government audits have different influences on the performance of state-owned enterprises in various regions. Compared with the eastern region, government audits can better promote the performance of state-owned enterprises in the central and western regions. Thus, there is hypothesis H2: compared with the state-owned enterprises in the eastern region, government audits can better promote the performance of state-owned enterprises in the central and western regions.

(3) Government Audits and Enterprise Scale

Large-scale state-owned enterprises have perfect corporate governance structures, high-level financial management and internal control, which makes it easy to improve their business performance. However, compared with large-scale state-owned enterprises, small-scale state-owned enterprises are relatively backward in financial systems and internal control management. Therefore, there is hypothesis H3: compared with large-scale state-owned enterprises, government audits can better promote the performance of small-scale state-owned enterprises.

3. Research Design

Table 1. Variable Definitions

	Variable	Variable Definition	
Explained Variable	ROA	Return on Assets	Operating Income/Average Assets
	ROE	Return on Equity	Net Profit/Average Net Assets
	TBQ	Tobin's Q	Total Assets/ Owner's Equity of the Company
Core Explanatory Variable	NSAA	Government Audits	
Control Variable	CS	Corporate Scale	Natural Logarithm of Total Assets of a Company
	DFL	Degree of Financial Leverage	Total Liabilities/Total Assets
	NCF	Net Cash Flow	Net cash flow/Total Assets from Operating Activities
	M	Management Shareholding Ratio	Amount of Capital Contribution/ Registered Capital
	BS	Board Size	Natural Logarithm of the Number of Directors

(1) Source of Samples

This paper takes several listed state-owned enterprises from 2009 to 2020 as samples. Besides, some data on government audits comes from the *China Audit Yearbook*, and the rest comes from the CSMAR database. 8090 valid samples are finally obtained after collection.

(2) Description of Variables

1. Explained Variable

Based on previous studies, this paper uses return on assets (ROA), return on equity (ROE) and Tobin's Q as indicators to measure performance.

(3) Research Model

To investigate how government audits impact the performance of state-owned enterprises, this paper constructs the following model:

$$ROA = \alpha_1 + \alpha_2 * NSAA + \alpha_3 * CS + \alpha_4 * DFL + \alpha_5 * NCF + \alpha_6 * M + \alpha_7 * BS + \iota + \nu + \varepsilon$$

4. Empirical Analysis

(1) Descriptive Statistics

According to the following table about the descriptive statistical results of the main variables, as for the return on assets (ROA), the average is 0.037, the median is 0.032, and the standard deviation is 0.045, indicating that the average and median of ROA are close with the small variation degree. As for the government audits (NSAA), the average is 0.129, lower than 0.5, which proves that many state-owned enterprises have not carried out government audits in recent years, and the government audits should strengthen the supervision of state-owned enterprises. As for the corporate scale (CS), the average is 22.80, the median is 22.64, and the standard deviation is 1.415. Generally speaking, the scale of state-owned enterprises is large, and the change in enterprise-scale in the sample is small. As for the degree of financial leverage (DFL), the average is 0.497, the median is 0.506, and the standard deviation is 0.197, which shows that the financial leverage fluctuates little in the sample. As for the net cash flow (NCF), the minimum is -0.324 and the maximum is 3.113, which indicates that there are great differences in the net cash flows of state-owned enterprises. As for the management shareholding ratio (M), the average is 0.465, the median is 0.002, and the standard deviation is 1.818, which shows that the management shareholding ratio fluctuates greatly in the sample. As for the board size (BS), the average is 9.252, the median is 9, and the standard deviation is 1.838, which shows that the board size varies widely and fluctuates greatly in the sample.

Table 2. Descriptive Statistics of Main Variables

Variable	Sample Size	Average	Median	Standard Deviation	Minimum	Maximum
ROA	8090	0.037	0.032	0.045	-0.109	0.185
NSAA	8090	0.129	0	0.335	0	1
CS	8090	22.80	22.64	1.415	20.23	26.95
DFL	8090	0.497	0.506	0.197	0.078	0.885
NCF	8090	0.146	0.026	0.444	-0.324	3.113
M	8090	0.465	0.002	1.818	0	12.74
BS	8090	9.252	9	1.838	5	15

(2) Correlation Analysis

This paper makes a simple correlation analysis on return on assets (ROA), government audits (NSAA), corporate scale (CS), degree of financial leverage (DFL), net cash flow (NCF), management shareholding ratio (M) and board size (BS). According to the following results that show the correlation coefficient among the variables, the correlation coefficient between ROA and NSAA is 0.028, which is positive and significant at the level of 5%. The larger the absolute value of the correlation coefficient, the closer the relationship between the two variables. In other words, the variables have a higher correlation. On the whole, the correlation coefficient of each variable is not close to -1 or 1, and the whole is in the range of -0.07 to 0.6, which shows that each variable has good independence and is less likely to have a negative impact on subsequent regression analysis. Hence, the data selected in this paper is reliable, which alleviates the collinearity of the regression equation to a certain extent and can be used for subsequent regression analysis.

Table 3. Correlation Coefficient of Variables

	ROA	NSAA	CS	DFL	NCF	M	BS
ROA	1						
NSAA	0.028**	1					
CS	0.006***	0.251***	1				
DFL	-0.364***	0.091***	0.440***	1			
NCF	0.083***	0.275***	0.585***	0.131***	1		
M	0.114***	-0.061***	-0.136***	-0.161***	-0.046***	1	
BS	0.050***	0.030***	0.198***	0.046***	0.160***	0.008	1

Note: *** denotes a significance level of 0.01, ** denotes a significance level of 0.05, and * denotes a significance level of 0.1

(3) VIF Multicollinearity Test

The VIF and 1/VIF of the corporate scale (CS) are 1.96 and 0.511 respectively. Those of the degree of financial leverage (DFL) are 1.30 and 0.772 respectively. Those of the net cash flow (NCF) are 1.57 and 0.636 respectively. Those of the management shareholding ratio (M) are 1.03 and 0.967 respectively. Those of the board size (BS) are 1.05 and 0.955 respectively.

The VIF of all the above variables is less than 10 with 1/VIF greater than 0.1. Meanwhile, the Mean VIF is 1.03, less than 10, which shows that the collinearity among the variables is not strong.

Table 4. The VIF value of the variable

VIF		
Variable	VIF	1/VIF
CS	1.96	0.510825
DFL	1.3	0.771903
NCF	1.57	0.635898
M	1.03	0.967467
BS	1.05	0.955424
Mean VIF	1.38	

(4) Benchmark Regression

Through the selection of indicators and model setting as well as testing in the above sections, the empirical analysis is conducted based on the two-way fixed effect model of panel data selection, with the results shown in the following table.

In the regression process, NSAA is taken as the basic variable, and then other control variables are added for regression, which will make the results more stable. In the estimation results of the table, the first column only regresses NSAA as an explanatory variable. From the regression results, NSAA has passed the significance test at the level of 1%, with a coefficient of 0.005. In other words, for each additional unit of NSAA, ROA will increase by 0.005 units accordingly, which shows that NSAA will promote the ROA of state-owned enterprises. In the second column, after adding control variables, the regression coefficient of NSAA is 0.004, which is significantly positive at the level of 1%. After including the above variables, although the coefficient values of NSAA, the most concerned explanatory variables in this paper, have a small change, the positive correlation between NSAA and ROA has not changed. Hence, government audits have a significant positive impact on ROA, which means that government audits have a positive impact on the performance of state-owned enterprises. It may be because government audits promote the transparency of the internal financial system and the specialization of internal control in state-owned enterprises, thus promoting the enterprise performance.

Table 5. Empirical analysis result

	(1)	(2)
	ROA	ROA
NSAA	0.005***	0.004***
	(3.34)	(2.76)
CS		0.008***
		(16.53)
DFL		-0.108***
		(-40.81)
NCF		0.002
		(1.25)
M		0.002***
		(7.61)
BS		0.000
		(0.46)
_ cons	0.042***	-0.075***
	(21.14)	(-7.73)
<i>Company</i>	YES	YES
<i>Year</i>	YES	YES
R^2	0.018	0.205
N	8090	8090

Note: *** denotes a significance level of 0.01, ** denotes a significance level of 0.05, and * denotes a significance level of 0.1

(5) Heterogeneity Test

1. Heterogeneity Test Based on Different Regions

According to the following table, as for NSAA, its coefficient is 0.006 in the western and central regions, which is significant at the level of 1%. Meanwhile, its coefficient is 0.002 in the eastern regions, which means that NASS in the central and western regions has a more significant impact on the performance of state-owned enterprises. The reason lies in more problems in state-owned enterprises in the central and western regions, such as poor financial standardization and weak supervision. Hence, there are often more problems examined by state-owned enterprises in the central and western regions, and the frequency of accountability and rectification increases, which can better improve the overall performance of enterprises, shorten the gap with the eastern regions, and then may significantly promote the performance and development of state-owned enterprises in the central and western regions.

Table 6. Heterogeneity Test Based on Different Regions

	(1)	(2)
	Central and Western Regions	Eastern Regions
NSAA	0.006***	0.002
	(2.75)	(1.32)
CS	0.006***	0.007***
	(8.52)	(12.62)
DFL	-0.119***	-0.098***
	(-28.80)	(-28.21)
NCF	0.024***	-0.002
	(7.23)	(-1.05)
M	0.001***	0.002***
	(3.08)	(6.96)
BS	0.001***	-0.00035
	(3.14)	(-1.07)
_ cons	-0.051***	-0.074***
	(-3.26)	(-5.93)
<i>Company</i>	YES	YES
<i>year</i>	YES	YES
R^2	0.251	0.182
F	67.373	60.677
N	3444	4646

Note: *** denotes a significance level of 0.01, ** denotes a significance level of 0.05, and * denotes a significance level of 0.1

2. Heterogeneity Test based on Enterprises on Different Scales

According to the following table, as for NSAA in small-scale state-owned enterprises, the regression coefficient of NSAA is positive 0.009, which is significant at the level of 1%. For large-scale state-owned enterprises, the promotion of government audits to their performance is not significant. The reason lies in more problems in small-scale state-owned enterprises, such as risk-taking ability, poor financial standardization, weak supervision, etc. Hence, there are often more problems examined in

small-scale state-owned enterprises, and the frequency of accountability and rectification increases, which can better improve the overall performance of these enterprises, shorten the gap with large-scale state-owned enterprises, and then may significantly promote the performance and development of small-scale state-owned enterprises.

Table 7. Heterogeneity Test based on Enterprises on Different Scales

	(1)	(2)
	Small-Scale	Large-Scale
NSAA	0.009***	-0.003
	(5.17)	(-1.43)
CS	0.007***	-0.003*
	(11.02)	(-1.87)
DFL	-0.101***	-0.119***
	(-35.08)	(-20.56)
NCF	0.103***	0.009***
	(16.19)	(6.07)
M	0.002***	0.011***
	(6.63)	(11.91)
BS	-0.00011	-0.00078**
	(-0.37)	(-2.06)
	(-9.34)	(-1.18)
_ cons	-0.064***	0.191***
	(-4.85)	(4.61)
<i>Company</i>	Yes	Yes
<i>year</i>	Yes	Yes
R^2	0.232	0.413
F	121.507	49.949
N	6865	1225

Note: *** denotes a significance level of 0.01, ** denotes a significance level of 0.05, and * denotes a significance level of 0.1

5. Robustness Test

(1) Replacement of Explained Variables

To test whether the fixed-effect regression model constructed above is robust and ensure rigorous results, the replacement of variables is selected to test the effectiveness of the original model, and the return on assets (ROA) as an explanatory variable is replaced by return on equity (ROE) and Tobin's Q (TBQ) for robustness test. The results are shown in Table 8.

According to the results of the robustness test, the coefficient of ROE is 0.009, passing the significance test of 1% level. The coefficient of Tobin's Q (TBQ) is 0.187, which also passes the significance test of 1% level. This result is consistent with the previous regression analysis results, and the robustness test further verifies the stability of the finding. Hence, it can be reconfirmed that the conclusion has strong robustness, thus strengthening the confidence in the relationship between government audits and the performance of state-owned enterprises.

(2) Replacement Method

The fixed effect regression is replaced by the ordinary least square method (OLS) for the test, with the regression results shown in Table 8.

In this study, it can be observed that government audits have a significant impact on ROE and Tobin's Q, with coefficients of 0.009 and 0.187 respectively, which pass the 1% significance test. This result is basically consistent with the previous empirical results, which further prove the relationship between government audits and the performance of state-owned enterprises.

In addition, the significance and correlation of other control variables do not change significantly, which indicates that the model established before is reasonable with stable and reliable regression results. Thus, the modeling of the factors affecting enterprise performance is reliable, and the interpretation and analysis of these factors are accurate and effective. In a word, research results have been statistically verified, which provides solid support for the relationship between government audits and the performance of state-owned enterprises.

(3) Eliminating the Epidemic Impact

When analyzing the whole data set, we often find that changing different time periods may lead to different conclusions. Therefore, to test whether the empirical results of the fixed effect regression model are robust and ensure rigorous results, the robustness is further tested by eliminating the epidemic impact data, with the results shown in Table 8.

Table 8. Data on epidemic impact were excluded to test robustness

	(1)	(2)	(3)	(4)
	ROE	TBQ	'ols'	Epidemic
NSAA	0.009***	0.187***	0.002**	0.003**
	(3.97)	(6.73)	(2.00)	(2.14)
CS	0.015***	-0.358***	0.006***	0.008***
	(13.65)	(-34.14)	(13.00)	(15.66)
DFL	-0.085***	-0.857***	-0.101***	-0.108***
	(-11.47)	(-15.20)	(-34.17)	(-39.03)
NCF	0.009***	0.310***	0.003***	0.002
	(3.28)	(15.85)	(2.65)	(1.44)
M	0.003***	0.034***	0.002***	0.002***
	(4.64)	(4.30)	(5.04)	(7.11)
BS	-0.00026	0.003	0.00070***	0.00011
	(-0.45)	(0.74)	(2.91)	(0.42)
<i>Company</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
R^2	0.082	0.354	0.173	0.207
F	34.585	186.670	224.696	118.819
<i>N</i>	8090	8090	8090	7280

Note: *** denotes a significance level of 0.01, ** denotes a significance level of 0.05, and * denotes a significance level of 0.1

Government audits (NSAA) pass the significance test at the level of 5%, with a coefficient of 0.003 in regression. It is basically consistent with the empirical results in the previous section. The

significance and correlation of core explanatory variables have not changed significantly, which proves that the establishment of the previous model is reasonable with stable regression results.

6. Research Conclusion and Suggestions

This paper takes listed state-owned enterprises from 2009 to 2020 as samples to empirically study how government audits impact the performance of state-owned enterprises, with results as follows. Firstly, government audits can improve the performance of state-owned enterprises. Secondly, compared with the state-owned enterprises in the eastern regions, government audits can better promote the performance of the state-owned enterprises in the central and western regions. Thirdly, compared with large-scale state-owned enterprises, government audits can better promote the performance of small-scale state-owned enterprises.

Given the conclusions, the following policy suggestions are put forward:

1. The government audit resources should be prioritized in the central and western regions to promote the overall performance of state-owned enterprises in China. There are great differences in the performance of state-owned enterprises in different regions. Besides, audit institutions play a significant role in promoting state-owned enterprises in the central and western regions. We should promote the financial standardization and supervision of state-owned enterprises in the central and western regions through government audits, and comprehensively promote the enterprise performance.
2. The government audits should strengthen the audit supervision of small-scale enterprises. There are great differences in the performance of state-owned enterprises of different scales in China. Audit institutions are vital to promote small-scale state-owned enterprises. Hence, the improvement of enterprise performance should be comprehensively promoted by promoting the transparency of internal and financial management of enterprises.

To sum up, government audits should be fully covered, and attention should be paid to the audit of state-owned enterprises and small-scale state-owned enterprises in underdeveloped areas of the central and western regions.

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