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Enhancement of Government Audit Independence and Standardization of State-Owned Enterprises: A Quasi-Natural Experiment Based on the Reform of the Management System for Personnel, Finance, and Materials at the Sub-Provincial Level

Xinying Zhu
School of Accounting, Anhui University of Finance and Economics, Bengbu 233030, China
Email: 2087630439@qq.com

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Abstract

This study takes the 2015 reform of unified management of personnel, finance, and materials in local audit institutions below the provincial level (implemented in 7 provinces/municipalities in China) as a quasi-natural experiment. It empirically tests the impact of this audit management system reform on the standardized operation of state-owned enterprises (SOEs). The results show that after the reform, the violation behaviors of local SOEs in the pilot areas decreased significantly. Further analysis reveals that the reform mainly restrains information disclosure violations and leader-related violations. This study provides empirical evidence for the effectiveness of the audit management system reform at the sub-provincial level, enriches the literature on audit independence, and offers insights for the deepening of future policies.

Keywords

Audit Management System Reform; State-Owned Enterprises; Corporate Violations

1. Introduction

Government audit, as a statutory mandatory supervision mechanism, plays an irreplaceable key role in the supervision of SOEs. At present, local audit institutions below the provincial level in China implement a dual leadership system. This system has significant limitations and inherent defects, making it difficult to effectively ensure audit independence. To improve audit independence, the Chinese government has continuously promoted audit system reform in recent years. Among them, the "Pilot Plan for the Reform of the Management System for Personnel, Finance, and Materials of Local Audit Institutions Below the Provincial Level" launched in 2015 was implemented as a pilot in seven provinces and municipalities. By centralizing the personnel, financial, and material management powers of audit institutions below the provincial level to the provincial audit department, this plan aims to reduce local government interference in audit work and thus enhance audit independence [1].

Based on the above background, this study selects local SOEs in China from 2012 to 2019 as the research sample and constructs a difference-in-differences (DID) model to empirically test the impact of the audit management system reform on the standardization of local SOEs. The results show that there is a significant negative correlation between the audit management system reform and corporate violation behaviors, and the reform helps to improve the standardized operation of SOEs. After distinguishing the types of violations, we find that the reform mainly reduces two types of behaviors: information disclosure violations and leader-related violations.

The research contributions of this paper are mainly reflected in the following aspects:It enriches the research on the impact of enhanced audit independence after the audit management system reform. Existing literature shows that the reform has a positive effect in reducing the audit risk of local SOEs [2], improving total factor productivity, and reducing government official reception expenses [3]. This paper focuses on the impact of enhanced audit independence on the standardized operation of SOEs, providing a new perspective for understanding the reform effect.It expands the research scope of factors affecting corporate violation behaviors.

2. Theoretical Analysis and Research Hypotheses

Government audit, as the core mechanism of external supervision for SOEs, its independence directly determines the supervision efficiency. Under the current dual leadership system, local audit institutions are restricted by local governments when investigating violation issues and putting forward opinions, making it difficult to exercise audit supervision power independently[7]. The lack of independence leads to the lack of fairness in audit supervision, damages the implementation effect and credibility, and ultimately weakens the supervision efficiency, making it difficult to play an external restraint role on SOEs.

According to the deterrence theory, corporate violation behaviors depend on the trade-off between costs and benefits. Before the reform, local audits were prone to interference from the government, leading to distorted audit results. The probability of being held accountable for corporate violations was low[8], and the deterrence effect was insufficient. After the audit management system reform enhanced government audit independence, audit institutions can get rid of local interference, carry out work objectively and fairly, ensure the authenticity and accuracy of audits, and make the violation behaviors of local SOEs more likely to be discovered. At the same time, the intensity of post-violation punishment increases, and the violation cost rises significantly, forcing enterprises to operate in a standardized manner. After the reform, the improvement of audit independence enables audit institutions to reveal the financial status and operational risks of enterprises more comprehensively and accurately, reducing the information disadvantage of external supervisors: It not only restrains the opportunistic behaviors of management but also provides reliable information for local governments and the public to improve supervision capabilities, forming a positive external supervision cycle. The combined effect of this improvement in information transparency and deterrence effect further strengthens external constraints. Based on the above analysis, the following hypothesis is proposed:

H1: The audit management system reform will reduce the violation behaviors of local SOEs below the provincial level in the pilot areas.

3. Research Design

3.1. Model Setting and Variable Definition

Based on the natural experiment of the unified management reform of personnel, finance, and materials in local audit institutions below the provincial level, a difference-in-differences (DID) model (Model 1) is constructed.

Model1:

$$Fraud_{i,t} = \beta_0 + \beta_1 Treat_i * Post_t + \beta_2 Control_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

In the formula, the subscript i represents the enterprise, and t represents the year. The explanatory variable is the dummy variable interaction term (did = $Treat_i$*$Post_t$), which represents the difference between local state-owned listed companies in the pilot areas and non-pilot areas after the audit management system reform. The dependent variable is whether the company violates rules (Fraud). $Control_{it}$is the group of control variables, $\mu_i$is the individual fixed effect, $\lambda_t$is the time fixed effect, and $\varepsilon_{i,t}$is the residual term.

Municipal-level state-owned listed companies belonging to the reform pilot areas are classified into the experimental group, and the dummy variable Treat is assigned 1; those not belonging to the reform pilot areas are classified into the control group, and the dummy variable Treat is assigned 0. When the sample year is 2016 or later, the dummy variable Post is assigned 1; otherwise, it is 0.

The specific measurement standards of each variable are shown in Table 1.

Table 1. Variable Definition Table

Variable Type	Variable Name	Variable Symbol	Variable Definition
Dependent Variable	Whether the company violates rules	Fraud	Assign 1 if the company has violations in year t, otherwise 0
Independent Variable	Group dummy variable	Treat	Assign 1 if the local SOE is registered in the pilot area, otherwise 0
	Time dummy variable	Post	Assign 1 if the year is later than 2015, otherwise 0

Control Variable	Company size	Size	Natural logarithm of total assets
	Ownership concentration	Top3	Shareholding ratio of the top 3 major shareholders
	Company growth	Growth	Operating income growth rate
	Return on total assets	ROA	Net profit / Total assets
	Cash asset ratio	Cash	Monetary funds / Total assets
	Intangible asset ratio	IA	Intangible assets / Total assets
	Type of social audit firm	big4	Assign 1 if the accounting firm for the annual financial statement audit is one of the "Big Four", otherwise 0
	Audit tenure	tenu	Number of years the firm has served the enterprise
	Supervisory board size	bos	Natural logarithm of the number of supervisory board members
	Senior management incentive	Mana_Share	Natural logarithm of (number of shares held by senior management + 1)
	Proportion of independent directors	Indirector	Proportion of independent directors in the board of directors
	Return on assets	AR	(Total profit + Financial expenses) / Total assets
	Dual role (CEO and Chairman)	Dual	Assign 1 if the chairman and general manager are the same person, otherwise 0
	Whether in loss	Loss	Assign 1 if the company is in loss, otherwise 0

3.2. Data Source and Sample Selection

To deeply analyze the impact of this reform on the behaviors of local SOEs and avoid the interference caused by the establishment of audit committees of municipal party committees in most regions around 2019, local state-owned A-share listed companies below the provincial level from 2012 to 2019 were selected as the research sample. Referring to existing studies, the sample selection process is as follows: (1) Screen local state-owned listed companies with state-owned equity nature and municipal-level ownership from the CSMAR database; (2) Exclude financial companies; (3) Further exclude samples where the ownership level or equity nature of the company changed during the sample period to ensure the stability and consistency of the sample. To ensure the robustness of the data, all continuous variables were winsorized at the 1% and 99% quantiles.

The corporate violation data in this study are from the "Major Incident Violation Punishment" data table of the RESSET database; the internal control index is from the DIB database; other corporate financial and corporate governance data are mainly from the CSMAR database. Considering that there is a significant regional peer effect in the violation behaviors of listed companies[5], in the statistical analysis, this study clusters the standard errors at the city level to accurately reflect the potential impact of inter-regional differences on violation behaviors.

4. Empirical Results and Analysis

4.1. Descriptive Statistical Analysis

Table 2 shows the descriptive statistical results of the main variables. The control group includes 1,776 samples, and the experimental group includes 984 samples, of which 369 are pre-reform samples and 615 are post-reform samples. Regarding the violation status of local listed SOEs, the mean value of Fraud is 0.265, which means that 26.5% of the enterprises had violations during the sample period. It should be noted that the number of observations for the internal control index and agency cost decreased due to data missing, and the distribution of other variables is within a reasonable range.

Table 2. Descriptive Statistical Analysis

Variable	Obs	Mean	SD	Min	Median	Max
did	2760	0.223	0.416	0.000	0.000	1.000
treated	2760	0.357	0.479	0.000	0.000	1.000
Fraud	2760	0.265	0.442	0.000	0.000	1.000
Ic	2753	6.263	1.198	0.000	6.508	6.739
Manger	2730	0.152	0.120	0.016	0.119	0.729
Size	2760	22.641	1.301	19.910	22.472	26.063
Top3	2760	49.102	14.897	21.310	48.339	84.947
Growth	2760	0.120	0.403	-0.639	0.060	2.629
ROA	2760	0.032	0.045	-0.143	0.028	0.163
Cash	2760	0.153	0.108	0.017	0.125	0.525
IA	2760	0.052	0.069	0.000	0.031	0.410
big4	2760	0.086	0.281	0.000	0.000	1.000
tenu	2760	10.046	7.104	1.000	8.000	26.000
bos	2760	4.009	1.197	3.000	3.000	8.000
Mana_Share	2760	6.012	6.141	0.000	7.155	16.972
Indirector	2760	37.163	5.421	33.330	33.330	57.140
AR	2760	0.050	0.049	-0.125	0.045	0.204
Dual	2760	0.124	0.330	0.000	0.000	1.000
Loss	2760	0.094	0.292	0.000	0.000	1.000

4.2. Benchmark Regression Result Analysis

According to the research design, a benchmark regression analysis was conducted on Model 1, and the results are shown in Table 3. From the regression results in

Column (3), after adding control variables, the regression coefficient is negative at the 1% significance level. This regression result fully supports the hypothesis that the reform has a significant negative impact on corporate violation behaviors.

Table 3. Impact of Audit Management System Reform on Corporate Violations

Variable	(1) Fraud	(2) Fraud	(3) Fraud
did	-0.074** (-2.46)	-0.078** (-2.35)	-0.078*** (-2.64)
Size		-0.033 (-1.18)	-0.033 (-1.23)
Top3		0.001 (0.53)	0.001 (0.49)
Growth		0.006 (0.28)	0.006 (0.29)
ROA		-3.253*** (-2.73)	-3.253** (-2.38)
Cash		-0.111 (-0.85)	-0.111 (-0.75)
IA		-0.238 (-0.82)	-0.238 (-0.83)
big4		-0.107 (-1.14)	-0.107 (-1.26)
tenu		-0.006** (-2.04)	-0.006 (-1.37)
bos		0.041* (1.91)	0.041** (2.18)
Mana_Share		0.002 (0.88)	0.002 (1.05)
Indirector		-0.002 (-0.76)	-0.002 (-0.65)
AR		3.441*** (3.29)	3.441*** (3.07)
Dual		0.028 (0.84)	0.028 (0.91)
Loss		0.010 (0.24)	0.010 (0.21)
Constant	0.282*** (41.87)	0.908 (1.44)	0.908 (1.39)
Company FE	YES	YES	YES
Year FE	YES	YES	YES
Year×Industry FE	YES	NO	YES
N	2,760	2760	2,760
Adj-R2	0.152	0.156	0.156

*Note: *, *, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the city level. The same below.

4.3. Robustness Tests

4.3.1. PSM-DID

This study adopts the Propensity Score Matching (PSM) method. When selecting covariates, the control variables mentioned above are used, and a 1:1 nearest neighbor matching method is used to screen the control group matching the experimental group. On this basis, combined with the difference-in-differences (DID) model to evaluate the effect of the reform. The empirical results of PSM-DID are shown in Table 4. The regression coefficient in Column (3) is positive at the 5% significance level, which supports the research hypothesis proposed earlier.

Table 4. PSM-DID Regression

Variable	(1) Fraud	(2) Fraud	(3) Fraud
did	-0.087* (-1.92)	-0.094* (-1.76)	-0.094** (-2.13)
Controls	NO	YES	YES
Company FE	YES	YES	YES
Year FE	YES	YES	YES
Cluster	YES	NO	YES
N	1,234	1234	1,234
Adj-R2	0.139	0.136	0.136

4.3.2. Parallel Trend Test

To verify this parallel trend assumption and evaluate the dynamic impact of the "Framework Opinion" policy after its implementation, Model (2) was constructed for analysis. In this model, the period one year before the policy implementation is set as the base period, and the definitions of other variables refer to Table 1.

$$Fraud_{i,t} = \beta_1 + \beta_2 pre\_3 + \beta_3 pre\_2 + \beta_4 pre\_1 + \beta_5 current$$
$$+ \beta_6 post\_1 + \beta_7 post\_2 + \beta_8 Control_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

The estimation results of Model (2) are plotted in Figure 1. Prior to the policy, we observe no discernible difference in violations between the treatment and control groups, consistent with the parallel trends assumption. A significant treatment effect emerges after the implementation, validating the causal interpretation of the policy impact.

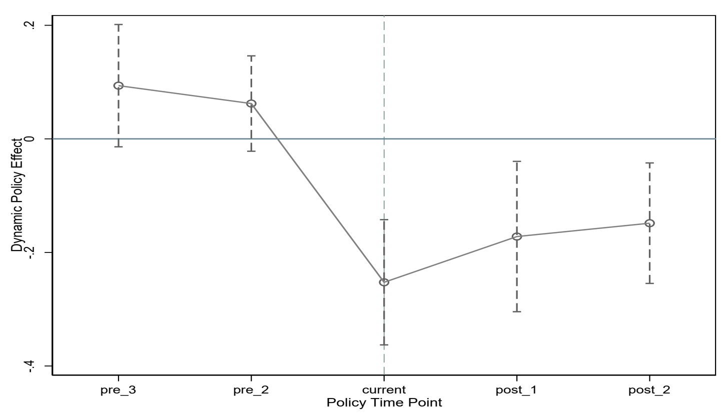

Figure 1. Parallel Trend Test

4.3.3. Placebo Test

To further verify the robustness of the benchmark regression results, a placebo test was conducted. As shown in Figure 2, in the placebo test, a dummy DID term was constructed, and the distribution of its estimated coefficients was observed. The results show that the estimated coefficients of these dummy DID terms are mainly concentrated around 0 and do not show significant statistical characteristics. This indicates that in the sample combination after random sampling, there was no significant impact on corporate violation behaviors.

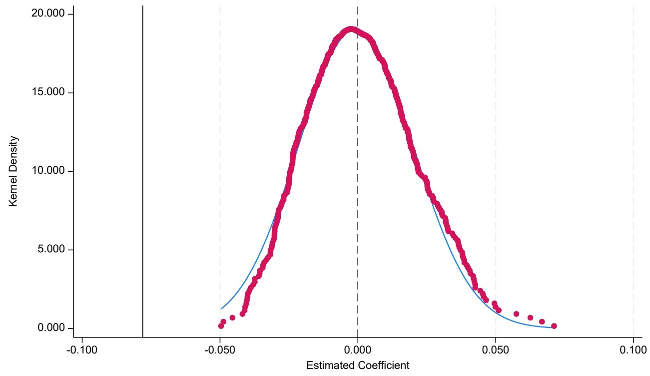

Figure 2. Placebo Test

4.3.4. Entropy Balancing Method

To further overcome the interference of sample selection bias on the research conclusions, this paper uses the entropy balancing method for robustness testing. Table 5 presents the regression results of the DID model after weighting by the entropy balancing method. The results show that after controlling for relevant variables, the coefficient of did is still negative at the 5% significance level, indicating that after the implementation of the audit management system reform, the violation behaviors of SOEs in the pilot areas decreased significantly. This result is consistent with the previous analysis based on PSM.

Table 5. Entropy balancing regression

Variable	(1) Fraud	(2) Fraud	(3) Fraud
did	-0.056** (-2.07)	-0.066* (-1.88)	-0.066** (-2.27)
Controls	YES	YES	YES
Company FE	YES	YES	YES
Year FE	YES	YES	YES
Cluster	YES	NO	YES
N	2,760	2760	2,760
Adj-R2	0.182	0.187	0.187

5. Further Research

5.1. Heterogeneity Analysis

When SOE executives are exposed for violation behaviors, they not only face economic penalties but also their political careers will be seriously affected[6]. This makes the violation cost of SOE executives significantly higher than that of private enterprise managers. In terms of information disclosure violations, SOEs show a higher tendency to violate rules compared with private enterprises [9].

This study classifies corporate violation behaviors into three types: information disclosure violations, corporate operation violations, and leader-related violations, according to the definition of violation types by the China Securities Regulatory Commission[4][10]. When an enterprise is investigated and confirmed to have any of the above types of violation behaviors in a certain year, the corresponding variable is assigned 1. The regression analysis results in Table 6 show that information disclosure violations are significant at the 10% significance level, while leader-related violations are significant at the 5% significance level. This indicates that after the audit management system reform, the external supervision role of government audit has effectively prompted local SOEs to reduce information disclosure violations and leader-related violations.

Table 6. Heterogeneity Analysis: Classification of Violation Types

Variable	(1) Information Disclosure Violations	(2) Corporate Operation Violations	(3) Leader-Related Violations
did	-0.0371* (-1.89)	-0.0020 (-0.20)	-0.0699** (-2.34)
Controls	YES	YES	YES
Company FE	YES	YES	YES
Year FE	YES	YES	YES
N	2,760	2,760	2,760
Adj-R2	0.121	0.00947	0.131

6. Conclusions and Implications

This paper takes the pilot audit management system reform in seven provinces and municipalities as the research object, uses the difference-in-differences (DID) method to conduct empirical tests, and focuses on analyzing the impact of the reform on the standardized operation of local SOEs. The research results show that after the implementation of the reform, the violation behaviors of SOEs in the pilot areas decreased significantly, effectively promoting the standardized operation of enterprises. Further classification tests found that the restraint effect of the reform is targeted, mainly reducing two types of behaviors: information disclosure violations and enterprise leader-related violations.

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