

Research on the Effectiveness of Government Audit in Preventing Systemic Financial Risks in the Big Data Environment

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Abstract

Based on unbalanced panel data from 30 Chinese provinces from 2008 to 2021, this paper examines the effectiveness of government audit in preventing systemic financial risks in the big data environment. The results show that government audit can still significantly inhibit systemic financial risks. Financial system risk accumulation plays a mediating role in this process, while the level of big data development has a negative moderating effect on the relationship between government audit and systemic financial risk prevention. Heterogeneity tests reveal that government audit has a more obvious preventive effect on systemic financial risks in the eastern and western regions, as well as in areas with low marketization levels. Accordingly, this paper recommends further promoting the digital transformation of government audit, improving the mechanism through which government audit inhibits financial risk accumulation, and implementing audit strategies tailored to local conditions.

Keywords: Government audit, Systemic financial risk, Risk accumulation, Big data, Development level

1. Introduction

The 2022 Government Work Report emphasized the need to "better coordinate development and security, and effectively prevent and mitigate risks in key areas." The 2022 National Audit Work Conference stressed the importance of "conducting audits around the continuous and effective prevention and mitigation of risks in key areas." Finance is the core of the economy, and systemic financial risk is a major risk in key areas, making it a priority for government audit work. Xu and Zhang (2022) (Xu and Zhang, 2022) argue that government audit can leverage its strategic and comprehensive advantages to comprehensively prevent systemic financial risks from the perspectives of the economy, public finance, and the financial system. The Audit Department Task Force (2016) (Audit Department Task Force, 2016) contends that government audit can perform its "immune system" function at three dimensions—macro government governance, meso market governance, and micro corporate governance—thereby effectively resisting systemic and regional financial risks. By leveraging its unique advantages, government audit has become an important means of compensating for the deficiencies of other financial regulatory authorities (Zhang R. and Li, 2023) (Zhang R. and Li, 2023). Studying how government audit can effectively prevent systemic financial risks has important theoretical and practical significance for ensuring the stable operation of the financial system and promoting high-quality economic development.

Existing research shows that, on the one hand, the level of big data development has improved the efficiency and accuracy of government audit (Jiang, 2022) (Jiang, 2022), negatively affecting systemic financial risks. On the other hand, the impact of big data development on systemic financial risk exhibits an inverted "U" shape (Chen L. et al., 2022) (Chen L. et al., 2022), with a positive impact under current conditions. The role of big data development in the comprehensive effect of government audit on systemic financial risk still requires further investigation. The pathways through which government audit affects systemic financial risk determine the focus of government audit work in preventing such risks. Li F. and Jiao (2020) (Li F. and Jiao, 2020) argue that national audit reduces local bank risks by improving government governance, suggesting that to prevent local bank risks, government audit should be strengthened to enhance governance levels. Cai and Zhou (2016) (Cai and Zhou, 2016) contend that government audit can effectively prevent systemic risks in the banking industry by optimizing bank asset quality and enhancing liquidity, recommending enhanced auditing of financial institutions' asset quality and liquidity. Cao Y. et al. (2019) (Cao Y. et al., 2019) find that the effective implementation of government audit helps ensure the stability of bank asset management business and prevent the occurrence of systemic financial risks, recommending enhanced auditing of bank asset management operations.

Risk accumulation within the financial system is the fundamental cause of systemic financial risk outbreaks (Miao and Yan, 2020) (Miao and Yan, 2020). Risk accumulates within the financial system, with influencing factors including credit scale, leverage ratio, and interconnectedness among financial institutions (Zhang L. and Kong, 2022; Perotti and Suarez, 2009) (Zhang L. and Kong, 2022; Perotti and Suarez, 2009). Accumulated risk is released under external shocks such as economic pro-cyclical fluctuations, financial market risk spillovers, and macroeconomic policy shocks (Adrian and Shin, 2008) (Adrian and Shin, 2008),

forming financial crises. According to systems theory, internal causes are the primary factors, while external factors act through internal causes. The fundamental approach to preventing systemic financial risk is to prevent the accumulation of risk within the financial system. To effectively prevent the occurrence of systemic financial risk, the focus of government audit work should be on preventing risk accumulation in the financial system.

Existing research primarily examines how government audit prevents systemic financial risks based on the direct causes of financial risk, with few studies focusing on financial risk accumulation. This paper uses unbalanced panel data from 30 Chinese provinces from 2008 to 2021 to study how government audit can effectively prevent systemic financial risks in the big data environment from three aspects: the environment of government audit (big data development level), key content (financial risk accumulation), and effects (regional and marketization level differences). It tests the moderating effect of big data development level, the effectiveness of financial risk accumulation, and the heterogeneity of government audit effects across different regions, providing practical evidence and theoretical basis for formulating effective government audit strategies, preventing systemic financial risks, and promoting high-quality economic development.

2. Theoretical Analysis and Research Hypotheses

2.1 *The Impact of Government Audit on Systemic Financial Risk in the Big Data Environment*

Gorton and Metrick (2012) (Gorton and Metrick, 2012) compared the regulatory effectiveness of different regulatory entities within the national governance framework and found that government audit departments exhibit higher levels of prudence and transparency, making them more targeted and effective in governing financial innovation risks. Zhang R. and Li (2023) (Zhang R. and Li, 2023) show that government audit can overcome bottlenecks in legal, technical, information, and regulatory dimensions, effectively compensating for the deficiencies of other financial regulatory institutions. First, government audit can promptly detect changes in the financial system within the big data environment. By linking databases with legal case resource databases, it can better grasp industry development trends and market dynamics to address the challenges posed by legal lag in financial regulation. Second, government audit has significant advantages in information acquisition. According to the "Audit Law of the People's Republic of China," government audit authorities have the right to access submitted materials, inspect accounts, and conduct investigations and evidence collection, enabling them to comprehensively grasp the operational status of internet finance and information about regulated entities, effectively mitigating risks arising from information asymmetry and information silos. Furthermore, government audit has introduced big data audit technology, promoting the implementation of the "Golden Audit Project," thereby improving work efficiency and data processing accuracy, providing technical support for revealing problems in the financial field and preventing the occurrence of systemic financial risks (Li C. and He X., 2019; Zhao Y. et al., 2019) [19,20]. Finally, the scope of government audit supervision has been continuously expanding (Zheng W. et al., 2022) (Zheng W. et al., 2022), making it the "second line of defense" for preventing systemic financial risks in the big data environment. Currently, the functions of financial regulatory entities are scattered, resulting in

regulatory gaps or overlaps. Government audit, by 介入 financial regulatory institutions or directly supervising financial institutions, and by utilizing its unique audit results announcement system, can effectively broaden social feedback channels, promote collaborative cooperation among regulatory entities, integrate financial-related data resources, and achieve dynamic monitoring of suspicious points, thereby more systematically grasping systemic financial risk. Although existing research shows that the level of big data development positively affects systemic financial risks under current conditions, the effect of government audit in preventing systemic financial risks is more obvious in the big data environment. That is, as the level of big data development increases, the comprehensive impact of government audit intensity on systemic financial risk is negative. Based on this, we propose:

H1: In the big data environment, government audit can effectively prevent systemic financial risks.

2.2 The Mediating Role of Risk Accumulation

Existing research suggests that the occurrence of systemic financial risk is the result of the system continuously accumulating risks during the economic cycle and releasing accumulated risks under the attack of external or internal events. For government audit to prevent the occurrence of systemic financial risk, it needs to focus on which factors affect the risk accumulation of the financial system, conduct targeted audits to reduce financial system risk accumulation, thereby reducing the probability of systemic financial risk occurrence and mitigating the losses caused by systemic financial risk. Existing research indicates that the asset scale, credit scale, leverage level, and network interconnectedness of the financial system directly affect the level of risk accumulation in the financial system (Xie X. and Wang X., 2022; Chen X. and Cheng, 2022) (Dell'Ariceia et al., 2012) (Dell'Ariceia et al., 2012). Government audit can focus on these areas. To prevent systemic financial risk, government audit should focus on auditing factors that may cause risk accumulation in the financial system, reduce risk accumulation in the financial system, decrease the measurement results of systemic financial risk, thereby reducing the probability of systemic financial risk occurrence under internal and external shocks, mitigating the losses caused by systemic financial risk after it occurs, and ultimately achieving the goal of preventing systemic financial risk. Based on this, we propose:

H2: Government audit can prevent systemic financial risk by reducing financial system risk accumulation.

2.3 The Moderating Role of Big Data Development Level

In 2002, national audit authorities began building the audit information system, known as the "Golden Audit Project." This project has now completed three phases, with the third phase aimed at constructing a more intelligent and integrated audit information system. In the era of the digital economy, the application of digital audit platforms and big data audit technologies has broken through the limitations of traditional audit methods, overcoming spatial barriers to information dissemination (Zhao Y. et al., 2019) (Zhao Y. et al., 2019), saving audit data acquisition time, shortening audit cycles, reducing audit costs, and enhancing the comprehensiveness and objectivity of audits (Li C. and He X., 2019) (Li C. and He X., 2019),

providing more scientific evidence for government decision-making. However, in terms of systemic financial risk prevention, government audit still faces numerous challenges. First, existing research shows that because big data technology is more applied to financial innovation, it has brought about more risks. At the current stage, the level of big data development positively affects systemic financial risk. Second, with the rapid growth of data volume in financial markets, data types have become more complex and diverse, raising corresponding requirements for data collection, storage, processing, and analysis technologies. However, due to resource constraints in government audit technology and talent, it may be difficult to keep pace with the development of big data (Guo M. et al., 2022) (Guo M. et al., 2022). Insufficient application of big data technology affects the full realization of government audit effectiveness. Third, massive data may contain inaccurate, incomplete, or even misleading information, which can disturb audit judgment and increase audit risk. The technical risks brought by big data development affect the risk prevention effectiveness of government audit. In summary, although government audit can significantly restrain systemic financial risks in the big data environment, at the current stage, as the level of big data development increases, the speed of improvement in government audit effectiveness is insufficient to fully respond to the concealment and complexity of financial risks, thus weakening this significance level to some extent. Based on this, we propose:

H3: At the current stage, the level of big data development will weaken the preventive effect of government audit on systemic financial risks.

3. Research Design

3.1 Data Sources

The research subjects are primarily government audit and systemic financial risk. Government audit data are sourced from the audit work reports and interpretations published on the official websites of provincial and municipal audit departments. Audit intensity data were extracted through web crawling and text analysis techniques. Systemic financial risk is the risk of the financial system. Although it is affected by external factors such as the real estate industry and local government debt, the risk spilling over into the financial system is already reflected in financial markets. China's listed financial institutions have large asset scales and complex interconnected networks; if their potential risks were to break out, they could easily evolve into systemic financial risk. Unlisted financial institutions are small in scale and, although they are sources of risk for the financial system, the impact of their failure is relatively small, and the likelihood of contagion to systemically important institutions is also low. Therefore, this study selects data from the provinces where 46 listed financial institutions in China are registered, covering 2008 to 2021, for empirical analysis. Systemic financial risk data are sourced from the CSMAR and Wind databases, with missing data obtained through manual retrieval of financial institution annual reports. Risk accumulation data come from regional statistical yearbooks and listed financial institution annual reports. Big data development level data come from the National Bureau of Statistics, the China Economic Information Network, and the CNKI database, with some missing data obtained through manual query of the China Statistical Yearbook. Control variable data mainly come from the National Bureau of Statistics and the

China Statistical Yearbook. Python and Stata 16.0 were used for data processing and analysis. Due to differences in the initial timing of audit work report publication across provinces, the final dataset consists of unbalanced panel data from 30 provinces, totaling 217 observations. All continuous variables were winsorized at the 1% level.

3.2 Variable Definitions

(1) **Dependent Variable: Systemic Financial Risk (SFR).** Following Yu C. et al. (2024) (Yu C. et al., 2024), an improved dual-contagion channel model is used to measure systemic financial risk. Interbank loans with other financial institutions, lending funds, and purchased financial assets under resale agreements are defined as inter-institutional loans. Deposits from other financial institutions, borrowing funds, and sold financial assets under repurchase agreements are defined as inter-institutional borrowings. The maximum entropy method is used to construct the inter-institutional lending network. In the simulation experiment, the external shock intensity is set to 2%. After the experiment, the total equity loss of financial institution i in year t is obtained, which is then divided by the province of registration. The systemic financial risk of province j in year t is equal to the ratio of the total equity loss of listed financial institutions within the region to their initial total equity [Formula 1]. A larger ratio indicates a higher probability of systemic financial risk occurrence in province j .

(2) **Core Explanatory Variable: Government Audit (GA).** There are two main methods for measuring government audit. At the provincial level, indicators such as the number of audited units, the amount of problems identified, and the number of suggestions made are used (Zheng W. et al., 2022) (Zheng W. et al., 2022). However, since the data include both financial and non-financial institutions, they cannot accurately reflect targeted auditing of the financial industry. At the bank micro level, a dummy variable is used based on whether each bank was audited during the year (Cao Y. et al., 2019) (Cao Y. et al., 2019), but this method cannot capture differences in audit intensity. Therefore, this paper uses a text analysis method to construct a proxy variable for government audit. Through Python web crawling, audit work reports and interpretations published on the official websites of 30 provincial audit departments were collected. After excluding reports where the audit executing unit was not a provincial audit department, 453 valid reports were obtained. Using text analysis, the frequency of four keywords—"finance," "bank," "securities," and "insurance"—was counted and mapped to the [0,1] interval to quantify the degree of attention paid to the financial industry in audit work across provinces. Since most provincial audit work is conducted in the first quarter of the following year and relevant work reports are published in the year of audit implementation, this study primarily examines the effect of government audit on systemic financial risk in the year of audit intervention.

(3) **Mediating Variable: Financial System Risk Accumulation (RA).** Asset scale expansion, credit scale expansion, and leverage increase stimulate the risk-taking behavior of financial institutions, leading to continuous accumulation of financial system risk (Xie X. and Wang X., 2022; Chen X. and Cheng, 2022) [13,14] (Fang Y. et al., 2020; He J. et al., 2022) (Fang Y. et al., 2020; He J. et al., 2022). Therefore, three variables—regional financial institution loan growth rate, total asset growth rate of listed financial institutions registered in the region, and average

leverage level—are used to construct a comprehensive variable reflecting financial system risk accumulation using the entropy method.

(4) Moderating Variable: Big Data Development Level (BDL). Following Han X. et al. (2019) (Han X. et al., 2019) and Wang X. L. et al. (2023) (Wang X. L. et al., 2023), considering the comprehensiveness and availability of provincial data, two primary indicators (big data infrastructure and big data technology application) and four secondary indicators (traditional network facilities, new digital facilities, commercial index, and civilian index) are selected. A comprehensive index is constructed using the entropy method to measure the big data development level of each province.

(5) Control Variables. Following Zuo and Liu (2022) (Zuo and Liu, 2022) and Zhang Z. and Yue (2022) (Zhang Z. and Yue, 2022), factors closely related to systemic financial risk are selected as control variables to better analyze the impact of government audit on systemic financial risk. These include: financial regulatory intensity (FRI), measured by the ratio of regional financial regulatory expenditure to financial industry added value; economic development level (EDL), measured by regional per capita GDP growth rate; openness level (OPEN), measured by the ratio of total regional import and export to regional GDP; foreign direct investment level (FDI), measured by the ratio of total investment of foreign-invested enterprises to regional GDP; inflation rate (INF), measured by the regional consumer price index; real estate development level (REDL), measured by the ratio of regional real estate investment to regional GDP; and technological innovation (TI), measured by the ratio of regional fiscal science and technology expenditure to total regional fiscal expenditure.

3.3 Model Specification

To test the impact of government audit on systemic financial risk in the big data environment, an unbalanced panel data model is constructed. Since the main time factors are already explained by the explanatory and control variables from an economic perspective, and the F-test results show no significant time effect, with the Hausman test indicating a fixed effect model, the panel data model is specified as an individual fixed effect model (Equation 1):

$$SFR_{jt} = \beta_0 + \beta_1 GA_{jt} + \sum \gamma Control_{jt} + \mu_j + \varepsilon_{jt}$$

To test the mediating effect of risk accumulation, the three-step regression method is used, constructing Models (2) and (3) based on Model (1):

$$RA_{jt} = \alpha_0 + \alpha_1 GA_{jt} + \sum \gamma Control_{jt} + \mu_j + \varepsilon_{jt}$$

$$SFR_{jt} = \gamma_0 + \gamma_1 GA_{jt} + \gamma_2 RA_{jt} + \sum \delta Control_{jt} + \mu_j + \varepsilon_{jt}$$

To test the moderating effect of big data development level, BDL and the interaction term $GA \times BDL$ are introduced based on Model (1) to construct the moderating effect test model (Equation 4):

$$SFR_{jt} = \delta_0 + \delta_1 GA_{jt} + \delta_2 BDL_{jt} + \delta_3 GA_{jt} \times BDL_{jt} + \sum \zeta Control_{jt} + \mu_j + \varepsilon_{jt}$$

The subscript j represents the province and t represents the year. When j takes values 1–7, it corresponds to the 7 control variables. μ_j controls for provincial fixed effects, and ε_{jt} represents the random error term.

Table 1. Descriptive Statistics of Main Variables

Variable	N	Mean	Std Dev	Min	Max
SFR	234	0.0121	0.0284	0.0014	0.5434
GA	234	0.1434	0.1000	0	1
RA	234	0.1245	0.0917	0.0402	0.4324
BDL	234	0.0254	0.0683	0.0023	0.4567
FRI	234	0.0265	0.0023	8.03e-05	0.0879
EDL	234	0.0456	0.0612	-0.0297	0.1266
OPEN	234	0.2134	0.3683	0.0028	1.8645
FDI	234	0.1261	0.3810	0.0096	1.6478
INF	234	102.097	1.987	98.8000	104.345
REDL	234	0.1389	0.0658	0.0697	0.5427

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Robust t-statistics in parentheses.

4. Empirical Analysis

4.1 Baseline Regression Analysis

Given the quantifiable differences among provinces, the individual fixed effect model is used for subsequent regression analysis, with robust standard errors to mitigate the impact of heteroscedasticity and increase the robustness of results. In both cases, the estimated coefficient of government audit (GA) is significantly negative at the 1% level, indicating that in the big data environment, increased attention to the financial industry by government audit can effectively inhibit the occurrence of systemic financial risk, thus validating Hypothesis H1.

4.2 Robustness Tests

(1) Replacement of Core Explanatory Variable. Following Guo M. et al. (2022) (Guo M. et al., 2022), substitute indicators are selected from three dimensions of government audit: disclosure function, prevention function, and resistance function. The disclosure function (Disclosure) is measured by the natural logarithm of the amount of problems identified by audit authorities; the prevention function (Prevention) is measured by the natural logarithm of the number of cases transferred to judicial and disciplinary inspection departments plus one; and the resistance function (Resistance) is measured by the natural logarithm of the number of audit reports issued plus one. The estimated coefficients of government audit are significantly negative at least at the 5% level, indicating the robustness of the baseline regression results.

(2) Exclusion of Major Financial Crisis Events. Considering the impact of the 2008 US subprime mortgage crisis, data from 2008–2009 are excluded and the regression is re-estimated. The estimated coefficient of government audit (GA) is significantly negative at the 10% level, indicating the robustness of the empirical results.

(3) Lagged Explanatory Variable. The effect of government audit has certain lag characteristics and can produce continuous effects, possibly inhibiting systemic financial risks in future years as well. Therefore, a one-period lag of government audit is used for re-estimation. The estimated coefficient of the lagged government audit (L.GA) is significantly negative at the 1% level, consistent with the baseline regression results, verifying the robustness of the previous findings and indicating that the inhibitory effect of government audit on systemic financial risk is persistent.

4.3 Mediating Effect Analysis

The estimated coefficient of government audit (GA) remains significantly negative at the 1% level, but its absolute value decreases from 0.286 in the baseline regression to 0.262, indicating that risk accumulation plays a partial mediating role, i.e., government audit can prevent systemic financial risk by reducing risk accumulation, thus validating Hypothesis H2.

4.4 Moderating Effect Analysis

The estimated coefficient of the interaction term (GA×BDL) is significantly positive at the 5% level, with an opposite sign to the estimated coefficient of government audit (GA), indicating that the level of big data development plays a negative moderating role. That is, the current increase in the level of big data development has weakened the inhibitory effect of government audit on systemic financial risk to some extent, thus validating Hypothesis H3.

4.5 Heterogeneity Analysis

(1) Regional Heterogeneity. Due to differences in economic development levels, government governance capacity, and financial industry development across regions, the preventive effect of government audit on systemic financial risk exhibits regional variation. The 30 provinces are divided into three groups—eastern, central, and western—for heterogeneity testing. In the eastern and western regions, the preventive effect of government audit on systemic financial risk is more obvious. The reason may be that the eastern region has a high level of economic

development, strong government governance capacity, and developed financial industry, with more sound local financial regulation, providing sufficient support and guarantee for government audit. Therefore, government audit in this region can significantly restrain systemic financial risk. The western region has a relatively low level of economic development and less developed financial industry, but relies more heavily on government audit. Meanwhile, local regulatory institutions are more significantly affected by government audit. Under strong audit supervision, local regulatory institutions become more alert to the emergence of financial risks and more conscious of maintaining financial stability. Therefore, government audit can also play an effective role in inhibiting systemic financial risk in this region, although its significance level may be lower than that of the eastern region due to overall economic constraints. The central region has a medium or rising level of economic development with average government governance capacity. Regions may neglect the regulatory role of government audit to some extent due to the pursuit of rapid development, reducing attention to financial risk alarm, resulting in weaker financial stability. Therefore, government audit in this region has not played an obvious and inhibitory role in systemic financial risk.

(2) Marketization Level Heterogeneity. Under different marketization levels, the demand and supply of government audit differ, and its functional performance also varies, leading to differences in the effectiveness of preventing systemic financial risk. Following Zhang Z. and Yue (2022) (Zhang Z. and Yue, 2022), the marketization index constructed by Wang Xiaolu and Fan Gang is used to measure marketization levels. Since the data are only updated to 2019, following Li M. et al. (2023) (Li M. et al., 2023), the data from 2020–2021 are estimated. The sample is divided into high and low marketization groups based on the mean marketization level for heterogeneity testing. Under low marketization levels, the inhibitory effect of government audit on systemic financial risk is better. The reason may be that in regions with high marketization levels, the legal and regulatory systems are more improved, financial information is more transparent, and the public has more diversified channels for monitoring the operation of the financial industry. Therefore, the demand for government audit governance is relatively reduced, and the preventive effect of government audit on systemic financial risk is also weakened. Conversely, in regions with relatively low marketization levels, the public and market have unique channels for monitoring financial industry risks, resulting in greater demand for and reliance on government audit, leading to better implementation effects of government audit and a more outstanding preventive role against systemic financial risk.

5. Conclusions and Recommendations

Using audit departments and listed financial institutions from 30 Chinese provinces from 2008 to 2021 as samples, this paper analyzes the relationship between government audit and systemic financial risk in the big data environment, examining the mediating effect of risk accumulation, the moderating effect of big data development level on the relationship between government audit and systemic financial risk, and the regional heterogeneity of government audit in preventing systemic financial risk. The results show that: (1) In the big data environment, government audit can still effectively prevent systemic financial risk; (2) Government audit can prevent systemic financial risk by reducing risk accumulation; (3) The level of big data development has a negative moderating effect on the preventive effect of

government audit on systemic financial risk; (4) Heterogeneity analysis shows that the preventive effect of government audit on systemic financial risk is more obvious in the eastern and western regions and in areas with low marketization levels.

Based on these findings, the following recommendations are proposed:

First, continue to promote the digital transformation of government audit. Increase investment in government audit technology, train audit personnel in data analysis capabilities, and further promote the in-depth application of big data audit technology to better prevent systemic financial risks.

Second, improve the monitoring and inhibition system of government audit for financial system risk accumulation. Build a comprehensive risk accumulation monitoring mechanism, focus on supervising the risk-taking level of financial institutions, avoid excessive risk accumulation, and effectively prevent the occurrence of systemic financial risk.

Third, strengthen the positive effects of big data technology in government audit. Establish a strict data quality control system to ensure the authenticity, completeness, and reliability of audit data, avoiding misleading audit information caused by improper use of big data technology that could interfere with audit judgment. At the same time, regularly evaluate the effectiveness of big data applications and continuously strengthen the ability of government audit to address systemic financial risks in the big data environment.

Fourth, implement government audit strategies tailored to local conditions. In the eastern and western regions, ensure that government audit receives sufficient resource support and guarantee, fully exerting its risk prevention function. In the central region, local governments should balance the relationship between development and security, emphasize the risk prevention role of government audit. Government audit authorities should increase risk sensitivity and strengthen communication and coordination with local governments to ensure that audit strategies align with local development goals, jointly preventing systemic financial risks.

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