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Bridging Management and Compliance: The Role of Tax Management in China's Coal Industry

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Abstract

Tax management involves organizing and handling tax affairs to ensure adherence to tax regulations, optimize tax liabilities, and minimize tax risks. China has heavily invested in enhancing its tax management infrastructure, including the Golden Tax Project, aiming for comprehensive tax regulation coverage. However, the coal industry continues to struggle with compliance issues, evidenced by frequent regulatory breaches. This study examine the influence of managerial factors on accounting compliance in the coal industry, focusing on the mediating role of tax management. Employing regression analysis and mediation models, we examine the relationship between managerial factors, tax management improvements, and accounting compliance. Our findings highlight the significant positive impact of enhanced tax management on compliance, underscoring the necessity for proactive tax strategies. The study offers valuable insights for policymakers and industry stakeholders, suggesting that improved tax management practices can significantly enhance compliance within the coal industry.

Keywords: coal industry, golden tax project, accounting compliance, tax management

1. Introduction

The coal industry is integral to China's economy, providing substantial energy and employment. Despite advancements in tax regulation, including the Golden Tax System, the sector faces persistent compliance issues. In 2021, coal constituted 56% of China's energy consumption (National Bureau of Statistics of China, 2023), highlighting its importance. Efforts to enhance tax management, such as the Golden Tax System's fourth phase, aim for precise tax supervision through data governance. However, the

coal industry continues to report significant tax violations, necessitating further investigation into effective compliance strategies.

The Chinese government has intensified its focus on improving tax management within the coal industry, as demonstrated by initiatives like Inner Mongolia's 20-year rectification operation. Such measures aim to combat tax evasion and fraud. The "Opinions on Further Deepening the Reform of Tax Collection and

Management" issued in 2021 emphasized strengthening compliance, particularly in the coal industry. This paper investigates how managerial factors influence accounting

compliance and the mediating role of tax management improvements in this process.

Table 1. Total primary energy consumption in China

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('10million tons)	2021	2020	2019	2018	2017	2016	2015	2014	2013
Raw Coal	293	284	281	278	276	275	277	282	281
Crude Oil	97	94	93	89	86	83	80	74	71
Natural Gas	47	42	39	36	31	27	25	24	22
Primary Power and Other	87	79	75	68	62	57	52	48	43

Source: National Bureau of Statistics of China, 2023

This study aims to uncover the factors influencing accounting compliance in China's coal sector, emphasizing the role of tax management. By analyzing state-led interventions, regulatory changes, and industry-specific policies, we seek to provide insights into effective compliance strategies.

2. Literature Review

Extensive research has been conducted on tax compliance determinants and strategies. Studies by De Neve et al. (2021) and Carrillo et al. (2021) highlight the importance of simplifying communication and providing public goods in enhancing compliance. Naeem and Gulzar (2021) emphasize the impact of simplified tax processes in developing countries. Nagel et al. (2019) discuss how tax training influences compliance behavior, while Farrar and King (2022) show that perceived blameworthiness of fraudulent actors affects observer compliance.

In the coal industry, the complex regulatory environment and organizational characteristics significantly influence compliance behavior. The Golden Tax Project (GTP) in China, an advanced information technology initiative, is expected to enhance tax compliance. Li et al. (2020) confirm its positive impact on general compliance. However, the coal industry still faces severe noncompliance issues (China Judgments Online, 2023), prompting intensified oversight by the State Administration of Taxation.

This study builds on existing literature by focusing on the coal industry's unique challenges and the potential of tax management improvements to enhance compliance.

3. Research Methodology

3.1 Data Source

We utilize empirical analysis to explore the relationship between tax management improvements and accounting compliance in the Chinese coal sector. Regression analysis and mediation models will assess the direct and mediating effects of tax management practices on compliance indicators.

Data will be sourced from the China Stock Market & Accounting Research (CSMAR) database, encompassing financial and accounting information of coal companies in China. The dataset spans from 2013 to 2022, allowing for a comprehensive analysis of trends.

Control variables such as company size, profitability, and regulatory environment will be included to ensure robust analysis. These controls help mitigate confounding effects, providing a clearer view of the relationship between tax management improvements and accounting compliance.

3.2 Hypothesis Development

Tax management upgrades play a pivotal role in enhancing corporate accounting compliance. Drawing on previous research, this study proposes the following hypothesis:

 H_1 : Tax management upgrade positively impact corporate accounting compliance.

H₂: Tax management upgrade mediates the relationship between managerial factors and the level of accounting compliance.

Advanced tax management systems, facilitated by technological upgrades, are expected to enhance financial reporting efficiency and accuracy. This leads to increased transparency and reduced tax-related risks, resulting in higher compliance levels.

Empirical evidence from various industries supports this hypothesis, suggesting that robust tax management practices improve compliance (Wang, Xu, Sun, & Cullinan, 2020). This study aims to validate this relationship in the coal sector through rigorous empirical analysis.

To examine the relationship between tax management upgrade and accounting compliance, this study establishes multiple panel regression Model 1 and Model 2 as follows.

Model 1. Multiple panel regression

 $BTD_{i,} = \beta_0 + \beta_1 TaxEnfor_{i,t} + \gamma_1 FirmFixedEffects + \gamma_2 YearDummies + \gamma_3 Controls + \varepsilon_{i,t}$

Model 2. Model of mediating effect of Tax Management Upgrade

 $BTD_{i,} = \beta_0 + \beta_1 InCon_{i,t} + \beta_2 TaxEnfor_{i,t} + \gamma_1 FirmFixedEffects + \gamma_2 YearDummies + \gamma_3 Controls + \varepsilon_{i,t}$

$$\begin{split} BTD_{i,} &= \beta_0 + \beta_1 CopGovern_{i,t} + \beta_2 TaxEnfor_{i,t} + \\ & \gamma_1 FirmFixedEffects + \gamma_2 YearDummies + \gamma_3 Controls \\ & + \varepsilon_{i,t} \end{split}$$

$$\begin{split} BTD_{i,} &= \beta_0 + \beta_1 RiskMan_{i,t} + \beta_2 TaxEnfor_{i,t} + \gamma_1 FirmFixedEffects \\ &+ \gamma_2 YearDummies + \gamma_3 Controls + \varepsilon_{i,t} \end{split}$$

 $BTD_{i,} = \beta_0 + \beta_1 AccEth_{i,t} + \beta_2 TaxEnfor_{i,t} + \gamma_1 FirmFixedEffects + \gamma_2 YearDummies + \gamma_3 Controls + \varepsilon_{i,t}$

3.3 Measurement of variables

The Chinese state accounting system has a close association with financial budgets and tax collections. Due to inconsistencies between accounting standards and tax laws, management enjoys considerable discretion in financial (Frank, Lynch, & Rego, 2009). Drawing on the methodology proposed by Manzon and Plesko (2003), the calculation of BTD is outlined in Model 2 and Table 2. This approach provides a structured framework for evaluating the Book-Tax differences and offers insights into the dynamic relationship between accounting and tax practices in the evolving

landscape of the Chinese financial system. Importantly, this metric acts as a proxy for measuring the degree of accounting compliance within the company. Therefore, a higher BTD value suggests a higher propensity for engaging in corporate tax activities, offering valuable insights into the company's adherence to accounting compliance standards.

Model 2. Model of BTD

$$BTD = \frac{PI - \frac{CITE - DITE}{T}}{ITA}$$

Table 2. Measurement of BTD

3					
Item	Descriptions				
BTD	Book-tax difference				
PI	Pretax profit				
CITE	Current income tax expense				
DITE	Deferred income tax expense				
Т	The firm's legal tax rate				
ITA	Initial total assets				

Tax Authority Enforcement (TaxEnfor) serves as an indicator reflecting the intensity of tax collection and management. Typically, it indirectly gauges this intensity through the tax effort index in finance. Tax effort, defined as the variance between the actual tax burden ratio and the estimated tax burden ratio, signifies the endeavor in converting the region's tax collection capacity into tangible tax revenue. Following the approach outlined by Zeng and Zhang (2009), the estimation involves determining the tax burden ratio of the coal industry in China. Subsequently, TaxEnfor is computed by contrasting the regression estimate with the actual tax burden ratio of the coal industry (Mertens, 2003). A higher TaxEnfor value indicates tax effort in the province, reflecting heightened tax authority enforcement within the coal industry.

Model 3. Model of TaxEnfor

$$\frac{T_{i,t}}{GDP_{i,t}} = \alpha_0 + \alpha_1 \frac{IND1_{i,t}}{GDP_{i,t}} + \alpha_2 \frac{IND2_{i,t}}{GDP_{i,t}} + \varepsilon_{i,t}$$

$$TaxEnfor = \frac{T}{GDP} - \frac{T^*}{GDP}$$

Table 3. Measurement of TaxEnfor

Item	Descriptions			
Т	Tax revenue			
GDPi,t	Regional Gross domestic product			
TaxEnfor	Tax Authority Enforcement			
IND1i,t	Regional Primary Industry GDP			
IND2i,t	Regional Secondary Industry GDP			

Controls in Model 1 represent all control variables, such as company size (Size), enterprise profitability (ProfAb), company growth ability (Growth) and company debt ratio (LabRate). In this study, company size is calculated by the natural logarithm of the total assets. On the one hand, large companies have more channels to avoid tax, and the cost of corporate tax activities is low(Gupta & Newberry, 1997). On the other hand, large companies have more access to funds than small ones; as a result, they have less motivation to use corporate tax activities to obtain funds(Holland, 1998). Therefore, this study believes that company size will have an impact on corporate tax activities, but the direction of impact cannot be determined. In addition, if the company chooses tax activities, it will get more tax activities income, so it is more likely to take more aggressive tax activities. Therefore, company profits (ProfAb) can be positively related to corporate tax activities. Generally, companies in growth need more financial support, and thus companies are more likely to adopt tax activities in order to obtain more after-tax profits. As a result, this study believes that company growth ability (Growth) is positively related to corporate tax activities. Stickney and McGee (1982) claimed that as the interest of the company's liability is paid before tax, the company's liability has the function of reducing the tax burden of the company, which is named tax shield (Stickney & McGee, 1982). Various types of tax shields adopted by a company will affect corporate tax activities. The higher the debt is, the weaker the company's tax activities motivation. Therefore, company liability (LabRate) is negatively related to corporate tax activities.

Model 1 uses FirmFixedEffects to eliminate the influence brought by different companies. In addition, accounting rule changes in corporate can also be eliminated by controlling FirmFixedEffects Moreover, Model 1 uses YearDummies to eliminate the influence brought by different years.

4. Findings and Discussion

4.1 Descriptive Statistics

Table 4. Sample Description

Table 4. Sample Description							
Variable	Obs	Mean	Std. Dev.	Min	Max		
btd	2083	0.0210888	0.1074317	-0.321119	0.2711645		
ic	2083	1.328853	1.469141	0	3		
corpgovern	2083	11.7446	3.551875	6	21		
riskman	2083	3.561434	5.447604	0	18.22801		
acceth	2083	0.0446471	0.2065775	0	1		
taxenfor	2083	227.5628	202.4218	-109.1918	629.8967		
size	2083	23.1886	1.618997	19.55133	27.9531		
profab	2083	0.0253691	0.0626452	-0.2952823	0.1880066		

growth	2083	1.274711	6.024659	-24.11152	15.01724
labrate	2083	0.5258008	0.1967165	0.0672837	0.9665849

Based on the descriptive statistics, the tax burden ratio (BTD) for coal enterprises exhibits a mean of 0.021 with a standard deviation of 0.107, indicating a moderate level of variability in tax obligations among the sampled enterprises, ranging from -0.321 to 0.271. Information disclosure (IC) levels average at 1.33 with a standard deviation of 1.47, reflecting a varied degree of transparency across the sampled companies, spanning from 0 to 3. Corporate governance standards (CorpGovern) present an average of approximately 11.74, suggesting a relatively high level of governance, with a range from 6 to 21. Risk management practices (RiskMan) demonstrate an average of about 3.56, with a wide dispersion ranging from 0 to 18.23, indicating considerable diversity in risk mitigation strategies. Accounting ethics (AccEth) exhibit a mean of 0.045 and a standard deviation of 0.207, showcasing a mixed adherence to ethical standards within the sampled entities. Tax enforcement (TaxEnfor) efforts show substantial variability, with an average of approximately 227.56 and a standard deviation of 202.42, ranging from -109.19 to 629.90. Enterprise size (Size) has an average of 23.19, with a standard deviation of 1.62, indicating a relatively homogenous size distribution. Profitability (ProfAb) presents a mean of 0.025 and a standard deviation of 0.063, suggesting moderate profitability levels across the sampled enterprises. Growth rates (Growth) demonstrate a diverse landscape, with an average of 1.27 and a standard deviation of 6.02, ranging from -24.11 to 15.02. Labor ratios (LabRate) average approximately 0.53, with a standard deviation of 0.20, illustrating a relatively stable labor composition among the sampled companies, with a range from 0.07 to 0.97. These descriptive findings lay the groundwork for subsequent analyses, providing insights into the distribution and characteristics of the variables under study.

4.2 Regression Analysis

The coefficient for tax management remains statistically significant (coef: 0.0000867, p < 0.001), indicating a positive association between tax management upgrade and accounting compliance even after controlling for other factors. Additionally, firm size and profitability also exhibit significant associations with accounting compliance, suggesting their influence on compliance levels.since the p-value is less than 0.05 and $\beta = 0.0000867$. therefore H1 can be supported and internal control has a positive impact on accounting compliance.

4.3 Mediation Analysis

The regressions of IC on BTD (β =-0.0039867, p-value<5%) and IC on Taxenfor (β =-7.190286, p-value<5%), as well as Taxenfor on BTD (β =.000223, p-value<5%), all yielded statistically significant results. Therefore, the mediating effect of Taxenfor is significant. Furthermore, when Taxenfor is included as a control variable, the regression of IC on BTD becomes nonsignificant. This indicates full mediating effect by Taxenfor.

The regressions of Corpgovern on BTD (β =-.0013817, p-value<5%) and Corpgovern on Taxenfor (β =2.973448, p-value<5%), as well as Taxenfor on BTD (β =.000223, p-value<5%), all yielded statistically significant results. Therefore, the mediating effect of Taxenfor is significant. Furthermore, when Taxenfor is included as a control variable, the regression of Corpgovern on BTD is still significant. This indicates parital mediating effect by Taxenfor.

The regressions of Riskman on BTD (β =-.0013817, p-value<5%) and Riskman on Taxenfor (β =2.973448, p-value<5%), as well as Taxenfor on BTD (β =.000223, p-value<5%), all yielded statistically significant results. Therefore, the mediating effect of Taxenfor is significant. Furthermore, when Taxenfor is included as a control variable, the regression of Riskman on BTD is still significant. This indicates parital mediating effect by Taxenfor.

The regressions of AccEth on BTD (β =-.0439733, p-value<5%) and AccEth on BTD (β =.000223, p-value<5%), yielded statistically significant results. However, AccEth on Taxenfor (β =2.817657 p-value>5%) is nonsignificant. Consequently, Taxenfor is not a mediating variable between AccEth and BTD.

5. Discussion

5.1 Policy Implications

The study's findings provide crucial insights for policymakers aiming to enhance accounting compliance within China's coal sector. The significant positive impact of tax management on compliance underscores the necessity for continuous investment in and upgrading of tax management systems, such as the Golden Tax Project. Policymakers should prioritize the integration of advanced technologies in tax management to ensure comprehensive oversight and precise tax supervision. Additionally, the significant regional disparities in tax enforcement suggest a need for region-specific policies that address local compliance challenges. Tailored tax enforcement strategies can mitigate the uneven application of tax regulations and ensure uniform compliance across different provinces.

The government's ongoing efforts, such as the Inner Mongolia rectification operation, highlight the importance of stringent tax enforcement in sectors prone to non-compliance. Extending similar initiatives to other regions and industries can strengthen the overall tax compliance framework. Furthermore, policymakers should consider providing targeted support and training to local tax authorities to enhance their enforcement capabilities and ensure effective implementation of tax regulations.

5.2 Implications for Organizational Practices

For coal companies, the study highlights the importance of robust internal controls, effective corporate governance, and comprehensive risk management practices. Implementing strong internal control systems can directly improve accounting compliance by ensuring accurate financial reporting and reducing opportunities for tax evasion. Companies should regularly audit their internal controls and update them to address emerging compliance risks.

Enhanced corporate governance practices, including transparent board oversight and clear governance policies, can significantly influence compliance behavior. Companies should focus on improving their governance structures to promote accountability and ethical conduct. Establishing a culture of compliance within the organization, supported by regular training and awareness programs, can further reinforce adherence to accounting standards and tax regulations.

Risk management is another critical area where improvements can lead to better compliance outcomes. Companies should develop and implement comprehensive risk management frameworks that identify, assess, and mitigate potential compliance risks. This proactive approach can help organizations anticipate and address compliance issues before they escalate.

5.3 Future Research Directions

While this study provides valuable insights into the role of tax management in enhancing accounting compliance, several areas warrant further research. Future studies could explore the specific mechanisms through which different managerial factors influence compliance behavior in more detail. Understanding the interplay between these factors and their cumulative impact on compliance can provide deeper insights into effective compliance strategies.

Additionally, examining the role of cultural, economic, and regulatory differences across regions can shed light on the factors contributing to the variability in tax enforcement and compliance. Comparative studies involving other high-risk industries can help generalize the findings and identify industry-specific challenges and solutions.

Longitudinal studies tracking the impact of policy changes and technological advancements in tax management over time can provide valuable insights into their effectiveness and inform future policy decisions. Such research can help identify best practices and guide the development of targeted interventions to enhance compliance across various sectors.

Finally, exploring the ethical dimensions of accounting practices and their relationship with tax compliance can offer a more comprehensive understanding of compliance behavior. Investigating how ethical training and organizational culture influence compliance can help develop strategies to promote ethical conduct and reduce non-compliance.

6. Recommendations

6.1 National Tax Authorities

National tax authorities should continue to invest in advanced technological solutions like the Golden Tax Project to improve tax management and compliance. Implementing cutting-edge data analytics, machine learning, and AI tools can enhance the accuracy and efficiency of tax collection and compliance monitoring.

National tax authorities should strengthen regional enforcement. Given the variability in tax enforcement across regions, it is crucial to develop tailored strategies that address specific local challenges. National tax authorities should provide additional resources and training to regional offices to ensure consistent and effective enforcement.

National tax authorities should strengthen communication and cooperation with the coal industry and provide customized tax compliance guidance and support. This includes organizing seminars and training courses on specific tax compliance challenges in the coal industry, conducting regular tax compliance audits, monitoring the tax compliance status of coal enterprises, and promptly identifying and correcting non-compliant behaviors.

Additionally, national tax authorities can collaborate with research institutions and industry associations to jointly develop effective policies and strategies to promote continuous improvement of tax compliance in the coal industry. Moreover, there is a need to establish more effective monitoring mechanisms and enhance the analysis and utilization of tax data to promptly identify potential tax risks and loopholes.

6.2 Coal Companies

Coal companies should prioritize the development and maintenance of strong internal control systems. Regular audits and reviews of these controls can ensure they effectively address compliance risks and enhance the accuracy of financial reporting.

Coal companies should strengthen corporate governance. Improving corporate governance practices is essential for fostering a culture of compliance. Companies should establish clear governance structures, ensure board oversight, and promote transparency and accountability in all operations.

Coal companies should comprehence risk management. Develop and implement comprehensive risk management frameworks to identify, assess, and mitigate potential compliance risks. This proactive approach can help companies anticipate issues and implement corrective measures promptly.

Coal companies should invest in employee training. Regular training and development programs for employees can enhance their understanding of tax regulations and compliance requirements. Fostering an ethical work culture where compliance is valued can significantly reduce non-compliance risks.

6.3 Industry Associations

Industry associations should play a pivotal role in facilitating knowledge sharing and best practices among member companies. Organizing forums, workshops, and conferences where companies can share their experiences and learn from each other is essential. This collective approach can help companies adopt more effective compliance strategies and stay updated on the latest regulatory changes.

Industry associations should actively represent the coal industry's interests in discussions with national tax authorities. By advocating for fair and practical tax policies that consider the unique challenges faced by the industry, associations can ensure that compliance requirements are reasonable and achievable. This advocacy can also help influence policy changes that support the industry's growth and sustainability.

Creating and disseminating comprehensive compliance guidelines tailored to the coal industry is crucial. These guidelines should be detailed and practical, providing companies with clear steps to meet compliance requirements. Associations can also offer templates and tools to help companies implement these guidelines effectively.

Encouraging and supporting research on tax management and compliance within the coal industry is vital. Collaborative research initiatives with academic institutions and industry experts can provide valuable insights and innovative solutions to enhance compliance practices. This research can also help identify emerging risks and opportunities in tax management.

Industry associations should regularly monitor and report on compliance trends within the coal industry. By analyzing data and identifying common challenges, associations can provide valuable feedback to both companies and policymakers. This monitoring can help highlight areas for improvement and track the progress of compliance initiatives over time.

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