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Impact of Government Digital Transformation on Corporate Tax Compliance: Evidence from China

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Abstract:

The value-enhancing function of information technology iteration establishes the inevitable connection between digitalization and tax governance. Government digital transformation seems to be critical to"data-driven tax governance". This paper seeks to shed light on how government digital transformation affects corporate tax compliance under the scenario of Chinese-style modernization. With the data

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of A-share listed companies from 2010 to 2022, series of empirical tests are displayed with the main method of Difference-in-Differences (DID) by considering the establishment of national big data pilot zones as a quasi-natural experiment. The findings mainly cover that government digital transformation can effectively promote corporate tax compliance by enhancing corporate performance, an active channel, and strengthening tax administration efforts, a passive channel. According to heterogeneity analysis, the positive impact of government digital transformation on corporate tax compliance appears to be more pronounced in the samples with higher marketization, higher levels of corporate digital transformation, and greater management power. Some policy suggestions are followed concluding enterprises should leverage digitalization to improve management systems, thereby enhancing tax compliance under the government's push for digital transformation.

Keywords: Government digital transformation, tax compliance, corporate performance, tax administration, Difference-in-differences

JEL Classification: C51, D22, O38

1. Introduction

Taxation plays a vital role in national governance. As the primary source of national fiscal revenue, it provides fundamental financial support for various governance activities. The report of the 20th National Congress of the Communist Party of China outlined comprehensively advancing the great rejuvenation of the Chinese nation through Chinese-style modernization, setting more ambitious strategic goals for national governance modernization and higher practical demands for tax governance modernization. Digital transformation is not only a requirement for overall national governance but also a key step in tax governance that must be carried out in the context of the modern era (Janowski, 2016). The 14th Five-Year Plan explicitly sets forth the development tasks of "deepening tax administration system reforms, building smart taxation, and promoting the modernization of tax administration". Therefore, advancing the digital transformation of tax governance is not only an unavoidable trend to meet the demands of national governance in the new era but also a key pathway to modernizing the tax system, improving governance efficiency, and promoting high-quality development (Guo *et al*., 2024).

Government digital transformation (GDT) plays a crucial role in establishing a modern digital governance system and enhancing governance capabilities. (Panagiotopoulos *et al*., 2019), providing a new opportunity for enhancing national governance and advancing "data-driven tax governance" (Xiao and Shao, 2020). In this context, how GDT can break down information barriers, enhance tax governance effectiveness, and explore the underlying mechanisms has become an important issue requiring urgent exploration (Wang *et al*.,

2024). According to data disclosed by the State Taxation Administration in the 2023 "China Tax Annual Report", total tax revenue in 2023 amounted to 17.7 trillion yuan (excluding customs duties and not deducting export tax rebates), with corporate income tax and domestic Value-added Tax totaling 11.1 trillion-yuan, accounting for approximately 62.71% of total tax revenue. These data highlight the important role of corporate taxation in national fiscal revenues, reflecting its core role in driving economic development and indicating the profound impact of tax policies on business operations. In 2023, a total of 174,000 businesses suspected of issuing false invoices and tax fraud were inspected, resulting in the recovery of approximately 16.6 billion yuan in export tax rebate losses. This result demonstrates the significant progress made by tax authorities in strengthening tax supervision and combating tax violations while also highlighting that some businesses still evade tax oversight through dubious means. GDT has driven the modernization of the tax supervision system; however, it still faces complex and evolving challenges. Improving corporate tax compliance (TC) remains a long-term and challenging goal.

Most of the existing TC literature has predominantly focused on reforms in tax collection and administration (Cheng *et al*., 2024a) or enterprises' own digitalization (Tiantian *et al*., 2023), while the role of GDT in shaping corporate TC remains largely underexplored. Recent studies have mainly examined GDT from the perspective of public service delivery and political governance (Buyannemekh *et al*., 2023; Nam, 2018), leaving a research gap regarding its behavioral consequences for firms. Against this backdrop, this study provides new evidence and extends the literature in three ways. First, we shift research perspective from the macro governance benefits of GDT to its micro-level regulatory and behavioral influence on firms, especially corporate TC. This offers a novel analytical lens for understanding how government digitalization reshapes state-business interactions and corporate compliance incentives. Second, we identify concrete mechanisms through which GDT affects TC by integrating both proactive and reactive compliance logics. Specifically, we reveal that GDT can improve firm performance (proactive compliance) while simultaneously strengthening tax enforcement and monitoring (reactive compliance). This dual-channel analysis helps uncover how digital public governance translates into measurable improvements in firm-level compliance behavior. Third, this study highlights important contextual heterogeneity in the GDT and TC relationship. We find that the compliance-enhancing effect of GDT is more significant in regions with higher marketization levels and among firms with stronger digital capabilities and more concentrated managerial control. These findings enrich the understanding of when and for whom digital governance is most likely to succeed, providing practical policy guidance for tailoring future GDT and tax governance reforms.

2. Literature Review and Research Hypotheses

2.1 Literature Review

TC refers to the behavior of taxpayers in meeting their tax obligations as stipulated by applicable tax laws, regulations, and policies. The existing literature on corporate TC can be categorized into government and non-government factors. The government analyzes TC to modernize the tax administration system and strengthen administrative techniques (Saragih *et al*., 2018). Additionally, such analysis influences the strength of tax administration by enhancing the willingness of local government officials to enforce taxes (Casaburi and Troiano, 2016), which enables the government not only to improve its capacity to collect taxes but also to encourage local officials to enforce taxes, thereby increasing tax administration efforts and enforcing corporate TC. Additionally, policies such as accelerated depreciation tax incentives for fixed assets have been introduced to alleviate the tax burden on businesses, thereby directly promoting corporate TC (Cui *et al*., 2022). Firms will also proactively increase their TC through their perception of tax fairness and trust that the government will use taxes wisely to improve their lives (Navarro *et al*., 2014). Regarding non-governmental factors, the normative effect of traditional culture has an inherent restraining nature, and firms recognize that traditional culture has a soft constraint effect that can help prevent tax evasion (Cheng *et al*., 2024b). Furthermore, the larger company's tax department, the more compliant it is with tax regulations (Chen *et al*., 2021), and companies with better governance avoid taxes less (Kerr, 2024). Corporate TC is influenced by multiple factors, with government tax regulations and policy guidance being key external factors, while a firm's compliance culture and management level are the core elements that ensure the sustainability of TC.

Existing research mainly explores two dimensions: government-driven mechanisms and firm-level behavioral determinants. For example, information transparency mechanisms emphasize that digital tools reduce information asymmetry and enhance policy predictability, thereby facilitating voluntary compliance. Digital tax reporting improves service accessibility and reduces uncertainty (Gupta and Jalles, 2022), while information disclosure can influence firms' perception of fairness and trust in public expenditure (Navarro *et al*., 2014). Notably, Xi and Ling (2025) show that digital tax administration can even promote firms' broader digital transformation, suggesting stronger willingness to engage in transparent governance practices. Deterrence and enforcement mechanisms argue that digitalization enables tax authorities to enhance monitoring capabilities and uncover tax evasion more effectively. Establishing big data-based risk identification systems significantly

strengthen regulatory precision (He and Yi, 2023), consistent with international findings that digital tax enforcement reduces evasion in high-risk sectors. Recent evidence further indicates that enhanced tax digitalization improves corporate innovation incentives via stronger governance and oversight effects (Xu *et al*., 2025), implying that enforcement may indirectly shape compliance by strengthening long-term development drivers. Compliance cost mechanisms examine how digital reforms influence firms' compliance burdens. While streamlined digital services should theoretically lower administrative costs and improve efficiency (Zhang *et al*., 2025), heterogeneous technological readiness may create new compliance burdens for digitally weak firms. Moreover, Sun *et al*. (2025) reveal that while corporate digital transformation reduces tax avoidance by lowering downside risk and political costs, it may simultaneously heighten managerial pressure and emotional factors-leading to divergent compliance choices. Thus, digitalization's impact may vary substantially across institutional environments and firm types.

In parallel, emerging literature highlights the unintended consequences of digital transformation. Homogeneous reliance on centralized platforms can reduce policy adaptability (Usai *et al*., 2021), and significant government investments may not yield immediate improvements in TC due to adjustment lags (Gebauer *et al*., 2020). This indicates that the effect of GDT on TC is not universally positive and may depend on contextual conditions. Taken together, while studies increasingly acknowledge the role of tax digitalization in shaping corporate behavior, few investigate how GDT reshapes corporate compliance behavior through both voluntary and deterrence channels, nor when it achieves the desired regulatory outcomes. Moreover, whether GDT's effectiveness differs across market environments, digital capability levels, and governance structures remains largely underexplored.

2.2 Research Hypotheses

GDT can effectively promote corporate TC by making tax processes more transparent and efficient using information technology (Srivastava and Devaraj, 2016). Tax authorities can monitor corporate tax situations in real time through electronic platforms and big data analysis, reducing human intervention and improper operations, which increase the cost of illegal business activities and encourage TC (Uyar *et al*., 2021). This transparency enhances business trust in TC and promotes adherence to tax laws and obligations. Through digital transformation, the government can improve the fairness of tax management, enhancing its credibility. When businesses perceive that the government's tax management is transparent, fair, and efficient, they are more willing to fulfill tax obligations (Kochanova *et al*., 2022). Digital tax platforms can respond promptly to business inquiries and concerns, im-

prove taxpayer satisfaction, and foster a culture of TC within firms. Furthermore, GDT is not limited to the digitalization of tax authorities but often involves digital upgrades in other government departments. Through cross-departmental information sharing, tax authorities can gain a more comprehensive understanding of business operations and financial conditions, thereby reduce tax evasion and enhance the accuracy and efficiency of tax supervision (Chen *et al*., 2025). We put forward the following hypothesis.

H_1: GDT can improve corporate TC levels.

GDT enhances corporate performance by facilitating firms in meeting their tax obligations. One of the core aspects of GDT is optimizing the business environment and improving the efficiency and transparency of government services. By establishing an integrated platform for data exchange, governments can better disseminate market, industry, and policy insights to firms, supporting improved prediction and strategic choices, thereby indirectly contributing to stronger corporate performance. From a behavioral economics perspective, firms respond to reduced information asymmetry and lower uncertainty by adjusting their investment and operational decisions, which can create an upward performance spiral. GDT enables governments to understand and meet business needs. Through digital platforms, the government can facilitate the flow of information, resources, and capital between the government and businesses based on the industry, size, and needs of firms, thereby promoting government–business cooperation to enhance corporate performance (Liu and Guo, 2024). Institutional theory suggests that firms internalize normative pressures from a digitally transforming government environment, aligning their behaviors with expected compliance norms, which further strengthens the performance-compliance link.

As governments promote digital transformation, companies are beginning to disclose their social responsibility reports through digital platforms. The transparency of social responsibility not only enhances a company's credibility but also bolsters its long-term market competitiveness, attracting broader market support and fostering performance growth. Companies that experience performance growth are often on an upward cycle and typically place greater emphasis on their social image and brand value. According to corporate governance theory, managers are incentivized to maintain long-term firm value, and proactive TC becomes a strategic choice to protect reputation and align with shareholder interests. Proactive TC helps build a positive image and enhances trust among consumers, employees, and investors. Following performance improvement, firms focus more on long-term strategies. When a firm does not adhere to tax rules, it may encounter governmental or societal sanctions that undermine its development and run counter to the interests of both shareholders and managers. We formulate the following hypothesis:

H_{2a}: GDT fosters corporate TC by enhancing corporate performance.

GDT can strengthen tax administration, thereby forcing firms to comply with tax regulations passively under increased regulatory pressure. GDT reduces tax administration costs through automated processes, electronic tax filings, and online tax payments (Huang *et al*., 2022). Moreover, the adoption of GDT enables tax authorities to utilize automated systems for collecting, managing, and analyzing tax data, significantly enhancing the efficiency of tax administration. Digital transformation facilitates data sharing between various government departments and social organizations, enabling tax authorities to analyze large volumes of economic data, including firm financial statements, consumption data, and bank transactions, to assess the tax capacity and behavior of tax subjects accurately. Leveraging big data allows tax agencies to better identify shadow economic activities and compliance risks, contributing to more reliable and efficient tax governance. (He and Yi, 2023).

As GDT enhances the comprehensiveness and standardization of tax administration, firms' operational space is significantly reduced, and the costs of non-compliance rise substantially. Behavioral economics indicates that firms' cost-benefit calculations under increased monitoring pressure led to more rule-abiding behavior, reflecting a passive compliance response. After weighing the risks of being audited and compliance costs, firms choose to comply with tax regulations to avoid potential legal penalties and reputational damage. This passive TC behavior also indirectly promotes the optimization of tax fairness and market order. Institutional and governance perspectives highlight that enhanced oversight and standardized enforcement reinforce normative and coercive pressures, strengthening the passive compliance channel. Drawing from this analysis, we put forward the following hypothesis:

H_{2b}: GDT facilitates corporate TC by increasing tax administration intensity.

3. Research design

Considering the enforcement of China's new Corporate Income Tax Law in 2008 and the effects of the financial crisis, our research focuses on A-share listed companies during the period from 2010 to 2022. This timeframe aligns with the continuous rollout of China's Digital Government Strategy, including the comprehensive reform of smart tax administration and the acceleration of electronic and platform-based tax governance since the early 2010s. Therefore, the selected sample window captures the full evolution of GDT policies and provides a valid institutional setting for assessing their impact on corporate TC. We exclude data from firms with abnormal listings, firms in the financial industry, those with significant

data gaps, firms reporting pre-tax profits less than or equal to zero, and firms with effective income tax rates either below zero or above one. To minimize the impact of outliers, we apply winsorization to the continuous variables at 1% and 99% percentiles. Data was sourced from the CSMAR, WIND, and RESSET databases. Ultimately, we analyze 25,488 observations.

3.1 Variable definitions

3.1.1 Dependent variable

Tax compliance (*TC*). We adopt the concepts of book tax difference (BTD) and residual book tax difference (DDBTD) to measure corporate *TC* (Wilson, 2009; Desai and Dharmapala, 2006), with the corresponding variables being denoted as *TCA* and *TCB*, respectively. The higher the BTD and DDBTD, the greater the discrepancy between accounting profit and taxable income divided by total assets, and indicating a higher likelihood of tax avoidance, resulting in a lower value of *TC*.

3.1.2 Independent variable

Government digital transformation (*GDT*). We construct an interaction term (*Treat* × *Post*) to measure the value of *GDT* (Xu *et al*., 2024). Firms situated in cities where the national big data comprehensive pilot policy was implemented are classified as the treatment group, while firms in other cities are assigned to the control group. We define a grouping dummy variable *Treat* to indicate whether a firm's city belongs to the big data comprehensive pilot zones. Samples from cities within the pilot zone are assigned a value of one, whereas those from other cities are assigned a value of zero. The time dummy variable *Post* indicates the period before and after policy implementation, taking on a value of one for the year of establishment and subsequent years, and a value of zero otherwise. *Treat* × *Post* serves as a dummy variable for *GDT*.

3.1.3 Control variables

We select factors that could potentially influence *TC* as control variables, including various firm-specific and regional characteristics (Jin *et al*., 2023; Chen *et al*., 2024). Firm-specific characteristics include firm size, asset turnover, financial leverage, capital structure, cash flow, return on investment, intangible asset ratio, ownership concentration, and nature of ownership. Regional characteristics encompass factors such as the level of economic development in the province where the firm is located. Table 1 presents the definitions.

Table 1: Definitions of main variables

Types	Variable	Symbol	Definition
Dependent Variable	Tax Compliance	*TCA*	(Pre-tax accounting profit – taxable income) / total assets at the end of the period
		TCB	Accounting tax differences excluding the effect of accrued profits
Independent Variable	Government Digital Transformation	*GDT*	Treat × Post
Control Variable	Firm Size	*SIZE*	Log of the year-end total assets of a firm
	Asset Turnover	*ATO*	Ratio of net sales proceeds over average total assets
	Financial Leverage	*LEV*	Total liabilities at year end / total assets at year end
	Capital Structure	*TANG*	(Net fixed assets + net inventories) / total assets
	Cash Flow	*CASH*	Net cash flows from operating activities / total assets
	Return on Investment	*EQINC*	Investment income / total assets
	Intangible Asset Ratio	*INTAG*	Intangible assets / total assets
	Ownership Concentration	*TOP*	Shareholding ratio of the largest shareholder
	Ownership Nature	*SOE*	State-owned enterprise = 1, otherwise = 0
	Economic Development Level	*GDP*	Nominal GDP / GDP conversion index

Source: Authors' own compilation

3.2 Model setting

To examine the relationship between *GDT* and *TC*, we refer to Xu *et al*. (2024) and Chen *et al*. (2024), the following multi-period difference-in-differences method (DID) was developed:

$$TCA_{i,t}\left(\text{or } TCB_{i,t}\right) = \alpha_0 + \alpha_1 GDT_{i,t} + \alpha_2 Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

where the subscripts *i* and *t* indicate the firm and year, respectively. We predict that α is significantly negative, *Controls* represents control variables, μ indicates individual fixed effects, λ indicates time fixed effects, and ε is a random error term.

4. Empirical analyses

4.1 Baseline results

4.1.1 Descriptive analysis

Descriptive statistics are presented in Table 2. The average *TCA* and *TCB* values for the sampled firms are 0.0024 and 0.0020, respectively. This finding suggests that, despite improvements in business transparency and information disclosure in the digital economy era, tax non-compliance remains a widespread issue, which is consistent with the conclusions proposed by Chen *et al.* (2024). The average value of *GDT* is 0.2989, indicating that 29.89% of the observations in the sample correspond to firms operating after the introduction of the big data pilot policy.

Table 2: Descriptive statistics

Variable	Observations	Mean	Ste.Dev	Minimum	Maximum
TCA	25,488	0.0024	0.0264	−0.0671	0.0910
TCB	25,488	0.0020	0.0269	−0.0747	0.0873
GDT	25,488	0.2989	0.4578	0	1
SIZE	25,488	22.3963	1.3095	20.1347	26.2925
ATO	25,488	0.6392	0.4312	0.0881	2.5632
LEV	25,488	1.2948	0.7306	0.5202	5.6850
TANG	25,488	0.3477	0.1719	0.0223	0.7745
CASH	25,488	0.0538	0.0672	−0.1426	0.2482
EQINC	25,488	0.5110	2.2837	−0.9713	19.2839
INTAG	25,488	0.0456	0.0514	0.0000	0.3263
TOP	25,488	34.8322	15.0714	8.7300	74.9800
SOE	25,488	0.4601	0.4984	0	1
GDP	25,488	8,717.3090	4,523.4630	688.5717	17,426.2900

Source: Authors' own calculations

4.1.2 Baseline regression

Table 3 presents the baseline regression results. These findings supporting hypothesis H_1.

Table 3: Regression results

	(1) *TCA*	(2) *TCB*	(3) *TCA*	(4) *TCB*
GDT	−0.0022*** (0.0006)	−0.0019*** (0.0006)	−0.0019*** (0.0006)	−0.0018*** (0.0006)
SIZE			−0.0012*** (0.0004)	−0.0011*** (0.0004)
ATO			−0.0004 (0.0009)	−0.0014 (0.0009)
LEV			−0.0041*** (0.0002)	−0.0031*** (0.0002)
TANG			−0.0037** (0.0019)	−0.0017 (0.0018)
CASH			0.0143*** (0.0031)	0.0416*** (0.0030)
EQINC			0.0004*** (0.0001)	0.0003*** (0.0001)
INTAG			−0.0306*** (0.0065)	−0.0239*** (0.0061)
TOP			−0.0000 (0.0000)	−0.0000 (0.0000)
SOE			−0.0005 (0.0008)	−0.0010 (0.0007)
GDP			0.0000* (0.0000)	0.0000** (0.0000)
Constant	0.0030*** (0.0002)	0.0026*** (0.0002)	0.0295*** (0.0108)	0.0220** (0.0101)
Obs.	25,296	25,296	25,296	25,296
R^2	0.4825	0.5449	0.4925	0.5562
Year	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes

Notes: (1) After applying the high-dimensional fixed-effects model, the sample size decreases because fixed effects cause some observations to become "single observations". (2) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. (3) The *t*-values in parentheses are calculated using robust standard errors (unless otherwise specified, the same applies hereafter).

Source: Authors' own calculations

4.1.3 Parallel trends test

The *TC* trends between the treatment and control groups must be roughly parallel before the policy intervention. An event study was conducted to test the parallel trends assumption (Deschenes *et al*., 2017), as illustrated in Figure 1. The key explanatory variable is the window period prior to the introduction of the national big data comprehensive pilot policy (pre4-pre2). Figures 1A and 1B present parallel trends. test results for *TCA* and *TCB*, respectively. By comparing the periods before (pre4-pre2) and after the policy implementation (post1-post6), a clear upward trend is observed, indicating that *GDT* has a significant positive impact on corporate TC.

Figure 1: Parallel trends test

Figure 1 A

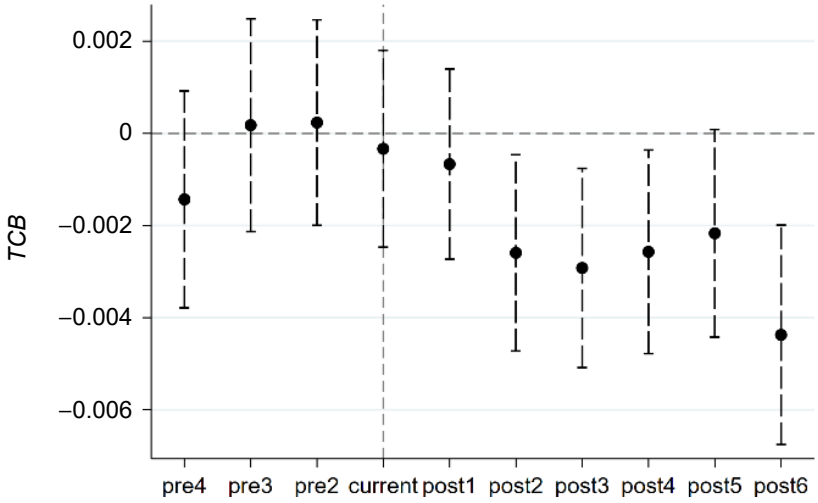
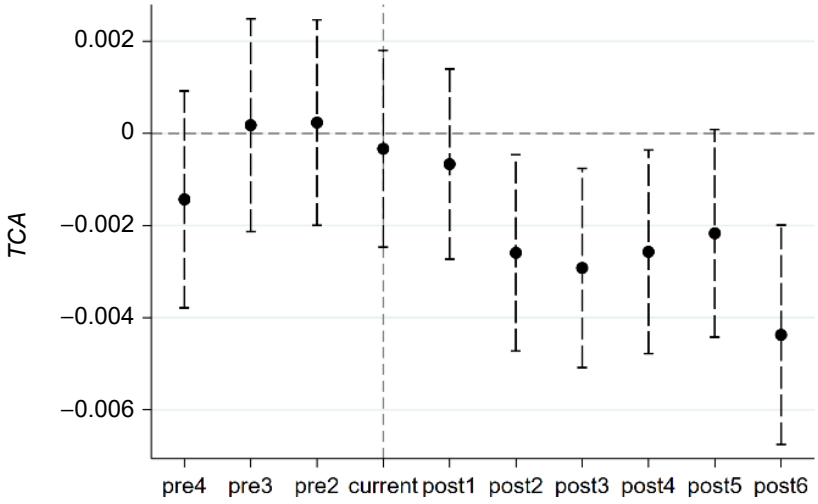


Figure 1 B



Source: Authors' own elaboration

4.2 Endogeneity tests

4.2.1 Placebo test

To account for the potential influence of unobservable factors at both the regional and temporal levels, we conducted a placebo test (Jin *et al.*, 2023). After randomly simulating the construction timing and locations of big data pilot zones, we applied a two-way fixed-effects DID estimation based on these random settings. The two measurement methods for the dependent variable were subjected to 500 repeated tests. Figures 2A and 2B present the results. The findings suggest that the primary conclusions of this study are both reliable and robust. As a result, the placebo test provides support for hypothesis H_1.

Figure 2: Placebo test

Figure 2 A

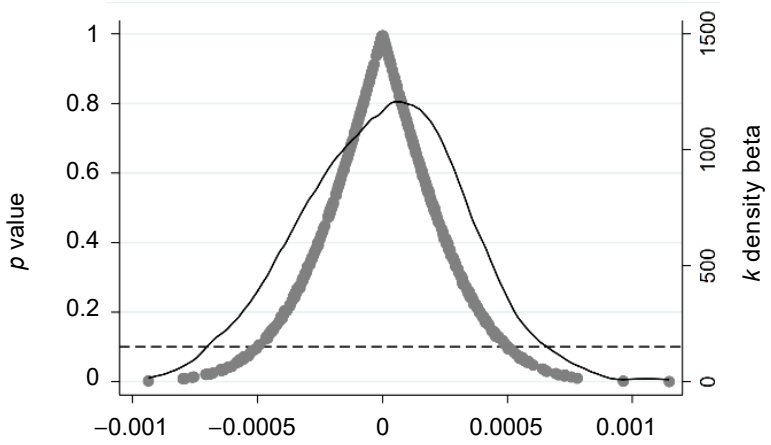
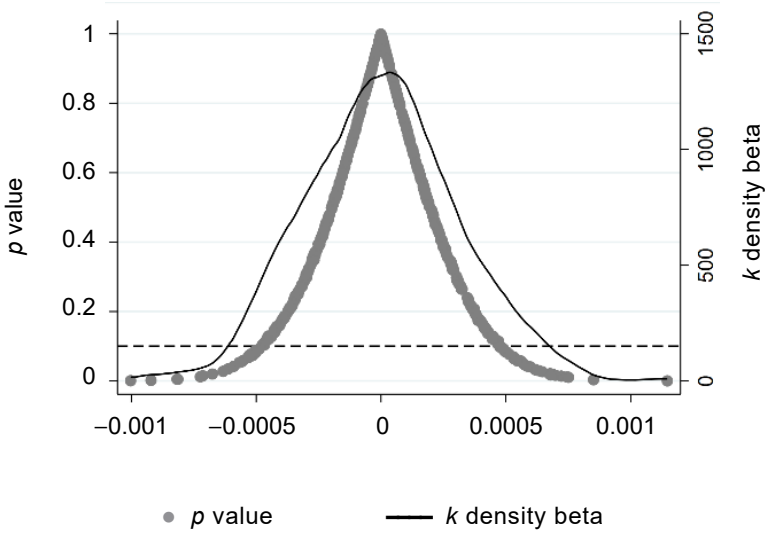


Figure 2 B



Source: Authors' own elaboration

4.2.1 Instrumental variable method

In this study, we use historical postal and telecommunications data from 1984 for various cities as instrumental variables to construct a comprehensive digital economy development index. Adopting the method of Nunn and Qian (2014), an interaction term is created by multiplying the national number of internet users in the previous year by the telephone density of each city in 1984, which is used as an instrumental variable for *GDT* in that year. Regarding relevance, historical telecom infrastructure exhibits strong path dependence, making regions with higher telephone density in the early period more capable of adopting digital technologies and supporting government digitalization more rapidly (Li *et al*., 2025). Regarding exogeneity, the telecom layout in the 1980s was determined mainly by administrative planning rather than firms' *TC* incentives, and given the long temporal gap and substantial changes in firm structure and institutional environments, historical telephone density should not directly affect current corporate *TC* after controlling for regional socio-economic conditions (Medeiros *et al*., 2025). Columns (1) to (3) of Table 4 display the results, which are robust.

4.2.2 Propensity score matching (PSM)

To eliminate estimation errors in policy effects caused by sample selection bias, it is crucial to identify individuals or groups in the control group that closely resemble those in the treatment group based on observable characteristics, thereby minimizing potential differences between the two groups. PSM is an effective and widely used sample matching method. After using a logit model to calculate propensity scores and applying 1:3 nearest-neighbor matching for sample pairing, the ATT (average treatment effect on the treated) of *TCA* and *TCB* are both significant (*t*-statistics of 3.76 and 3.57, respectively). As columns (4) and (5) of Table 4 shown, further strengthening the robustness.

Table 4: Results of the instrumental variable method and PSM-DID

	(1)	(2)	(3)	(4)	(5)
GDT		−0.0049*** (0.0016)	−0.0037*** (0.0015)	−0.0021*** (0.0008)	−0.0018** (0.0008)
IV	0.0000*** (0.0000)				
Constant				0.0162 (0.0140)	0.0062 (0.0131)
Control	Yes	Yes	Yes	Yes	Yes
Kleibergen–Paap		1,713.066***	1,713.066***		
Cragg–Donald Wald *F*-statistic		4,737.546	4,737.546		
Obs.		24,068	24,068	17,779	17,779
R^2		0.0484	0.0484	0.5274	0.5877
Year	Yes	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes	Yes

Source: Authors' own calculations

4.3 Robustness tests

4.3.1 Excluding other policy interferences

However, national big data pilot zones were gradually implemented and established during the critical stage of China's comprehensive reform, and other reform initiatives during this period may have had indirect or direct effects on corporate *TC*. The "Golden Tax Project Phase III" (GTP) has become a major reform initiative in recent years. We further control for the *GTP* dummy variable, where *GTP* is assigned a value of one if region *i* piloted the GTP in year *t* and a value of zero otherwise. Table 5 (columns 1–2) indicates the study's key results hold even with *GTP* considered.

4.3.2 Extending the observation window

To avoid endogeneity arising from reverse causality, we replace the independent variable (*GDT*) with its lagged values GDT_{t-1} and GDT_{t-2}. Columns (3) to (6) in Table 5 present the re-

gression results after substitution. These results indicate that *GDT* not only improves corporate *TC* in the short term but also has a lasting and lagged effect, providing long-term incentives and supervision for firms.

4.3.3 Replacing standard errors

We previously analyzed heteroscedasticity-robust standard errors in the baseline regression and other regression models. Considering the potential for within-group autocorrelation, we replace these errors with cluster-robust standard errors that account for both time and individual two-way fixed effects clustered at the firm level. The results remain significant (Table 5 columns 7–8), indicating that the empirical findings from earlier analyses are robust.

4.4.4 Excluding certain years

External environmental factors often impact corporate activities. Due to the spread of the COVID-19 pandemic, the global economy experienced a severe recession in 2020. The 2020 sample was excluded, and the regression was re-estimated. The results in columns (9) and (10) of Table 5 indicate that after adjusting for the sample period, the effect of *GDT* on corporate *TC* remains largely unchanged, further reinforcing the robustness of our main research findings.

Table 5: Results of robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	TCA	***TCB***	***TCA***	***TCB***	***TCA***	***TCB***	***TCA***	***TCB***	***TCA***	***TCB***
GDT	−0.0019*** (0.0006)	−0.0019*** (0.0006)					−0.0019** (0.0009)	−0.0018** (0.0008)	−0.0018*** (0.0007)	(0.0006)
GTP	−0.0003 (0.0008)	−0.0007 (0.0008)								
GDT_{t-1}			−0.0021*** (0.0007)	−0.0016** (0.0007)						
GDT_{t-2}					−0.0030*** (0.0007)	−0.0024*** (0.0007)				
Constant	0.0296*** (0.0108)	0.0223** (0.0102)	0.0048 (0.0132)	0.0056 (0.0125)	0.0078 (0.0147)	−0.0008 (0.0137)	0.0295* (0.0164)	0.0220 (0.0140)	0.0315*** (0.0114)	0.0296*** (0.0108)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	25,296	25,296	19,001	19,001	15,992	15,992	25,296	25,296	22,628	22,628
R^2	0.4925	0.5562	0.5272	0.5618	0.5311	0.5586	0.4925	0.5562	0.4998	0.4925
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' own calculations

4.4 Heterogeneity analysis

Variations in the degree of marketization, the level of corporate digital transformation, and management power may result in differences in how *GDT* affects *TC*. We further explore the heterogeneous impact of *GDT* on *TC* in environments with varying levels of marketization, corporate digital transformation, and management powers.

4.4.1 Degree of marketization

The degree of marketization directly affects the effectiveness of *GDT* in promoting corporate *TC*. In regions with a higher level of marketization, the effectiveness of GDT in improving corporate *TC* is significantly amplified because market-based institutions and competitive pressures shape firms' behavioral responses to regulation. In such environments, stronger rule-of-law foundations, greater transparency in factor and product markets, and reduced government intervention jointly enhance the credibility and enforcement power of digital tax governance. As *GDT* upgrades tax monitoring from discretionary, offline processes to automated, data-driven supervision, the expected cost of tax evasion sharply increases while the reputational risk associated with non-compliance becomes more salient under competitive market pressure. At the same time, firms in highly marketized regions typically demonstrate higher levels of digital capability, enabling them to integrate digital tax systems more efficiently and reduce compliance frictions. Therefore, when *GDT* strengthens tax enforcement and information transparency, firms in highly marketized environments are more likely to adopt compliant behavior as a rational strategy for sustaining legitimacy, reducing operational risk, and maintaining competitive advantages. This study divides cities into high- and low-marketization groups basis of the median of the city market index to conduct a grouped regression (Yu and Deng, 2021). The results presented in Table 6 align with the findings of the previous analysis. In cities with higher marketization, digital government transformation significantly promotes corporate *TC*.

Table 6: Results of the analysis of heterogeneity in marketization

	Low level of marketization		High level of marketization	
	TCA	***TCB***	***TCA***	***TCB***
GDT	−0.0004 (0.0009)	−0.0002 (0.0009)	−0.0038*** (0.0011)	−0.0037*** (0.0011)
Constant	0.0276 (0.0171)	0.0289* (0.0160)	0.0311 (0.0194)	0.0052 (0.0182)
Control	Yes	Yes	Yes	Yes
Obs.	12305	12305	12245	12245
R^2	0.5175	0.5559	0.5389	0.6146
Year	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes

Source: Authors' own calculations

4.4.2 Extent of corporate digital transformation

According to the technology acceptance model, user behavior is primarily determined by the "perceived usefulness" and "ease of use" of new technologies. *GDT* creates favorable external conditions for reducing information asymmetry between the government and businesses, while also dismantling data barriers. Higher degree of digital transformation firms has stronger perceived usefulness and ease of use of digital tax platforms, making them more likely to adopt and use these technological platforms to enhance *TC*. Vocabulary is a carrier of knowledge, and keywords reflect the level of emphasis. Following prior research, we measure corporate digital transformation by the frequency of digitization-related terms. (Hu and Zhang, 2015). Firms with a digital transformation level above the sample median are classified as high-digitalization firms, others are categorized as low-digitalization firms. The results are shown in Table 7. These findings suggest that *GDT* exerts a more pronounced impact on improving *TC* in firms with higher levels of digitalization. The degree of corporate digital transformation fundamentally shapes how firms respond to improvements in digital governance. Firms with higher digital maturity generally possess stronger data-processing capabilities, standardized internal information systems, and more transparent financial reporting mechanisms. These technological and organizational traits not only reduce the marginal cost of *TC* but also increase the deterrence effect of digital supervision, as firms' opera-

tions become more traceable and auditable in real time. From a behavioral perspective, digitalized firms place greater emphasis on legitimacy and stakeholder trust, making compliant behavior a strategic choice aligned with long-term value creation.

Table 7: Heterogeneity analysis of digitization levels

	Low level of corporate digitalization		High level of corporate digitalization	
	TCA	***TCB***	***TCA***	***TCB***
GDT	−0.0017* (0.0009)	−0.0013 (0.0009)	−0.0039*** (0.0012)	−0.0042*** (0.0011)
Constant	0.0419** (0.0170)	0.0487*** (0.0162)	0.0301 (0.0195)	0.0085 (0.0192)
Control	Yes	Yes	Yes	Yes
Obs.	12,844	12,844	11,726	11,726
R^2	0.5168	0.5665	0.5576	0.6180
Year	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes

Source: Authors' own calculations

4.4.3 Management authority

Management power has a profound impact on factors such as corporate *TC*, culture, and policy implementation. According to agency theory, when management holds strong decision-making power, it can swiftly align firm strategies with government tax policies, ensuring that internal processes adapt to new regulations. Firms with centralized decision-making structures are better positioned to implement digital tax systems, integrate new compliance practices, and streamline organizational resources. The higher the management authority, the faster the firm can adapt to digital tax platforms, driving improvements in *TC*. On the other hand, firms with weaker management power, especially those with more decentralized structures, face challenges in coordinating the necessary changes. Decision-making in such firms tends to be slower and more complex, which can delay or hinder the adoption of *GDT*. These firms may not fully utilize digital tax platforms or adjust their processes efficiently, which diminishes the overall impact of *GDT* on *TC*. Therefore, firms with stronger management authority are more likely to benefit from *GDT*, as they can implement the necessary

changes more effectively, resulting in higher *TC* levels. This study builds on the methodology of previous literature and employs principal component analysis to construct a comprehensive management capability index (Grinstein and Hribar, 2004; Fan *et al*, 2013). Firms are divided into high and low management power groups based on the median value as the cutoff point. The results are shown in Table 8. As observed, *GDT* exerts a stronger influence on promoting *TC* in firms with higher management power, which aligns with the previous analysis.

Table 8: Analysis of management power heterogeneity

	Low management power		**High management power**	
	TCA	***TCB***	***TCA***	***TCB***
GDT	−0.0012	−0.0014	−0.0030***	−0.0028***
	(0.0012)	(0.0012)	(0.0008)	(0.0008)
Constant	−0.0163	−0.0276	0.0516***	0.0478***
	(0.0196)	(0.0185)	(0.0153)	(0.0141)
Control	Yes	Yes	Yes	Yes
Obs.	11,425	11,425	13,168	13,168
R^2	0.5370	0.6099	0.5215	0.5621
Year	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes

Source: Authors' own calculations

5. Mechanism tests

We examine the impact mechanism of *GDT* on both active and passive *TC* from the perspectives of corporate performance and tax administration. The mediation model representing these two mechanism variables as *Mediator* is defined as follows (Dell, 2010):

5.1 Corporate performance

GDT increases corporate performance by optimizing the business environment, promoting government-business cooperation, and enhancing corporate social responsibility (Qiao *et al*., 2025), leading firms to comply with tax regulations proactively. Improved corporate performance and proactive *TC* are closely related. When a firm's performance improves, its financial conditions and profitability are typically strengthened. Firms have become increasingly focused on fulfilling their social responsibilities, enhancing their corporate image, reducing tax risks, and promoting sustainable development (Jemiolo and Farnsel, 2023; Inger, 2022). At the same time, higher profitability increases the marginal loss associated with penalties, reputational damage, and financing constraints triggered by non-compliance. In addition, the benefits gained from government support and preferential policies become more valuable when performance improves, giving firms stronger incentives to maintain cooperative and compliant relationships with authorities. Referring to Smith (2014), we considered total factor productivity as a measure of productivity levels. The results support H_{2a}, demonstrating that *GDT* significantly enhances corporate performance. This improvement makes proactive *TC* the optimal choice for firms, thereby fostering voluntary TC.

5.2 Tax administration

GDT strengthens tax administration by reducing tax collection costs, improving tax administration efficiency, and promoting the comprehensiveness of tax administration. These effects lead to passive *TC* among firms. The greater the intensity of tax administration, the stronger the deterrent effect on firms, increasing the risk of tax authorities detecting financial manipulation (Cheng *et al*., 2024a; Fotoh, 2025). High-intensity tax administration is often accompanied by greater standardization and transparency in tax management, providing clearer requirements for firms and reducing the scope for maneuvering. As tax administration intensity increases, firms face stronger tax supervision, leading to a significant rise in the costs of illegal activities and the risks of tax evasion, thus compelling firms to comply with tax laws more consciously. Digital tax systems enable real-time monitoring and risk profiling, transforming ex-post audit into continuous supervision. This not only raises firms' expected probability of exposure but also compresses the time window for tax evasion. We consider the variable *TE* (Xu *et al*., 2011), which is defined as the ratio of actual tax revenue to estimated tax revenue for each region, to measure the intensity of tax administration. A higher ratio indicates stronger tax administration in the region. The empirical results in column (2) of Table 9 validate H_{2b}, indicating that *GDT* significantly enhances tax administration intensity and reduces opportunities for tax evasion.

Table 9: Results of mechanism tests

	(1) *TFP*	(2) *TE*
GDT	0.0393*** (0.0068)	0.0866*** (0.0034)
Constant	−6.7395*** (0.1401)	−0.0007 (0.0512)
Control	Yes	Yes
Obs.	23,139	25,288
R^2	0.9725	0.8367
Year	Yes	Yes
Id	Yes	Yes

Source: Authors' own calculations

6. Conclusions

6.1 Research conclusions

We using A-share listed companies as a sample, and conducted an empirical analysis to examine how GDT influences corporate TC in China. The main findings are as follows:

First, our study confirms existing arguments that digital governance enhances tax administration efficiency and reduces information asymmetry (Han *et al*., 2025). This impact remains robust after a series of endogeneity and robustness tests. Second, channel analysis revealed that GDT improves corporate performance, leading to proactive TC. Additionally, it strengthens the intensity of tax administration, resulting in passive TC. Third, heterogeneity analysis revealed that the positive impact of GDT on corporate TC is more significant in environments characterized by higher levels of marketization, greater corporate digitalization, and stronger management power.

6.2 Policy implications

Building on above research findings, we propose following policy implications.

Government should continue to adopt a systemic approach and advance digital transformation from a comprehensive and long-term perspective to enhance tax governance efficiency. Through GDT it should be possible to optimize resource allocation; strengthen interdepartmental collaboration; further enhance the transparency, fairness, and accuracy of tax governance; continuously improve the tax management system; and enhance overall governance effectiveness to achieve data-driven tax governance, laying the foundation for high-quality development. Considering that GDT has a stronger compliance-enhancing effect in regions with a higher degree of marketization, tax authorities should intensify investment in digital tax infrastructure and improve regulatory capabilities in less-marketized regions to narrow regional disparities. Firms with higher digitalization levels respond more effectively to GDT, so policies should support digital adoption among SMEs through standardized tax service platforms and targeted subsidies. GDT also exhibits a stronger effect where managerial authority is greater, which calls for optimizing governance mechanisms by enhancing real-time monitoring and implementing risk alert systems to prevent opportunistic behavior. To strengthen both proactive and passive compliance channels identified in our mechanism analysis, the government should improve cross-platform data sharing and reinforce tax risk identification systems, enabling more precise and intelligent supervision.

Enterprises should follow digital development trends and promote TC. Corporate management should fully recognize the importance of TC, play a leadership role, establish a sound internal tax management system, and foster a healthy corporate culture. Additionally, by collaborating with the government during the digital transformation process, businesses can actively cooperate with tax regulatory mechanisms and introduce digital management tools to improve corporate operational efficiency and tax management capabilities. Firms can improve tax management efficiency, enhance TC, and ultimately achieve long-term sustainable development. Firms with higher digitalization levels and stronger managerial power benefit more from GDT, so they should continue investing in digital tax systems, improving data governance, and enhancing the skills of tax professionals to maximize compliance gains. Enterprises in regions with lower marketization or with weaker digital capabilities should gradually adopt digital tools, participate in training programs, and leverage external intelligent tax services to build capacity. These measures help firms reduce compliance costs, improve operational efficiency, and achieve a balance between proactive and passive compliance. Digital transformation provides firms with unprecedented opportunities but also brings unprecedented challenges. Only by continuously enhancing their tax manage-

ment capabilities in this process can firms stand out in the intense market competition and ensure a win-win situation for TC and business performance.

6.3 Limitations and future directions

As with any study, there are certain limitations that should be acknowledged. Using A-share listed firms from 2010–2022 may limit the generalizability of the findings, particularly to SMEs and unlisted enterprises in China. The establishment time and promotion efforts of national big data pilot zones vary across different regions, and this heterogeneity may affect the evaluation of effects. GDT encompasses a wide range of areas, yet this research primarily focuses on tax collection and administration, potentially overlooking the impacts of other dimensions. Future studies should consider expanding the sample size, comprehensively examining all aspects of digital transformation, thereby enriching our understanding of its impact and providing a more robust foundation for policy formulation.

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