Research on the Impact of Industry Type on Data Asset Disclosure

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ABSTRACT

In August 2023, the Ministry of Finance issued the Provisional Regulations on the Accounting Treatment of Enterprise Data Resources, which clarified the principles, disclosure requirements, scope, and listing of enterprise data asset accounting treatment, and came into effect on January 1, 2024. The data used in this study were obtained from the WIND database and excluded companies that disclosed data assets and then reset them to zero, resulting in a sample of 110 companies. The empirical analysis was conducted using the OLS regression model to investigate the impact of property rights on the scale of data assets. The study found that the type of industry is positively correlated with the scale of data asset disclosure, and that the scale of data asset disclosure is moderated by the property rights of the enterprise.

Keywords: Scale of data assets; Industry type; Property rights

1. Introduction

The development of digitalization has promoted the public to better participate in the legislation process (Remeikienė & Davidavičienė, 2023) and also promoted the rapid development of the global digital economy. A large number of manufacturing industries have begun to undergo digital transformation (Cuong et al., 2025). The enterprise digitalization has become a key strategic pathway for enhancing competitiveness and market adaptability. As a core intangible asset, data has gained increasing prominence, playing a decisive role in strengthening firms' innovation capacity and overall market position. The Fourth Plenary Session of the 19th CPC Central Committee marked a major policy shift by proposing, for the first time, to incorporate data as a production factor into the distribution mechanism—underscoring its critical role in the national economic cycle. In line with this direction, the Ministry of Finance issued the Interim Provisions on the Accounting Treatment of Enterprise Data Resources in August 2023, which clarified the standards, classification, scope, and disclosure requirements for the accounting treatment of enterprise data assets. These provisions officially took effect on January 1, 2024. Further reinforcing this momentum, the National Data Administration—together with the Ministry of Industry and Information Technology and 17 other departments—launched the "Data Element X" Three-Year Action Plan (2024–2026) in January 2024 to accelerate the development and utilization of data assets across sectors. Since the first quarter of

2024, some enterprises have begun incorporating data assets into their financial statements. However, adoption remains limited, and many firms are still in a wait-and-see mode, reflecting uncertainties around valuation standards, implementation procedures, and potential strategic implications.

Since the concept of data assets was introduced, a number of studies have emerged. However, most existing research has focused on a few key areas: the discussion around the inclusion of data assets in financial statements (Cheng,2023), the accounting recognition and valuation of enterprise data assets (Luo et al.,2023), and the impact of data asset capitalization policies on enterprise stock prices (Wang et al.,2024). In contrast, few studies have examined the influence of industry type on the scale of data asset disclosures. Using a sample of enterprises that have publicly disclosed data asset information, this paper investigates how the industry in which a firm operates affects the extent of its data asset reporting. To date, the total amount of data assets disclosed by firms in the computer and communication industries compared with those in other industries is presented in Figure 1:

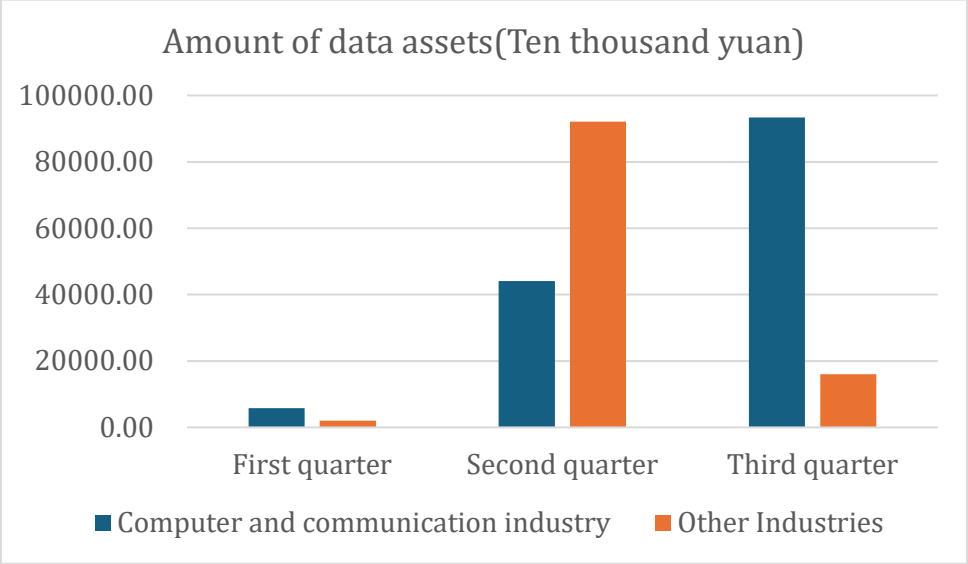

Figure 1: Amount of data assets disclosed

As shown in Figure 1, the total amount of data assets disclosed in the first quarter is relatively low. The overall scale of disclosures in the second and third quarters appears similar, indicating a stabilization in reporting trends. From the perspective of industry type, the computer and communication industries demonstrate a steadily increasing scale of data asset disclosure. The disclosure patterns in these industries appear relatively rational and consistent, with no significant fluctuations in the overall trend. In the first quarter, enterprises in the computer and communication industries responded positively to the policy, actively disclosing data asset information. In the second and third quarters, while data asset disclosure in the computer and communication industries continued to grow steadily, the scale of disclosure in other industries declined. This divergence suggests that firms in the computer and communication sectors possess more robust and stable data resources, enabling them to adapt more effectively to emerging data asset reporting requirements.

The contributions of this paper are mainly reflected in three aspects. First, it enriches the existing literature

by investigating the influence of industry type on the scale of enterprise data asset disclosure. Second, by examining the patterns and scale of data asset disclosures, the study provides a valuable reference for enterprises across various industries as they navigate the process of incorporating data assets into their financial statements. Third, the paper further explores how the relationship between industry type and data asset disclosure scale is moderated by the nature of enterprise property rights, offering new insights into the heterogeneity of data capitalization practices.

2. Literature review

Following the issuance of the Interim Provisions on the Accounting Treatment of Enterprise Data Resources, data element resources—once recorded and accounted for—will be formally included as asset items in enterprise financial statements. Unlike traditional asset categories, data assets have emerged as a distinct class within the context of the information economy and the development of big data applications. Due to their unique nature, various organizations and scholars have offered differing interpretations of the concept of data assets. For instance, the China Asset Appraisal Association defines data assets as data resources that are legally owned or controlled by specific entities, can generate sustained utility, and are capable of bringing direct or indirect economic benefits. Shen et al. (2024) and others argue that data assets refer to data-centric resources and services that meet asset recognition criteria, emphasizing that their essential nature remains consistent with that of traditional assets. Zhu et al. (2018) define data assets as data sets possessing ownership rights—including rights of exploration, usage, and transfer—which are valuable, measurable, and interpretable. Ding et al. (2024) Xu et al. (2022) suggest that data assets refer to data with specific application scenarios, owned and controlled by enterprises, and capable of being used continuously for more than one year. Ma et al. (2023) propose that data assets are digital information resources developed or recorded within the economic cycle through certain investments, held by organizations or individuals, stored in physical or electronic form, capable of generating economic or social value, and reusable over the long term. Regarding the inclusion of data assets in financial statements, Cheng (2023) argues that three conditions must be met: the enterprise must have control over the data; the data must be capable of generating probable economic benefits; and the cost or value of the data must be reliably measurable. Cheng further suggests that the valuation of data assets should be based on relevance and faithful representation, and that their listing and disclosure should align with the objectives and principles of IFRS accounting element recognition and disclosure standards.

With regard to industry types and information disclosure, Li et al. (2014) conducted an empirical analysis and found a positive correlation between industry type and the disclosure of corporate profit forecast information. Similarly, Zhu et al. (2008) concluded that industry type plays a significant role in shaping voluntary environmental information disclosure practices. Their research showed that listed companies in environmentally sensitive and heavily polluting industries tend to disclose more environmental information. Currently, there is relatively limited research in China specifically addressing the relationship between industry type and broader forms of information disclosure. As such, further exploration of this relationship

holds considerable academic value and practical relevance.

With regard to data asset information disclosure, most existing studies have focused on its impact on various aspects of enterprise performance. For example, Wei et al. (2022) examined the relationship between data asset disclosure and analyst forecast accuracy using text analysis methods. Yuan et al. (2022) found that the extent of data asset disclosure is positively associated with enterprise value. Niu et al. (2024) explored the relationship between data asset disclosure and auditor pricing, revealing that greater disclosure influences audit fees and risk assessments.

While existing studies predominantly examine the impact of data asset information disclosure on enterprises from a disclosure-centered perspective, there is a notable lack of literature investigating the scale of data asset disclosure from the standpoint of enterprise and industry characteristics.

3. Theoretical Analysis and Research Hypotheses

With the advancement of digitalization, networking, and intelligent technologies, the computer and communications industry has generated vast volumes of data. Zhu et al. (2018) define data assets as data sets in the digital space that possess ownership rights—including exploration, usage, and transfer rights—and are characterized by value, measurability, and readability. In the Internet era, the computer and communications industry has accumulated extensive data, and the portion of this data that is valuable, quantifiable, and interpretable can be further processed into data resources and ultimately recognized as data assets. Compared with firms in other industries, companies in the computer and communications sector possess significantly more data resources and have greater expertise in data development and application. These advantages are likely to have a substantial impact on their willingness and ability to disclose data assets. Based on this, this article proposes hypothesis 1:

Hypothesis 1: Companies in the computer and communications industries disclose larger data assets.

Enterprises with different types of property rights exhibit distinct characteristics in terms of management practices, development strategies, corporate objectives, and policy responsiveness. State-owned enterprises (SOEs), in particular, serve as the cornerstone of China's national economic development and play a leading role in guiding the country's economic trajectory. Since the Fourth Plenary Session of the 19th CPC Central Committee, data has been officially recognized as a key factor of production in China—alongside land, capital, labor, and technology—marking a significant shift in national development priorities. In August 2023, the Ministry of Finance issued the Interim Provisions on the Accounting Treatment of Enterprise Data Resources, which took effect on January 1, 2024. This marked the beginning of a new era in which data assets are formally incorporated into corporate financial statements. In the context of the digital economy, the market is full of digital information (Subedi, 2024), and data has emerged as a novel and highly valuable factor of production (Pan et al., 2024). As a critical force in driving digital economic development, state-owned enterprises are expected to have a significant influence on the disclosure and management of data assets (Zhao et al., 2023). Based on this, this article proposes Hypothesis 2:

Hypothesis 2: The impact of industry type on the disclosure scale of data assets is moderated by the nature of property rights.

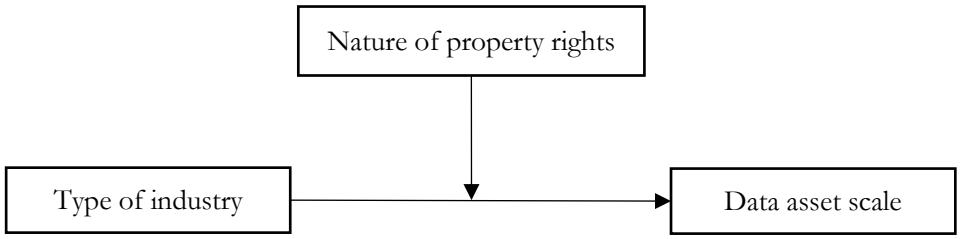

Figure 2: Research model diagram

4. Study design

4.1 Data Sources

This study selects A-share listed companies on the Shanghai and Shenzhen stock exchanges that have disclosed data asset information since 2024 as the research sample. Firms that disclosed and subsequently withdrew or restated their data asset information were excluded. After screening, a total of 110 valid observations were retained. All firm-level data used in this paper are sourced from the WIND database.

4.2 Variable Definition

(1) Explanatory Variable: Industry Type (IND). This paper uses industry type as the explanatory variable. Following the Shenwan industry classification standard, a value of 1 is assigned to firms classified under the computer and communication industry, while a value of 0 is assigned to firms in all other industries (non-computer and communication).

(2) Explained Variable: Data Asset Scale (DA). The explained variable in this study is the scale of data assets disclosed by listed enterprises. It is measured by taking the natural logarithm of the reported amount of data assets to account for skewness and improve comparability across firms.

(3) Moderating Variable: Nature of Property Rights (SOE). Following the approach of Zheng et al. (2023), this study uses the nature of the actual controller to distinguish between state-owned and non-state-owned enterprises, in accordance with the specific institutional context of China. A value of 1 is assigned if the enterprise is state-owned, and 0 if it is non-state-owned.

(4) Control Variables: Drawing on the research of Zheng et al. (2023) and Yuan et al. (2024), this study includes the following control variables: cash flow (Cashflow), the shareholding ratio of the largest shareholder (TOP1), dual role of chairman and general manager (DUAL), and firm growth (Growth). These variables are selected to control for firm-level financial and governance characteristics that may influence the scale of data asset disclosure. The specific definitions and measurement methods for each variable are detailed in Table 1.

Table 1: Description of variables

Types of variables	Variable name	Variable symbol	Description of definition
Explained variable	Size of data assets	DA	The amount of data assets disclosed in the current period is taken as the natural logarithm
Explanatory variables	Industry type	IND	Computer and communication industries are assigned 1, and non-computer and communication industries are assigned 0
Moderating variables	Nature of property rights	SOE	Soes are assigned a value of 1 and non-soes are assigned a value of 0
Control variables	Cash flow	Cashflow	Cash flow from operating activities for the period/operating income for the period
	Percentage of shareholding of the largest shareholder	TOP1	Shareholding ratio of the largest shareholder for the period
	Two in one	DUAL	If the general manager and chairman of the board are held by one person, the value is 1; otherwise, it is 0
	Growth	Growth	(current period operating income/previous period operating income)-1

4.3 Model Construction

This article refers to the research of Xia et al. (2024) to construct the following model (1)

$$DA = \beta_0 + \beta_1 IND + \beta_2 Cashflow + \beta_3 TOP1 + \beta_4 DUAL + \beta_5 Growth + \varepsilon \quad (1)$$

In Model (1), DA represents the scale of data asset disclosure by the enterprise, measured as the natural logarithm of the disclosed amount. Cashflow, TOP1, DUAL, and Growth are firm-level control variables. In the equation, β0 denotes the constant term, β1-β5 are the regression coefficients, and ε represents the random error term. This study primarily focuses on the significance and direction of the coefficient β1. A significantly positive β1 suggests that firms in the computer and communications industry disclose a greater scale of data assets. Conversely, a significantly negative β1 indicates that firms in other industries disclose a larger scale of data assets.

5. Empirical results analysis

5.1 Descriptive statistics

Prior to conducting the correlation analysis, a descriptive statistical analysis was performed on all selected sample variables to provide an overview of the data characteristics. The results are presented in Table 2.

Table 2: Descriptive statistics results

Variables of interest	Number of samples	Mean	Standard deviation	Median	Minimum	Maximum
DA	110	6.004	1.966	6.044	2.682	10.63
IND	110	0.373	0.486	0	0	1
SOE	110	0.427	0.497	0	0	1
Cashflow	110	1.811	6.452	1.017	0.519	68.24
Growth	110	0.534	0.689	0.526	-0.878	2.807
TOP1	110	0.352	0.170	0.316	0.079	0.756
DUAL	110	0.227	0.421	0	0	1

Table 2 presents the descriptive statistics of the study variables. The mean value of the core explanatory variable, Industry Type, is 0.373, indicating that approximately 37.3% of the enterprises that have disclosed data asset information belong to the computer and communications industry. The mean value of the dependent variable, Data Asset Scale, is 6.004, with a median of 6.044, suggesting a relatively symmetric distribution. Regarding the control variables, Cash Flow exhibits a standard deviation of 6.452, with a maximum value of 68.24 and a minimum of 1.811, reflecting substantial variation in cash flow among different enterprises. The mean value of Growth is 0.534, with a median of 0.526, a maximum of 2.807, and a minimum of –0.878. This indicates considerable heterogeneity in the growth rates of the sampled enterprises; however, the overall distribution is relatively balanced, supporting its appropriateness as a control variable.

5.2 Correlation analysis

(1) As shown in Table 3, the correlation coefficient between Data Asset Scale (DA) and Industry Type (IND) is 0.464, which is statistically significant at the 1% level. This indicates that, compared with other industries, enterprises in the computer and communications sector tend to disclose a larger scale of data assets, providing preliminary support for Hypothesis 1. Among the control variables, the shareholding ratio of the largest shareholder (TOP1) is significantly correlated with DA at the 5% level, with a correlation coefficient of –0.199. This suggests a negative relationship, whereby a higher concentration of ownership is associated with a smaller scale of data asset disclosure. Additionally, Enterprise Growth (Growth) is also significantly correlated with DA at the 5% level, with a correlation coefficient of 0.200. This implies that firms with stronger growth potential are more likely to respond to national policies and actively pursue new development opportunities, including data asset disclosure.

(2) From the statistical principle, if the correlation coefficient between variables is greater than 0.8, it means that there is multicollinearity among variables.

Table 3: Correlation analysis

Variables	DA	IND	SOE	Cashflow	TOP1	DUAL	Growth
DA	1						
IND	0.464***	1					
SOE	-0.179*	-0.096	1				
Cashflow	-0.131	0.104	0.116	1			
TOP1	-0.199**	-0.145	0.648***	0.069	1		
DUAL	-0.131	0.031	-0.381***	-0.047	-0.242**	1	
Growth	0.200**	-0.011	0.026	0.000	-0.009	-0.108	1

Note: ***, ** and * indicate significant correlations at the levels of 1%, 5% and 10% (two sided), respectively.

5.3 Benchmark regression

(1) To examine the impact of property rights on the scale of enterprise data asset disclosure, this paper applies the Ordinary Least Squares (OLS) method to estimate Model (1). Table 3(1) presents the regression results without control variables, while Table 3(2) reports the results after including control variables. The regression coefficient for Industry Type is 1.876 and is statistically significant at the 1% level, indicating that industry type has a significantly positive effect on the scale of data asset disclosure. This provides empirical support for Hypothesis 1. In Table 3(2), the coefficients of several control variables are also noteworthy. Cashflow, TOP1 (the shareholding ratio of the largest shareholder), and DUAL (duality of chairman and general manager) all have significantly negative coefficients. This suggests that enterprises with higher current-period cash flow, a higher concentration of ownership, or dual-role leadership structures are less likely to disclose large amounts of data assets. In contrast, the coefficient for Growth is 0.530 and is significant at the 5% level, indicating that firms with stronger operational performance are more likely to disclose larger scales of data assets.

(2) According to statistical research standards, in empirical studies within the social sciences, an adjusted R2 value greater than 0.1 is generally considered acceptable for model fit. In this study, the adjusted R2 of Model (1) is 0.331, indicating a strong model fit. This suggests that the independent variables explain a substantial proportion of the variance in the dependent variable, demonstrating a high degree of explanatory power.

Table 4: Regression results

	(1)	(2)	(3)
	DA	DA	DA
IND	1.876***	1.887***	0.762*
	(0.345)	(0.330)	(0.389)
IND*SOE			2.814***
			(0.621)
SOE			-1.452***

			(0.441)
Cashflow		-0.054**	-0.067***
		(0.025)	(0.023)
Growth		0.530**	0.452**
		(0.230)	(0.211)
TOP1		-1.840*	-1.291
		(0.967)	(1.122)
DUAL		-0.804**	-0.890**
		(0.389)	(0.372)
_cons	5.305***	5.946***	6.493***
	(0.211)	(0.459)	(0.443)
N	110	110	110
R^2	0.215	0.331	0.453

Note: Standard errors in parentheses; ***, ** and * indicate significance levels at 1%, 5% and 10%, respectively; The table below is the same.

5.4 Robustness test

Generally speaking, in order to ensure that the empirical results are not a random phenomenon resulting from sample estimation, robustness tests are conducted to examine whether the regression results remain stable under different parameter settings or estimation methods. Commonly used robustness testing methods include the following: (1) Changing the calculation method of relevant variables: The measurement of key variables can be adjusted and reintroduced into the model to test whether the estimation results remain robust. For example, when measuring the scale of data asset disclosure, the natural logarithm of total disclosed data assets can be used. Alternatively, the ratio of data assets to total assets can replace the absolute amount of disclosed data. (2) Changing the sample size: If the full sample includes enterprises from multiple industries, subsample regressions can be conducted by selecting specific industries for separate analysis, thereby testing the consistency of the results across different subsets. (3) Changing the estimation method: Alternative econometric techniques, such as LOGIT or the Generalized Method of Moments (GMM), can be applied to re-estimate the model. The results can then be compared with those from the original method to assess the stability and reliability of the findings.

Table 5: Robustness test

	(1) DA	(2) DA21	(3) DA22	(4) DA23
IND1	1.053***			
	(0.399)			
IND		1.469***	1.332*	2.378***
		(0.420)	(0.684)	(0.466)
Cashflow	-0.049*	-1.710*	-0.174	-0.060**

	(0.028)	(0.854)	(0.528)	(0.024)
Growth	0.543**	1.354	0.285	1.266
	(0.256)	(4.512)	(0.929)	(1.933)
TOP1	-1.833	-5.001***	-1.818	-0.664
	(1.107)	(1.216)	(1.926)	(1.426)
DUAL	-0.855*	-1.322**	-1.510*	-0.273
	(0.432)	(0.510)	(0.831)	(0.538)
_cons	6.317***	9.708**	6.658***	4.932***
	(0.525)	(3.398)	(1.757)	(1.264)
N	110	17	40	53
R^2	0.176	0.818	0.211	0.403

To enhance the robustness of the empirical results, this study acknowledges that, despite the inclusion of several control variables in the benchmark regression analysis, there may still be unobserved factors that could influence the outcomes. These omitted variables may introduce potential bias into the estimation. Therefore, to verify the robustness of the model, multiple testing approaches are employed, including the redefinition of explanatory variables and the division of samples by quarter. The results of the robustness tests are presented in Table 5.

(1) Redefine the explanatory variables

To test the robustness of the regression results, this study redefines the explanatory variable. Specifically, enterprises in the computer industry are assigned a value of 1, while those in other industries are assigned a value of 0. This new variable is then used to replace the original explanatory variable in Model (1), and the regression is re-estimated. The results are presented in Table 5(1). As shown in the table, the regression coefficient for the redefined industry type variable (IND1) is 1.053 and is significantly positive at the 1% level. This result is consistent with the findings of the benchmark regression, indicating that the model's results are robust.

(2) Regressing existing samples quarterly

The year 2024 marks the first year of formal data asset information disclosure. Across various industries and sectors, disclosure practices remain in the exploratory stage. In the first three quarters of 2024, some enterprises disclosed data asset information and later retracted or adjusted it. To eliminate the influence of such anomalies on the benchmark regression results, this study divides the existing sample by quarter and re-estimates Model (1) for each period. The regression results are presented in Table 5(2), (3), and (4). As shown, the regression coefficient for the first quarter is 1.469 and is significantly positive at the 1% level. The coefficient for the second quarter is 1.332, significant at the 10% level, while the coefficient for the third quarter is 2.378, also significant at the 1% level. These results are consistent with those of the benchmark regression, further confirming the robustness and stability of the model's findings.

5.5 Heterogeneity analysis

The above analysis of the relationship between industry type and the scale of data asset disclosure primarily focuses on firm-level characteristics, without considering whether this relationship varies by ownership

structure. To address this gap, the following section conducts a heterogeneity analysis based on the nature of property rights, examining whether the impact of industry type on data asset disclosure differs between state-owned and non-state-owned enterprises.

To test for moderating effects, this paper includes an interaction term between industry type and property rights (IND * SOE) in Model (1). The regression results, shown in Table 4(3), indicate that the coefficient of the interaction term IND * SOE is 2.814 and is significantly positive at the 1% level. This suggests that, within the same industry, state-owned enterprises disclose a larger scale of data assets compared to non-state-owned enterprises. In other words, the influence of industry type on data asset disclosure is positively moderated by the nature of property rights. Therefore, Hypothesis 2 is supported.

6. Conclusion

At the Fourth Plenary Session of the 19th CPC Central Committee, data was officially recognized as a factor of production for the first time, alongside land, labor, capital, and technology—marking its status as the fifth core factor in the production system. Subsequently, in August 2023, the Ministry of Finance issued the Interim Provisions on the Accounting Treatment of Enterprise Data Resources to guide enterprises in incorporating data assets into their financial statements. Against this policy backdrop, this study examines enterprises that disclosed data assets in their financial reports during the first three quarters of 2024, resulting in a final sample of 110 firms. Through empirical analysis of this sample, the paper investigates the effect of industry type on the scale of data asset disclosure. The results reveal two key findings: First, industry type has a significant positive effect on the scale of data asset disclosure—firms in the computer and communications industry tend to disclose a larger volume of data assets. Second, the relationship between industry type and data asset disclosure is positively moderated by the nature of property rights; within the computer and communications industry, state-owned enterprises disclose larger data asset volumes compared to their non-state-owned counterparts.

This paper uses enterprises that disclosed data assets during the first three quarters of 2024 as the research sample, resulting in a total of 110 observations. Although the sample size is limited, it reflects the early stage of data asset disclosure practices. As the policy framework surrounding data assets continues to evolve and mature, an increasing number of enterprises are expected to engage in data asset disclosure, thereby expanding the available sample for future analysis. Moving forward, continued attention will be given to developments in data asset disclosure and related research, with the aim of addressing current limitations and further refining the analytical framework.

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