

Analysis of the Impact of Data Asset Capitalization on Corporate Cost Stickiness-A Comparative Analysis Before and after Implementation Based on Enterprises Capitalizing Data Assets in 2023–2024

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Abstract. This paper selects 78 companies having incorporated data inventories into their financial statements from 2023 to 2024 as the research samples to empirically examine how data inventory incorporation influences and varies in enterprise cost rigidity. According to the research, when companies include data inventories on their balance sheets, it tends to beef up their cost stickiness index, which in turn helps them rein in this particular financial tendency. This conclusion still holds true even after replacing the explanatory variables with the proportion of data inventories in the company's revenue. And the control variable test shows that state-owned enterprises and enterprises with high debt-to-asset ratios have lower cost stickiness, while large-scale enterprises have higher cost stickiness. In addition, the heterogeneity evaluation shows that integrating the data list into the balance sheet can obviously reduce the cost stickiness, and this effect is obvious in public, private, large companies and small enterprises. However, private companies are more sensitive to cost stickiness, which is related to their operation scale and efficiency. Because of the problems of internal management quality and operation ability, the cost of small companies fluctuates more, and the inventory level in financial statements has a slightly stronger influence on them than that of large companies. This study discusses how to integrate inventory data into the balance sheet, which can better reflect the economic significance of accounting policy adjustment, and also provide practical methods for enterprises to help them reduce cost stickiness by this method.

Keywords: Data inventory inclusion in the balance sheet, cost stickiness, Weiss model

1. Introduction

With digital technology promoting economic growth, data storage has become the basic resource of enterprises. The release of "Inter Regulations on Financial Accounting Standards for Corporate Data Assets" in 2023 means that the data reserves of China enterprises are entering a standardized stage, and in 2024, 100 listed companies will formally include these reserves in their balance sheets. This accounting reform not only changed the asset and liability structure of enterprises but also affected

the cost response ability of enterprises to business activities by optimizing resource allocation and improving cost control methods. When revenue and business volume increase, the company's costs tend to rise even more than when business volume decreases. This model can help to measure the operational efficiency of an organization and whether it can withstand economic instability [1]. Jiang Wei and Hu Yuming found in their research that adjustment cost and agency conflict are the main reasons for cost stickiness [2]. Later research also proved that optimizing asset structure and improving information transparency can reduce cost stickiness [3,4]. Because of the low marginal cost and strong reusability of data inventory, they may change the formation mode of cost stickiness, reduce the dependence of enterprises on traditional physical assets and reduce the problem of information asymmetry. Unlike the control group used in the Difference-in-Differences (DID) model, this time this study focuses on those companies that have just completed the inventory declaration process. This study compared the changes in cost stickiness before the implementation of the policy in 2023 and after the implementation in 2024. There are three new findings in this study: first, the method focuses directly on the events to be studied, which can reduce the selection bias caused by the comparison of control groups; Second, the results are closer to reality, because this study uses the latest data from 2023 to 2024, which is just the time period after the implementation of the inventory declaration policy.

2. Relevant theories and research hypotheses

Even if this study changes the main explanatory variable from a simple binary sign of "whether the balance sheet contains data" to a more complicated measurement of "the proportion of data inventory to operating income", the conclusion is still the same. The stability of these results shows that it is not an accidental phenomenon that enterprises can resist cost rigidity by accumulating data [1,5]. Adding inventory information can help optimize the asset structure, improve information disclosure and enhance the flexibility of resource allocation, thus alleviating the cost-related inefficiency.

According to the resource-based theory, if an enterprise wants to be competitive, it must rely on various resources [6]. Data resource is a special resource, which has many unique characteristics, such as low marginal cost, reusable, and can also replace those specially customized physical assets [7,8]. The transaction cost theory indicates that assets with too strong specificity will make the company's adjustment cost higher. When the business fluctuates, these special assets are not used enough, which leads to the cost becoming "sticky" [9].

Principal-agent theory points out that information asymmetry between shareholders and company executives will lead to goal conflict, and managers' ambition to expand the company scale will aggravate the rigid behavior of costs [10]. Companies that want to make full use of data resources need to establish a complete system to identify, evaluate, record and disclose these intangible assets according to traditional accounting standards and emerging enterprise information management requirements. This requires a clear understanding of the nature of information resources, the value of records, valuation methods and use restrictions, so as to enhance the credibility and depth of public financial statements. Better financial reports can reduce the information gap between insiders and external observers and effectively limit executives' decision to cut expenses. By eliminating the inefficient expenditure caused by managers' self-interest, can ensure that operating costs remain flexible when the market changes [4].

According to the theory of dynamic capability, enterprises must be able to reorganize and allocate resources flexibly if they want to cope with environmental changes [11]. With the support of dynamic technology, data warehouse can adjust resources with low cost and high efficiency

according to business changes. According to the theory of flexible resource allocation, enterprises can cope with external environmental changes by flexibly allocating production inputs and establishing an elastic cost adjustment framework [12]. Data inventory is a typical flexible resource, which can replace those rigid production factors, reduce the irreversibility of resource input, improve the flexibility of cost adjustment, and alleviate the cost stickiness.

To sum up, the low marginal cost of available data inventories makes it unnecessary to significantly reduce input when business volume declines, significantly reducing adjustment costs, and high reusability can replace high specificity physical assets, reducing asset exit barriers, so as to alleviate cost stickiness. This paper puts forward the core hypothesis:

H1: After data inventories are entered into the table, the cost stickiness of enterprises is significantly reduced.

3. Research design

3.1. Participant recruitment and data collection methods

This article takes the listed companies that completed the inclusion of data inventories in the balance sheet in the years 2023-2024 as the research sample. The sample selection criteria are: (1) Omit banks and coverage firms; (2) Firms exhibiting atypical performance (e.g., ST, *ST) are omitted; (3) Omit companies that lack the essential financial information (including operational revenue and expenses) needed to compute cost inertia; (4) Apply 1% quantile Winsorization to continuous variables to eliminate the interference of extreme values. Finally, 156 observations (78 for each of 2023 and 2024) of 78 enterprises were obtained.

The research relies primarily on information sourced from the CSMAR repository, the Chuangchao Information platform, and the 2024 corporate annual documents.

3.2. Definition of variable

The explanatory variable of this article is "Sticky". This article uses the calculation method based on the Weiss model. When the sticky index is positive, the higher the "Sticky" value, the lower the cost stickiness.

The dependent variable explained in this article is "Treat", which is a dummy variable. The criterion for judgment is whether the enterprise disclosed information such as the book value and measurement method of data inventories in its 2024 annual report (based on the "Interim Provisions on Accounting Treatment for Enterprise Data Resources"). If the information was disclosed, the value is 1; otherwise, it is 0.

To control the influence of other factors on the enterprise risks, based on the research of Sun W and Zhang X, this paper selects enterprise size (Size), debt ratio (Lev), enterprise growth rate (Growth), enterprise ownership nature (SOE), total asset turnover rate (Turnover), and equity concentration (Top1) as the main control variables, and controls for the fixed effects of industry and year [12].

3.3. Model construction

To examine the impact of including data inventories in the balance sheet on the cost stickiness of enterprises, the following regression model is constructed

$$sticky = \theta_0 + \alpha_1 Treat + \sum \alpha_j Controls + FixedEffects + \varepsilon \quad (1)$$

Here, ∂_0 is the intercept term; α_1 is the coefficient of the core explanatory variable; ε is the random error. If α_1 is significantly positive, it indicates that the cost stickiness index has increased after the data inventories were included in the table, meaning that the cost stickiness has decreased after the data inventories were incorporated into the table, supporting Hypothesis H1.

4. Empirical testing and result analysis

4.1. Descriptive statistics

According to Table 1, the average value of the enterprise cost stickiness index is 0.967, and the standard deviation is 0.126. This indicates that the overall cost stickiness of the sample enterprises is relatively stable. The standard deviation of the enterprise size is 1.770, indicating that the size of the sample enterprises fluctuates relatively little. The enterprise size standard deviation of 1.770 shows minimal variation among the sampled organizations. The average concentration ratio of equity is 36.022%, indicating that the first major shareholder of the sample enterprises holds a relatively high proportion of shares. The mean property rights index comes in at 0.545, which suggests that the sample includes a fairly even mix of both state-run and privately held companies.

Table 1. Descriptive statistics of main variables

Variable	Mean value	Standard deviation	Min	Max	Sample size
Sticky	0.967	0.126	0.682	1.079	156
Treat	0.5	0.502	0	1	156
Size	23.543	1.770	20.282	28.303	156
Lev	0.489	0.199	0.0553	0.840	156
Growth	0.355	0.704	-0.587	4.229	156
Turnover	0.665	0.711	0.073	3.731	156
Top1	34.834%	15.576%	3.98%	70.31%	156
SOE	0.545	0.5	0	1	156

4.2. Baseline regression analysis

This study employed the fixed effects model to conduct a baseline regression test to examine the impact of data inventory inclusion on cost stickiness. The results are presented in Table 2.

According to Table 2, the coefficient of the core explanatory variable Treat is 0.136, indicating that after the data inventories are included in the data, the average enterprise cost stickiness index increases by 13.6%. Combined with the mapping relationship between Weiss' cost stickiness index and actual cost stickiness, the corresponding cost stickiness decreases by approximately 15% - 20%. This indicates that the cost optimization effect resulting from incorporating the data list into the data is very significant. Incorporating the data list significantly enhances the "stickiness" level, that is, it reduces the stickiness of costs. Hypothesis H1 has been fully verified.

Further analysis of the control variables indicates that state-owned enterprises have lower cost stickiness. Enterprises with high debt levels have lower cost stickiness than those with low debt levels, and large enterprises have higher cost stickiness.

Table 2. Results of baseline regression analysis

Variable	Sticky
Treat	0.136*** (0.018)
SOE	0.108*** (0.023)
Lev	0.748* (0.422)
Growth	0.028 (0.037)
Top1	-0.015 (0.014)
Size	-0.468*** (0.131)
Turnover	0.021 (0.186)
Industry	Yes
Year	Yes
N	156
Within_R ²	0.5016

Note: *, **, *** respectively represent significance levels of 10%, 5%, and 1%.(up and down same)

4.3. Robustness test

To put the benchmark regression findings to the test and ensure they hold water, this study runs a robustness check by swapping out the key explanatory variable with an alternative measure: the original variable Treat (the dummy variable for data inventories being recorded in the balance sheet) is replaced with DARatio (the proportion of data inventories in the operating income). From the qualitative perspective of "whether to be recorded in the balance sheet" to the quantitative perspective of "the intensity of being recorded in the balance sheet", the impact of data inventory recording on the cost stickiness of enterprises is re-examined. The regression results are shown in Table 3. In the benchmark regression, the coefficient of Treat is 0.129; In the robustness test, the coefficient of DARatio is 1.582. The directional signs of key explanatory variables are consistent in different analyses and statistically significant. This study has observed that companies with recorded data assets tend to show stronger cost rigidity, and this trend cannot be attributed only to the way these variables are measured or defined. In addition, the coefficient sign and significance level of control variables (including Growth, SOE and Size) change little between the two regression models, which further proves the effectiveness of the model setting.

The research results show that the inclusion of data assets in the company's balance sheets will affect the cost behavior, which not only reflects the policy significance of this practice, but also reflects its influence degree. Specifically, the higher the proportion of these assets, the more obvious

the decline in cost stickiness. This robust test further proves the credibility of the main conclusions of the study.

Table 3. Results of robustness test regression

Variable	Sticky	Sticky
Treat	0.129*** (7.06)	
DARatio		1.582** (1.99)
Lev	0.017 (0.20)	0.0315 (0.31)
Growth	0.021** (2.01)	0.023* (1.75)
SOE	0.044 (1.58)	0.042 (1.33)
Top1	0.000 (0.05)	0.000 (0.22)
Size	-0.013 (-1.12)	-0.011 (-0.80)
Turnover	0.028 (1.89)	0.032** (1.99)
Industry	control	control
N	156	156
R ²	0.4293	0.1976

4.4. Heterogeneity analysis

Companies with different ownership have different management methods and external resource restrictions. Publicly supported companies usually have a more stable policy environment and stronger financial guarantee, while privately owned companies can respond to market changes and make decisions quickly. Therefore, when the policy changes, different types of companies will show different cost rigidity. According to the framework of previous research, this study divided the samples into two groups-Publicly Owned Enterprises and private firms and then made benchmark regression respectively. The results are shown in Table 4, and the treatment effect of these two companies are statistically significant. However, the influence of firm size is obvious only in the private sector group, but no similar effect is seen in the publicly owned group. In addition, the coefficient of asset turnover of non-soes is significant, while the influence of Soes on asset turnover is not significant. It is indicated that non-state-owned enterprises are more sensitive to scale and operational efficiency because their business decisions are more dependent on market feedback. Incorporating data inventories into the balance sheet can lead to a more efficient allocation of resources, which in turn is more probable to break the cycle of cost rigidity.

Table 4. Results of enterprise nature heterogeneity

	State-owned group	Non-state-owned group
Treat	0.129*** (0.0247)	0.123*** (0.0290)
Size	0.0125 (0.0162)	-0.0367* (0.0204)
Lev	-0.0540 (0.183)	0.0725 (0.172)
Growth	0.0692 (0.0454)	0.0184 (0.0166)
Turnover	-0.0013 (0.0275)	0.0481* (0.0285)
Top1	-0.000664 (0.00108)	-0.00116 (0.00232)
Year	control	control
Industry	control	control
N	85	71

Different-sized enterprises vary in terms of their cost adjustment capabilities and market bargaining power. Large-scale enterprises usually have more comprehensive cost control systems and stable supply chains, while the cost structure of small-scale enterprises is more susceptible to external shocks. Different-sized enterprises vary in terms of their cost adjustment capabilities and market bargaining power. Large-scale enterprises usually have more comprehensive cost control systems and stable supply chains, while the cost structure of small-scale enterprises is more susceptible to external shocks. Therefore, the impact of policy shocks on the cost stickiness of enterprises of different sizes may exhibit heterogeneity.

This paper categorizes the sample into two enterprise groups based on median size. Separate baseline model tests are conducted for each group. The empirical results are shown in Table 5, the coefficients of Treat in both large and small enterprise groups are significant, and the coefficient of small enterprise groups (0.143) is slightly larger than that of large enterprise groups (0.113). Concurrently, asset turnover rates and the largest shareholder's stake prove to be game-changing factors for smaller business conglomerates, whereas these influential elements fall by the wayside when it comes to their larger counterparts. This shows that small companies are more inflexible in traditional asset allocation and spend more on adjustment, so adding data inventories to their balance sheets can significantly improve their flexible resource availability.

Table 5. Results of enterprise size heterogeneity

	Large-scale grouping	Small-scale group
Treat	0.113*** (0.0259)	0.143*** (0.0261)
Size	-0.00671 (0.0245)	-0.0421 (0.0271)

Table 5. (continued)

Lev	-0.0348 (0.140)	0.0879 (0.147)
Growth	0.0472 (0.0478)	0.0125 (0.0127)
Turnover	-0.00560 (0.0185)	0.0608** (0.0230)
Top1	-0.00129 (0.00136)	0.00274* (0.00139)
IND	control	control
Year	control	control
Industry	control	control
N	78	78

5. Conclusion

This study investigates the listed companies that confirmed data assets in financial statements in 2023 and 2024 and discusses the impact of this accounting treatment on the company's expenditure pattern. The study evaluates the overall impact and the differences caused by the specific characteristics of the company. The main findings are as follows: First, it seems that the inclusion of data assets in the balance sheet significantly reduces the rigidity of the company's costs. Even if the core variable is changed from a simple binary indicator of "whether it is included in the balance sheet" to a more detailed measurement method of "the proportion of data assets to operating income", this conclusion still holds, which enhances the reliability of results. This shows that the weakening effect of data asset recognition on cost rigidity is widespread, and this reducing effect will be stronger with the improvement of data asset integration. Secondly, the analysis of control variables shows that the ownership structure, debt level and enterprise scale are important factors affecting cost stickiness. The cost stickiness of state-owned enterprises is obviously lower than that of non-state-owned enterprises because they have a more reliable resource base and governance framework. Companies with high debt ratios have lower cost stickiness, while large companies have higher cost stickiness because their asset structures are more inflexible and their adjustment costs are higher. Finally, no matter the size of the company or the type of ownership, as long as the data assets are confirmed on the balance sheet, their cost stickiness will be reduced, which is true in different organizational structures. The reaction degree of the influence mechanism is different: non-state-owned enterprises are more sensitive to the cost stickiness caused by the change of scale and asset turnover rate, but state-owned enterprises do not have this characteristic; Small companies are more susceptible to the inventory of balance sheet data than large companies, and their cost stickiness is particularly responsive to changes in asset turnover and equity concentration, but large companies are not so strongly related.

The results of this study are of great significance to both theory and practical application. Theoretically, it links data assets and cost stickiness in the balance sheet and expands the academic discussion about data inventory accounting under the background of current accounting reform. In addition, it also provides a new understanding of the factors affecting cost stickiness in financial reports. In practical application, this study provides practical guidance for enterprises on how to

integrate data inventories into their balance sheets and strengthen cost management. It is also a useful reference for regulators who want to improve this kind of asset accounting standard.

The current research has some limitations. First of all, because the identification of data inventory on the balance sheet is delayed, the analysis can only look at short-term data, so the long-term impact of data inventory on cost stickiness has not been studied. Secondly, variables such as the degree of enterprise digitalization have not been comprehensively evaluated, and they may be regulatory factors. Future research can look at how data inventory affects cost rigidity in different situations.

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