Proceedings of Business and Economic Studies, 2026, Volume 9, Issue 6
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

Research on the Problems and Optimization of Data Asset Accounting Confirmation and Measurement

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Abstract: The inclusion of data assets in financial statements can quantitatively reflect the value of data factors on corporate financial reports, consolidate enterprises' asset base, push enterprises to pay attention to the development, management, and utilization of data resources, and provide more comprehensive accounting information for stakeholders such as investors and regulatory authorities. Nevertheless, differing from traditional tangible assets and intangible assets, data assets bear distinctive particularities. They are intangible with complicated ownership relations; their values fluctuate under the influence of technological iteration, market demand, data quality, and multiple other factors, and their costs can hardly match values precisely. As a result, the conventional accounting confirmation and measurement system cannot fully adapt to the accounting treatment requirements of data assets. Therefore, systematically studying existing problems in the accounting confirmation and measurement of data assets and putting forward scientific and reasonable improvement measures carry important theoretical and practical significance.

Keywords: Data assets; Accounting confirmation; Accounting measurement; Optimization path

Online publication: July 14, 2026

1. Introduction

China is attaching growing importance to data factors, and relevant institutional construction is being gradually promoted. In 2019, the Fourth Plenary Session of the 19th Central Committee of the Communist Party of China officially incorporated data into the scope of production factors, laying an important institutional foundation for data assetization. In 2022, the *Opinions on Building a Basic Data System to Better Tap the Role of Data Factors* was issued, systematically constructing the basic institutional framework for data factors covering property rights, circulation, distribution, and governance. In August 2023, the Ministry of Finance issued the *Interim Provisions on the Accounting Treatment of Enterprises' Data Resources* (hereinafter referred to as the Interim Provisions), which, for the first time, endows data resources with asset attributes at the national accounting system level and specifies relevant accounting treatment standards.

2. Problems existing in accounting confirmation and measurement of data assets

2.1. Problems in accounting confirmation

2.1.1. Vague confirmation criteria and lack of unified specifications

On the one hand, there are no clear provisions on control standards. Due to complicated ownership of data assets, enterprises struggle to confirm whether they hold control over such assets. For data assets acquired through cooperation, ownership generally belongs to all cooperating parties, while the acquiring enterprise only holds the right to use. There exist no explicit rules on whether such data assets should be confirmed and how to determine the confirmed amount [1–3]. On the other hand, the identification criteria for "future economic benefits" remain unspecific. The value of data assets is uncertain, making it difficult to judge whether they can continuously bring economic benefits to enterprises. Some enterprises recognize unqualified data resources as assets to beautify financial statements, while others fail to record eligible data resources as assets, resulting in incomparable accounting information.

2.1.2. Unclear definition of confirmation scope leading to omission and abuse

Some enterprises lack an in-depth understanding of data assets and only recognize purchased data resources that can directly generate economic benefits as assets, ignoring self-collected and self-processed data resources. Though accumulated over a long period, such self-developed data cannot create economic benefits immediately and are excluded from the accounting confirmation scope, leading to an understatement of data asset value. Conversely, certain enterprises expand the confirmation scope improperly by recording data resources without asset attributes as assets and causing distortion of accounting information. Besides, disputes remain over the confirmation scope of derivative data assets. Derived from the processing of original data and valued based on source data, derivative data assets are not specified in the Interim Provisions in terms of independent recognition requirements and confirmation methods, triggering operational confusion among enterprises in practical work.

2.1.3. Ambiguous confirmation timing resulting in lagged accounting information

The formation of data assets is a continuous process spanning raw data collection, processing, and the final formation of economically beneficial data assets, which takes a certain amount of time. However, unified specifications on the confirmation timing of data assets are absent currently. According to the Interim Provisions, confirmation timing mainly depends on the point when data assets reach intended use or saleable status, yet the judgment benchmarks for "intended use" and "saleable status" are undefined and confuse enterprises in practical operation[4]. Unclear confirmation timing causes some enterprises to recognize data assets in advance and others to defer recognition, impairing the timeliness of accounting information and the comparability of financial data across different entities.

2.2. Problems in accounting measurement

2.2.1. Improper selection of measurement attributes failing to reflect true value of data assets

At present, most enterprises apply the historical cost method for data asset measurement by taking acquisition cost as the measurement base. Such an approach cannot fit the characteristics of data assets and thus leads to overvaluation or undervaluation of asset value. Data asset value changes dynamically with technological upgrading and market fluctuation, which cannot be captured under historical cost measurement, and reduces the relevance of accounting information. In addition, a large gap exists between acquisition cost and the intrinsic

value of data assets: some assets cost little but bring substantial future economic returns, while others incur high input yet produce limited earnings. Historical cost method cannot reflect such mismatches between cost and economic value.

2.2.2. Non-standard initial measurement and difficulties in cost accumulation

Initial measurement of data assets centers on acquisition cost collection, yet the complicated formation procedure creates prominent obstacles for cost aggregation and results in irregular initial measurement. For purchased data assets, total cost shall cover purchase price, relevant taxes, and expenditures directly attributable to processing and sorting activities required to bring assets to the intended usable condition. Nevertheless, many enterprises only include the purchase price in the initial cost and omit follow-up expenses such as processing, sorting, and ownership certification fees, leading to an under-recorded initial measurement amount. For self-developed and self-collected data assets consisting of collection expense, processing cost, and R&D outlay, accurate cost aggregation proves challenging. Some enterprises improperly add irrelevant expenses to asset cost or leave out eligible expenditures, which distorts initial measurement results.

2.2.3. Imperfect subsequent measurement unable to track value changes

First of all, amortization methods and amortization periods are selected arbitrarily. The Interim Provisions require enterprises to pick amortization approaches in line with the service life and expected consumption pattern of the economic benefits of data assets. However, influenced by technical iteration and market demand, the useful life of data assets is hard to estimate precisely, leaving great subjectivity in amortization term determination. Secondly, no definite standards are available for impairment test. Given the drastic value volatility of data assets, regular impairment assessment is necessary, but rules for identifying impairment indicators and calculating recoverable amount are missing. Consequently, many enterprises fail to accrue impairment provisions timely or calculate inaccurate provision amounts, making book value inconsistent with actual asset worth [5–7]. Thirdly, accounting treatment rules for subsequent update and upgrade expenses of data assets are undefined. Some enterprises expense such upgrade outlays into current profit or loss, while others capitalize them into asset cost, creating disorder in subsequent measurement.

3. Optimization paths for accounting confirmation and measurement of data assets

3.1. Improving specification standards for data asset accounting confirmation

Based on the implementation feedback of the Interim Provisions, refine confirmation criteria and formulate definite benchmarks for control judgment and future economic benefit identification. On one hand, set up judging rules for “control” of data assets, distinguish ownership and usufruct according to proprietary features of data resources, and stipulate that data assets where enterprises hold only usage rights but maintain effective control and obtain prospective economic benefits qualify for asset recognition with detailed qualifying terms[8]. On the other hand, elaborate criteria for forecasting future economic benefits by combining business model, market demand, and technological evolution of data assets, specify prediction methodologies and evaluation grounds to narrow down discretionary judgment space for enterprises. Meanwhile, supplement confirmation rules for self-developed data assets, draw a clear demarcation between the research phase and the development phase against the practical R&D process to standardize expense classification and recognition practice. Formulate exclusive confirmation clauses for derivative data assets covering recognition prerequisites, timing,

and amount so as to eliminate ambiguous scope definition.

Define the overall confirmation scope to include all eligible data resources such as self-collected, processed, purchased, cooperatively-developed, and derivative data assets, and avoid value undercounting; meanwhile, explicitly exclude invalid data unable to generate future gains, data with unclear ownership, and temporarily-used data without asset features to prevent arbitrary scope expansion and accounting distortion. Establish a verification system for data asset confirmation, requiring enterprises to submit supporting documents including ownership certification, value appraisal reports, and future benefit projection documents to ensure compliance during recognition [9,10]. Clarify confirmation timing according to asset formation process: purchased data assets are recognized upon payment, full delivery, and availability for intended use; self-developed assets are confirmed when development work is finished and ready for designated application; inventories for sale are recorded after complete processing and attainment of saleable status. Such differentiated rules guarantee timeliness and comparability of financial information.

3.2. Optimizing accounting measurement approaches of data assets

Optimization of measurement methods shall be oriented toward core traits of data assets including intangibility, replicability, and value volatility, tackle existing drawbacks such as single measurement mode, inaccurate value reflection, and poor operability, and build a diversified measurement system balancing reliability and relevance. Firstly, upgrade the applicability of historical cost measurement by specifying full-range cost coverage including collection fees, R&D costs, and manual processing expenses during acquisition, storage, and development for initial measurement; refine amortization clauses for subsequent measurement and adopt rational amortization modes matching update speed, service life, and impairment risk to prevent artificial overstatement or understatement of asset value [11]. Secondly, introduce fair value measurement progressively and complete a supporting evaluation system relying on professional appraisal institutions; formulate scientific assessment indicators and procedures by referencing market activity, application scenarios, and profit expectation of data assets. For assets with an active trading market, the market approach is prioritized to confirm fair value; the income approach or the cost approach is applied for valuation when no mature market exists to reflect the current real worth. Thirdly, explore mixed measurement model matching asset utilization characteristics: core data assets adopt combined historical cost and fair value measurement to secure reliability while tracking value fluctuation timely. In addition, compile detailed operational guidelines for different asset categories, upgrade the professional competency of accounting staff, and reduce measurement deviation to guarantee supportive and accurate financial data for corporate decision-making and investor judgment [12].

3.3. Perfecting internal management and accounting system within enterprises

Enterprises shall attach high importance to data assets and build exclusive management systems with clarified job responsibilities covering data collection, processing, storage, application, and disposal. Set up detailed data asset ledgers documenting source, ownership, processing progress, cost, valuation, and usage status to realize full traceability of data resources. Strengthen data security governance and build protection mechanisms against information leakage, loss, and tampering so as to preserve asset integrity [13,14]. In accordance with the Interim Provisions, complete internal accounting systems by setting up dedicated accounts including Data Assets, Accumulated Amortization of Data Assets, Impairment Provision for Data Assets and Semi-finished Data Products, define account scope and accounting procedures, formulate standardized operational norms covering

confirmation, measurement, bookkeeping and financial reporting, and clarify accountability of accounting personnel for standardized treatment.

Carry out regular internal audit targeting data asset accounting work to discover and rectify calculation errors promptly and safeguard the truthfulness of accounting information. Develop multi-level training programs for financial staff with teaching contents involving definition, characteristics, accounting rules, valuation techniques, and information technology related to data assets, helping practitioners master key difficulties in confirmation and measurement and improve operational accuracy. Encourage accountants to participate in digital economy training and on-site data management practice to accumulate practical experience and upgrade professional competence [15]. Besides, recruit interdisciplinary talents equipped with accounting, information technology, and data management expertise to enrich financial teams and satisfy the comprehensive accounting requirements of data assets.

4. Conclusion

To sum up, data assets will gain increasingly prominent strategic importance, and new challenges as well as opportunities will continuously emerge in their accounting confirmation and measurement. Follow-up research can be carried out in the following directions: first, develop diversified fair value measurement methodologies and reasonable valuation models based on massive data analysis; second, explore intelligent accounting solutions aided by artificial intelligence and big data technologies to improve efficiency and precision of data asset accounting, polish research outcomes, and provide solid theoretical support for the industrialization of data assets.

Disclosure statement

The author declares no conflict of interest.

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