

# *Value Reassessment Logic of Resource-Based Enterprises in the Context of Energy Transition*

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**Keywords:** Energy transition; Resource-based enterprises; Disclosure of data asset information; Market response; value reassessment

**Abstract:** Under the energy transition, resource-based enterprises face the challenge of value reassessment, and traditional valuation models are ineffective due to neglecting data assets. This study adopts empirical methods to explore the impact and pathway of data asset information disclosure on market response through regression analysis, robustness testing, mechanism testing, moderation effects, and heterogeneity analysis. The results show that there is a significant positive relationship between data asset information disclosure and market response, and the regression coefficients are significant at the 1% level; Robustness testing (replacing independent variables, dependent variable windows, sub samples) enhances the reliability of the results; Endogeneity testing eliminates interference; Mechanism verification confirms the transmission effect of investor, analyst, and media attention; The moderation effect shows that the readability of annual reports is most significantly moderated during the data collection stage; Heterogeneity analysis shows that market reactions are more prominent in various stages of data assetization (especially in the analysis stage), high competitive industries, high-tech and high quality internal control enterprises. This study constructs a value reassessment framework for data asset information disclosure from the perspective of energy transition, revealing market response mechanisms and group differences, providing support for theoretical development and practical applications, and promoting resource-based enterprises to achieve sustainable value creation in the energy revolution and digital economy.

## 1 Introduction

In the global wave of energy transition[1], resource-based enterprises are undergoing a profound reevaluation of their value from traditional fossil fuels to renewable energy. Existing research mostly focuses on the static financial disclosure of data assets, but rarely explores their dynamic impact mechanism[2] on the reevaluation of resource-based enterprises in the context of energy transition. The challenge of existing literature is that traditional asset valuation frameworks struggle to capture the intangible and non competitive characteristics of data assets, while income based or market-based valuation relies on mature trading markets - which are particularly scarce in the early stages of energy transition. Although international accounting standards will gradually include data assets in the intangible asset framework after 2024, the special characteristics of resource-based

enterprises, such as the risk of impairment of high carbon emission assets and the data intensive nature of new energy projects, make their value revaluation path more complex. The motivation for this study is to fill this theoretical gap: to empirically explore how the disclosure of data asset information by resource-based enterprises affects market reactions through investor, analyst, and media attention in the context of energy transition, and thus drives value reassessment. The research objectives include: revealing the linear relationship between data asset information disclosure and market response; Analyze the transmission mechanism of investor, analyst, and media attention; Verify the moderating effect on the readability of annual reports; And explore the heterogeneous effects of different transformation stages, industry competition levels, and corporate attributes. The contribution of this study lies in innovatively constructing a theoretical framework for the revaluation of data asset information disclosure from the perspective of energy transition, incorporating external factors of concern (investors, analysts, media) into the same analysis system, and clarifying the role path of market reactions. Compared to traditional stock price synchronicity indicators, this study uses short-term excess returns (CAR) to directly observe information pricing dynamics, providing micro evidence for verifying the semi strong efficient market hypothesis. By focusing on the particularity of resource-based enterprises, this study not only enriches the theoretical system of the economic consequences of data assets, but also provides practical guidance for enterprises, investors, and regulatory authorities in the energy transition to re evaluate their value, promoting sustainable value creation for resource-based enterprises in the dual transformation of digital economy and energy revolution.

## 2 Correlation theory

### 2.1 Multidimensional Perspectives and Core Issues in Data Asset Research

As a core production factor in the digital economy era, the definition and attributes of data assets[3] have always been the focus of academic and practical discussions. Since Richard Peterson first proposed the concept of "data assets" in 1974, its connotation has continuously evolved: from being seen as an extension of holdings such as bonds in the early days, to being emphasized as directly related to market value and competitive positioning, and then defined as data resources owned or controlled by enterprises that can bring economic benefits. Currently, information assets, digital assets, and data assets are often considered similar concepts, but the core attributes of data assets have been widely recognized - clear ownership, reasonable value measurement, and continuous use for one year or more in the daily operations of enterprises. Its uniqueness is reflected in its non competitiveness, replicability, and shareability, which often make its value far exceed production costs and form a sharp contrast with physical and intangible assets. However, there is no unified standard for evaluating the value of data assets, and the immaturity of the trading market makes it difficult to accurately estimate future returns. In terms of the economic consequences of data assets, research presents multidimensional characteristics. At the enterprise level, data assets alleviate financing constraints by optimizing credit resource allocation, improving liquidity, attracting consumers to obtain economic profits, enhancing innovation capabilities and production efficiency, and ultimately driving enterprise value growth; Combining it with services can create new revenue streams and form a competitive advantage. At the industrial level, the accumulation of data assets promotes information circulation and resource sharing, promotes industrial digitization and digital industrialization, optimizes production processes, and enhances the production efficiency of the real economy. At the macroeconomic level, data assets, as emerging production factors, enrich the production function and directly or indirectly drive economic growth through economies of scale, although they still follow the law of diminishing marginal output in the long run. Regarding the disclosure of data asset information, the current accounting standards have not

yet clarified their recognition and measurement rules, and regulators have not included it in the mandatory disclosure scope. Many enterprises are in the voluntary disclosure stage. The insufficient presentation of intangible assets in traditional accounting reports can easily lead to an imbalance between earnings and market returns, prompting companies with significant intangible assets to voluntarily disclose supplementary information. Existing research indicates that disclosure of data asset information has a positive impact, such as alleviating financing constraints, improving analyst forecast accuracy, and reducing audit fees. However, there is still insufficient research on the market reactions triggered by the disclosure of data asset information, and only a few literature explore its information efficiency from the perspective of stock price synchronicity. Compared to the long-term equilibrium state reflected by stock price synchronicity, market reactions can more directly observe the dynamic process of information pricing through excess returns (CAR) during the event window period, providing micro evidence for verifying the semi strong efficient market hypothesis. This field urgently needs to be further explored

## **2.2 Event driven and Information Disclosure Perspectives in Market Reaction Research**

The event study method [4], as a core tool for market response analysis, has formed a multidimensional application framework in academic research abroad. Early research focused on major corporate events, such as Jensen and Ruback's (1983) finding that mergers and acquisitions can cause a significant increase in the target company's stock price in the short term, reflecting the market's positive expectations for synergies; Ball and Brown (1968) were groundbreaking in revealing the correlation between profit disclosure and stock price changes. Subsequently, Bernard and Thomas (1990) further validated the sustainability of profit surprises and positive market reactions, reflecting the dynamic evaluation of the market on the quality of corporate profits and future prospects. With the expansion of research, the event study method has extended to emerging fields: McWilliams and Siegel (2000) confirmed that positive corporate social responsibility measures can trigger positive market reactions, while Henderson and Cockburn (1996) showed that major technological breakthroughs can lead to significant stock price increases, highlighting the market's attention to corporate innovation capabilities. At the level of the relationship between information disclosure and market response, research shows that different types of information disclosure trigger differentiated market responses. Voluntary disclosure of information usually generates positive market reactions, such as reducing the cost of capital; Negative information, such as goodwill impairment, triggers negative reactions. It is worth noting that there is an imbalance in the impact of "good news" and "bad news" on stock price fluctuations, which is a common phenomenon in multiple capital markets. Although existing research has revealed a close relationship between information disclosure and market response, the market response triggered by data asset information disclosure is still in the exploratory stage, and its dynamic pricing process and mechanism urgently need to be analyzed in depth.

## **3 Research method**

### **3.1 Information Disclosure and Market Reaction Mechanism from the Perspective of External Attention**

In the capital market, high-quality information disclosure is the core driving force that attracts the attention of investors, analysts, and media. The attention behavior of these external entities has a profound impact on the quality of information disclosure and market response. At the level of investor attention, companies with high information transparency are more likely to attract

institutional investors, and the disclosure of information by companies with high attention is more likely to trigger faster and more significant market reactions; At the analyst level, the quantity and quality of information disclosure directly affect the analyst's willingness to track. High quality information disclosure can enhance analyst trust, promote in-depth research, and improve capital market efficiency; At the level of media attention, media reports influence the capital market through information diffusion and filtering. Even if fundamental information is controlled, media exposure can still trigger short-term abnormal fluctuations in stock prices. However, although existing research has explored the relationship between information disclosure and external attention, the mechanism by which information disclosure affects market reactions through investor, analyst, and media attention in the emerging field of data assets still needs to be further explored. This article focuses on the role of data asset information disclosure and market response from an external perspective, providing theoretical support for understanding the information pricing mechanism of emerging production factors.

### **3.2 Theoretical basis and market reaction logic of data asset information disclosure**

The efficient market hypothesis [5] divides market efficiency into three types: weak efficiency, semi strong efficiency, and strong efficiency. In a semi strong efficient market, stock prices reflect all publicly available information (such as financial reports and macroeconomic data), and data asset information disclosure, as a key means of information dissemination, is quickly absorbed by the market and reflected in stock prices, providing theoretical support for studying information pricing mechanisms. The theory of information asymmetry points out that there are differences in the degree of information mastery among different market participants. Management usually has a higher understanding of the quality and risk of data assets than external investors, and the lack of unified accounting standards and mandatory standards further exacerbates information asymmetry; High quality information disclosure can effectively alleviate this asymmetry, which affects investment decisions and stock price performance. The signal transmission theory explains how information advantaged parties (such as enterprises) influence information disadvantaged parties (such as investors) by sending signals (such as data asset information disclosure); Enterprises can demonstrate their core competitiveness and send positive signals by disclosing data asset details excessively, while delaying the disclosure of negative information may trigger market panic. The three together form the theoretical basis for understanding the relationship between data asset information disclosure and market reactions.

### **3.3 Data asset disclosure response mechanism**

The disclosure of data asset information triggers positive market reactions by reducing information asymmetry and transmitting positive signals (H1). Specifically, disclosing details of data assets by enterprises can convey signals of core competitiveness to investors, reduce valuation uncertainty, and enhance market confidence; At the same time, data asset information has value relevance to stakeholders such as investors, customers, and suppliers, which can promote cooperative support and form a positive market response. At the mechanism level, the disclosure of data asset information attracts investors' attention and triggers significant market reactions (H2): investors evaluate the potential profitability of enterprises based on the disclosed information, accelerate information diffusion and market digestion, and promote positive stock price fluctuations. Analyst attention forms a complete chain of "preliminary diffusion value interpretation" through professional interpretation (H3): Analysts use their professional knowledge to evaluate the value and risk of data assets, alleviate information asymmetry, and further attract investors' attention through their reputation effect, strengthening market response. Media attention promotes market

response through information dissemination and reputation amplification mechanisms (H4): Media coverage spreads data asset information, enhances corporate social influence and brand reputation, and guides investor decision-making. In addition, the readability of annual reports has a positive moderating effect on the market response to data asset information disclosure (H5): annual reports with strong readability reduce investors' cognitive burden, convey signals of good corporate governance, enhance market participants' confidence, and promote positive investment decisions and stock price increases through clear and transparent information transmission. The impact mechanism of the above assumptions is shown in Figure 1.

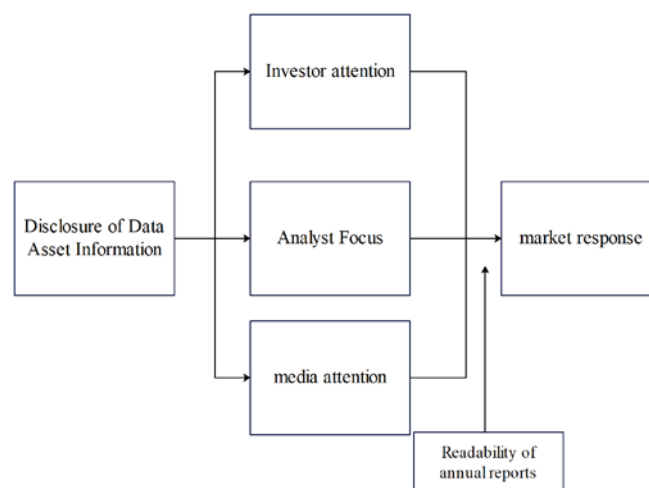


Figure 1 Signal Transmission and External Attention Framework

## 4 Results and discussion

### 4.1 Empirical Study on Data Asset Disclosure of Resource based Enterprises under Energy Transition

This study selected all A-share listed companies from 2007 to 2023 as the research sample, and after excluding financial, insurance, ST/PT status enterprises, and key indicator missing samples, a total of 41304 observation values were obtained. The data was sourced from the CSMAR database and subjected to 1% and 99% quantile reduction for continuous variables. Stata16.0 was used for empirical analysis.

The explanatory variable is the level of data asset information disclosure (dataasset), which is measured through text analysis[6]. Based on the four stages of data assetization (data collection, data storage, data analysis, and data application), the ratio of the exact sum of word frequencies (Lexicoywords) of each stage's vocabulary in the annual report to the total word frequency (TotalWords) after excluding English, numbers, and stop words is calculated, multiplied by 100, which is:

$$\text{dataasset} = \left( \frac{\sum \text{Dictionarywords}}{\text{TotalWords}} \right) \times 100 \quad (\text{Formula 1})$$

the larger the value, the higher the level of disclosure.

The dependent variable is short-term market response (CAR), measured using event study method: the annual report release date is taken as the event date, and the research window is [-1,1]. The normal rate of return is estimated using the CAPM model, and the formula is:

$$r_{i,t} = r_{f,t} + \beta_i(r_{m,t} - r_{f,t}) \quad (\text{Formula 2})$$

Where  $r_{i,t}$  and  $t$  are the daily returns of stock  $i$  on the  $t$ -th day,  $r_{f,t}$  and  $r_{m,t}$  are the risk-free rates, and  $r_m$  and  $t$  are the market composite index returns; Abnormal rate of return  $AR_{i,t} = r_{i,t} - r_{m,t}$ , cumulative abnormal returns

$$CAR(t_1, t_2) = \sum AR_{i,t} \quad (\text{Formula3})$$

The controlled variables include company size (Size, natural logarithm of total assets), asset liability ratio (Lev, total liabilities/total assets), return on equity[7](ROE, net profit/average balance of owner's equity), cash flow ratio (Cashflow, net cash flow from operating activities/total assets), number of directors (Board, natural logarithm), shareholding ratio of the largest shareholder (Top1, number of shares/total shares), property rights nature (SOE, 1 for state-owned enterprises, otherwise 0), and listing age (ListAge,  $\ln(\text{current year} - \text{listing year} + 1)$ ). The model is constructed as follows:

$$CAR(-1,1) = \beta_0 + \beta_1 \text{dataasset} + \text{Controls} + \text{Year} + \text{Industry} + \varepsilon \quad (\text{Formula4})$$

The positive coefficient of  $\beta_1$  indicates that the disclosure of data asset information triggers a positive market response.

## 4.2 Model experiment

Descriptive statistics show that the mean level of data asset information disclosure is 0.0774, with a standard deviation of 0.1295 and a range of 0 to 1.0449, indicating significant differences in the disclosure levels of sample companies; The mean of short-term market response (CAR (-1,1)) is -0.0014, with a standard deviation of 0.0467 and a range of -0.1261 to 0.1542. The data is relatively concentrated but exhibits fluctuations. The average size of the company is 22.1872, with a standard deviation of 1.3066 and a range of 19.8113 to 26.2296; The average asset liability ratio (Lev) is 0.4272, with a standard deviation of 0.2059, ranging from 0.0505 to 0.8943, reflecting significant differences in corporate leverage levels. The mean return on equity (ROE) is 0.0684, with a standard deviation of 0.1221, ranging from -0.6184 to 0.362, indicating a differentiation in profit performance; The average cash flow ratio is 0.0488, with a standard deviation of 0.0701, ranging from -0.1658 to 0.2466, reflecting differences in the stability of operating cash flow. The average number of directors (Board) is 2.1296, with a standard deviation of 0.1985, ranging from 1.6094 to 2.7081; The average shareholding ratio of the largest shareholder (Top1) is 0.3481, with a standard deviation of 0.1489 and a range of 0.0844 to 0.7434; The mean property ownership (SOE) is 0.3896, with a standard deviation of 0.4877 and a range of 0 to 1; The average ListAge is 2.0711 with a standard deviation of 0.9222, ranging from 0 to 3.3673, reflecting the diversity of the sample in terms of size, governance, equity structure, and listing time. The specific descriptive statistical results are shown in Table 1

*Table 1 Descriptive Statistics*

Variable	N	Mean	Median	SD	Min	Max
dataasset	41304	0.0774	0.0386	0.1295	0.0000	1.0449
CAR(-1,1)	41304	-0.0014	-0.0072	0.0467	-0.1261	0.1542
Size	41304	22.1872	21.9867	1.3066	19.8113	26.2296
Lev	41304	0.4272	0.4222	0.2059	0.0505	0.8943
ROE	41304	0.0684	0.0745	0.1221	-0.6184	0.3620
Cashflow	41304	0.0488	0.0479	0.0701	-0.1658	0.2466
Board	41304	2.1296	2.1972	0.1985	1.6094	2.7081
Top1	41304	0.3481	0.3279	0.1489	0.0844	0.7434
SOE	41304	0.3896	0.0000	0.4877	0.0000	1.0000
ListAge	41304	2.0711	2.3026	0.9222	0.0000	3.3673

Correlation analysis shows that there is a significant positive correlation between data asset information disclosure and market response (correlation coefficient 0.014 \* \* \*), supporting hypothesis H1. The correlation coefficients between control variables are all less than 0.5, indicating that the model has no serious collinearity issues. The multicollinearity test [8] showed that the VIF values of all variables were far less than 10 (minimum 1.05, maximum 1.66), with an average VIF of 1.31, further confirming the low degree of collinearity between variables and suitability for regression analysis.

### 4.3 Effect analysis

There is a significant positive relationship between data asset information disclosure and market response, with regression coefficients [9] of 0.0236, 0.0242, and 0.0238, respectively, after controlling for different variable combinations and fixed effects, all of which are significant at the 1% level, supporting hypothesis H1. The robustness test strengthened the reliability of the results by replacing the independent variable measurement method (new indicator coefficient 0.1252), the dependent variable window (CAR (-2,2) coefficient 0.0204), and sub sample regression (excluding pre-2013 data coefficient 0.0241); The endogeneity test uses the average disclosure level of the same industry during the same period as the instrumental variable, and the second stage regression coefficient of 0.0314 is significant at the 10% level, excluding endogeneity issues. Mechanism testing shows that data asset information disclosure significantly increases investor attention (coefficient 0.0082), analyst attention (coefficient 0.3826), and media attention (coefficient 0.3816), all at the 1% level, verifying the role of external attention as an important transmission channel. In terms of moderation effect, the readability of annual reports has a positive moderating effect on the relationship between data asset information disclosure and market response. The moderation effect is most significant in the data collection stage, followed by the storage stage. However, the moderation effect is not significant in the data analysis and application stage due to strong information professionalism and high interpretation costs. Heterogeneity analysis is conducted from four dimensions: each stage of data assetization (collection, storage, analysis, and application) triggers positive market reactions, and the data analysis stage has the most prominent impact due to its involvement in data processing and decision-making capabilities; Enterprises with high levels of competition in the industry have a more significant market response to data asset information disclosure, as companies in highly competitive industries tend to transmit competitiveness signals through active disclosure; The disclosure of data asset information by high-tech enterprises has triggered a significant positive market response, while it is not significant for non high-tech enterprises. This is because data assets of high-tech enterprises are their core competitiveness, and disclosure can highlight their advantages; Enterprises with high internal control quality have a more significant market response to data asset information disclosure, as high-quality internal control enhances information credibility and sends positive signals. These findings reveal the regulatory mechanisms and group differences in the market response to data asset information disclosure, providing a segmented perspective for understanding its economic consequences.

## 5 Conclusion

There is a significant positive relationship between data asset information disclosure and market response, with regression coefficients of 0.0236, 0.0242, and 0.0238, respectively, after controlling for different variable combinations and fixed effects, all of which are significant at the 1% level, supporting the core hypothesis. The robustness test strengthened the reliability of the results by replacing the independent variable measurement method (new indicator coefficient 0.1252), the dependent variable window (longer-term window CAR (-2,2) coefficient 0.0204), and sub sample

regression (coefficient 0.0241 after excluding early data); The endogeneity test uses the average disclosure level of the same industry during the same period as the instrumental variable, and the second stage regression coefficient of 0.0314 is significant at the 10% level, excluding endogeneity issues. Mechanism testing shows that data asset information disclosure significantly increases investor attention (coefficient 0.0082), analyst attention (coefficient 0.3826), and media attention (coefficient 0.3816), verifying the role of external attention as an important transmission channel. In terms of moderation effect, the readability of annual reports has a positive moderating effect on the relationship between data asset information disclosure and market response. The moderation effect is most significant in the data collection stage, followed by the storage stage. However, the moderation effect is not significant in the data analysis and application stage due to strong information professionalism and high interpretation costs. Heterogeneity analysis [10] is conducted from four dimensions: each stage of data assetization (collection, storage, analysis, application) triggers positive market reactions, and the data analysis stage has the most prominent impact due to its involvement in data processing and decision-making capabilities; Enterprises with high levels of competition in the industry have a more significant market response to data asset information disclosure, as companies in highly competitive industries tend to transmit competitiveness signals through active disclosure; The disclosure of data asset information by high-tech enterprises has triggered a significant positive market response, while it is not significant for non high-tech enterprises. This is because data assets of high-tech enterprises are their core competitiveness, and disclosure can highlight their advantages; Enterprises with high internal control quality have a more significant market response to data asset information disclosure, as high-quality internal control enhances information credibility and sends positive signals. These findings reveal the regulatory mechanisms and group differences in the market response to data asset information disclosure, providing a segmented perspective for understanding its economic consequences.

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