

Research on Data Asset Valuation Pricing and the Path to Sustainable Business Development in a Green Economy

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Abstract: Driven by the green economy, data assets, as vital resources for business digital transformation and innovation, are becoming central elements in promoting sustainable business development. With the increasing global environmental awareness and implementation of green economic policies, how to effectively value and price data assets has become a key issue in corporate strategic management. This paper analyzes existing data asset valuation models and, considering the policy impacts under the green economy, discusses how to build a resilient data asset valuation and pricing system within the green economic framework. The study shows that reasonable data asset valuation can not only optimize resource allocation but also enhance innovation capabilities and competitive advantages, ultimately aiding in achieving long-term sustainable development.

Keywords: Green economy, Data assets, Valuation pricing, Sustainable business development, Path research

1. Introduction

The world is currently experiencing a rapid rise in the green economy, with countries globally promoting low-carbon and environmentally friendly development models through policies. However, the unique attributes of data assets dictate that their valuation and pricing cannot rely on traditional models. Businesses facing increasing environmental pressures and complex market conditions must find effective paths to balance economic development with green responsibilities. The green economy requires businesses to shift from solely pursuing profit to a more comprehensive, sustainable operating model. In this transformation, data assets play an irreplaceable role. They are not only key to technology innovation and market expansion but also crucial in driving sustainable business practices. Especially under a green economy, businesses can find a new balance between environmental protection and profitability through reasonable pricing and management of data assets. With a scientific data asset valuation model, businesses can better optimize resource allocation and enhance operational efficiency, thus securing a favorable position in fierce market competition. Therefore, studying how to build a scientific and reasonable data asset valuation and pricing system under the green economy framework has not only theoretical innovation significance but also provides valuable guidance for business practices.

2. Concept and Characteristics of Data Assets in a Green Economy Context

2.1. Connotation of the Green Economy

The green economy represents a new economic model that promotes economic growth by reducing environmental pollution and resource consumption. This model not only focuses on economic benefits but also emphasizes the sustainable development of society and the environment, requiring businesses to take on ecological responsibilities while achieving profits. The core of the green economy is to optimize resource utilization through innovation and technological progress, driving businesses toward more environmentally friendly and sustainable operating models. In this context, businesses' production methods, resource allocation, and management decisions are undergoing profound changes[1].

2.2. Connotation and Characteristics of Data Assets

As an important intangible resource for businesses, data assets are gradually changing traditional production and business models. Unlike tangible assets, data assets exist in the form of information, with broad application scenarios and significant potential value. Their intangibility means they can be reused multiple times without losing value after a single use[2]. Additionally, the shareability of data assets allows them to be applied across departments and industries in various business scenarios. Furthermore, data assets are dynamic, constantly updating with time and environmental changes, requiring businesses to rely on advanced technologies, such as big data analytics and artificial intelligence, to fully tap their value. These characteristics make data assets an irreplaceable role in the modern economy[3].

2.3. Importance of Data Assets in a Green Economy

In a green economy, the importance of data assets is further amplified. Firstly, data assets can help businesses improve resource efficiency; through in-depth data analysis, businesses can optimize production processes and reduce unnecessary resource waste. Secondly, data assets provide crucial support for technological innovation; businesses can discover new directions for green technology R&D through data insights, thus promoting the development of environmentally friendly products and low-carbon technologies. Moreover, data assets can help businesses more accurately grasp market demands in decision-making, optimize supply chain management, and reduce environmental loads, thus achieving more environmentally friendly operations[4]. In this process, data assets not only drive technological progress but also enhance businesses' market competitiveness, becoming key elements for sustainable development. Thus, under the push of the green economy, data assets offer businesses new solutions to balance economic benefits with environmental responsibilities[5].

3. Analysis of Data Asset Valuation and Pricing Models

3.1. Review of Traditional Asset Valuation Models

Traditional asset valuation models mainly include cost method, market method, and income method, which have been widely used in tangible asset valuation. However, these models have significant limitations for data assets. The cost method, based on the production and acquisition costs of assets, struggles to measure the potential value enhancement and innovation capability of data assets. The market method requires comparable market transactions, but due to the intangibility and uniqueness of data assets, there is often a lack of comparable market data. Although the income method considers future earnings, it struggles to fully capture the dynamic changes and long-term potential of data

assets. Therefore, traditional models are not well-suited to the special nature of data assets and require necessary improvements and innovations^[6].

3.2. Special Considerations for Data Asset Valuation

The uniqueness of data assets presents unique challenges for valuation. Firstly, the dynamic and multi-purpose nature of data assets means their value is not static but varies with time, market demand, and technological development. Secondly, the intangibility of data makes it difficult to conduct direct market transactions like tangible assets, lacking a clear market price reference. Moreover, the value of data often depends on how businesses use it, particularly through the development and application of technologies such as big data analysis and artificial intelligence, which can fully realize the potential value of data assets. Therefore, valuing data assets should not only consider their current economic benefits but also evaluate their potential future value enhancement and technology-driven added value^[7].

3.3. Innovations in Data Asset Pricing Models

To address the challenges of data asset valuation and meet the needs of businesses under a green economy, data asset pricing models need innovation. In line with the core concepts of the green economy, businesses should not only consider the economic value of data but also assess its contributions to environmental protection and social responsibility. For example, businesses could design pricing models based on environmental performance, incorporating the value of data in energy-saving and resource optimization into the valuation system. Additionally, innovative data pricing models should also consider factors like data security and privacy protection, especially in the era of big data, where the security and legality of data directly impact its market value^[8]. By building adaptable pricing models, businesses can more accurately assess the value of data assets, thus playing a greater role in the green economy^[9].

4. Factors Influencing Data Asset Pricing in a Green Economy

4.1. Impact of Policies and Regulations

In a green economy, government policies and regulations play a crucial guiding role in data asset pricing. Countries have introduced policies and regulations supporting green development, encouraging businesses to reduce environmental impacts through data-driven technological innovations. These policies not only define the environmental responsibilities businesses must fulfill but also provide incentives for green technological innovations^[10]. For instance, the implementation of carbon trading systems and environmental protection taxes makes it possible for businesses to optimize resource allocation and reduce carbon emissions through effective use of data assets. Therefore, data asset pricing must consider policy factors, especially how to integrate environmental responsibilities with economic benefits. Moreover, as data privacy and security regulations become increasingly stringent globally, data asset pricing must also consider compliance to ensure lawful data usage does not harm business reputation and market value^[11].

4.2. Impact of Market Demand

Market demand is another key factor in data asset pricing. In a green economy, the continuous growth in consumer and market demand for green products and services drives businesses to adopt more environmentally friendly technologies and products. As a key resource supporting these green innovations, data asset pricing is also influenced by market demand. For example, more consumers are willing to pay a premium for businesses that provide green solutions, which often rely on the

application of data assets to optimize their products and services. Therefore, when pricing data assets, businesses must fully consider the market's preference and trends for green technologies, not only enhancing their market competitiveness but also providing a basis for data asset market pricing^[12].

4.3. The Driving Role of Technological Advancements

Technological progress significantly influences data asset pricing, particularly with the advancement of cutting-edge technologies such as big data, artificial intelligence, and the Internet of Things, which further enhance the value of data assets. These technologies not only improve the ability of businesses to analyze, predict, and optimize using data assets but also expand the application scenarios of data assets. For example, big data technology enables businesses to more accurately predict market demands and optimize supply chain management, reducing operational costs. Moreover, the application of artificial intelligence technology allows businesses to extract potential commercial value from massive data, further enhancing the market value of data assets. Therefore, technological development is not only a driving force for data asset valuation but also an important reference factor for pricing. Businesses must consider the enhancement of data value due to technological advancements to ensure that their data asset pricing is forward-looking and reasonable^[13].

5. Relationship between Data Asset Valuation Pricing and the Path to Sustainable Business Development

5.1. Integration of Data Assets with Business Strategy

In the context of the green economy, the valuation and pricing of data assets are not merely financial decisions but are directly linked to the strategic goals of businesses. Businesses need to integrate data assets into their overall strategic framework, enhancing resource utilization efficiency, optimizing business processes, and promoting innovative development through data-driven methods. In this scenario, data assets are not just resources but core elements for businesses to achieve green innovation and enhance market competitiveness. By integrating data assets with business strategy, businesses can more agilely respond to market changes, especially under the push of the green economy, achieving sustained growth with lower resource consumption and higher efficiency. Additionally, the data asset pricing process can also provide a scientific basis for business strategic decisions, enabling businesses to allocate resources more accurately and ensure long-term sustainable development^[14].

5.2. Data Asset Pricing and the Enhancement of Sustainable

Development Capability Reasonable valuation and pricing are key pathways for businesses to enhance their sustainable development capabilities. Data assets, through precise market insights, operational optimization, and intelligent decision support, help businesses reduce their carbon footprint and enhance energy efficiency, thereby achieving optimal resource allocation and maximizing environmental benefits. Through data analysis, businesses can better identify inefficient links in their business processes and make technological improvements or innovations to reduce resource wastage and pollution emissions. Reasonable pricing of data assets reflects not only their current market value but also provides significant support for businesses' long-term sustainable development under a green economy. As businesses enhance their level of data application, the added value of data assets continuously increases, and their environmental capabilities and fulfillment of social responsibilities are also simultaneously enhanced.

5.3. Exploration of Sustainable Development Paths

Under the framework of the green economy, data asset valuation pricing provides businesses with new paths for sustainable development. Firstly, data assets can assist businesses in achieving green technology innovation and application; through in-depth analysis of data, businesses can develop more energy-efficient and environmentally friendly products and services, meeting the market demands of the green economy. Secondly, data assets can promote the transformation of business operational models from traditional resource-based economic models to data-driven innovative economic models. This transformation not only helps businesses improve resource utilization efficiency and reduce production costs but also significantly enhances their environmental performance and social reputation. Lastly, reasonable pricing of data assets can provide businesses with continuous economic returns, ensuring their competitiveness and sustainable development capabilities in the green economy. Therefore, when valuing and pricing data assets, businesses should not only consider their economic benefits but also view them as essential tools for achieving green transformation and sustainable development[15].

6. Conclusion

In the wave of the green economy, the path to sustainable business development no longer relies solely on traditional resources and capital but increasingly depends on data resources as intangible assets. As a vital strategic resource for businesses in the new era, reasonable valuation and pricing of data assets not only provide economic benefits but more importantly, drive businesses to make qualitative leaps in technological innovation, environmental responsibility, and optimized resource allocation. The green economy sets higher standards for businesses, requiring them to take on ecological responsibilities while pursuing profits, and data assets are precisely the core force helping businesses achieve this balance. Through a scientific valuation system and innovative pricing strategies, businesses can not only fully unleash the potential of data assets but also stand out under the growing global environmental pressures, finding a sustainable development path that meets the demands of the era. This transformation is not only the direction of future business development but also a necessary path to respond to the challenges of the green economy and create long-term social value.

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