

An Analysis of the Economic Performance of Chinese Enterprises in the New Energy Sector under Policy Changes and Market Slump

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Abstract: The new energy sector in China has experienced rapid growth due to major policy support proposed in the recent plans. However, recent policy changes, including reductions in subsidies, have brought new challenges and competition, making it necessary to analyze how these factors have affected the economic performance and strategic adjustments of new energy companies. Therefore, this paper examines the economic dynamics of Chinese new energy enterprises under the influence of national policies, with a focus on the impact of the 14th Five-Year Plan. The DuPont analysis of the financial data of 12 new energy companies from 2019 to 2023 reveals that since the 12th Five-Year Plan, government financial support and technological advancements have significantly increased corporate revenues. However, the implementation of the 14th Five-Year Plan and the elimination of subsidy policies have resulted in a leveling off of revenue growth and an intensification of market competition. In addition, an assessment of these enterprises' profitability indicates that policy adjustments may have varying degrees of impact. It is found that investment in R&D partially mitigates the adverse effects of market saturation on revenues, while corporate strategy and market adaptability play a pivotal role in economic performance. In short, the paper can provide policymakers and corporate managers with some insights into the economic dynamics of the new energy sector and offers suggestions for policy adjustments.

Keywords: New Energy Enterprises, Policy Impact, Market Competition, DuPont Analysis, Financial Performance.

1. Introduction

As a relatively new industry in China, the new energy sector has benefited from strong government subsidies and supportive policies aimed at expanding the market and easing the burden on enterprises involved in new energy. During the period from the Eleventh Five-Year Plan to the Thirteenth Five-Year Plan, the subsidy policy attracted and supported the establishment and development of a considerable number of new energy enterprises, which filled the vacancies of domestic new energy enterprises in a short period of time. However, recent shifts in government policy direction for the new energy industry, coupled with price declines caused by overcapacity and intensified competition, have led to significant changes in the business performance of many emerging new energy enterprises and companies involved in related sectors. This paper seeks to examine a selection of large-scale new

energy enterprises that have experienced notable changes, compiling and analyzing their business data to explore the effects of varying strategies on enterprise performance in response to national policy shifts and economic downturns. By doing so, the aim is to provide statistical insights that may contribute to the future development of China's new energy enterprises. This paper uses DuPont analysis to calculate and sort out the data of various enterprises, while also reviewing their annual reports to summarize the measures taken in response to external environmental changes, and identifying patterns by synthesizing both sets of findings.

2. Related Work

The development of new energy enterprises follows the global development trend, and this law is also confirmed in China, i.e. "new energy enterprises have a strong correlation with regional and global economic conditions" [1]. With the overall progress of China's economy, the demand for new energy has also increased. In China, due to long-term government intervention through subsidy policies in the new energy sector, these enterprises rely more on policies than the regional and global macro-economy. At the same time, changes in the global economic landscape in recent years have led to shifts in the direction of new energy development and policy [2,3]. With more competitors in the market, the growth rate of market demand has gradually lagged behind the growth rate on the supply side [4]. Against the backdrop of the global economic downturn and the gradual shift in government subsidy policies, this study explores, through statistical and correlation analyses, whether there is a certain correlation between "measures taken by different enterprises" and "results caused by different measures" in China.

3. Methodology

3.1. DuPont Analysis

The DuPont Analysis provides a comprehensive analysis of a company's operations through the calculation of relationships between several key financial ratios to derive a company's Return on Assets (ROA), which is used to compare the profitability of companies within the same industry. The calculation formula is as follows:

$$\text{ROA} = \text{Net Profit Margin (NPM)} \times \text{Total Asset Turnover (TAT)} \times \text{Equity Multiplier (EM)} \quad (1)$$

where $\text{NPM} = \text{Net Profit (NP)} / \text{Operating Revenue (OR)}$; $\text{TAT} = \text{Operating Revenue (OR)} / \text{Total Assets (TA)}$; $\text{EM} = 1 / (1 - \text{Asset Debt Ratio (TDR)})$; ROA is essentially a reflection of a company's profitability, and the higher the ROA, the stronger the profit-generating ability of the company. This analytical method mainly uses three indicators, namely EM, TAT and NPM, for calculation and analysis. EM is mainly affected by the gearing ratio. The higher the gearing ratio is, the higher the equity multiplier is, indicating an increase in the debt level of the enterprise and a corresponding increase in financial risk. NPM reflects the percentage of net profit in operating income, mainly reflecting the profitability of the enterprise. The greater the NPM, the greater the profitability of the enterprise. TAT reflects the ratio of business revenue to total assets within a certain period of time, the higher the total asset turnover ratio, the higher the efficiency of the enterprise's asset utilization.

3.2. Data Sources and Sample Selection

This study focuses on 12 large Chinese companies that have been in operation for many years and have recently seen significant changes in their performance data. Since internal factors, such as personnel changes, have had minimal impact on these companies, it is more fitting to examine the influence of external factors on their performance. These companies include Longji Green Energy

Technology Co., Ltd., Jingke Energy Co., Ltd., Tongwei Co., Ltd., Jingao Solar Energy Technology Co., Ltd., TCL central New Energy Technology Co., Ltd., Zhejiang Huayou Co., Ltd., Xinwangda Electronics Co., Ltd., Jiangxi Ganfeng lithium industry Co., Ltd., Tianqi Lithium Industry Co., Ltd., Sungrow Power Supply Co., Ltd., Huizhou Yiwei Lithium Energy Co., Ltd., and Shanghai Aixu New Energy Co., Ltd. The data are mainly derived from the annual reports released by the above 12 enterprises in recent years, while the information on changes in national policies comes from relevant official documents. According to the classification of main business, the above companies include 6 enterprises with photovoltaic products as the main products and 6 enterprises with lithium battery products as the main products. Among them, the main business scope of photovoltaic enterprises is the enterprises that are relatively easy to cause short-term changes in the company's operating income (compared with photovoltaic facility construction enterprises) due to the rapid technological update of photovoltaic solar panels and photovoltaic cells. Lithium battery enterprises include upstream enterprises related to lithium ore processing (excluding enterprises related to lithium ore processing equipment, with little short-term change) and enterprises related to lithium battery design and manufacturing.

3.3. Data Processing and Analytical Processes

The pertinent financial data were extracted from the annual reports of each company, including total revenue (TR), total costs (C), net profit (NP), total assets (TA), and total debt (TD). These data form the basis for subsequent calculations. Subsequently, a series of key financial ratios were calculated using the appropriate formulas. First, the total debt ratio (TDR) was calculated using the formula $TDR = \text{Total Debt (TD)} / \text{Total Assets (TA)}$, which assesses the company's leverage level. Subsequently, the net profit margin (NPM) was calculated using the formula $NPM = \text{Net Profit (NP)} / \text{Total Revenue (TR)}$, which provides insight into the company's profitability. Subsequently, the total asset turnover (TAT) ratio was determined using the formula $TAT = \text{Total Revenue (TR)} / \text{Total Assets (TA)}$, which serves to measure the efficiency of the company's asset utilization. Ultimately, the Equity Multiplier (EM) was determined through the application of the formula $EM = 1 / (1 - TDR)$, which provides insight into the extent of financial leverage utilized by the company. Subsequently, the aforementioned financial ratios were entered into the DuPont analysis model in order to calculate the Return on Equity (ROE) and Return on Assets (ROA). The return on equity (ROE) is derived from the product of the net profit margin, total asset turnover, and equity multiplier, indicating the return on shareholders' equity. The ROA is calculated as the product of the net profit margin and the total asset turnover, reflecting the overall profitability of the company's assets. The results will be used in a comparative analysis of each company's performance within the same industry context, elucidating the impact of external factors on their financial performance.

4. Results

4.1. Comparison of the Economic Performance among Enterprises

The business situation of the 12 enterprises can be divided into three types, as shown in Table 1.

Table 1: Enterprise Sales Revenue Performance by Type

Type	Name
Enterprises with a downward trend in sales revenue	TCL, Xinwangda Electronics, Jiangxi Ganfeng Lithium Industry, and Shanghai Aixu New Energy
Enterprises with relatively	Longji Green Energy Technology, Tongwei, Zhejiang Huayou, and

Table 1: (continued).

unchanged sales revenue	Tianqi Lithium Industry
Enterprises with a significant increase in sales revenue	Jingke Energy, Jingao Solar Energy Technology, Huizhou Yiwei Lithium Energy, and Sungrow Power Supply.

4.1.1. Enterprises with Declining Revenues

For companies with significant declines in operating revenue, including TCL, Xinwangda Electronics, Jiangxi Ganfeng Lithium Industry, and Shanghai Aixu New Energy, the EOA index shows a downward trend. The main reason for the decline of the EOA index is the decline of the Tat index. Due to the increasing pressure of the market competition environment in China's new energy market, from the second quarter of 2023 and the beginning of the third quarter of 2023, the price competition caused by overcapacity has broken through the critical point. This has resulted in a price war for new energy products, which, due to their high technological content and rapid pace of innovation, have prompted companies to reduce prices in order to avoid inventory backlogs. The price reduction measures led to the decline of the company's sales revenue, which in turn caused the Tat index and the EOA index to fall. It is noteworthy that the EM index of both Xinwangda Electronics and Shanghai Aixu New Energy has increased, which is likely strongly related to the rise in the debt ratio caused by the decline in sales volume.

4.1.2. Enterprises with Relatively Stable Revenues

Companies with relatively stable operating revenue include Longji Green Energy Technology, Tongwei, Zhejiang Huayou, and Tianqi Lithium Industry. The operating income of the four companies remain basically unchanged or fluctuated in a very small range. With its livestock feed business, Tongwei has basically stabilized its total operating income against the background of the sharp fall in the prices of its photovoltaic industry affected by the market. However, the decline in NPM index and Tat index caused by the decline in market prices will inevitably reduce its ROA value. The EOA index for Longji Green Energy Technology, Zhejiang Huayou, and Tianqi Lithium Industry also declined for similar reasons. However, these companies managed to achieve growth by expanding global marketing channels and increasing the shipment volume of their main products. It should be noted that the businesses of Hejiang Huayou and Tianqi Lithium Industry are mainly related to the smelting and processing of basic raw materials in the upstream of the new energy industry. This coincides with the *Guiding Opinions on Promoting the Development of the Energy and Electronics Industry*, which proposes to enhance the capability to ensure essential resources such as lithium, nickel, cobalt, and platinum, and to reinforce the advancement and implementation of alternative materials. This adjustment makes these companies more adaptable to market prices under the influence of national policies..

4.1.3. Enterprises with Significant Revenue Growth

The three companies except Huizhou Yiwei are mainly engaged in photovoltaic industry. The photovoltaic industry has long been valued by the government. Since the 14th Five-Year Plan, a series of policy documents have been issued to promote the development of the photovoltaic industry, including but not limited to the matters related to promoting the healthy development of the photovoltaic industry and the notice on promoting the coordinated development of the supply chain of the photovoltaic industry chain. The government has played an obvious role in promoting relevant enterprises. Huizhou Yiwei Lithium Energy, with its highly globalized business operations, presents

a different case. In 2023, the operating revenue of overseas electronic component manufacturing accounted for 27.3% of the total operating revenue, far exceeding the proportion of the revenue of ordinary domestic enterprises in China. Moreover, the company's overseas operating gross profit margin was 24.72%, far exceeding its domestic gross profit margin by 14.16%. This has enabled Huizhou Yiwei Lithium Energy to maintain an upward revenue trend.

4.2. Impact of Policy Support

4.2.1. Positive Aspect

Since the 12th Five-Year Plan, China has gradually provided policy support for new energy and related enterprises. This support includes financial subsidies, optimized energy tax policies, improved energy investment policies, and improved energy financial systems. During the 12th Five-Year Plan period, PV power generation enterprises provided grid-connected power companies with economic subsidies ranging from RMB 0.1 to RMB 0.42/kWh (including tax), depending on the economic development of different regions. Meanwhile, some PV companies were given tax breaks of 85% and economic incentives for companies that met the criteria. For the new energy vehicle industry, the Government has exempted vehicle and vessel tax, purchase tax (including import tax) and other related taxes. Consumers purchasing new energy vehicles are entitled to tax exemptions based on the price of the vehicle: a 10% tax incentive for vehicles with a purchase price of less than 150,000 RMB, an 8% tax incentive for vehicles priced between 150,000 RMB and 300,000 RMB, and a 6% tax incentive for vehicles priced over 300,000 RMB. By investing in new energy-related infrastructure construction, reducing industry taxes and increasing investment guarantees in the new energy sector, the new energy industry base is expanding rapidly and continues to attract capital inflows. At this time, the upward trend of the new energy industry is obvious, supply is much lower than demand, and there is less competitive pressure. As a result, the operating income of these 12 enterprises has grown significantly. It is worth noting that, with the exception of TCL Zhonghuan New Energy Technology, the revenue growth rate of the above enterprises peaks in 2022.

4.2.2. Negative Aspect

The recent shift in relevant policies has directed the attention of the new energy industry towards sectoral expansion, thereby initiating a new phase of new energy infrastructure projects, including the development of charging stations and energy storage systems. This strategic direction has not only facilitated the development of new energy infrastructure but has also stimulated innovation and the application of related technologies. Despite the removal of subsidies for the purchase of new energy vehicles, companies within the industry have responded to market changes by improving technology and reducing production costs. The primary business areas of Sungrow Power Supply include photovoltaic inverters, energy storage, new energy investment and development, wind power converters, and hydrogen energy-related projects. The average scientific research investment of the enterprise in recent years is 4.29%, which greatly strengthens the brand effect and scale effect of the enterprise, reduces the cost of the enterprise, and wins the advantage in the market competition for the enterprise. The ROA value of the enterprise has also been improved for a long time. Among the remaining 11 enterprises, although the absolute growth rate of business income has declined for six companies, Huizhou Yiwei, Jingke Energy, Jingao Solar Energy, Longji Green Energy Technology, Zhejiang Huayou Cobalt Industry, and Tianqi Lithium Industry, the growth rate of business income remains positive. The decline in the growth rate of operating income of the six enterprises has a strong positive correlation with their own scientific research investment. The correlation coefficient calculated for the relationship between the growth rate of operating income and R&D investment for these six enterprises in 2023 is 92.64%. This finding aligns with the conclusions of Liu Shuaishuai's

research on the impact of R&D investment intensity on enterprise performance [5] and Xia's empirical research on the effects of R&D investment on enterprise performance [6]. The correlation of the data proves that the six enterprises conform to the objective law that under the influence of market saturation, the higher the proportion of research investment in the appropriate range, the stronger the ability of enterprises to withstand market changes. R&D investment by enterprises has a beneficial effect on the rapid transformation of business orientation, expansion of business scope, reduction of production costs, and improvement of brand recognition value among customers. This contributes to the stabilization of the enterprise's basic market position in the context of market shrinkage and the expansion of the future customer base. The market environment has resulted in varying degrees of decline for several enterprises, including Tongwei, TCL Zhonghuan New Energy Technology Xinwangda Electronics, Jiangxi Ganfeng Lithium Industry Group, and Shanghai Aixu New Energy. It is noteworthy that the marketing businesses of the five enterprises include lithium battery manufacturing (which has experienced a decline in market share due to national policies) and photovoltaic new energy-related manufacturing (which is a saturated market with high levels of competition). Besides, Tongwei and Xinwangda Electronics engage in the production of animal feed and portable electronic equipment, respectively. The extensive scope of the business operations of these two enterprises enables them to better adapt to the adverse impact of market changes, including the shrinkage of certain markets. In contrast, the narrower business scope of TCL Zhonghuan New Energy Technology, Jiangxi Ganfeng Lithium Industry, and Shanghai Aixu New Energy renders them more susceptible to market fluctuations.

5. Conclusion

By analyzing 12 leading enterprises in the field of new energy, this paper makes statistics on the different trends of Chinese enterprises under the new policy and analyzes the reasons for the trends. The findings indicate that the cessation of China's subsidy policy for new energy vehicle purchases has led to a reduction in operating income for lithium battery-related enterprises, increased costs, and diminished operating profits. As the photovoltaic industry has become increasingly saturated in recent years, competition among photovoltaic-related new energy enterprises has intensified. Meanwhile, the downstream market is pursuing lower price products, resulting in the decline of photovoltaic product profits, which has a great impact on the operating income of some enterprises. Government policies do have adverse effects on all kinds of new energy related enterprises by directly or indirectly affecting the business income and costs of enterprises. Especially in recent years, the combination of the contraction of the new energy market caused by the global economic downturn and the end of policy subsidies has amplified this adverse factor. However, enterprises can adjust their marketing direction to adapt to changes in the market environment and policies by taking measures such as expanding business scope and increasing the proportion of scientific research investment.

References

- [1] Dong, Q.Y., et al. (2023) *Coupling coordination degree of environment, energy, and economic growth in resource-based provinces of China*. *Resources Policy*, 81: 103308
- [2] Kuzemko, C., et al. (2020) *Covid-19 and the politics of sustainable energy transitions*. *Energy Res Soc Sci*.
- [3] Tian, J., et al. (2021) *Global low-carbon energy transition in the post-COVID-19 era*. *Applied Energy*, 307, 11820-118205.
- [4] Yu, S. et al. (2020) *Determinants of overcapacity in China's renewable energy industry: Evidence from wind, photovoltaic, and biomass energy enterprises*.
- [5] Liu, S. (2023) *Research on the impact of R&D investment intensity on enterprise comprehensive performance [d]*. Henan University.
- [6] Xia, X. (2018) *Empirical research on the impact of R&D investment on enterprise performance [d]*. Nanjing University.