

Analysis and Control of Investment Risks for Coal Enterprises under the Dual-Carbon Goals

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Abstract: This article takes Zhengzhou Coal Electricity Co., Ltd. (600121) as the research subject, based on the financial data from 2019 to 2023, and systematically analyzes the multi-dimensional investment risks it faces under the "dual carbon" goal. The research finds that the company has internal risks such as an unbalanced investment structure, insufficient R&D investment, and long-term assets occupying funds; externally, it is squeezed by policy tightening and demand contraction, resulting in unstable profitability and increased financing difficulties. Based on this, targeted control strategies such as optimizing the investment structure, strengthening R&D and post-investment management, and promoting price guarantee contracts are proposed. The aim is to provide theoretical references and practical paths for traditional coal enterprises in the process of low-carbon transformation in terms of investment risk management.

Keywords: Dual carbon target; Investment risk; Coal enterprises; Risk Control.

1. Introduction

As the largest developing country in the world, China has the highest coal production and consumption volume globally. This has led to the fact that coal and its downstream industries account for over 50% of China's carbon emissions, causing significant pollution to the environment. Moreover, China's share in the world's total carbon emissions is extremely high. Therefore, developing a low-carbon economy has increasingly become a key focus of China's economic development, and promoting high-quality development has become a new goal for China's development. [1] With the implementation of the "carbon neutrality" strategy, China's economy and society are rapidly entering the "carbon economy" era. A series of unprecedented new policies, technologies and applications are constantly emerging, presenting both significant opportunities and challenges for coal enterprises to transform and develop. Zhengzhou Coal and Electricity Co., Ltd. (stock code: 600121, hereinafter referred to as M Company) is a key coal enterprise in Henan Province. It not only bears the responsibility of ensuring regional energy security but also faces the severe test of industry transformation. This study focuses on the investment risks and response strategies of Zhengzhou Coal and Electricity under the dual carbon goals, aiming to provide a reference transformation path for traditional coal enterprises.

2. Literature Review

2.1. Research Status of Investment Risk Identification

Investment risk identification serves as the cornerstone of investment risk management, and its significance is self-evident. By employing scientific and reasonable methods for identifying investment risks, one can accurately detect the latent investment risks of enterprises, thereby providing strong support for them to formulate contingency strategies in advance and make adequate preparations, effectively ensuring the safety of their investments and reducing the likelihood of risk occurrence.

The identification of investment risks is already relatively

mature. Some scholars focus on the relevant risk factors of investment risks. He Suowei (2024) pointed out that power enterprises need to focus on identifying six types of risks, and environmental and technical risks are particularly prominent due to the natural dependence of photovoltaic and wind power projects. [2] Huang Yiling (2024) focuses on the political, economic, and social risks of Central Asia energy investment, highlighting the impact of geopolitical and resource attributes on risks. [3] Duan Xiaochen, Bao Mo, et al. (2022) identified five primary indicators of politics, economy, society, nature, and technology through an analysis of 31 overseas railway cases.

Huang Shizhong et al. (2021) introduced the "Carbon Quotient" (CQ) method, which assesses the financial impact of carbon risks through the ratio of "unrealized carbon costs/carbon emission asset total". [4] Yu Jianjing et al. (2024) proposed enhancing financial performance and reducing regulatory costs through green technological innovation and environmental information disclosure. Jiang Kunchen, Chen Wan, and Shu Xingge (2023) identified risks from both the macro and micro levels [5].

2.2. Current State of Investment Risk Assessment Research

Investment risk assessment is of vital importance in the overall investment risk management. It presents risks in a quantified form, thereby clearly defining the priority order of risks. Duan Xiaochen and Bao Mo et al. (2022) first divided the risk indicators into levels through AHP, and then combined the fuzzy evaluation method to standardize the 17 secondary indicators, establishing an investment risk-related risk factor indicator system. [6] Qiao Lin (2024) utilized big data visualization technology and knowledge graph reasoning to achieve dynamic assessment of state-owned capital investment risks and the exploration of latent risks. [7] Zhao Jie, Jiang Xiaoyu et al. (2020) used the entropy method to determine the four dimensions of politics, economy, market, society, and industry, and constructed an investment risk assessment indicator system for foreign agricultural investment. They analyzed according to the importance of investment risk-related factors and derived relevant control

suggestions and measures [8].

In the coal industry, it has distinct industry uniqueness, which requires enterprises to fully consider their own distinctive characteristics during the risk management process. Li Bo (2021) believes that the financial risks of listed coal enterprises are not caused by a single factor, but are the result of the interweaving and joint action of multiple factors. Therefore, in terms of risk control, systematic thinking and comprehensive analysis should also be carried out. [9] Zhang Xianzhi and Shi Xinyu (2021) pointed out that in the process of promoting carbon emission reduction, enterprises will inevitably encounter a series of accounting and financial problems. Enterprises need to adopt active and effective response strategies to deal with various risks. Reduce their operational burden and thereby lower financial risks, providing a solid financial guarantee for the smooth implementation of carbon emission reduction work [10].

2.3. Research Status of Investment Risk Control

Investment risk control, as the ultimate goal of the enterprise's investment risk identification process, is of crucial significance. Many scholars have studied the control measures of investment risks from multiple perspectives. For instance, Kang Zhouyu (2024) pointed out that Yunnan Energy Investment reduced technical uncertainty and reputation risks through technological research and ESG management, thereby preventing the investment risks of the enterprise. Wang Liqin (2021) indicated that state-owned enterprises' equity investment enterprises address investment risks by establishing a combination of post-investment management mechanisms and exit mechanisms, such as regularly evaluating project growth potential and exiting high-risk projects through equity transfer or mergers and acquisitions to avoid investment risks [11]. Zhu Ningbo and Wang Lei (2022) proposed the "Shadow Following Method," which dynamically captures the micro risks of agricultural investment through close observation and data analysis of the person following the shadowed party (such as on-site personnel of the project), effectively solving the problem of insufficient dynamic risk identification by traditional methods [12].

In conclusion, the existing research has been relatively comprehensive in terms of investment risks, achieving remarkable results in industry adaptability, method diversification, and entity collaboration. The existing research

mainly focuses on financial risk analysis for coal enterprises, but there are still issues such as insufficient cross-industry risk comparison studies and lagging identification of carbon policy fluctuation risks. There are also some gaps in research specifically focusing on the investment risks of coal enterprises under the dual carbon goals. Therefore, this paper focuses on the prevention and control of investment risks for coal enterprises under the dual carbon goals, aiming to provide theoretical support for the investment risk control of coal enterprises.

3. Investment Risk Analysis of M Coal Enterprises under the Dual-Carbon Goals

3.1. M Coal Company Profile and Financial Status

3.1.1. Company Profile

Zhengzhou Coal Electricity Co., Ltd. (hereinafter referred to as "M Company") is a joint-stock enterprise established through fundraising by Zhengzhou Coal Industry Group Co., Ltd. as the sole initiator. The company's main business is coal mining and sales. It has strong technological research and development capabilities and possesses core technologies such as safe and efficient mining of "three soft" unstable coal seams, gas control, and prevention of mine water disasters. More than 20 of its achievements have reached the domestic leading and international advanced levels, and it has won provincial and ministerial first and second prizes. The results are remarkable. However, with the implementation of the dual carbon target, as a high-pollution enterprise, M Coal Company has experienced significant fluctuations in its financial situation in recent years and is facing certain risks.

3.1.2. M Coal Company's Investment Status

As the world's largest consumer of coal, China accounts for over 50% of the global coal consumption. Coal enterprises, being high-pollution industries, are impacted by the dual carbon goals. This has prompted coal enterprises to adopt measures such as improving production technologies and increasing research and development investment to cope with the resulting effects. However, in the short term, the long and difficult process of enterprise renewal and transformation makes it challenging for them. The proposal of the dual carbon goals will bring numerous challenges and risks to coal enterprises.

Table 1. Financial Status of M Coal Company from 2019 to 2023 (Unit: Ten Thousand Yuan)

	2019	2020	2021	2022	2023
Total Assets	1344160	1445260	1351442	1392145	1326264
Total Liabilities	962013	1188585	1098822	1122831	1045840
debt-to-asset ratio%	71	82	81	81	79
Operating Revenue	357987	279333	321226	442310	432326
Operating costs	267961	245901	212265	283705	289542
Net profit	-92190	-94408	-21498	6802	3198

Data source: Annual reports of M Coal Enterprises
Therefore, this article takes some financial data from M Coal Company from 2019 to 2023 as an example to analyze the financial status of M Coal Company in recent years and dissect its potential investment risks, as shown in Table 1. Generally speaking, the reasonable range of the asset-liability ratio in the coal industry is around 50%—70%. However, M

Company's asset-liability ratio from 2019 to 2023 has remained high overall, placing the company's asset-liability ratio in the higher range of the industry. High debt means huge interest expenses, especially during the downward cycle of coal prices, where the company may fall into a situation of "increasing revenue but not increasing profits" or even losses, greatly increasing the company's financial risks.

Table 2. Relevant indicators of investment risk for Company M from 2019 to 2023

	2019	2020	2021	2022	2023
Return on total assets%	-6.86	-6.53	-1.59	0.49	0.24
Return on net assets%	-7.39	-7.12	-8.51	2.53	1.14
Operating profit margin%	- 15.83	- 29.11	7.33	11.61	8.37
debt-to-asset ratio%	71	82	81	81	79

Data source: Calculated using formulas from M Company's annual report

It is not difficult to see from Table 2 that M Company's profitability has been persistently weak with significant fluctuations. This indicates that after the introduction of the dual carbon goals in 2020, the company faces challenges in controlling costs and increasing operating income. This

Table 3. Investment situation of M Coal Company from 2019 to 2023 (Unit: 10,000 yuan)

	2019	2020	2021	2022	2023
Newly added fixed assets	40607.51	47034.66	82850.17	122175.94	68791.29
Newly added intangible assets	25.63	1.77	89.56	41.34	111.81
Newly added projects under construction	31550.12	20090.87	5500.60	-64912.36	14627.21
R&D expenditure	257.76	981.88	1155.50	1266.96	4140.62
Total domestic investment	72441.02	68109.18	89595.82	58571.88	87670.93

Data source: M Coal Enterprise Annual Report

Between 2019 and 2023, the proportion of the company's newly added fixed assets in its total internal investment continued to increase, consistently exceeding 50%. However, the proportion of research and development (R&D) expenditure, which represents future development potential, remained below 2%, indicating a tendency to "emphasize equipment procurement and underestimate technological research and development." This imbalanced investment strategy ties the company to the traditional path of scale expansion, posing dual risks. Although M Company's internal investment scale continues to climb, it is unable to generate revenue in the short term. The company's long-term maintenance of high-intensity investment occupies a large amount of working capital, leading to issues such as tight cash flow, which can easily trigger investment risks and have a

Table 4. Bank Loan Status of M Coal Company from 2019 to 2023 (Unit: 10,000 yuan)

	2019	2020	2021	2022	2023
short-term borrowing	301100	304082	299630	258575	216600
long-term loans	—	—	—	—	7970
Total Liabilities	962014	1188585	1098822	1050998	1045840
Proportion of bank loans%	31.3	25.58	27.27	24.6	21.47
Net cash flow from financing activities	-2469	-38076	-45819	-63073	-185112

Data source: M Coal Enterprise Annual Report

Since 2019-2023, M Coal Company's borrowings have primarily been short-term loans, with virtually no long-term loans. Meanwhile, long-term equity investments have seen a rapid increase over the past five years. However, the investment income generated has consistently remained at a low level, and even turned negative in some years. Various indicators suggest that M Coal Company's capital chain is facing significant risks and crises.

This aggressive expansion strategy directly led to the depletion of the company's cash flow. Therefore, foreign investment not only failed to bring expected returns, but instead dragged the company into the dangerous situation of

suggests that the return on shareholders' equity is extremely unstable, posing significant risks to earnings quality and exerting pressure on investors' confidence. Investors may adopt measures such as reducing or even withdrawing investments to avoid risks.

In summary, M Coal Company's asset scale fluctuates, its asset-liability ratio remains high for a long time, and its shareholder capital profitability is weak. M Company has to face significant investment risks. Especially as a coal-fired power enterprise, its performance is vulnerable to multiple factors such as energy policies, coal prices, and environmental protection requirements, posing a high potential systemic risk. It is evident that M Company faces high investment risks and requires attention.

3.2. Investment risk analysis of M Company

3.2.1. Risk of Imbalanced Investment Structure

negative impact on the company's long-term stable operation.

3.2.2. Capital Occupation and Recovery Risk

As can be seen from Table 3, Company M's investment is highly concentrated in long-term assets such as fixed assets and projects under construction. This large-scale investment in long-term assets, due to its large capital occupation and long cycle, will inevitably result in a significant amount of capital being tied up, exposing the enterprise to considerable risks. Furthermore, investment recovery faces high uncertainty. In the context of energy transformation, relying on the traditional investment model of expanding production capacity raises significant questions about the future cash flow recovery ability, undoubtedly exacerbating the risks faced by the enterprise.

3.2.3. Risk of Capital Chain Pressure

"borrowing new debts to repay old debts" and even potential capital chain rupture, forcing M Company to face greater risks.

3.2.4. Risk of Policy Changes

During the implementation of the dual carbon goals, the central and local governments have made strategic adjustments to energy resources to some extent. Due to policy changes and adjustments, it is bound to have a certain impact on the company's revenue, and higher requirements will be imposed on coal enterprises.

Taking the 2021 "Catalogue of Green Bond Supported Projects" as an example, this catalogue explicitly excludes the clean utilization of fossil fuels. M Coal Company's original

plan to support the construction of smart mines through green bond financing fell through. The sudden policy shift forced M Company to turn to high-cost trust financing, resulting in increased investment costs. This reflects that under the framework of energy transformation policies, coal enterprises are generally labeled as "high-carbon" industries. Policy changes can bring unpredictable risks to enterprises, continuously squeezing their investment capabilities and profit margins, and exacerbating their investment risks.

4. Investment Risk Control of M Coal Enterprise Under the Dual Carbon Goals

4.1. Optimize the Internal Investment Structure and Enhance the Competitiveness of Enterprises

Before conducting investment activities, it is necessary to conduct objective and multi-dimensional research and evaluation of the target project, fully demonstrating its feasibility of implementation. In addition, a dynamic monitoring system needs to be established. For key projects to be implemented, it is important to strengthen risk prevention and control awareness throughout the entire process, coordinate the supervision functions of multiple lines such as audit and finance, achieve full-process tracking of capital flow, and ensure that every project expenditure has complete compliance documentation.

Establishing an adaptive risk management mechanism is equally crucial for enterprise investment security. Taking risk transfer strategies as an example, enterprises can diversify risks through insurance coverage. For projects with higher risk levels, they can purchase corresponding commercial insurance products. In the event of unexpected circumstances during project operation, enterprises can transfer some losses to the insurance provider, thereby reducing their own risk exposure.

4.2. Standardize Foreign Investment Decisions and Optimize Strategic Objectives

Company M must thoroughly reverse the dangerous practice of using short-term debt to support long-term equity investments. For long-term equity investment projects, priority should be given to matching long-term loans, introducing strategic investors, or seeking support from policy-based green industry funds to reduce liquidity risk. For equity investment projects with a long payback period, it is necessary to actively expand long-term funding channels, such as applying for policy-based green transformation loans, introducing strategic investors, issuing project revenue bonds, or seeking support from special industrial funds for carbon neutrality [13].

4.3. Entering Into a Value-Insured Contract to Adapt to Policy and Market Changes

After the introduction of the dual carbon goals, coal price fluctuations have become more pronounced, which is detrimental to the healthy development of coal enterprises and severely affects their financial situation. Consequently, M Company has experienced persistently low net profits in recent years. According to the "Medium and Long-term Contract Signing and Performance Plan" issued by the National Development and Reform Commission in 2023,

enterprises are allowed to sign medium- and long-term contracts with pricing mechanisms for major customers. This not only maintains customer stability but also protects the interests of both customers and the enterprise itself, effectively addressing various risk impacts. Therefore, to cope with external risks brought about by market demand fluctuations and policy changes under the dual carbon goals, M Company should actively explore and promote long-term agreements and flexible price linkage mechanisms, stabilizing business expectations through the signing of structured guaranteed price contracts.

Specifically, M Company can proactively sign medium- and long-term coal supply agreements with major downstream customers such as power and steel companies, clarifying basic supply volumes and price fluctuation clauses. When formulating guaranteed price contracts, M Company needs to consider its own strength, assess various potential risks, strictly control product quality internally, ensure safe production, and enhance its competitiveness. Through such contractual arrangements, M Company can not only enhance revenue stability and alleviate capital chain pressure, but also make advance plans on the compliance front, effectively reducing the company's investment risks. This enables M Company to maintain high competitiveness under the policy impact of the dual carbon goals and promote the sustained and healthy development of the enterprise.

5. Conclusion and Prospect

5.1. Research Conclusion

This article takes Zhengzhou Coal and Electricity Co., Ltd. (M Company) as the research object, systematically analyzing the multidimensional investment risks it faces under the "dual carbon" goal background and their causes. The research finds that M Company's investment risks are concentrated in three aspects: first, the internal investment structure is severely imbalanced, making it difficult to adapt to the requirements of low-carbon transformation; second, there are strategic deviations in external investments, resulting in significant pressure on the capital chain; third, external environmental challenges are intensifying, and the continuous tightening of policies and structural contraction of market demand jointly squeeze its profit and financing space, further amplifying the uncertainty of investment returns.

Based on this, this paper proposes strategies such as optimizing the internal investment structure, standardizing foreign investment decisions, matching long-term funds, and promoting medium- and long-term guaranteed contracts to systematically enhance enterprises' risk prevention and control capabilities and sustainable operation abilities. This study provides theoretical references and practical paths for coal enterprises' investment decisions and risk management under the "dual carbon" goals.

5.2. Research Prospect

In the future, with the continuous deepening of the dual carbon goals and the accelerated transformation of the energy structure, coal enterprises must shift from passive response to active planning. On the one hand, enterprises should pay more attention to cultivating green technology and innovation capabilities, increase R&D investment in clean production, carbon capture and utilization, and other fields, and promote the upgrading of traditional businesses towards low-carbon and intelligent transformation. On the other hand, they need

to strengthen strategic determination, carry out orderly extensions around their main businesses, prudently promote cross-industry investment, and actively utilize green financial tools to alleviate financial pressure. At the government level, more targeted transformation support policies can also be considered to guide enterprises through a stable transition. Only through the dual drive of internal reform and external policy support can the coal industry achieve sustainable development in the energy revolution and contribute to the realization of China's dual carbon goals.

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