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Research on Financial Risk Identification and Prevention Countermeasures for Green Transformation of Resource-Intensive Enterprises

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Abstract: Against the backdrop of the in-depth advancement of the "Dual Carbon" strategic goals and ecological civilization construction, resource-intensive enterprises are confronted with an urgent demand for green transformation. From the perspective of accounting and financial management, this paper conducts a systematic study on the identification and prevention countermeasures of financial risks in the process of green transformation of resource-intensive enterprises. It is found that the financial risks of such enterprises in green transformation are mainly reflected in four aspects: insufficient capital supply and excessively high financing costs in the financing link; faulty investment decisions and lower-than-expected returns in the investment link; unbalanced cost control and tight cash flow in the operation and profit distribution link; as well as risks of adapting to policy adjustments and meeting environmental compliance standards in the policy compliance link. These risks arise from the combined effects of multiple factors, including the imbalance of internal financial management and control, the tightening of external environmental constraints, the inherent attribute restrictions of transformation, and the inadequacy of technical adaptation and internal control systems. In response to the above problems, this paper puts forward prevention countermeasures such as optimizing financing and investment management, strengthening the control of operation and profits, abiding by the bottom line of policy compliance, and constructing a comprehensive financial risk early warning system. The research shows that the financial risks of resource-intensive enterprises in green transformation are characterized by concealment, transmission and long-term nature, and it is necessary to build a systematic and full-process risk prevention and control system. This is to realize the coordinated development of ecological, economic and social benefits, and provide theoretical reference and practical guidance for enterprises to advance green transformation in a steady manner.

Keywords: Resource-Intensive Enterprises; Green Transformation; Financial Risk; Risk Identification; Prevention Countermeasures

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1.Introduction

With the comprehensive promotion of ecological civilization construction and the realization of the "Dual Carbon" strategic goals in China, high-energy-consuming resource-intensive enterprises such as those in the mining and metallurgical industries are facing unprecedented pressure of transformation. Green transformation is not merely a technological revolution, but also involves the restructuring of financial structure. When promoting energy conservation, emission reduction and environmental compliance, enterprises need to invest a large amount of capital and bear policy uncertainties and market fluctuations, which

give rise to various types of new financial risks. In financial activities, financial risk refers to the possibility that changes in the external environment lead to the deviation of actual returns from expected ones and even trigger operational crises. Under the background of green transformation, the sharp surge in environmental compliance costs, the long payback period of green investment and the non-standard accounting of carbon assets all pose potential risks to enterprises. From the perspective of accounting and financial management, this paper systematically sorts out the main types of financial risks faced by resource-intensive enterprises in the process of green transformation, deeply analyzes their causes and puts forward corresponding prevention countermeasures, so as to provide theoretical reference and practical guidance for relevant enterprises.

2.Connotation and Driving Forces of Green Transformation in Resource-Intensive Enterprises

2.1 Connotation of Green Transformation in Resource-Intensive Enterprises

Resource-intensive enterprises take the exploitation and processing of non-renewable resources such as coal and minerals as their core business, and they serve as an important pillar for resource supply in the national economy[1]. However, their traditional development model is featured by high energy consumption, high emissions and high pollution, with low resource utilization efficiency, which runs counter to the requirements of ecological civilization construction. Under the background of the Dual Carbon strategy, the green transformation of resource-intensive enterprises is not a simple increase in environmental protection investment or end-of-pipe pollution control, but a systematic reform covering all dimensions of enterprise development, with the core goal of achieving the coordinated unification of economic, ecological and social benefits[2]. Its connotation can be condensed into the three-dimensional coordinated transformation.

At the strategic level, enterprises abandon the traditional mindset of "development first, environmental protection later" and shift from a resource-dependent model to an eco-friendly one. They fully embed the concept of green development into long-term planning, corporate governance and business objectives, so as to realize the mutual development of enterprise operation and ecological protection. At the operational level, centering on clean production and circular economy, enterprises reduce resource consumption from the source of exploitation and cut pollutant emissions in the production process through green technological innovation, production process transformation and energy-saving equipment renewal, thus promoting the low-carbon and clean operation of the whole production process. At the value level, enterprises break the linear value chain of "resource-product-waste" and build a closed-loop network of "resource-product-renewable resource"[3]. They extend the green value of the industrial chain, cultivate new green business forms and economic growth drivers, and form a sustainable mode of value creation[4].

2.2 Driving Forces of Green Transformation in Resource-Intensive Enterprises

The green transformation of resource-based enterprises is the inevitable result of the combined effects of four factors: policy regulation, market demand, technological innovation, and internal enterprise needs. The interaction between external push factors and internal driving forces promotes the shift from passive transformation to proactive transformation. First, policy regulation through constraints and incentives serves as the core external driver. China has continuously improved environmental regulations, raised pollutant and energy consumption emission standards, and intensified environmental enforcement. Policies such as the "Dual Carbon" goals and capacity replacement mechanisms compel high-energy-consuming and high-polluting production capacities to exit the market. Simultaneously, supporting instruments including environmental protection taxes, green credit facilities, and additional deductions for research and development expenses create a "constraint plus incentive" policy system. This makes green transformation an inevitable choice for enterprises to avoid policy risks and capture policy benefits. Second, upgraded market demand and capital market orientation represent important external pull factors. Consumer demand for green products continues to rise, while downstream industries continuously improve green procurement standards. Highly polluting products with low standards gradually lose market competitiveness. Capital markets show increasing attention to corporate ESG performance, giving green enterprises significant advantages in financing costs and capital access. This pressures enterprises to optimize production and enhance the green attributes of their products. Third, green technology innovation provides core support[5]. China has achieved continuous breakthroughs in green mining, clean production, and resource recycling technologies, with increasing levels of industrial application. This effectively reduces the

technical thresholds and implementation costs of enterprise transformation. Combined with national special subsidies and science and technology policy support, these advancements stimulate enterprises' enthusiasm for technological innovation, providing solid technical guarantees for green transformation implementation. Fourth, internal enterprise development needs constitute the fundamental driving force. Resource-based enterprises face development bottlenecks including the depletion of non-renewable resources and rising extraction costs, making traditional development models unsustainable. Simultaneously, tightening ecological constraints increase environmental governance costs. Green transformation can effectively break through these development bottlenecks while improving enterprise brand image and cultivating core competitiveness. This makes green transformation an inherent choice for enterprises to overcome development difficulties and achieve high-quality sustainable development.

3.Identification of Financial Risks in Green Transformation of Resource-Based Enterprises

3.1 Financial Risks in Financing Activities

Financing activities represent the starting point of green transformation for resource-based enterprises and constitute the primary stage where financial risks tend to concentrate. The core risks focus on three aspects: capital supply, financing costs, and debt-servicing capacity. First, insufficient capital supply poses a significant risk. Green transformation involves comprehensive process upgrades requiring substantial and continuous capital investment. However, enterprises face severely limited internal capital accumulation due to declining profitability in traditional business segments and reduced returns from resource extraction. Additionally, green projects typically exhibit weak early-stage profitability and extended payback periods, reducing their attractiveness to market-oriented capital seeking short-term returns. Coupled with enterprises' limited familiarity with new green financing instruments such as green bonds and green funds, funding gaps may emerge, directly causing transformation stagnation. Second, elevated financing costs present another challenge. Some enterprises, failing to meet environmental qualification standards or maintaining low credit ratings, cannot access preferential policies such as low-interest green credit. They must resort to high-interest financing channels including private lending, while additional expenditures such as green certification, environmental assessments, and professional consulting services further increase financial burdens on both daily operations and transformation efforts. Third, inadequate debt-servicing capacity creates substantial risk. Some enterprises, eager to advance transformation, indiscriminately expand debt scales, leading to significantly elevated debt-to-asset ratios. Since green project benefits materialize with lag and cannot generate stable cash flows in the short term to adequately cover principal and interest payments, this may trigger debt defaults, cash flow chain disruptions, and other cascading financial problems.

3.2 Financial Risks in Investment Activities

Investment activities form the core of green transformation, directly determining transformation effectiveness and capital utilization efficiency. Financial risks primarily stem from three aspects: investment decisions, return expectations, and asset impairment. First, investment decision-making errors pose considerable risks. Some enterprises lack multi-dimensional evaluation mechanisms integrating finance, environmental protection, technology, and market perspectives. They blindly follow trends when investing in green projects without assessing project feasibility, compliance, and technical compatibility against their own capital strength and technological reserves. This leads to project implementation obstacles, construction delays, and unrecoverable upfront investments in capital and labor costs. Second, investment returns falling short of expectations represent a common risk. Green projects generally feature long investment cycles, substantial initial capital requirements, and slow benefit realization. Affected by multiple factors including market supply-demand fluctuations, rapid green technology iterations, and industrial policy adjustments, actual operating returns often fall significantly below preliminary projections. Sustained losses continuously exacerbate enterprise capital constraints, restricting subsequent transformation investments. Third, asset impairment risk emerges during transformation. Traditional production equipment eliminated during transformation lacks market demand due to technological obsolescence and environmental non-compliance, making liquidation difficult and generating disposal losses. Meanwhile, newly acquired green equipment and technologies may become outdated quickly due to rapid industry technological updates. These dual factors combine to substantially

increase enterprise asset impairment losses, directly eroding net assets and reducing asset quality.

3.3 Financial Risks in Operations and Profit Distribution

Operations and profit distribution activities span the entire green transformation process. Financial risks in these two areas are interconnected and mutually transmitting, seriously constraining the sustainability of green transformation. Operational risks concentrate on green costs, cash flows, and supply chain coordination. First, loss of control over green cost management presents a key risk. Some enterprises have not established comprehensive green cost accounting and control systems. Related investments including environmental facility maintenance and green raw material procurement remain outside full control scope. Combined with insufficient production technology optimization and low resource utilization efficiency, this leads to continuously escalating green costs, progressively compressing overall enterprise profit margins. Second, cash flow circulation difficulties emerge as a critical concern. Transformation requires continuous capital injection to support equipment upgrades and production operations. However, green product markets remain immature with limited consumer acceptance, exhibiting significant sales and price volatility. Combined with slow accounts receivable collection and green raw material inventory accumulation, enterprise cash inflows become insufficient to meet outflows, making it difficult to support daily operations and transformation progress. Regarding profit distribution, the core risks involve earnings instability and unreasonable distribution policies. During the transition period, traditional business revenues decline due to production capacity adjustments, while new green businesses have not yet achieved scale profitability. This results in significant overall earnings volatility and poor cash flow stability. Some enterprises maintain rigid distribution policies without dynamic adjustments based on transformation needs. Excessive dividends deplete capital reserves, while excessive retained earnings reduce capital utilization efficiency. Both scenarios intensify capital constraints and adversely affect transformation progress.

3.4 Financial Risks in Policy Compliance

Policy compliance represents an important prerequisite for green transformation of resource-based enterprises. Financial risks in this area stem from inadequate policy adaptation and insufficient environmental control. Once triggered, these risks can easily cause systemic financial losses. First, policy adjustment adaptation risk deserves attention. Under the advancing “Dual Carbon” strategy, national and local environmental, fiscal, and industrial policies continue to be optimized and refined, with various environmental standards and energy consumption limits consistently rising and policy change frequency significantly increasing. If enterprises fail to establish routine policy analysis and response mechanisms, responding sluggishly to policy changes with untimely adjustments, transformation projects may fail to meet new regulatory requirements. This results in inability to obtain project approvals and policy subsidies, unrecoverable upfront transformation capital, and increased tax burdens and financing costs due to policy changes. Second, environmental compliance failure risk has become increasingly prominent. Currently, domestic environmental enforcement intensity continues to strengthen with increasingly strict enforcement standards. Enterprises with inadequate environmental facility allocation or pollution control technologies failing to meet requirements face administrative penalties including substantial fines, mandatory rectification within specified periods, or even production suspension and business closure, directly increasing compliance costs. Simultaneously, environmental violations are recorded in enterprise credit files, leading to downgraded credit ratings. This triggers difficulties in obtaining financing, contract terminations by partners, and ultimately cascading financial risks including profit declines and cash flow tensions.

4.Analysis of Causes of Financial Risks in Green Transformation of Resource-Based Enterprises

Various financial risks emerging during the green transformation of resource-based enterprises do not result from a single factor. Instead, they represent the product of multiple factors intertwining and working synergistically, including internal financial control deficiencies, external policy and market constraints, inherent transformation attribute constraints, and insufficient technical adaptation. From an accounting perspective and considering the inherent industry characteristics of resource-based enterprises—namely “high investment, high energy consumption, high pollution, and low value-added”—this paper systematically analyzes the formation causes of financial risks from four core dimensions. The objective is to provide solid theoretical support and practical basis for developing targeted mitigation strategies in subsequent sections, closely

aligning with the actual operational difficulties and financial pain points encountered during green transformation of resource-based enterprises.

4.1 Imbalanced Internal Financial Control: Deficiencies in Financing, Investment, and Operational Management

An imperfect internal financial control system and inadequate control mechanisms represent the core internal causes triggering financial risks in green transformation of resource-based enterprises. This issue primarily concentrates on two core aspects: lack of standardization in financing and investment management, and insufficient refinement in operational control. Regarding financing, enterprises face difficulties in quickly resolving the long-standing problem of single financing channels. They excessively rely on traditional bank credit while demonstrating significant deficiencies in understanding and utilizing new green financing instruments such as green bonds, green funds, and green trusts. Capital structure planning lacks scientific rigor and forward-looking perspective. Indiscriminate expansion of debt scales directly leads to continuously elevated debt-to-asset ratios and surging debt-servicing pressures, subsequently triggering series of financing risks. This situation cannot effectively support the continuous advancement of green transformation and is unfavorable for stable supply and reasonable allocation of transformation capital. Regarding investment, enterprises generally lack multi-dimensional project feasibility evaluation mechanisms integrating "finance, environmental protection, technology, and market" perspectives. They are easily influenced by industry trends to blindly follow investment patterns in green projects. Without accurately assessing core financial indicators and technical or environmental compatibility based on their own capital strength and technological capabilities, investment failures are highly likely. This not only fails to ensure investment returns from green projects but also directly affects smooth project advancement, causing ineffective capital consumption. Regarding operations, dedicated green cost accounting systems remain incomplete. Related investments including environmental facility maintenance and green raw material procurement have not been fully incorporated into enterprise control scope. Additionally, refined management of accounts receivable and inventory exhibits significant lag, with slow capital recovery and prominent inventory accumulation problems. Low cash flow turnover efficiency and overlapping operational issues further exacerbate enterprise operational financial risks.

4.2 Tightening External Environmental Constraints: Increased Policy and Market Uncertainty

The production and operations of resource-based enterprises highly depend on resource endowments and external development environments. Their green transformation processes are even more directly influenced by external conditions. Dual uncertainties at the policy level and market level represent important external causes triggering financial risks during enterprise transformation. Regarding policy, under the advancing "Dual Carbon" strategic objectives, national and local governments continuously raise environmental access thresholds. Green industry-related policies and fiscal incentive policies remain in a dynamic process of continuous optimization and upgrading, while environmental enforcement intensity and precision constantly increase. Some enterprises, lacking policy analysis capabilities, fail to adapt to policy changes in a timely manner, directly facing substantial losses from environmental fines and production suspensions for rectification. Meanwhile, adjustments in policies such as green credit and tax preferences cause established transformation plans and financial plans to become difficult to align precisely. This directly disrupts enterprise transformation progress and capital arrangements, substantially increasing the difficulty of financial decision-making and the probability of decision-making errors. Regarding markets, domestic green product markets currently remain immature. Market recognition and consumer acceptance of green products still require further improvement. Green transformation products launched by some enterprises generally face market dilemmas including poor sales and significant price fluctuations. Simultaneously, continuously rising green raw material prices and high green technical service fees further increase enterprise operational costs. Intensified homogeneous competition in green transformation within the industry leads some enterprises to blindly increase investments to capture market share, ultimately further exacerbating enterprise capital shortage problems and forming a closed loop of market-level financial risks.

4.3 Inherent Constraints of Transformation: Imbalance Between Capital Demand and Return Cycles

Green transformation of resource-based enterprises is not simply equipment updates or process modifications. The inherent

attributes of transformation itself determine that financial risks during the transformation process exhibit significant characteristics of long-term duration and contagion. The core constraining factor lies in the severe imbalance between rigid capital demand and investment return cycles. Green transformation involves multiple critical stages including environmental facility upgrades, green core technology research and development, clean energy substitution, and full-link production process optimization. Each stage requires substantial and continuous capital investment with considerable difficulty and uncertainty in capital recovery. However, most resource-based enterprises, affected by continuously declining profitability in traditional resource extraction business, face severely insufficient internal capital accumulation. They cannot independently support transformation capital requirements and must rely excessively on external financing. This situation further increases enterprise capital pressures, directly triggering financing risks and cash flow tension risks, seriously hindering the continuous and steady advancement of enterprise green transformation. Green projects generally feature long investment return cycles, typically requiring 3-5 years or even longer to achieve stable profitability. This creates severe mismatches with short-term repayment pressures from enterprise external financing. Enterprises cannot form stable debt-servicing cash flows in the short term, further exacerbating problems of excessive financial leverage and potential risks of cash flow chain disruptions. Additionally, some enterprises fail to make adequate capacity coordination planning during transformation. Poor coordination between eliminating traditional high-energy-consuming production capacity and cultivating green low-carbon production capacity creates capacity gap periods, easily triggering dual risks of enterprise asset impairment and profit declines.

4.4 Insufficient Technical Adaptation and Absent Internal Control Systems: Weak Risk Prevention Capabilities

Inadequate green technology adaptability and the absence of enterprise internal risk prevention systems interact to further amplify financial risks in green transformation of resource-based enterprises. These two issues also represent important drivers causing financial risks to transmit and spread within enterprises. Regarding technology, green transformation of resource-based enterprises highly depends on advanced green mining, clean production technologies, and environmental governance equipment. However, overall green technology development in China currently remains immature. Certain core technologies and high-end equipment still rely on imports, with persistently high costs for technology introduction and equipment procurement. Simultaneously, enterprises generally lack professional green technology research and application talent internally, with insufficient technology conversion and implementation capabilities. Introduced advanced technologies cannot effectively adapt to their own production processes and equipment systems, resulting in low technology application efficiency. This not only makes it difficult to achieve basic environmental compliance emission targets, but the rapid iteration speed of green technologies also easily triggers related asset impairment. Enterprises may consequently face dual risks of environmental compliance losses and production interruptions. Regarding internal controls, most resource-based enterprises have not yet established risk prevention mechanisms specifically targeting green transformation. They lack scientific risk early-warning systems and end-to-end risk control processes. Identification, assessment, and control of various financial risks during transformation exhibit significant lag. Additionally, financial personnel lack sufficient green finance professional competence, making it difficult to accurately identify and respond to various new types of green financial risks. This directly affects the effective implementation of risk prevention work, ultimately causing various risks to continuously accumulate and transmit within enterprises, eventually triggering systemic financial risks.

5.Mitigation Strategies for Financial Risks in Green Transformation of Resource-Based Enterprises

Green transformation represents an inevitable choice for resource-based enterprises to respond to the “Dual Carbon” goals and achieve sustainable development. However, the transformation process involves substantial capital investment, technological iteration, and production capacity adjustment. Financial risks permeate the entire process spanning financing, investment, operations, and profit distribution, exhibiting characteristics of concealment, contagion, and long-term duration. Considering the traditional attributes of resource-based enterprises—namely “high investment, high energy consumption, high pollution, and low value-added”—along with the particularities of transformation, this section constructs a systematic and actionable financial risk mitigation framework based on the risk identification results. This framework aims to assist

enterprises in advancing green transformation smoothly while achieving coordinated development of ecological, economic, and social benefits.

5.1 Optimizing Financing and Investment Management to Address Capital and Return Risks

To address primary financial risks including capital shortages, single financing channels, and uncertain investment returns, enterprises must coordinate and optimize financing and investment management to achieve stable capital supply and controllable investment returns. Regarding financing, enterprises should construct a diversified green financing system driven by both "policy and market" mechanisms. They should proactively align with national and local policy support including green credit, green bonds, and fiscal interest subsidies, prioritizing applications for transformation projects such as environmental facility upgrades to access preferential policies and reduce financing costs. Simultaneously, enterprises should explore market-oriented financing potential by issuing green corporate bonds, attracting green fund investments, and exploring new financing methods such as equity financing and financial leasing. This approach optimizes capital structure while strictly controlling debt-to-asset ratios to avoid leverage risks. Regarding investment, enterprises should establish multi-dimensional feasibility evaluation mechanisms integrating "finance, environmental protection, technology, and market" perspectives. They must rigorously screen transformation projects and assess core indicators, optimize investment structures to diversify risks, and strengthen end-to-end investment monitoring with post-investment performance evaluations. These measures ensure efficient capital utilization and achieve expected investment returns.

5.2 Strengthening Operational and Profit Control to Consolidate Cash Flow and Profitability Foundations

Excessive green costs in operations, unstable cash flows, and unreasonable profit distribution represent financial risks that cannot be overlooked during transformation. Enterprises must implement refined control measures to consolidate their financial foundations. Regarding operational control, enterprises should comprehensively incorporate green costs into their cost accounting systems, focusing on controlling costs related to environmental facility depreciation, environmental consumables, and green technology research and development. By optimizing production processes, promoting energy-saving and consumption-reducing technologies, and improving environmental facility utilization rates, enterprises can reduce green costs per unit of product. They should establish comprehensive cash flow management systems throughout the entire cycle, preparing precise cash flow budgets, strengthening accounts receivable management, optimizing credit policies to accelerate capital recovery, and reasonably controlling inventory scales to reduce capital occupation. Establishing cash flow early-warning mechanisms enables real-time monitoring and disposal of abnormalities, ensuring cash flow balance. Regarding profit distribution, enterprises should formulate differentiated profit distribution policies based on capital requirements and profitability levels at different stages of green transformation. This approach balances capital reserves with shareholder returns, linking profit distribution to green transformation performance and employee performance to motivate all stakeholders, achieving equilibrium between short-term interests and long-term development.

5.3 Strictly Adhering to Policy Compliance Bottom Lines to Avoid Policy-Oriented Risks

Green transformation of resource-based enterprises is profoundly influenced by environmental, fiscal, and industrial policies. Policy changes can trigger financial risks including environmental fines, production capacity adjustments, and tax burden variations, necessitating strengthened policy analysis and compliance management. On one hand, enterprises should establish routine policy analysis mechanisms by forming dedicated working groups to track policy changes in real-time. They must thoroughly analyze policy impacts on enterprise financial conditions and transformation pathways, anticipate trends, and adjust transformation and financial plans in advance. This enables precise alignment with policy support while reducing financial losses. On the other hand, enterprises must strictly adhere to policy compliance bottom lines by complying with all policies and regulations. They should increase environmental investments, improve environmental facility construction, and ensure production operations fully meet environmental standards with timely hazard rectification. Actively pursuing green tax preference policies can reduce tax burdens. Enterprises should standardize operational behaviors, prohibit non-compliant expansion, and strengthen communication with relevant departments to ensure compliant and orderly transformation throughout the entire process.

5.4 Constructing Comprehensive Risk Early-Warning Systems to Enhance Proactive Prevention Capabilities

Given the concealment and contagion characteristics of financial risks in green transformation, relying solely on post-event disposal cannot effectively prevent risks. Enterprises must construct comprehensive, multi-level financial risk early-warning systems to enhance proactive prevention capabilities. They should build dual early-warning indicator systems incorporating both "financial and non-financial indicators." Financial indicators should cover core metrics including debt-to-asset ratios, current ratios, cash flow gap rates, and investment return rates, with clear warning thresholds established for each indicator. Non-financial indicators should include environmental compliance rates and green technology maturity levels, compensating for limitations of financial indicators. Reasonable weight allocation among indicators and construction of scoring models enable precise risk assessment. Enterprises should improve end-to-end risk early-warning mechanisms by establishing intelligent monitoring systems based on financial information platforms. These systems should collect data in real-time, alert abnormalities, conduct regular risk assessments, issue warning signals, and develop targeted emergency response plans with clear procedures and responsibilities. This achieves comprehensive coverage throughout the entire risk management process.

6.Conclusion

Amid the advancing "Dual Carbon" strategy and deepening ecological civilization construction, green transformation has become an inevitable choice for resource-based enterprises to break through development bottlenecks and achieve sustainable development. However, various financial risks emerging during the transformation process have become key factors constraining transformation effectiveness. This study focuses on resource-based enterprises and, from the perspective of accounting and financial management, systematically examines four core financial risks in their green transformation: insufficient capital supply and elevated financing costs in financing activities; decision-making errors and suboptimal investment returns in investment activities; imbalanced cost control and cash flow constraints in operations and profit distribution; and policy adjustment adaptation and environmental compliance risks in policy compliance. Furthermore, this paper thoroughly analyzes four underlying causes of these risks: imbalanced internal financial control, tightening external environmental constraints, inherent constraints of transformation itself, and insufficient technical adaptation coupled with absent internal control systems. Corresponding mitigation strategies are proposed, including optimizing financing and investment management, strengthening operational and profit control, strictly adhering to policy compliance bottom lines, and constructing comprehensive risk early-warning systems.

The research indicates that financial risks in green transformation of resource-based enterprises result from the combined effects of multiple internal and external factors, exhibiting characteristics of concealment, contagion, and long-term duration. Therefore, constructing a systematic, end-to-end risk prevention and control system is essential. The research conclusions not only provide actionable practical guidance for resource-based enterprises to avoid financial risks and advance transformation smoothly but also enrich research outcomes in the fields of green finance and enterprise transformation. Future research could further incorporate industry-specific characteristics of different resource-based enterprises to develop more targeted risk identification models and prevention mechanisms. This would provide stronger theoretical and decision-making support for high-quality green transformation of enterprises under the "Dual Carbon" goals.

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