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A Literature Review on the Drivers of Corporate Carbon Performance Based on the Goal of Dual Carbon

Yunxin Feng*

Anxi College of Tea Science (College of Digital Economy), Fujian Agriculture and Forestry University, Quanzhou, 362400, Fujian, China

**Corresponding author: Yunxin Feng.*

Abstract

According to the Dual Carbon objectives, corporate carbon performance plays an important role in the low-carbon transition of China. The available reviews are largely reliant on literature published between 2010 and 2020 and do not offer enough information on the logic of the drivers in the new era; most of them just split the internal and external factors in general. This paper will choose core journals in both Chinese and English literature published between 2020 and 2026 and develop a three-dimensional analytical structure using external institutional policies, market stakeholders, and internal governance strategies using Chinese and foreign core literature in the same period. Carbon performance is defined as having two types, i.e., outcome-oriented and process - outcome integrated, and measurement criteria have not been made uniform. Internal digitalization, green innovation, and changes in managerial cognition may be the only methods of enhancing carbon performance due to external regulation and stakeholder pressure. The impact of different drivers is limited by the characteristics of the firm and the regional heterogeneity. The existing studies have such drawbacks as non-uniform measurement criteria and clusters of studies focused on listed companies. Based on these findings, the present paper suggests research opportunities that could be used as reference points for corporate decarbonization and policy enhancement.

Keywords

"Dual Carbon" goals, corporate carbon performance, driving factors, environmental regulation

1. Introduction

To solve the underlying problems of contemporary global climate change and create a green, low-carbon, and environmentally friendly sustainable development model, numerous countries and regions all over the world have adopted carbon-neutralization projects [1]. In light of the further implementation of the Dual Carbon objectives, enterprises, which are the major contributors to carbon emissions, have carbon performance rates that will directly influence the effectiveness of low-carbon transition in China. The different drivers of corporate carbon performance have been defined clearly to practice great significance in directing enterprises to actively reduce emissions and enhancing the low-carbon policy system. The current available literature on the topic has kept extending, however, the conceptual understanding of carbon performance is varied, the measuring criteria have not been standardized, and the limits and causalities of various drivers are disputed. Earlier works have investigated the drivers of carbon performance, but these were conducted using literature

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published between 2010 and 2020. Time was still young then, and thus China had not yet fully developed its top-level design of the Dual Carbon goal, and the new situations involving the carbon market, ESG disclosure, and cross-border carbon trade rules were yet to be felt on a massive scale. The logic that drives the corporate carbon performance is not synthesized enough due to recent new policies, technologies, and market environments. Earlier review articles have tended to divide drivers into internal and external drivers, with little unity to the research.

Since 2020, digital technologies have evolved fast, green financial instruments have continued to be developed, and the internal and external conditions of decarbonization that the company is exposed to have greatly altered; the usefulness of past research findings should be reconsidered. In such a way, this paper will focus on the Chinese and English core journal articles published from 2020 to 2026 as the subject of analysis, the conceptual meanings and measurement and assessment systems of corporate carbon performance, go beyond the conventional internal-external dichotomy approach, develop a three-dimensional integrative analytical model that includes external institutional policies, market stakeholders and internal governance strategies, summarize systematically the various drivers of corporate carbon performance in the new era, determine the mechanisms and heterogeneity limits of different factors, analyze the existing research gaps in this area, and suggest future research directions, which will contribute towards the development of the domestic literature review studies in the area of carbon performance and offer useful guidelines to the practice of corporate low carbon initiatives, policy formulation, and further academic empirical studies.

2. Search Methods and Scope

2.1 Search

The present paper uses the CNKI database as the main literature resource and Web of Science as a supplementary tool. It has been decided to use Boolean logic in order to build the following search query: (carbon performance OR carbon emission performance OR carbon efficiency OR carbon productivity) AND (driving factors OR influencing factors OR motivations OR antecedents OR drivers).

2.2 Screening

In order to provide good literature quality, clear inclusion and exclusion criteria for literature are developed in this paper, as presented in Table 1.

Table 1: Literature inclusion and exclusion criteria

Criterion type	Inclusion	Exclusion
Time window	January 2020–August 2026	Literature predating the theoretical or institutional starting year
Literature type	Peer-reviewed journal articles	Newspaper articles, conference papers, and unpublished working papers
Quality threshold	CSSCI/PKU Core or SSCI-indexed journals	Journals of unknown origin or with unverifiable quality
Topic relevance	Addresses both topic terms: carbon performance and driving factors	Literature addressing only one of the two

2.3 Inclusion

Based on the screening criteria given above, this research has done its literature screening in a stepwise manner as per the PRISMA process. The entire screening process is depicted in Figure 1.

3. Conceptual Definition and Measurement System of Corporate Carbon Performance

3.1 Conceptual Definition of Carbon Performance

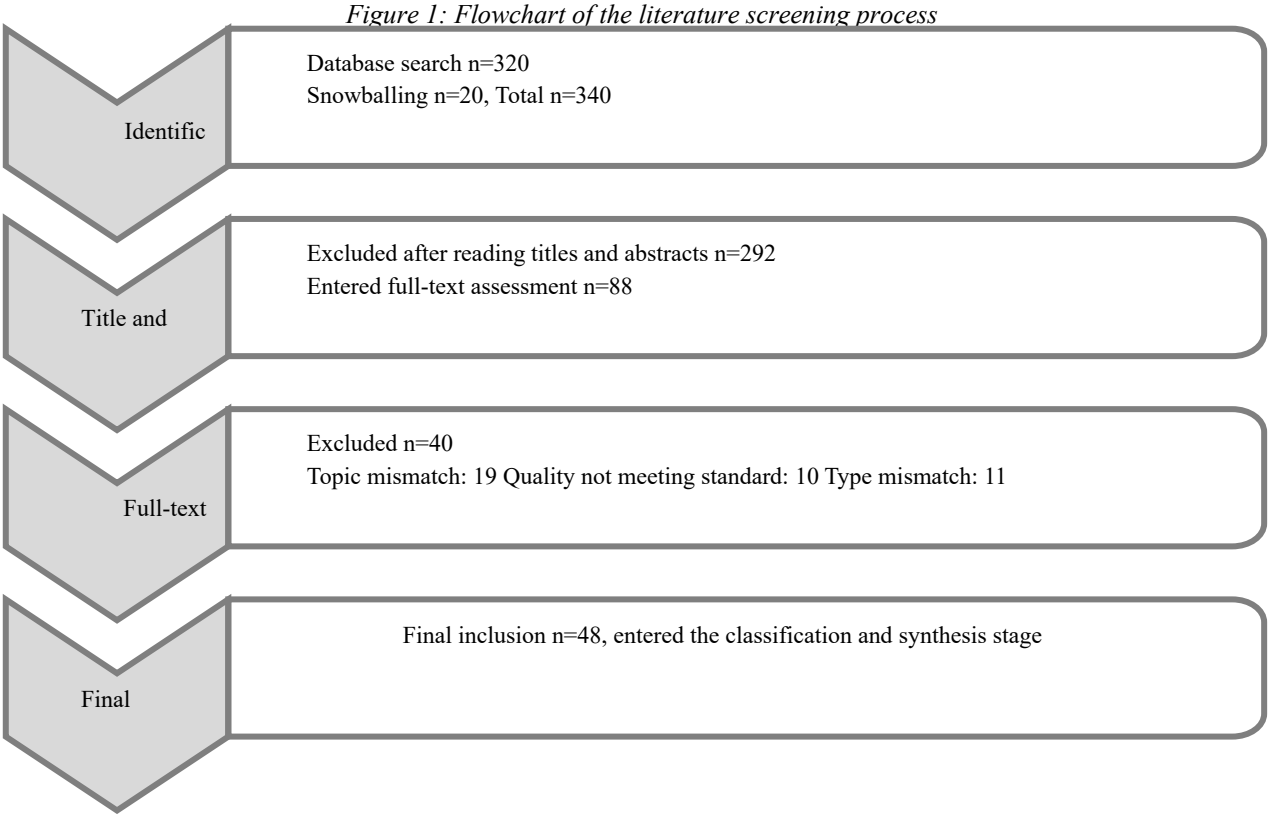
3.1.1 Concept of Carbon Performance

The emergence of carbon performance as an academic idea is highly associated with the agenda of global climate governance. In earlier works by foreign researchers, there was a suggestion that, based on the

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etymology approach, carbon performance can be defined as the materialization and concentration of corporate environmental performance in the carbon emission aspect [2]. Carbon performance was initially seen as one of the environmental performance components. The development of the discourse system of the "low-carbon economy" and the development of carbon emission accounting technologies made carbon performance receive its independent academic status over time. Before discussing corporate carbon performance, a fundamental question should be addressed: what is measured? Does it concern the growth or the reduction in emission numbers or the quality of management capacity? Various answers to such questions have led to the emergence of two conceptual definition directions.

Figure 1: Flowchart of the literature screening process



The initial orientation may be referred to as an outcome-oriented perspective that relies on carbon emission intensity as a key dependent variable to study corporate carbon performance. The method explicitly compares carbon performance to the outcome-oriented expression of carbon emissions, including the overall carbon emission and carbon productivity. It has the merits of well-defined limits, accessibility of data, and the possibility of making comparisons across firms and over time [3]. Empirical researchers opt to eventually adopt it since it is simple to use, measurable, reproducible, and testable. Likewise, there are other researchers who have used this measurement procedure in research about green factory pilots [4].

The other orientation can be referred to as the process-outcome integration view, which suggests that carbon performance should be viewed as a multi-dimensional construct that encompasses all aspects of carbon management. The proponents of this perspective claim that concentrating on emission outcomes only leaves out at least two things. Firstly, industry characteristics are not within the control of firms; there are some industries that are naturally carbon-intensive, and it is not fair to compare figures. Secondly, carbon management has a lag effect: investments made in the present have to take two or three years to pay off, and an over-reliance on current-period outcomes might not represent the actual performance of corporate carbon management [5]. Thus, they suggest including process-based factors like carbon management system development, implementation of emission reduction technologies, quality of information disclosure, and strategic planning in the evaluation.

The two orientations are both valuable, but current research developments demonstrate that the process-outcome integration perspective is becoming more popular. Particularly in the context of the Chinese Dual Carbon target policies, the conceptual boundary of corporate carbon performance is growing not only in

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quantitative term of how many carbon reductions were made but also in terms of how carbon is reduced and how carbon emission information is communicated externally. It is an indication of further development of academic understanding of the phenomenon of carbon performance and consolidation of its academic position.

3.2 Measurement and Evaluation of Carbon Performance

In terms of measurement methods, existing research generally follows three paths.

The single-indicator approach is the easiest and most straightforward; it involves taking into account total carbon emissions, carbon intensity of emissions, or carbon productivity as proxy indicators. The information is clear and easy to compare, however, there is only an opportunity to see the "outcome" but not the "process". The initial foreign researchers expressed the amount of carbon performance by the ratio of total sales less sales returns and allowances to total carbon dioxide emissions [6]. Other scholars utilized the percentage of total company greenhouse gas emissions over total sales, which is carbon emission intensity, to assess company carbon performance [7]. The composite indicator system is a way to address this weakness through the application of the PSR (Pressure-State-Response) or DPSIR (Driving forces-Pressure-State-Impact-Response) framework to develop a multidimensional evaluation system, bundling emission volume, management capabilities, and quality of disclosure into an overall score. It covers more area, but there has always been difficulty with the subjective aspect of indicator weighting. The efficiency evaluation approach sees carbon performance as some form of relative efficiency and measures it using Data Envelopment Analysis (DEA) and its derivatives (including the slack-based measure [SBM] model and the super-efficiency SBM model) [8]. Its benefits include high flexibility in the context of many inputs and outputs and no requirement to pre-specify a function.

However, it is important to note that inconsistent measurement standards cause a problem with the comparability of conclusions. With the same driving factor, the resulting directions can be entirely different when using various measures [9]. It also prompts further researchers to consider the idea of using several measurement indicators during cross-validation in the context of robustness testing and systematically examining the applicability conditions and limits of various measurement indicators.

4. Drivers of Corporate Carbon Performance

According to the available literature, this paper divides the factors that motivate corporate carbon performance into three categories, namely, external institutional and policy drivers, market and stakeholder drivers, and internal corporate governance and strategic drivers. The three dimensions can be characterized by a progressive thinking of institution-market-organization and can also be seen as an evolutionary process of this sphere within the last few years, moving towards both external attribution and integration of internal and external factors.

4.1 External Institutional and Policy Drivers

The external institutional environment is the main trigger to improve corporate carbon performance. According to the policy structure of the "Dual Carbon" aims, China's governments have developed a fairly well-developed environmental regulatory system. Theoretically, environmental regulation instruments can be classified into two large categories based on their methods of operation, which are command-and-control environmental regulation and market-based environmental regulation. Researchers have looked at the consequences and limits of such institutions in relation to the corporate carbon performance in various perspectives.

4.1.1 Command-and-Control Environmental Regulation

Command-and-control environmental regulation is a form of mandatory restriction applied by the government to corporate carbon emissions behavior by way of laws, regulations, administrative orders, emission standards, etc., where violation of these restrictions would lead to either public condemnation or legal penalties. Command-and-control regulation had the dominant position as an external driver of carbon performance during the initial phases of research.

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Regulation in the form of command and control is the most straightforward and inflexible type of regulation, and this rigidity does not necessarily imply that more stringent measures are always the right ones. Available studies report a so-called inverted U-shaped relationship between command-and-control environmental regulation and corporate carbon performance: when there is a moderate level of command-and-control regulation, enterprises will be forced to lower emissions, but as the level of intensity rises beyond a certain point, the costs of compliance become too high, and the investment in reducing corporate emissions declines, and carbon performance deteriorates [10]. Policy implication is that regulation has a degree; at some level, marginal costs exceed marginal benefits.

The academic emphasis has slowly moved over the last several years towards the regulation tools in contrast to the regulation intensity. Recent policy instruments, including green factory pilots, green supply chain pilots, and government green procurement, have sequentially been brought into the sphere of research. Despite the fact that all of them belong to the category of command-and-control regulation, the way they operate and their impact are significantly different.

The pilot program of the green factory was initiated by the Ministry of Industry and Information Technology in 2016. It encourages manufacturing companies to shift to intensive use of land, safe raw materials, clean production, and resource-based waste utilization through the combination of standard guidance and benchmark demonstration, as well as low-carbon energy. This strategy has really helped in enhancing the carbon performance of manufacturing enterprises. The mechanisms are green innovation capability and total factor productivity, which cannot be dispensed with. The results are especially noticeable in the eastern regions, non-state-owned enterprises, and small enterprises [4].

The pilot green supply chain logic is slightly different. It uses the core enterprise-based driving impact of chains to pass down the emission-reduction pressure upstream in the supply chain. This policy may also enhance the carbon performance of pilot companies by means of green innovation, efficiency improvement, and environmental information disclosure. Nevertheless, the study has established that the primary beneficiaries of this policy were already mature and technology-intensive firms, whereas the carbon emissions of growing and labor-intensive firms increased. This shows that the carbon performance effect of the policy is not universal; the corporate life cycle and factor intensity are some contextual factors [11].

The green procurement of the government takes on a different route, which involves the use of government purchasing power as a lever to instill environmental access limits and green requirements in the whole procurement process. The policy has the potential to substantially enhance corporate carbon performance, and its mechanisms include three connections: concept shaping, source prevention and control, and end-of-pipe treatment. Nevertheless, literature indicates that when the managerial decision-making ability is high, it leads to increased environmental subsidies, and increased external regulation pressure, it becomes more likely to see the policy effects; on the other hand, if there is managerial myopia or financing conditions, it weakens these effects [12].

Considering all three of these categories of tools together, as the green factory on the level of an individual enterprise, chain-based transmission within the supply chain, and market forcing via public procurement, even though they have different areas of application, a certain tendency can be observed: the environmental regulation of the command-and-control type is moving beyond simply compulsory restrictions into some more sophisticated and specific instructions.

4.1.2 Market-Based Environmental Regulation

Market-based environmental regulation, unlike command-and-control regulation, uses price signals and economic incentives to direct enterprises to autonomous emission reduction. As most of the research that takes carbon trading policy as an example claims, this institution has the potential to enhance the performance of corporate carbon, although the effectiveness of policies is limited by extraneous factors, including market liquidity, allowance allocation procedures, and the level of local environmental enforcement. The impact is stronger with auction caps, in highly polluting industries, and in areas with high enforcement [13]. Meanwhile, there is also evidence that carbon trading is not very influential and thus does not create clear industry and spatial spillovers, and it is challenging to encourage unregulated market entities to decrease emissions simultaneously.

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Other studies, with a long-term dynamic approach, suggest that the market-based regulation and carbon performance relationship is not a straightforward positive linear one but shows U-shaped behaviour: at the beginning of the policy process, investment in emission-reducing facilities and adjustment of institutions results in the short-term inhibition of carbon performance. It is only with the accumulation of low-carbon technologies and carbon management experience that the incentive effect begins to occur slowly [10].

This suggests that the possibility of market-based regulation attaining best outcomes is not only dependent on policy design but also largely on the length of observation and the environment that supports it. It is still a line of investigation that deserves investigation in the current body of work about how to alleviate the transitional challenges of enterprise transformation and increase the spillover impact of policies.

4.2 Market and Stakeholder Drivers

Whereas institutions and policies can be viewed as driving forces that operate top-down, markets and stakeholders may be seen as bottom-up driving forces. The emergence of environmental consciousness among people, the boom of green consumerism, and the enhancement of green standards in the world's supply chains have led to a growing scholarly interest in the drivers of this dimension. Businesses are accountable to stakeholders other than shareholders (government, creditors, customers, and the general population) in regards to their environmental responsibility, and carbon performance is the most significant example of how such responsibility is implemented.

4.2.1 Public Environmental Attention

The issue of public environmental awareness is one that has only gained traction among carbon performance scholars in recent years. It can be regarded as a form of soft pressure which does not have any legal weight, however its penetration into the corporate decision-making environment occurs via such avenues as the opinion of the people, consumption behavior, and social control. The given attention pushes companies to enhance their carbon performance along two ways: firstly, compelling them to introduce green technologies; secondly, imposing indirect impacts on them by changing the regional energy consumption pattern. Enterprises are more likely to react to external expectations by investing in technology to improve reputation in areas where the level of public environmental awareness is higher; at the same time, regional energy consumption preferences are also gradually changing because of popular tastes, which consequently impacts the carbon emission performance of micro-level enterprises [14].

The heterogeneity analysis indicates that the positive impact of public attention is significantly larger in companies with more extensive environmental regulation, in low-carbon pilot cities, and in companies with worse social responsibility. To put it differently, there exists some kind of synergy between public pressure and formal institutions: institutions offer transmission conduits to public oversight, whereas public pressure helps fill the gaps that institutions do not. It is also natural that in the case of enterprises that are less self-disciplined, the outside influence of public opinion is greater, and the coercive effect will be greater accordingly.

4.2.2 Stakeholder Pressure

The stakeholder analysis framework has a systematic advantage over single-dimensional research perspectives and is much more important in comparison. The structure includes such aspects as the government, shareholders, creditors, consumers, communities, and competitors. Disclosure of carbon performance by enterprises to consumers can have an impact on consumer purchase intentions [15]. External pressure on enterprises, which are the competitors, influences the level of corporate carbon performance via internal drivers, and thus the competitive effect on corporate ecological innovation occurs [16], etc. This leads to an even more challenging question: in case these pressures of different directions and different intensities work together on enterprises, who is it precisely that steers carbon performance?

According to the literature, the answer to this question is slowly emerging. An investigation using the WSR (Wuli-Shili-Renli) system approach proves that the combined action of various stakeholders does have a strong potential to enhance the carbon performance of a corporation, and government control, shareholders, credit restrictions, and customer interest have positive facilitator roles in various ways [8]. Nevertheless, to be honest, the worth of such work is more in the discovery of the way the impact is made than in the confirmation of its presence or absence. It disrupts the simplistic cognition of the past that external pressure will automatically

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cause performance and verifies the fact that the result of stakeholder governance requires internal cognitive restructuring of strategies and reallocation of resources before it can finally be achieved. To put it differently, the ability of external pressure to be converted into action on reduction of emissions is determined by the willingness and capability of enterprises to receive and digest this pressure [17].

Further research on the analysis of contextual heterogeneity also indicates that there are different response logics. The non-state-owned enterprises have a shorter decision-making chain and greater sensitivity to the market, whereas state-owned enterprises require restructuring external pressure into an internal action via institutionalized strategic arrangements.

Switching the analysis viewpoint to that of key roles between individual subjects instead of multiple subjects, the influence of shareholders on governance cannot be avoided. The conventional studies generally address the value of supervision by direct shareholder ownership, but fail to consider the implicit networks created by equity association in the capital market. Both common shareholders and cross-shareholdings permit companies to form relationships with other companies using a shared institutional investor, and information, governance experience, and sometimes even green technologies may be passed through the network. Empirical evidence indicates that this network may actually enhance corporate carbon performance with governance enhancement and technological optimization being the two significant paths of implementation [18]. However, to be honest, the extent of the network effect is very sensitive to the specific characteristics of the enterprise, its external conditions, and regional factors, and the generalization of the results has yet to be verified under more conditions.

4.2.3 Market Pressure and Supply Chain Drivers

The active participation of customers as stakeholders, particularly foreign customers, is gaining more importance among other stakeholders. The development of the European Union Carbon Border Adjustment Mechanism (CBAM) has made the issue a case of impossibility to ignore it rather than a case of worthiness to be considered [19]. The carbon emission behavior of Chinese suppliers is experiencing a qualitative shift in which they were previously perceived as an ethically tinted ethical problem but now are viewed as a practical trade compliance limit. Not reaching carbon performance limits can also cause direct market access denial.

The empirical studies conducted through the prism of mandatory ESG information disclosure are very instructive: foreign green consumers may actually prompt suppliers to enhance carbon performance, and the main transmission channel is to compel suppliers to enhance their green R&D and innovation capacity. That is, the green procurement regulations of the overseas end buyers are passed upstream in the supply chain. To keep orders, Chinese companies should invest more in green R&D and streamline production procedures, and the carbon performance will automatically be enhanced. The present study also indicates two boundary conditions: the further the geographical distance, the less strong the enhancement impact, and the existence of the phenomenon of distance decay when transmitting green information between cross-border supply chains; the higher the level of market competition, the greater the propensity of suppliers to meet the demands of customers in terms of the environment. Moreover, state-owned enterprises, well-established enterprises, enterprises with large concentrations of customers, and enterprises that have been certified under any green system gain the most. Finally, it is the disparity in absorptive capacity and responsiveness motivation that is functioning [20].

The combination of public attention, stakeholder pressure, shareholder relationship networks, and overseas green customers appears to have a similar theoretical base, i.e., external pressure, organizational response, and performance output, but with different entry points. Attention to social public opinion as a soft constraint, stakeholder framework as multi-subject, shareholder network as in-depth analysis of the attributes of equity structure, and overseas customer analysis as extended to the cross-border supply chain governance scenarios. All these views accurately describe a pressure transmission chain that goes from near to far and from direct to indirect.

4.3 Internal Corporate Governance and Strategic Drivers

In case the major driving factors of the two previous dimensions are both external to the enterprise, internal corporate governance and strategic options become the endogenous driving forces toward enhancing carbon performance. The carbon performance benefit of an organization is finally based on its particular

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organizational skills, technological facilities, and strategic decisions. External pressure may only have significant implications when it transforms the internal capabilities. In recent years, the internal governance and strategic drivers of a company have been raised significantly due to the rapid growth of digital technology and the severe change in the nature of corporate strategy caused by the achievement of the Dual Carbon objectives.

4.3.1 Digital Transformation and Technological Empowerment

Digital transformation is defined as the application of digital technologies to completely transform the organization's structures, business processes, and business models. Concerning the context of carbon performance, the Internet of Things allows streaming emissions data in real time, big data may be used to monitor carbon footprints, artificial intelligence is utilized to optimize energy schedules and make decisions on reducing emissions, and blockchain increases the visibility and reliability of carbon information disclosures [21].

The empirical studies with resource-based enterprises as samples prove that digital transformation does indeed play a significant role in carbon performance [22]. The intermediary in this process is internal governance - digital transformation helps the company to manage the carbon emission process better due to increased information transparency and efficiency in decision-making. Analysis of heterogeneity indicates that such an impact is not constant but depends on the type of industry, the location, and environmental regulations. The impact is stronger in labour-intensive companies, companies located in the eastern or central regions, and companies with stringent environmental regulations. To put it another way, in order to make digital technology become a productivity driver in reducing carbon, it needs to correspond to the endowments and institutional context of the enterprise.

The chain of transmission of the concept of technological innovation in the form of digital transformation-technological innovation-carbon performance improvement has been confirmed, and it is noted that government and market factors are highly positively related to innovation behavior [23]. The study finds out further that the marketization of data elements may also help to enhance carbon performance largely by encouraging digital transformation and improving innovation capacity.

The field of artificial intelligence has been steadily drawing more and more attention in the last two years as a technological frontier. The empirical analysis indicates that AI is associated with a substantial and well-established positive impact on carbon performance, yet the most intriguing result is the presence of a so-called regulatory paradox: the investment in the data element foundations and labor costs can potentially prevent the carbon reduction impact of the AI [24]. When there is an excess of accumulated data, enterprises are unable to ingest it, and redundancy and noise hinder AI decisions; when the cost of labor is excessively high, enterprises are tempted to substitute them with AI, and marginal utility decreases, and the importance of human experience and judgment in carbon management is thrown away. Hence, additional AI is not necessarily better; the allocation of factors needs to be rational. Moreover, regional synergy is another important variable. The technological dividend is especially significant in non-border regions and regions with medium-to-high synergy - the emission reduction effect of AI is determined not only by the enterprise itself but by the flow of knowledge between the regions and the dynamics of the technology market.

4.3.2 Green Technology Innovation

With digital transformation as the underpinning, green technology innovation represents an important connection whereby enterprises convert external pressure into real-life emission reduction outcomes, and it is also the central link that impacts carbon emission reduction directly. A literature review of the current studies indicates that the positive effect of green technology innovation on carbon performance can be achieved in two paths. One is R&D and innovation cycles, which means to cut down emissions at the roots by creating energy-saving and carbon-cutting technologies and clean energy use technologies. The other one is the internal process control, which means using technological innovation to facilitate low-carbon conversion of production processes and minimizing carbon emissions throughout the whole production process by managing operations carefully [25]. Heterogeneity analysis also reveals that this effect is especially strong in state-owned companies, high-tech companies, and technology-intensive companies. It implies that green technology innovation cannot reduce emissions homogeneously across all companies but is highly limited by endowment conditions (the level of technological accumulation of the enterprise, ownership structure, and industry factor intensity).

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Speaking practically speaking, companies should invest more and more in research and development of low-carbon technologies and combine the internal and external sources of innovation by means of the diverse paths of industry-university-research cooperation to strengthen the stocks of green technologies. Simultaneously, the construction of an intelligent inner-control system and a dynamic carbon-emission management system cannot be avoided. They are valuable because they provide the systematic adoption of digital tools in the whole process of pre-assessment, in-process control and post-reviewing carbon emissions, which actually helps to achieve the close integration between digital technology and low-carbon governance.

4.3.3 FinTech

The emergence of fintech over recent years has provided another opportunity for corporate carbon performance. It decreases the level of information asymmetry, enhances credit allocation, and releases financing pressure due to the introduction of new models, including big data risk control, intelligent investment advisory, supply chain finance, etc. At the same time, the technology spillover effect of fintech companies also drives cooperative businesses into the process of digitalization and green innovation [26]. These expectations have been confirmed: fintech has a strong positive effect on carbon performance, and the mediation channels are “finance empowerment” and “technology empowerment” [27]. Nevertheless, heterogeneity analysis reveals that the effect is stronger in areas with low climate risk, non-state-owned companies, profitable companies, and companies with positive growth. This result implies that the carbon performance effect of fintech is not unconditional and universal but very sensitive to the financial situation of the company and the external risk situation it works in.

4.3.4 Managerial Cognition and Behavior

Managerial cognition and behavior represent a critical switch between strategic formulation and performance output. The existence of technological factors, capital availability, and institutional structures notwithstanding, when management has no cognitive structure and readiness to implement what is necessary to internalize external pressure into organizational action, significant improvement in carbon performance cannot be implemented. In terms of managerial myopia, i.e.,, managers being too focused on short-term financial objectives in decision-making and consistently underestimating the creation of long-term value, the existing literature supports the fact that the extent of myopia is highly significantly negatively correlated with the level of corporate carbon performance [28]. Foreign scholars of earlier times also discovered that the environmental orientation of the board may influence corporate carbon performance both directly and indirectly by means of low-carbon strategy [29]. Heterogeneity analysis indicates that in highly polluting industries, the impact of managerial myopia on carbon performance is greater. The basic reason behind this is that carbon emissions management in this area inherently necessitates a long-term strategic perspective and a longer-term investment, which amplifies the cost of myopic behavior. By contrast, the above negative effects are significantly mitigated in enterprises that have green investors, executives who have an overseas background, or a larger fraction of women executives [30]. Green investors offer outside monitoring and long-term value focus; executives with foreign experience tend to be more innovative in their view of ESG; and female executives are more inclined to make their decisions based on social responsibility. There are also relatively straightforward governance outcomes of this: optimal board composition, incorporation of green investors with long-term interests, and consistent improvement of the cognitive capacity of management on environmental issues are viable ways of reducing myopic tendencies and releasing the driver of carbon performance improvement at the origin [31].

As mentioned above, some levels below the internal corporate governance and strategic driver dimensions can be seen as having relatively clear hierarchical relationships: the lowest level is the digital technology base, the middle level is green technology innovation, which builds upon financial factors, and the highest level is the cognition and willingness of the management. Such four layers, when placed on each other, are exactly what forms a full transmission chain between technological feasibility and organizational execution and, finally, cognitive willingness. The lack of strength or presence in any link can result in the systematic enhancement of carbon performance being hindered during the implementation stage.

The comparison of the heterogeneity findings associated with the four routes of digitalization, green technology innovation, fintech, and managerial cognition will show that, in most cases, it depends on the endowment of resources within the enterprise itself and the institutions of the region in which it is situated as to the possibility of a few internal drivers being able to free the carbon reduction dividend. Companies with

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richer reserves of technology and finances and situated in areas with moderately effective environmental regulation have higher chances to improve carbon performance using internal governance.

5. Future Prospects

Even though there is a plethora of theoretical explanations and empirical evidence on the motivators of corporate carbon performance, a thorough review of the available literature reveals certain gaps in the study and areas of opportunities that have not been covered yet. Future research can be developed along the lines of:

The study of the standardization and comparability of measurement systems. This paper notes that the measurement criteria regarding carbon performance are varied. The single-indicator method, composite index method, and efficiency evaluation method all have strengths and weaknesses, and the results may be very different based on the measurement approach used. It is thus important to examine the conditions and limits within which various measures can be applied systematically.

Synergy and dynamic development of multi-dimensional stakeholder drivers. The interaction effects between various stakeholders are not given adequate consideration by existing literature. In case government regulations, popular opinion, and customer demands exist simultaneously and they do not go in the same direction, how do companies balance and select between them? Are these pressures reinforcing or canceling each other out? Moreover, many articles consider stakeholder pressure as a fixed exogenous factor, but in practice, the level, orientation, as well as the mixture of these pressures vary all the time. The most valuable way to explore further is to dynamically trace how the structure of pressure influences the evolutionary path of corporate carbon performance.

The study of carbon performance drivers in the context of emerging institutions and in practice. The growth of the carbon market in China, the necessity to disclose ESG, green supply chain regulations and the introduction of the CBAM carbon border system create new institutional conditions. The available literature has not yet provided adequate information on the mechanisms of action of certain new policy tools. Further studies may be conducted on the effects of frontier institutions like cross-border carbon regulation, mandatory corporate carbon information disclosure, and green financial instruments on the carbon performance of various types of Chinese enterprises.

Enhancing studies during heterogeneous situations and extending to SMEs and highly polluting organizations. Empirical samples at present focus on listed businesses, and not much research has been done on the determinants of carbon performance in the vast pool of unlisted small and medium-sized enterprises (SMEs). SMEs are significant players in carbon emissions, yet they experience logistical limitations, including lack of funds, inadequate carbon accounting capabilities, and poor low-carbon understanding of management. The way external drivers impact them is substantially different from how they do with big listed companies. Future studies need to broaden the sample boundary, focus on SMEs and organizations in highly polluting industries, and, considering the resource-constrained nature of SMEs investigate carbon performance improvement strategies that are appropriate to SMEs, thus overcoming the bias of current research samples that represent leading companies.

6. Conclusion

The present paper reviews the 48 core articles published in 2020-2026 systematically, clarifies the concept and the measurement system of corporate carbon performance, creates a three-dimensional model of external institutional policies, market stakeholders, and internal governance strategies, and systematically summarizes the factors of carbon performance, shattering the fragmented approach of the current body of literature which merely divides internal and external factors. Studies indicate that existing carbon performance is in two conceptual directions: outcomes-oriented and process-outcome integration. The measurement approaches are many but not standardized. The external institutional regulation and market stakeholder pressure are significant drivers of emissions reduction, but these external aspects should be absorbed and changed by the internal resources, technology, and governance of a company so as to achieve a meaningful improvement in carbon performance. A number of driving influences are usually limited by the heterogeneity in firms' characteristics, life cycle, and institutional environments across regions. There cannot be a single track of decarbonization that is universal to all enterprises.

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These conclusions can also have practical significance. Both policy incentives' strength and enterprise transition costs must be considered by the government when implementing low-carbon policies, and differentiated and refined governance should be implemented. The enterprises are required to strike a balance between external compliance and internal capacity building and pay attention to digital technology, green innovation, and development of long-term low-carbon awareness in the management. As is known, current studies also have some challenges, including lack of uniformity in measuring instruments, failure to explore the mechanism of interactions of various forms of pressure, dynamic causality identification which could be improved, and lack of sample size. These shortcomings will be addressed in later research to offer theory support to low-carbon corporate transition in China and institutionalization of the concepts of the Dual Carbon agenda.

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Conflicts of Interest

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