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# Empirical Data from Organizations in Chinses Green Industrial Zones on Institutional Constraints, Ecological Logistical Management, and Circular Economic Resources

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***Abstract***

*In order to achieve sustainable development, businesses created a model of environmentally friendly economic growth by enacting green innovation strategies and creating a circular supply chain, which is anticipated to reduce resource consumption and save the environment through resource recycling. The Circular Economy (CE) and China's Green Industries Zones (CGIZ) are similar but different. This research aims to elucidate the connections between these two ideas. It lists the applications of mutual theory that are used to research CE and GSCM. The input–output indicators for Green Logistics Efficiency (GLE) have been created developed based on the five concepts of high-quality economic development: "innovation, coordination, green, openness, and sharing.Supply chain traceability's moderating effect on the relationships is also evaluated in this study. We used the PLS-SEM approach to evaluate the hypotheses using real-world information from 211 Chinese manufacturing SMEs.We employ resource dependence theory and a natural resource-based view as our theoretical pillars to analyse both the direct and indirect impacts of green logistics administration on corporate sustainability performance through circular economy practices.Lastly, the relationship between SMEs' performance in environmental sustainability and green logistics management is mediated by circular economy practices. To confirm the mediation, we also ran the the Sobel method test.*

***Keywords:*** *Circular Economy (CE), SMEs', Green Logistics Management, Sustainable Development, Chinses Green Industrial Zones (CGIZ), Supply Chain, Natural Resource, PLS-SEM Technique, Environment-Friendly.*

## INTRODUCTION

In an attempt to move toward more sustainable development, China has made commitments in recent years to lessen the effects of the country's economic growth on the environment, create a "win-win" ecological or economic model, and create a society that is resource-efficient and environmentally conscious (a "two-oriented" society) [1]. The state has established a number of rules and regulations aimed at the government, corporations, and society in an attempt to establish an industrial system based on the circular economy, which is seen as a crucial element of sustainable development. There is considerable motivation to attain sustainability objectives in industrial parks, green manufacturing, social aspects of the ecological economy, [1, 2], and firm-level missions. The "resources-products-renewable resources" circular flow model of an eco-industrial park has evolved into the norm when industrial organization patterns change, and it now represents important participants in environmentally friendly growth at the new conceptual "park-level [3, 4]." An Eco-Industrial Park (EIP) is modelled after the natural ecosystem's "food chain" and is intended to implement industrial ecology concepts and a circular economy.

Under an EIP, companies collaborate with one another and the local community to reduce waste and pollution, have resources (materials, energy, information, infrastructure, or natural resources) effectively, use clean forms of production, [4, 5] and support sustainable development, which aims to develop economic and social gains in a sustainable manner while also improving the environment.

The main objective of China's 14th five-year plan is high-quality economic development. The transition from extensive, highly polluting, and highly consumed management to efficient, green, or sustainable intense management is high-quality development. An essential component of the logistics industry's superior growth is

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green logistics [6]. The "two-wheel drive" of social and economic growth and ecological environmental conservation is realized via the pursuit of economic gains without endangering the environment. This is the core of green logistics. Sustainable development and synchronization of the economy, society, and environment are the ultimate goals of green logistics [6, 7]. But there are still additional issues with how green logistics is developing and changing in each nation.

The conventional logistics sector is developing in a rather haphazard manner. All nations have had significant resource waste and ineffective management [7]. These circumstances, which include irrational traffic patterns and unchecked automotive carbon emissions, have led to ever worsening environmental pollution issues. With the growth of the e-commerce sector in the past few years, express garbage is emerging as a significant new source of urban pollution. This is an issue that the logistics sector cannot overlook if it is to grow sustainably and environmentally. Enhancing the effectiveness of green logistics is crucial for both solving the problems of environmental degradation and high-quality economic growth [8]. Currently, governments, academia, and society are concerned about the logistics industry's superior growth or green efficiency.

In response to the growing consumer demand for environmental protection, businesses should provide sustainable and creative approaches to address these pressing environmental concerns. In addition to successfully overcoming resource restrictions and environmental issues, green innovation efficiently fosters sustainable growth in the economy [9]. Green product, green service, green process, and green logistics innovation are the major components of a firm's green innovation strategy. Green product innovation is new product design that focuses on how a product will affect the environment once its useful life is over [10]. Green product innovation, in contrast to traditional product innovation, is a strategy used by businesses to adjust to changing consumer demands and the environment, minimize excessive energy and raw material consumption in compliance with environmental regulations, [11, 12], and prevent needless risks to the safety and well-being of their customers.

It satisfies customer demands for safeguarding the environment and helps businesses in expanding into new areas, making it difficult for businesses to duplicate their offerings and keep their goods competitive. Innovation in green products that is successful may increase the efficiency with which resources are used and provide businesses a competitive edge. Green process innovation is the application of green ideas across the whole product manufacturing process to assist businesses in making better use of their resources [12, 13]. Green process innovation lowers production costs, ensures that products meet environmental standards, and incorporates stakeholder environmental demands into production design. Innovation in green processes may significantly lower energy & raw material use, as well as pollution to the environment. By putting green process innovation into practice, businesses may increase their size, create green goods, and enhance their brand [14]. The design of environmentally friendly services, the creation of green inventions, and the combining of environmental services are the fundamental components of green service innovation. By offering environmental protection services, it lessens its influence on the environment and emphasizes societal responsibility for the environment [14, 15].

By encouraging green service innovation, including cleaner manufacturing and preservation of the environment services, businesses may gain a competitive edge, raise barriers to entry for rivals, and contribute to the realization of sustainable development objectives. The term "green logistics" describes the use of sophisticated logistics technology to shipping, storage, packing, unloading, and processing in a way that minimizes energy usage, [15, 16], prioritizes environmental sustainability, and has positive social and economic effects. Green logistics is important in practice because it lowers energy use, protects the environment, and boosts economic efficiency.

Organizational level ideas provide the basis for a large portion of GSCM's theory. Though to a lesser degree, CE studies have additionally made use of other theoretical viewpoints, as the study that follows in this article attests to [17, 18]. There has been little theoretical growth and extension in CE research, with a large concentration on practice and analysis. The key driving forces behind this investigation are a number of linked scientific questions that still need to be addressed. Which theories are applicable anywhere? Which is applicable

to both fields? Which theoretical stances may be transferred from one to the other while attempting to comprehend different phenomena? Which ideas have a better chance of helping us comprehend the other field? In order to answer the study questions and accomplish the objectives, this article first defines the concepts of GSCM and CE. The second part also examines the connections between GSCM and CE. In the third phase, theories used in GSCM and CE investigations are identified and papers for further study are gathered via a systematic assessment of the literature. The theory that may be used to both GSCM & CE, projected from one area to the other, is explored via a critical study of all the chosen publications in the fourth part. Proposals for research are made in light of the thorough examination.

A significant European action plan and national laws, such the People's Republic of China's Circular Economy Promotion Law, already centre on CE. Communities and cities are thus urged to implement creative approaches to the circular economy at the level of the city. Recent research identifies the primary Circular Economy (CE) projects supported in rising case studies globally, providing insight into how cities might become more circular in their operations. Furthermore, some writers investigate urban circularity using specific metrics, including rates of garbage recycling or resource use, among others. In addition to possible advantages, putting CE measures into action has a variety of environmental dangers.

These techniques enable the identification of significant environmental effects resulting from various items, activities, & processes [17]. This study raises the issue of whether the environmental evaluations carried out under the CE framework to date really correspond with the efforts of CE that are being supported in cities. If cities want to make the switch to a sustainable CE, this is an important issue.

The impact of Green Logistics Management (GLM) on ecological sustainability has been the primary focus of current research on the subject. However, there is a paucity of research on the impact of GLM on a company's CEP (circular economy practices) and Sustainability Performance (SP). A relatively recent concept known as the "Circular Economy" (CE) seeks to transform society as a whole into an environment that is more sustainable by maximizing the economic, environmental, and social aspects of businesses with the involvement of all relevant stakeholders. "The regenerative cycle, which facilitates reuse of used goods, components, and supplies efficiently, thus improving profitability while decreasing environmental distraction" is the cornerstone of the Circular Economy (CE) idea.

The potential and difficulties of implementing CEP in SMEs have been reported in a number of studies. According to research, CEP is a critical indicator of how well SMEs will fare in terms of sustainability. Research has shown that SMEs' CEP enhances their innovation that is sustainable and leads to SP. According to recent studies, GLM may be seen of as an organizational element that helps the CEP. The body of existing research argued against the GLM is an essential step and prerequisite for creating a CE [18]. An additional body of research reveals how crucial the GLM is to improving a company's sustainability performance. researchers have reported a relationship between a firm's overall SP and the GLM, while another set of researchers has confirmed a relationship between the GLM and the other sustainability performance characteristics.

On the other hand, a different field of study argues that there isn't always a direct correlation between GLM and SP, leading to inconsistent results in the literature. While some research finds an inconsequential connection, others have revealed a strong link between GLM and SP. We must investigate the role of CEP in regulating the relationship involving GLM & SP in light of this conflicting data. We hypothesise that CEP effectively mediates the effects of GLM on SP, as the GLM is a need for putting the CEP into practice, [18, 19], which in turn improves the environmental performance of businesses. Furthermore, we propose the Supply Chain Traceability (SCT) moderates the GLM-CEP connection and has a favourable effect on businesses' CEP. According to recent research, using the SCT might be a crucial catalyst for resolving supply chain interruptions and advancing environmentally friendly activities inside the logistics network to advance CE standards. The research concludes by assessing the GLM's theoretical and real-world benefits on SMEs' sustainability via increased CEP, [20], as well as the study's limitations and potential future paths.

The four Objectives of the study as followings, (1) Examine how well the institutional systems in place are fostering sustainable growth and environmental preservation. (2) Analyse how well supply chain and logistics work to promote sustainability and lower carbon footprints. (3) Analyse the financial sustainability and

environmental advantages of companies using circular economy techniques. (4) Participate in the creation of thorough sustainability frameworks and policies that are adapted to the unique requirements of China's green industrial zones.

## LITERATURE REVIEW

(Zhu, Q. 2016) [21] Manufacturers are compelled to adopt Sustainable Production (SP) methods by institutional forces. While a manufacturer's assistance from an industrial area is equally significant, there aren't many research on the subject of industrial zones' significance for SP practices. The objective of this research is to comprehend the ways in which industrial zones' support and institutional constraints (coercive, normative, and mimetic) drive SP activities collectively. Five variables on SP are associated with effective use of resources, water, energy, and land from a life cycle viewpoint, according to an exploratory analysis of factors conducted using 422 sample of Chinese manufacturing from 31 regions. The majority of SP activities are motivated by normative pressure, with the exception of land-saving techniques, which operate independently of industrial zones, according to the results of a hierarchical regression analysis. While industrial zones must promote land & energy saving techniques, forceful force may bring about SP behaviours connected to resource conservation, such as water and energy conservation.

(Dzwigol, H., 2021) [22] The foundations for forming and expanding the idea of a green economy are examined in this essay. Work with waste, environmental performance methods, and maximum conservation in the age of depletion of resources are the phases of the circular economy's evolutionary growth that are taken into consideration. The notion of the "circular economy" is connected with the words "round economy," "cyclical economy," "recovery economy," "closed-cycle economy," and "green economy," according to the paper's analysis of scientific viewpoints on its origin. The analysis and conventional categorization of the various scientific schools' approaches to the category of "circular economy" falls into twelve groups: closed-cycle economy, renewable resource economy, global economic model, closed-loop economic system based on R-principles, the concept of economic development, sustainable development strategy, an instrument of the "green" economy, business philosophy, economic activity, use of production waste, and recycling of secondary raw materials. In order to achieve the long-term sustainability of logistics systems, the authors propose the circular economy as a novel approach to structuring logistics procedures based on the closed movement of resources with their smallest possible losses in the form of waste and the greatest involvement of secondary resources in production.

(Gan, W., 2022) [23] Globally, the digital economy is expanding, and in China, industrial digitalization particularly has gained a lot of traction lately. This study looks at the obstacles in China's pilot provinces for ecological civilization (Fujian, Jiangxi, Guizhou, and Hainan) as well as the simultaneous and coordinated growth of the logistics sector, digitalization, and ecological civilization. According to the report, all four of these provinces have failed to recognize ecological civilization while the other three have developed in tandem. The three are very variable in terms of their temporal and geographical distribution in the provinces of Jiangxi and Fujian.

(Feng, K., 2021) [24] Governments and scholars have begun to pay more and more attention to the notion of Circular Economy (CE) since the People's Republic of China passed the Circular Economy (CE) Promotion Law in 2009. Different sets of principles & adoption methodologies have begun to be established by policy makers, corporations, and scholars. This essay examines the factors that encourage and enable the adoption of CE within the context of China's economy. It incorporates a number of contemporary CE practices in China and performs an analysis of the recycling rate from official government reports, which indicate that China has made some headway in reusing industrial tangible waste as well as important renewable resources, like steel and iron, though there are still obstacles to overcome. Additional research indicates that China needs to encourage CE in a more methodical way across people, groups, and the country.

(Farooque, M., 2019) [25] This essay seeks to pinpoint and methodically examine the causal connections between the many obstacles to China's circular food supply chains. Based on several organizational theories, this study creates a theoretical framework to pinpoint pertinent obstacles to incorporating the circular economy

concept into food supply chain management. The research makes use of 105 replies from different organizations involved in the Chinese food supply chain, such as food processors, retailers, distributors, and government representatives. It investigates the causal-effect links between the identified obstacles using the fuzzy Decision-Making Trial & Evaluation Laboratory (DEMATEL) approach.

(Fan, Y., 2020) [26] Unlike the conventional linear developmental model, the Circular Economy (CE) is a new paradigm that emphasizes resource recycling in order to conserve resources, save the environment, and promote economic growth. As a result, many nations have adopted the circular economy as a plan of action since it has been helpful in modifying the industrial structure, altering the trajectory of economic growth, establishing an ecological civilization as a whole and ultimately advancing sustainable development. Nonetheless, it is uncommon to assess the state of CE development. China has undertaken the "11th and 12th Five Years" to advance the circular economy's growth across the nation, and they have accomplished amazing things. In this research, we used Data Envelopment Analysis (DEA) to evaluate the circular economy level of development of 31 Chinese province areas in 2017.

(Wu, J., 2023) [27] This study evaluates the effect of national Eco-Industrial Parks (EIPs) on the development of green technology, concentrating on Chinese cities. Panel data from 314 Chinese prefecture-level cities from 2002 to 2017 is analysed using staggered difference-in-differences, and the findings demonstrate that EIPs considerably accelerate the development of green technologies. The robustness of this conclusion was confirmed by a number of robustness assessments, involving the use of event research, Oster missing variable identification, and the appropriate city slope as instruments. EIPs promote green technology advancement via three channels: scale agglomeration level, industrial structure optimization, and research expenditure intensity.

(Fu, J., 2020) [28] China's Greater Bay Area has recognized the value of environmental sustainability in advancing its economic development. In one of the world's most dynamic economic regions, this chapter seeks to expose the core planning policy approach which establishes the primary goals for environmentally friendly development and growth throughout generations. It is seen as a chance to support the interests of local, regional, and global stakeholders on matters pertaining to sustainability and health, including the UN Sustainable Development Goals (SDGs) and worries about global climate change.

(Savini, F. 2019) [29] The conventional view is that a circular economy will serve as a long-term means of achieving economic expansion. Circularity proponents assert that shutting materials streams in cities is necessary to ensure economic development while concurrently lowering material inputs and trash outputs. The history and significance of these recommendations in environmental policymaking are examined in this article. It makes the case that the circular economy is an eco-accumulation regime where trash serves as the primary resource for both production and consumption. Using the legacy of the circular economy policies in the Netherlands including Amsterdam as a focal point, the paper describes how a national green-growth urban agenda supported by waste value has been developed.

(Agrawal, R., Agrawal, S., 2023) [30] Governments and authorities are paying more and more attention to important issues like global warming and climate change, thus it is imperative that we look at what enables companies to participate in Green Finance (GF). The urgent requirement of Green Innovation (GI) in the public sector is prioritized by the external factors of environmental contamination. In addition to the GI procedure for environmental protection, GF allocates financial resources to the Research and Development (R&D) of clean energy & ecologically friendly products and processes. Financial limitations and GI-impaired industries involving innovative goods, services, processes, and the global market are lessened by GF policies. This study aims to provide a historical and modern review of GF & GI in order to better comprehend how both of these concepts have served as a spark for circular economy activities.

(Alkhuzaim, L., 2021) [31] The use of energy analysis as an accounting for the environment technique is becoming more and more popular. Even after preliminary research, its connections to and consequences for circular economies and sustainable supply chains remain little understood. Further significant chances to advance these sustainability-focused sectors may arise from energy analysis. Donor side valuation techniques are used in energy analysis, which serves as the foundation for measuring economic, social, and environmental performance. We address how donor-side evaluations of environmentally friendly supply chain administration

& circular economy performance assessment techniques might be extended to make better use of energy analysis. Using energy-based performance metrics, we provide insights into a more ecologically sustainable supply chain & circularity performance assessment, accounting, and appraisal.

Based on the above literature analysis, the following hypotheses are proposed in this paper:

***H1:*** *GLM has a positive effect on companies' SP.*

***H2:*** *GLM impacts the firm's CEP.*

***H3:*** *An intermediary connecting GLM and SP is CEP.*

***H4:*** *SCT increases a company's CEP.*

***H5:*** *The link between GLM and CEP is moderated by SCT.*

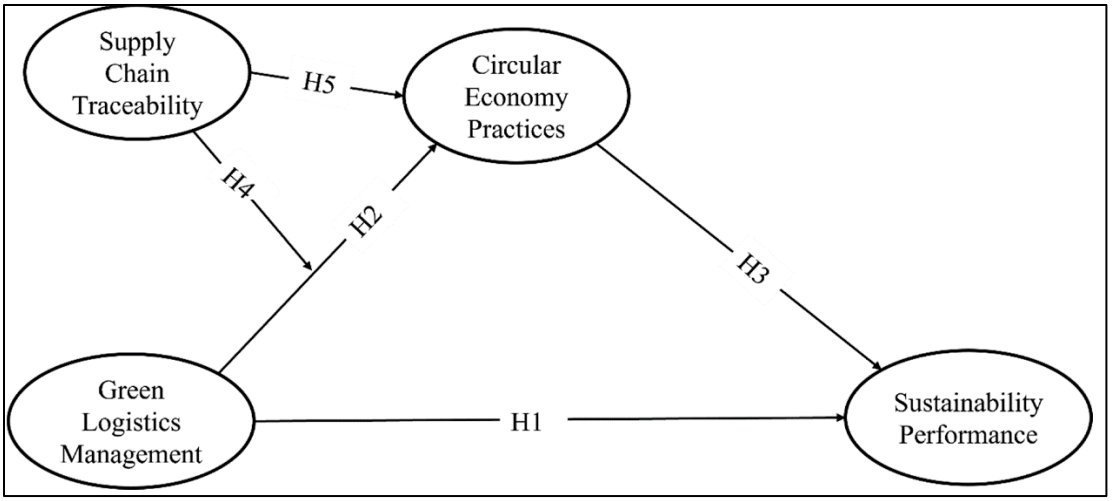


**Fig. 1** Research Framework

## METHOD

### Data and Sample

Chinese SMEs that have embraced green techniques to enhance sustainability performance provided the study's data. These SMEs were selected due to the fact that they operate in an extremely unstable environment when environmental success depends on green techniques like GLM, SCT, and CEP. Furthermore, millions of people are directly employed by SMEs, which constitute the backbone of the Chinese economy. Even if Chinese SMEs are hesitant to implement environmental standards, things have recently changed for the better. SMEs in a variety of industries have received funding from numerous international organisations to carry out safety and green activities. Therefore, evaluating how GLM, SCT, [32], and CEP may enhance the sustainability of the environment in Chinese SMEs is crucial.

Using a self-administered questionnaire, the team of investigators looked into how GLM and SCT affected CEP and SP in Chinese SMEs. Thirty-nine small- and medium-sized business owners and four academics participated in our pilot project. We slightly changed the survey questions in response to their suggestions. Our poll was directed towards SME managers who had a thorough understanding of the performance and operations of their companies. With a cover letter outlining our research objectives and acknowledging their voluntary involvement, the researchers gave a survey to 270 SMEs. We informed our respondents that the information they provided would remain anonymous & would only be utilised for academic research. A total of 211 full and functional questionnaires were obtained, yielding a 78% response rate. The time frame for gathering the data was April through August of 2022.

## Measures

All of our suggestions, which were selected from previous studies, were assessed using a range of questionnaire items, some of which were modified to better suit the investigation's objectives. A Likert scale with seven points was used to evaluate exogenous influences. The recommendations were followed in the development of the instrument. For pilot testing, we gave the research components and items to 29 SME professionals and four academics. The degree to which they thought these items accurately reflected their linked concepts was what they were asked to rate.

## Method of Data Analysis

Examining GLM's effect on SP using CEP was the goal of this experimental and confirmatory study. To obtain more accurate data and conclusions, a variety of statistical techniques were applied. Before employing analytical techniques, the collected responses, for instance, were coded and proofread for errors. In order to evaluate the study framework for PLS path modelling and test the dataset, statistical analysis was conducted using SPSS version 20.0 & Smart-PLS version. The first steps were filtering the data, locating outliers and missing values, doing descriptive assessments, and analysing the sample demographic distributions using SPSS. Next, using PLS-SEM, the relationships between the conceptual framework's latent variables were assessed.

## Analysis

Due to the substantial and significant standardised loadings that each model item has on its target construct, our investigation also confirmed the CV. Our model constructs' AVE values, which range from 0.574 through 0.829, support the measures' CV. Table 1.

**Table 1 An overview of the measurement model's results.**

| Constructs | Items | Factor Loading | CR | CA | AVE | VIF |
|---|---|---|---|---|---|---|
| Green Logistics Management | GL1 | 0.896 | 0.986 | 0.896 | 0.549 | 1.185 |
| | GL2 | 0.749 | | | | |
| | GL3 | 0.896 | | | | |
| | GL4 | 0.479 | | | | |
| | GL5 | 0.179 | | | | |
| Supply Chain Traceability | SCT1 | 0.892 | 0.817 | 0.975 | 0.548 | 1.186 |
| | SCT2 | 0.764 | | | | |
| | SCT3 | 0.842 | | | | |
| | SCT4 | 0.487 | | | | |
| | SCT5 | 0.648 | | | | |
| Circular Economy Practices | CEP1 | 0.956 | 0.987 | 0.946 | 0.846 | 1.158 |
| | CEP2 | 0.826 | | | | |
| | CEP3 | 0.942 | | | | |
| | CEP4 | 0.489 | | | | |
| | CEP5 | 0.866 | | | | |
| Sustainability Performance | SP1 | 0.896 | 0.832 | 0.942 | 0.692 | n.a. |
| | SP2 | 0.915 | | | | |
| | SP3 | 0.786 | | | | |
| | SP4 | 0.872 | | | | |
| | SP5 | 0.862 | | | | |

The diagonal values within the related rows and columns must be much greater than the elements that are off-diagonal in order to guarantee an appropriate DV. Table 2 demonstrates that each factor in our measurement model is subject to this criterion.

**Table 2 The Fornell-Lacker Standard.**

| Constructs | SCT | GT | SP | CEP |
|---|---|---|---|---|
| Supply chain Traceability | 0.798 | | | |
| Green Logistics Management | 0.364 | 0.749 | | |
| Sustainability Performance | 0.975 | 0.541 | 0.594 | |
| Circular Economy Practices | 0.366 | 0.86 | 0.974 | 0.648 |

The model's DV was then evaluated using the HTMT ratio. We concluded that the model had a strong DV because the data indicates that each of the constructs in Table 3 have HTMT ratios below the suggested 0.85. The greatest HTMT value found was 0.667, indicating that the structures' DV was accurate. All in all, our model's constructs demonstrated a high level of reliability and validity.

**Table 3 HTMT criterion.**

| | Green Logistics | Circular Economy Practices | Supply Chain Traceability |
|---|---|---|---|
| Circular Economy Practices | 0.746 | | |
| Green Logistics | 0.489 | 0.641 | |
| Supply Chain Traceability | 0.658 | 0.654 | 0.531 |

This led to the establishment of prediction capabilities. Furthermore, the Q2 value demonstrates the endogenous components' predictive relevance; a value greater than indicates this relevance. The results also showed that the components in this investigation have a significant predictive significance (CEP Q2 = 0.242, SP Q2 = 0.300). Table 4. Additionally, the SRMR generated by the PLS-SEM was used to assess the model fit. The SRMR correlation was found to be 0.08, a value that is below the 0.10 maximum threshold and indicates that our model fits the data well.

**Table 5 Model's Predictive Power.**

| Endogenous Constructs | $R^2$ | $Q^2$ |
|---|---|---|
| Circular Economy Practices | 0.286 | 0.246 |
| Sustainability performance | 0.489 | 0.309 |

Following an evaluation of the model's goodness of fit, multicollinearity, and predictive significance, we examined both the direct and indirect relationships between the GL, SCT, CEP, and SP. The route coefficients for each hypothesis are shown in Table 5.

**Table 5 Result of Hypothesis**

| Hypothesis | Coefficients | T-statistical | Results |
|---|---|---|---|
| H1: CEP-SP | 0.749 (0.0649)*** | 7.496 | *Supported* |
| H2: GL-SP | 0.189 (0.049)*** | 3.196 | *Supported* |
| H3: GL-CEP | 0.318 (0.028)*** | 4.526 | *Supported* |
| H4: GL-SP-CEP | 0.215 (0.051)*** | 5.972 | *Supported* |
| H5: CEP-SCT | 0.041 (0.019)*** | 2.316 | *Supported* |

## DISCUSSION

To achieve the national goals, businesses must perform better in terms of sustainability. Many companies use sustainable and environmentally friendly practices that enhance firm-level SP [33]. To guarantee sustainability, a number of businesses, for example, have integrated Green Supply Chain Management (GSCM) techniques into their operational protocols. GLM is an essential part of a supply chain that is environmentally friendly and could be a major factor in corporate SP. Thus, the purpose of our work was to evaluate how green logistic contributes to SMEs' SP using CEP.

In order to investigate the various impacts of green innovation strategies on the functioning of the circular supply chain, this study breaks down the strategies of companies into four categories: green product creative thinking, green manufacturing innovation, green innovation in services, and green logistics innovation. It does this by drawing on the theories of the circular economy and dynamic capability [34]. A theoretical foundation for businesses creating circular supply chains and green innovation strategies in the post-epidemic era has been provided by the empirical analysis, which has made clear the relationships between the efficiency of a supply chain that is circular, economic policy uncertainty, and green innovation strategies. Additionally, it offers businesses a useful resource for handling the difficulties posed by the unpredictability of the economy and enhancing the effectiveness of the circular supply network. It provides businesses with practical ways to boost the efficiency of the circular supply chain and adopt green innovation initiatives.

The current literature on sustainability and GLM is affected by this study in a number of theoretical ways. Initially, our work adds to the conceptual structure of the NRBV & RDT, hence enhancing the scant literature

on SMEs in developing nations [35, 36]. In order to comprehend the variables influencing CEP and SP in a fiercely competitive business environment, our research broadens the application of the NRBV and RDT. Secondly, our study offers empirical support for the claim that GLM adoption is essential to improving CEP and SP. Our findings show that GLM promotes the CEP and SP, which is compatible with the NRBV hypothesis [36]. This outcome is consistent with research conducted globally in various sites. This shows that in order to achieve CEP and SP goals, the NRBV paradigm may be implemented anywhere and is not region-specific. Our research thus expands the range of businesses' NRBV.

Third, by establishing a clear connection between CEP and SP, our study broadens the body of knowledge. It implies that a greater amount of circular economy activity has a major positive impact on the SP of Chinese SMEs. This result is a crucial addition to the present research conducted in developing economies, since the majority of studies that have discovered an immediate relationship between CEP & SP have been conducted in established countries. The conversation about the place of green initiatives—in particular, CEPs—in the SP of organisation is advanced by the NRBV paradigm.

## CONCLUSION

The research's conclusions, in summary, have wide-ranging implications for managers, regulators, and legislators. According to this research, in order to attain SP and boost efficiency, a corporation should incorporate several GSCM activities with on-the-ground procedures while following the CEP. Many companies use the circular economy (CE), a low-cost technique, to convert their linear financial structures into ones that are circular, enabling long-term sustainability for the company. CE business models have the potential to boost an organization's worth and help overcome challenges related to a lack of resources. Additionally, a company's key strengths in attaining corporate sustainability will be strengthened by the CEP. It is increasingly requested of stakeholders to take GLM into account while creating an action plan for sustainability & analysing the outcomes of their CEP. The study will have a significant influence on South Asia because SMEs are essential to the region's expanding economies. To sum up, the results of this study are critical since they provide a thorough understanding of how the GL & CEP are actually implemented in order to improve SP. Lastly, by analysing and experimentally investigating the moderating impact of unpredictability in economic policy on the connection between green innovation & the effectiveness of the circular supply chain, we provide yet another significant contribution to the literature. Stated differently, a more unpredictable economic strategy increases the importance of green innovation in improving the circular supply chain's performance. Businesses would find it more difficult to get bank loans when the government implemented strict financial supervision regulations, which would put a great deal of financial strain on businesses' strategic investments.

The study's conclusions may have limitations even though they make a substantial contribution and may direct future research. The data collection for this study came from medium-sized and small-sized enterprises in Chinses, and would restrict the conclusions' generalizability. To confirm the accuracy of our observations, future studies might think about gathering data from different businesses and geographical areas. Furthermore, although the research's sample accurately reflect the target demographic, the results could be impacted by the sample size. As a result, other approaches to boost respondent engagement might be used in further research. Additionally, we used the PLS-SEM method for validating the model and analysing data**.**

## REFERENCES

Jiang, Y.; Meng, Q.; Li, X. Performance evaluation of regional scientific and technological innovation driving high-quality economic development. Stat. Decis.-Mak. 2021, 37, 76–80.

Cao, Y.; Li, W.; Lin, H. The path of high-quality development of China's regional logistics industry is based on the empirical analysis of 31 provinces and municipalities in China. Bus. Res. 2020, 12, 66–74.

Chen, Z.; Sun, G. A coordinated study on the coupling of scientific and technological innovation and high-quality economic development in Guangdong, Hong Kong and Macao. Yunnan Soc. Sci. 2021, 4, 92–100.

Tian, Q.; Liu, Y.; Li, N.; Wu, Q.; Liu, M. Study on the efficiency evaluation of logistics industry in the Pan-Ring Bohai Economic Circle based on DEA. Road Traffic Technol. 2020, 37, 149–158.

Bo, H.; Liu, T.; Liu, J.; Deng, S. A study on the level of open level of FTZ based on PCA-TOPSIS. Sci. Res. Manag. 2018, 39, 69–79.

Wang, W.; Kao, X. The study of logistics efficiency measurement in Bohai Rim area from the perspective of high-quality development c is based on the three-stage DEA model. Bus. Res. 2021, 4, 75–84.
Chen, Y. Under the background of high-quality economic development, the evaluation and promotion of regional logistics capacity in China--take Shandong Province as an example. Bus. Econ. Res. 2021, 15, 113–116.
Khan, D.; Kumar, A.; Samadder, S.R. Impact of socioeconomic status on municipal solid waste generation rate. Waste Manag. 2016, 49, 15–25.
Fu, Z.; Zhang, S.; Li, X.; Shao, J.; Wang, K.; Chen, H. MSW oxy-enriched incineration technology applied in China: Combustion temperature, flue gas loss and economic considerations. Waste Manag. 2015, 38, 149–156.
Kurniawan, T.A.; Lo, W.H.; Sillanpää, M.E. Treatment of contaminated water laden with 4-chlorophenol using coconut shell waste-based activated carbon modified with chemical agents. Sep. Sci. Technol. 2011, 46, 460–472.
Zhu, M.; Kurniawan, T.A.; Yanping, Y.; Dzarfan Othman, M.H.; Avtar, R.; Fu, D.; Hwang, G.H. Fabrication, characterization, and application of ternary magnetic recyclable Bi2WO6/BiOI@Fe3O4 composite for photodegradation of tetracycline in aqueous solutions. J. Environ. Manag. 2020, 270, 110839.
Premakumara, D.G.J.; Canete, A.L.M.L.; Nagaishi, M.; Kurniawan, T.A. Policy implementation of the Republic Act (RA) No. 9003 in the Philippines on MSW management: A case study of Cebu City. Waste Manag. 2014, 34, 971–979.
Guan, Y.; Ge, C.; Li, Z.; Nie, X.; Zhang, Z.; Luo, A. Metal contents and composting feasibility of rural waste from abandoned dumping site in Zhejiang, China. Energy Proc. 2011, 5, 1274–1278.
Zhang, W.; Zhang, L.; Li, A. Anaerobic co-digestion of food waste with MSW incineration plant fresh leachate: Process performance and synergistic effects. Chem. Eng. J. 2015, 259, 795–805.
Satya, A.; Harimawan, A.; Haryani, G.S.; Johir, M.A.H.; Vigneswaran, S.; Kurniawan, T.A.; Setiadi, T. Integrated treatment of submerged membrane and adsorption using dried Aphanothece sp for removal of cadmium from synthetic wastewater. J. Water Proc. Eng. 2021, 41, 102022.
Xiao, L.; Lin, T.; Chen, S.; Zhang, G.; Ye, Z.; Yu, Z. Characterizing urban household waste generation and metabolism considering community stratification in an urbanizing area of China. PLoS ONE 2015, 10, e0145405.
Fu, D.; Kurniawan, T.A.; Li, H.; Wang, H.; Wang, Y.; Li, Q. Co-oxidative removal of As(III) and tetracycline (TC) from aqueous solutions based on a heterogeneous Fenton's oxidation using Fe nanoparticles (Fe NP)-impregnated solid digestate. Environ. Pollut. 2021, 290, 118062.
Wang, M.M.; Liu, Z.Q. How do green innovation strategies contribute to firm performance under supply chain risk? Evidence from China's manufacturing sector. Front. Psychol. 2022, 13, 894766.
Xie, X.; Huo, J.; Zou, H. Green process innovation, green product innovation, and corporate financial performance: A content analysis method. J. Bus. Res. 2019, 101, 697–706.
Lee, K.H.; Min, B. Green R&D for eco-innovation and its impact on carbon emissions and firm performance. J. Clean. Prod. 2015, 108, 534–542.
Zhu, Q. (2016). Institutional pressures and support from industrial zones for motivating sustainable production among Chinese manufacturers. International Journal of Production Economics, 181, 402-409.
Dzwigol, H., Trushkina, N., & Kwilinski, A. (2021). The organizational and economic mechanism of implementing the concept of green logistics. Virtual Economics, 4(2), 41-75.
Gan, W., Yao, W., Huang, S., & Liu, Y. (2022). A study on the coupled and coordinated development of the logistics industry, digitalization, and ecological civilization in Chinese regions. Sustainability, 14(11), 6390.
Feng, K., & Lam, C. Y. (2021). An overview of circular economy in China: How the current challenges shape the plans for the future. The Chinese Economy, 54(5), 355-371.
Farooque, M., Zhang, A., & Liu, Y. (2019). Barriers to circular food supply chains in China. Supply Chain Management: An International Journal, 24(5), 677-696.
Fan, Y., & Fang, C. (2020). Circular economy development in China-current situation, evaluation and policy implications. Environmental impact assessment review, 84, 106441.
Wu, J., Nie, X., Wang, H., & Li, W. (2023). Eco-industrial parks and green technological progress: evidence from Chinese cities. Technological Forecasting and Social Change, 189, 122360.
Fu, J., & Ng, A. W. (2020). Green finance reform and innovation for sustainable development of the Greater Bay Area: Towards an ecosystem for sustainability. Sustainable Energy and Green Finance for a Low-carbon Economy: Perspectives from the Greater Bay Area of China, 3-23.
Savini, F. (2019). The economy that runs on waste: accumulation in the circular city. Journal of environmental policy & planning, 21(6), 675-691.
Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2023). Adoption of green finance and green innovation for achieving circularity: An exploratory review and future directions. Geoscience Frontiers, 101669.
Alkhuzaim, L., Zhu, Q., & Sarkis, J. (2021). Evaluating emergy analysis at the nexus of circular economy and sustainable supply chain management. Sustainable Production and Consumption, 25, 413-424.
Chen, Y.S.; Lin, Y.H.; Lin, C.Y.; Chang, C.W. Enhancing green absorptive capacity, green dynamic capacities and green service innovation to improve firm performance: An analysis of structural equation modeling (SEM). Sustainability 2015, 7, 15674–15692.

Lin, Y.H.; Chen, Y.S. Determinants of green competitive advantage: The roles of green knowledge sharing, green dynamic capabilities, and green service innovation. Quality 2017, 51, 1663–1685.

Tan, K.; Siddik, A.B.; Sobhani, F.A.; Hamayun, M.; Masukujjaman, M. Do Environmental Strategy and Awareness Improve Firms' Environmental and Financial Performance? The Role of Competitive Advantage. Sustainability 2022, 14, 10600.

Siddik, A.B.; Yong, L.; Rahman, M.N. The Role of Fintech in Circular Economy Practices to Improve Sustainability Performance: A Two-Staged SEM-ANN Approach. Environ. Sci. Pollut. Res. 2023.

Dey, P.K.; Malesios, C.; De, D.; Budhwar, P.; Chowdhury, S.; Cheffi, W. Circular Economy to Enhance Sustainability of Small and Medium Sized Enterprises. Bus. Strategy. Environ. 2020, 29, 2145–2169.