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Study of Factors Influencing Sustainable Supply Chain Management (SSCM) in China

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Abstract

Sustainability in the transportation and supply chain industry has been a concern for decades. Conversations have been ongoing about how to reduce the carbon footprint, incorporate electric vehicles into fleets, and adopt alternative fuels. Now, however, we're at a crossroad. The global climate crisis has reached a tipping point, highlighting transportation's contribution to the problem in the boardrooms of most corporations. And for good reason. According to the U.S. Environmental Protection Agency, transportation is responsible for nearly a third (29%) of all greenhouse gas emissions. While passenger vehicles make up a significant portion of that number, ships, trains, planes and freight trucks are also in the mix.

The purpose of this research is to study factors influencing Sustainable Supply Chain Management (SSCM) in China. These factors include seven first-order variables: independent variables: Carbon Footprint (CF), Organizational Practices (OP), Transportation Model (TM), Environmentally Responsible Packages (EP), Alternative Energy (AE), Partnership Initiative (PI), and Technology Development (TD); two second-order variables: Environmental, Social, and Governance (ESG) and Operating Model (OPER) and one dependent variable: Sustainable Supply Chain Management (SSCM). 400 sample were collected using electronic questionnaire through social media. We used Structural Equation Models (SEM) for data analysis. The result shows that since the RMSEA, which is an absolute fit index that assesses how far our hypothesized model is from a perfect model, for this model is .039 (<.05) which strongly indicates a "close fit" and the Goodness of Fit Index (GFI) value is .903 (>.90), the model seems to fit well according to the descriptive measures of fit. Moreover, CFI, which is incremental fit indices that compare the fit of our hypothesized model with that of a baseline model (i.e., a model with the worst fit), its value equals .956 indicating an acceptable fit.

Keywords: Sustainable Supply Chain Management (SSCM), SEM, Environmental, Social, and Governance (ESG), Blockchain, Internet of Things (IoT), and 3D printing

1. Introduction

1.1 Background of the Study

Sustainability in the transportation and supply chain industry has been a concern for decades. Conversations have been ongoing about how to reduce the carbon footprint, incorporate electric vehicles into fleets, and adopt alternative fuels. Now, however, we're at a crossroad. The global climate crisis has reached a tipping point, highlighting transportation's contribution to the problem in the boardrooms of most corporations. And for good reason. According to the U.S. Environmental Protection Agency, transportation is responsible for nearly a third (29%) of all greenhouse gas emissions. While passenger vehicles make up a significant portion of that number, ships, trains, planes and freight trucks are also in the mix.

The urgency to address sustainability in the transportation and supply chain industry has never been more critical. The consequences of ignoring this issue are dire and affect everyone on the planet. Climate change, air pollution, and resource depletion are just a few of the environmental challenges that threaten the health and well-being of our planet and its inhabitants.

The transportation sector is a significant contributor to greenhouse gas emissions, and reducing these emissions is critical to mitigating the impact of climate change. To address this challenge, many corporations are turning to electric vehicles, alternative fuels, and other sustainable transportation options. However, the transition to sustainable transportation is not without its challenges. One of the main barriers to adopting sustainable transportation is the high cost of transitioning to these new technologies. Electric vehicles, for example, can be expensive to purchase, and the necessary infrastructure to support them is not yet widespread. Additionally, companies may need to restructure their entire supply chain to accommodate these new technologies, which can be time-consuming and costly.

Another challenge is the lack of regulatory incentives to encourage sustainable transportation. Governments and regulatory bodies can play a crucial role in incentivizing sustainable transportation by offering tax breaks, subsidies, or other financial incentives to companies that adopt sustainable transportation practices. Despite these challenges, there is a growing recognition among corporations that sustainability in the transportation and supply chain industry is not just an ethical imperative, but also a business imperative. Companies that adopt sustainable transportation practices can reduce their carbon footprint, improve their brand reputation, and potentially save money in the long run.

Sustainability in the transportation and supply chain industry is a critical issue that requires urgent action. The transition to sustainable transportation is not without its challenges, but it is essential for mitigating the impact of climate change and securing a more sustainable future for our planet. Companies that take action now to adopt sustainable transportation practices can reap the benefits of a more sustainable future while also contributing to the global effort to combat climate change.

1.2 Statement of Problem

The problem statement for Sustainable Supply Chain Management (SSCM) in China is the lack of comprehensive and effective implementation of sustainable practices throughout the supply chain. Despite the increasing awareness of the importance of sustainability, many Chinese companies still prioritize short-term profits over long-term sustainability, leading to negative environmental and social impacts.

Furthermore, China's rapid economic growth and industrialization have led to increasing demands for resources and energy, exacerbating the environmental impacts of supply chain activities. The lack of regulations and enforcement of existing regulations also contribute to the problem, as some companies are not held accountable for their unsustainable practices.

The problem is compounded by the complexity of the Chinese supply chain, which involves multiple tiers of suppliers and subcontractors. This complexity makes it difficult for companies to trace their supply chain and monitor sustainability practices throughout the entire chain.

To address this problem, there is a need for a comprehensive approach to SSCM in China that involves collaboration among stakeholders, including government, industry, and civil society. Such an approach should prioritize the implementation of sustainable practices across the entire supply chain, from raw material sourcing to end-of-life disposal. It should also involve the development and implementation of regulations and incentives that encourage sustainable practices and penalize non-compliance. Overall, the problem of unsustainable supply chain practices in China requires urgent attention and action to ensure a more sustainable future for the country and the world.

1.3 Purpose of the Study

The purpose of this research is to study factors influencing Sustainable Supply Chain Management (SSCM) in China. These factors include seven first-order variables: independent variables: Carbon Footprint (CF), Organizational Practices (OP), Transportation Model (TM), Environmentally Responsible Packages (EP), Alternative Energy (AE), Partnership Initiative (PI), and Technology Development (TD); two second-order variables: Environmental, Social, and Governance (ESG) and Operating Model (OPER) and one dependent variable: Sustainable Supply Chain.

1.4 Literature Review

1.4.1 Environmental, Social, & Governance (ESG) Theory

Environmental, Social, and Governance (ESG) theory is a framework that integrates non-financial factors into investment decisions, aiming to generate sustainable and responsible returns. ESG factors encompass a wide range of issues, including climate change, labor practices, board diversity, corporate ethics, and community engagement. This theory has gained significant momentum in recent years, and investors are increasingly using ESG criteria to make investment decisions.

Environmental Factors:

Environmental factors within the ESG framework focus on a company's impact on the natural environment. Key issues include carbon emissions, resource depletion, waste management, and pollution. Research has consistently shown that companies with strong environmental performance are more likely to exhibit long-term financial outperformance (Friede , Busch, & Bassen, 2015). Furthermore, initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) provide guidelines for companies to disclose climate-related risks and opportunities, facilitating informed investment decision-making.

Social Factors:

Social factors refer to a company's impact on society and stakeholders, including employees, customers, and local communities. This includes issues such as labor rights, employee diversity, product safety, and community development. Research indicates a positive relationship between strong social performance and financial performance, as companies that prioritize social responsibility are more likely to attract and retain talent, enhance brand reputation, and build customer loyalty (Clark, Feiner, & Viehs, 2015).

Governance Factors:

Governance factors focus on the internal structures and practices of a company, including board composition, executive compensation, and shareholder rights. Robust governance practices promote transparency, accountability, and ethical decision-making. Numerous studies have demonstrated a positive correlation between strong governance and financial performance, highlighting the importance of effective oversight and risk management (Hawley, Hoepner, Johnson, Sandberg, & Waitzer, 2019).

History of ESG Theory:

The origins of ESG theory can be traced back to the socially responsible investing (SRI) movement of the 1960s and 1970s. SRI aimed to incorporate social and environmental considerations into investment decisions, and it gained popularity among investors who were concerned about the social and environmental impact of their investments. Over time, the SRI movement evolved into the ESG theory, which incorporates a more comprehensive framework for evaluating a company's sustainability and ethical impact.

Benefits of ESG Theory:

There are several benefits to using ESG criteria to assess a company's sustainability and ethical impact. First, ESG analysis provides investors with a more comprehensive view of a company's performance, beyond traditional financial metrics. This can help investors identify risks and opportunities that may not be captured by financial analysis alone.

Second, ESG analysis can help investors identify companies that are more likely to perform well over the long term. Companies that perform well on ESG criteria tend to have better risk management practices, stronger relationships with stakeholders, and more resilient business models. This can lead to better financial performance over the long term (Eccles & Serafeim, 2013).

Third, ESG analysis can help investors align their investments with their values. Many investors are concerned about the social and environmental impact of their investments, and ESG analysis can help them identify companies that align with their values (Grewal, 2018).

Challenges of ESG Theory:

Despite the benefits of ESG analysis, there are also several challenges associated with this approach. One challenge is the lack of standardization in ESG metrics. There is currently no standardized framework for evaluating ESG performance, which makes it difficult for investors to compare companies across industries and regions.

Second, there is a lack of reliable data on ESG performance. Many companies do not disclose information on their ESG performance, and there is no regulatory requirement for them to do so. This makes it difficult for investors to assess a company's sustainability and ethical impact accurately.

ESG theory provides a holistic framework for investors to incorporate environmental, social, and governance factors into their decision-making processes. As sustainability concerns continue to grow, integrating ESG considerations into investment strategies is crucial for achieving long-term value creation and promoting a more sustainable and equitable future.

1.4.2 Sustainable Supply Chain Management (SSCM)

Sustainable supply chain management (SSCM) is the integration of environmental, social, and economic factors into the supply chain decision-making process to create long-term value for all stakeholders. There are some theories and frameworks that have been proposed to guide SSCM practices:

Triple Bottom Line (TBL) Theory:

TBL theory is a sustainability framework that considers the economic, social, and environmental impacts of business operations. The theory suggests that companies should aim to create value in all three areas rather than focusing solely on profits. The TBL theory has been widely adopted as a guiding principle for SSCM (Elkington, 1999).

Natural Resource-Based View (NRBV):

NRBV theory posits that a company's competitive advantage is determined by its access to and use of natural resources. The theory suggests that companies can create a sustainable competitive advantage by managing their natural resources more effectively than their competitors (Hart, 1995).

Closed-Loop Supply Chain (CLSC) Theory:

CLSC theory proposes that waste from one part of the supply chain can be used as a resource in another part of the supply chain. The theory suggests that companies can reduce their environmental impact and create economic value by closing the loop and reusing materials and resources (Guide & Van Wassenhove, 2001).

Stakeholder Theory:

Stakeholder theory suggests that companies should consider the interests of all stakeholders in their decision-making process, including customers, employees, suppliers, and the community. The theory suggests that companies can create long-term value by balancing the interests of all stakeholders (Freeman, 1984).

Circular Economy (CE) Theory:

CE theory proposes a closed-loop system where resources are reused, and waste is minimized through a series of loops. The theory suggests that companies can create value by designing products and services that are durable, repairable, and recyclable (Ellen MacArthur Foundation , 2013).

1.5 Related Literature

1.5.1 Effect of Transportation Model Sustainable Supply Chain Management (SSCM)

Transportation is a crucial aspect of supply chain management, and it plays a critical role in achieving sustainable supply chain management (SSCM) goals. The transportation model used by a company can have a significant impact on its sustainability performance.

One of the critical impacts of transportation models on SSCM is the carbon footprint of the transportation process. The choice of transportation model can significantly affect the carbon emissions generated during the transportation process. For example, the use of rail or water transportation can result in lower carbon emissions compared to road transportation. According to a study by M. Adhikari et al. (2020), the use of intermodal transportation can result in significant carbon emission reductions, which is essential for achieving SSCM goals.

The choice of transportation model can also affect the social aspect of SSCM, such as the working conditions of the transportation workers. For example, the use of air transportation, which is known for its high-speed delivery, can have negative effects on the working conditions of the workers. According to a study by S. Sahu et al. (2018), air transportation can lead to increased pressure on workers, resulting in increased stress and fatigue.

Furthermore, the transportation model can also affect the economic aspect of SSCM, such as the transportation cost. For example, the use of intermodal transportation can be more cost-effective compared to road transportation, which can help companies achieve their economic sustainability goals. According to a study by J. Wang et al. (2019), intermodal transportation can help reduce transportation costs, which is essential for achieving economic sustainability.

1.5.2 Effect of ESG on Sustainable Supply Chain Management

ESG (Environmental, Social, and Governance) factors have become increasingly important in shaping sustainable supply chain management practices. ESG considerations are becoming critical in ensuring that companies can meet their sustainability goals, minimize risks, and maximize their impact on society and the environment.

ESG factors help companies to assess and manage risks, increase transparency, and enhance their reputation. By integrating ESG considerations into their supply chain management, companies can create sustainable supply chains that benefit both their business and the communities in which they operate.

For instance, a study by the consulting firm Accenture (2020) showed that companies that prioritize ESG factors in their supply chains experience a variety of benefits, including reduced supply chain risks, increased operational efficiency, improved supplier relationships, and enhanced brand reputation. Another study by MIT (2020) found that companies that integrate ESG factors into their supply chains can generate up to 20% cost savings and reduce greenhouse gas emissions by 16%.

Additionally, ESG considerations can play a critical role in attracting investors, as more investors are seeking sustainable investments that align with their values. It study by Morgan Stanley (2021), it was found that companies with high ESG ratings outperformed their peers in terms of profitability and share price performance.

In conclusion, ESG considerations are becoming increasingly important in shaping sustainable supply chain management practices. By integrating ESG factors into their supply chain management, companies can create sustainable supply chains that benefit both their business and the communities in which they operate.

1.5.3 Effect of Operating Model on Sustainable Supply Chain Management

The operating model of a company can have a significant impact on its ability to implement sustainable supply chain management practices. A sustainable supply chain is one that seeks to balance economic, environmental, and social factors in its operations. Companies with sustainable supply chains are increasingly valued by consumers, investors, and regulators for their ability to minimize negative impacts and create long-term value.

One key factor in implementing sustainable supply chain management is the degree of collaboration between the company and its suppliers. A collaborative approach can help ensure that suppliers share the company's commitment to sustainability and are willing to work together to identify and address environmental and social risks. This requires a level of trust and transparency that may not be present in traditional transactional supply chain relationships.

Another important factor is the level of integration between sustainability considerations and the company's overall business strategy. This requires a holistic approach to sustainability that considers the entire supply chain and seeks to minimize negative impacts at each stage. It may also require changes in procurement, manufacturing, and distribution processes to reduce waste, minimize energy consumption, and reduce greenhouse gas emissions (Ghosh & Shah, 2021).

Finally, the operating model must provide incentives for sustainable practices. This can include financial incentives such as reduced costs for suppliers that meet sustainability targets, or non-financial incentives such as recognition for sustainability achievements (Hoffmann & Sprengel , 2020).

Research has shown that companies that adopt sustainable supply chain management practices can benefit from reduced costs, improved brand reputation, and increased customer loyalty. A study by the MIT Center for Transportation & Logistics found that companies with sustainable supply chains had a 15% reduction in costs, a 25% increase in shareholder value, and a 20% increase in customer loyalty compared to companies without sustainable supply chains (Kiron, Kruschwitz, Haanaes, & Reeves, 2015).

In conclusion, the operating model of a company can have a significant impact on its ability to implement sustainable supply chain management practices. A collaborative approach, holistic approach, and incentives for sustainability are key factors that can help drive sustainable supply chain management. Companies that adopt sustainable supply chain practices can benefit from reduced costs, improved brand reputation, and increased customer loyalty.

1.5.4 Effect of Partnership Initiative on Sustainable Supply Chain Management

Partnership initiatives can have a significant impact on sustainable supply chain management by encouraging collaboration, transparency, and innovation among stakeholders. In this response, we will explore some of the effects of partnership initiatives on sustainable supply chain management, supported by references from academic literature.

Improved collaboration and information sharing: Partnership initiatives can bring together stakeholders from different parts of the supply chain, including suppliers, manufacturers, distributors, and retailers, to work towards common sustainability goals. This can help to foster collaboration, promote information sharing, and facilitate the adoption of best practices in sustainable supply chain management. A study by Handfield et al. (2014) found that collaborative partnerships among supply chain stakeholders can lead to improved sustainability performance.

Increased transparency and accountability: Partnership initiatives can also promote greater transparency and accountability in supply chain management by encouraging stakeholders to disclose information about their sustainability practices and performance. This can help to identify areas of improvement and enable stakeholders to work together to address sustainability challenges. For example, the Global Reporting Initiative (GRI) provides a framework for companies to report on their sustainability performance, which can be used to promote transparency and accountability in supply chain management.

Enhanced innovation and competitiveness: Partnership initiatives can also encourage innovation and help companies to gain a competitive advantage by promoting the development of new sustainable products, processes, and technologies. For example, the Sustainable Apparel Coalition (SAC) brings together leading apparel brands and retailers to develop a common approach to measuring and improving the sustainability of their products and supply chains. This can lead to the development of new, more sustainable products and processes, which can help companies to differentiate themselves in the marketplace.

In conclusion, partnership initiatives can have a positive impact on sustainable supply chain management by promoting collaboration, transparency, and innovation among stakeholders. These initiatives can help to improve sustainability performance, enhance accountability, and enable companies to gain a competitive advantage in the marketplace.

1.5.5 Effect of Technology Development on Sustainable Supply Chain Management

Technology development has had a significant impact on sustainable supply chain management. The use of technology has made it easier for organizations to manage their supply chains, reduce waste, increase efficiency, and improve environmental and social performance. Some of the ways that technology has impacted sustainable supply chain management are as follows:

Supply Chain Visibility and Transparency

Technology has enabled organizations to monitor their supply chains more closely, providing real-time information about the movement of goods and materials. This visibility helps organizations identify inefficiencies, reduce waste, and optimize transportation and logistics. For instance, GPS-enabled tracking systems and RFID tags are used to track goods, while blockchain technology provides a tamper-proof record of transactions, ensuring transparency and accountability (Yang, Huang, & Ngai, 2017).

Energy Efficiency and Carbon Footprint Reduction

Technology can help organizations reduce their energy consumption and carbon footprint. For instance, smart grid technologies enable the integration of renewable energy sources, reducing reliance on fossil fuels. Likewise, the use of sensors, automation, and artificial intelligence can improve energy efficiency by optimizing production processes, reducing waste, and lowering energy consumption (Sarkis, Zhu, & Lai, 2011).

Circular Economy

Technology can enable a circular economy by facilitating the reuse, repair, and recycling of materials. For example, additive manufacturing or 3D printing technologies allow for the creation of customized products from recycled materials. Meanwhile, reverse logistics systems can enable the collection and repurposing of products, reducing waste and promoting sustainability.

Social Responsibility

Technology can help organizations promote social responsibility in their supply chains. For example, mobile applications can be used to monitor and improve labor conditions, track worker health and safety, and address human rights violations. Additionally, social media can be used to raise awareness about social and environmental issues, promote sustainable practices, and engage stakeholders.

1.6 Hypothesis

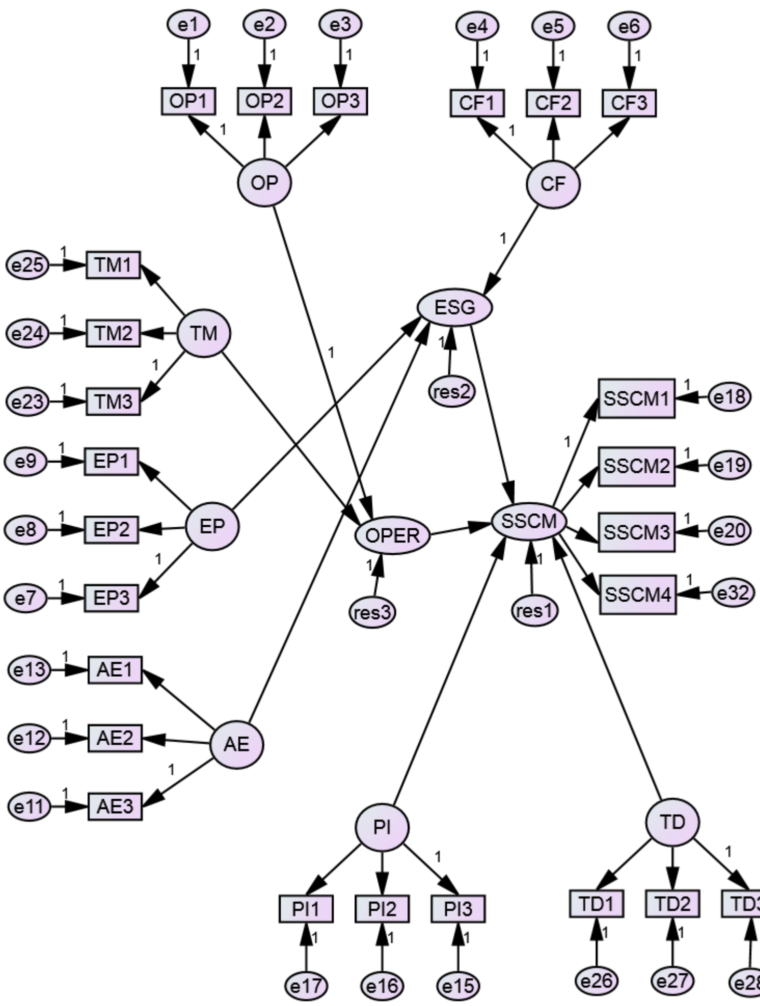
H1: Environment, Social & Governance (ESG) will have the effect on Sustainable Supply Chain Management (SSCM).

H2: Operating Model (OPER) will have the effect on Sustainable Supply Chain Management (SSCM).

H3: Partnership Initiative (PI) will have the effect on Sustainable Supply Chain Management (SSCM).

H4: Technology Development (TD) will have the effect on Sustainable Supply Chain Management.

The Hypothesized Model (Second-order SEM)



First-order variables: Carbon Footprint (CF), Organizational Practices (OP), Transportation Model (TM), Environmentally Responsible Packages (EP), Alternative Energy (AE), Partnership Initiative (PI), Technology Development (TD)

Second-order variables: Environmental, Social, and Governance (ESG), Operating Model (OPER)2. RESEARCH METHODOLOGY

2. Method

2.1 Research Strategy

In this study, a quantitative research method was employed to achieve the research objectives, which was to investigate the factors that Influencing on Sustainable Supply Chain Management (SSCM) in China. The researcher utilized questionnaires as a survey tool to collect and analyze data. The questionnaire was constructed based on relevant theories and approved by experts.

Quantitative research methods can be categorized into three types: descriptive, experimental, and casual comparative. This study adopted a casual comparative approach, which focuses on examining how the independent variables affect the dependent variable as part of cause-and-effect relationships, with a particular emphasis on the interaction between independent variables and the dependent variable (Williams, 2007).

The research sample was carefully selected from the population using a combination of convenient and purposive sampling methods. Inferential statistics, descriptive statistics, and Structural Equation Modelling (SEM) for Factor Analysis were the statistical techniques used for data analysis and interpretation.

2.2 Reliability

The value of Cronbach’s alpha coefficient is using by the researcher to measure the reliability of the Questionnaire. The researcher was performed 30 peoples as a sample for the pilot test and afterward enter the data into IBM SPSS 23 statistical software. The value of Cronbach’s alpha coefficient of the questionnaire must be greater than 0.70 for all parts, therefore the questionnaire is considered as reliable (Taber, 2018).

Criteria of Cronbach's alpha coefficient

Cronbach's alpha coefficient	Reliability Level	Desirability Level
0.80 – 1.00	Very High	Excellent
0.70 – 0.79	High	Good
0.50 – 0.69	Medium	Fair
0.30 – 0.49	Low	Poor
Less than 0.30	Very Low	Unacceptable

The result of Cronbach's Alpha Test from 30 samples: All Factors

Statement of each part	Alpha Coefficient	Accepted/ Not
Carbon Footprint	0.902	Accepted
Organizational Practices	0.857	Accepted
Transportation Model	0.915	Accepted
Environmentally Responsible Packages	0.921	Accepted
Alternative Energy	0.911	Accepted
Partnership Initiative	0.905	Accepted
Technology Development	0.875	Accepted
Environmental, Social, and Governance	0.827	Accepted
Operating Model	0.893	Accepted
Sustainable Supply Chain Management	0.925	Accepted
All Factors	0.903	Accepted

2.3 Population and Sample Size

2.3.1 Population

Population can be described as the people who lived in Beijing, China. The target population including the native and foreigners who live, work and study in Beijing not lower than 1 year.

2.3.2 Sample Size

Structural Equation Modeling (SEM) is a powerful and versatile technique that extends the generic linear model. Like other statistical methods, SEM has a set of assumptions that must be met or approximated to ensure accurate results. One of the main challenges in SEM is determining the appropriate sample size, which unfortunately has no general method for selection.

Bentler and Chou (1987) suggest that researchers use at least 5 examples for each parameter estimate in SEM analysis, assuming that the data is well-behaved (e.g., no missing data, normally distributed, etc.). Additionally, they recommend that researchers use 5 cases per parameter estimate instead of every observed variable. Since measured variables usually have at least one path coefficient related to another variable in the analysis, as well as a residual term or variance estimate, it is important to follow the recommendations of Bentler, Chou, and Stevens and have a minimum of 15 cases per measured variable. Most of the researchers are recommended to using the sample size of 200 or 5/10 cases per parameters at least (Kline, 2005).

Moreover, the outcomes of the simulation of Monte Carlo which is studying the use of confirmatory factor analysis models (Loehlin, 1992). After assessing his literature, he realizes that for this kind of model with 2 to 4 factors, the researchers should have a plan on collecting at 100 cases minimum, 200 cases is better (if possible). Consequences of using the smaller samples contain of more convergence failures (the software cannot make a acceptable solution), lowered precision of parameter estimates, inappropriate solutions (together with the negative error variance estimates for measured variables), and especially, standard errors – SEM program standard errors are computed under the assumption of large sample sizes.

Based on the many the researchers are recommended to using the sample size of 200 or 5/10 cases per parameters at least (Kline, 2005). This research has 25 parameters and the calculation of sample as follow:

$$28\times10=280$$

The sample size of this research is the 280. However, the researcher is choosing the 400 sample size which is often considered as the most "cost effective" sample size and it gives the statistical accuracy of ±5%.

3. Research Findings

3.1 RMR, GFI

Model evaluation uses root mean square residuals (RMR) as one of the review criteria, and a model is considered good or satisfactory if the RMR value is low. RMR is the root mean square of the residuals. RMR is the sum of the squares of the sample variances and covariances minus the corresponding estimated variances and covariances, and the square root of the mean. RMR is acceptable if it is less than 0.08. The smaller the RMR, the better the fit the smaller the RMR, the higher the goodness of fit. The goodness-of-fit index (GFI) is a measure of goodness-of-fit that ranges from 0 to 1 but can theoretically be a negative number with no significance. By convention, the GFI should be equal to or greater than 0.90 for the model to be considered acceptable. The adjusted goodness-of-fit index (AGFI) is the adjusted GFI value and should be greater than 0.9 or more for the model to be considered acceptable. Parsimonious normed fit index (PGFI) determines whether the research model is too complex, and the same sample information but similar models are better with a larger parsimonious index. Usually PGFI >0.50, the model is considered satisfactory.

Model	RMR	GFI	AGFI	PGFI
Default model	.094	.930	.914	.750
Saturated model	.000	1.000		
Independence model	.651	.229	.165	.212

According to the above table of our SEM result, the Goodness of Fit Index (GFI) value is .930 (>.90), the model seems to fit well according to the descriptive measures of fit. For the PGFI, our result is 0.75, which is greater than 0.50, so that our model can be considered as satisfactory.

3.2 Baseline Comparisons

The value of IFI, NFI, and CFI are meant to be lie between zero to one but the value should be closer to one. The value between 0.90 – 0.95 indicates that the model is adequate fit and if greater than 0.95 indicates that the model is very well fit (Hulland, Chow, & Lam, 1996).

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.895	.879	.956	.950	.956
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

According to the above table, CFI, which is incremental fit indices that compare the fit of our hypothesized model with that of a baseline model (i.e., a model with the worst fit), its value equals .956 indicating an acceptable fit.

3.3 RMSEA

RMSEA is possess the many interest among the evaluation of the fit indices because of its unique relative power of the combination of properties. RMSEA fit statistic is one of the most informative principles in covariance structure modelling (Byrne, 2001). The value of RMSEA is less than 0.05 indicates the good fit and value higher than 0.08 indicate that there are reasonable errors of the approximation in the population (Browne & Cudeck (1992) & Byrne (2001)).

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.039	.032	.045	.998
Independence model	.173	.168	.177	.000

Since the RMSEA, which is an absolute fit index that assesses how far our hypothesized model is from a perfect model, for this model is .039 (<.05) which strongly indicates a “close fit”.

4. Hypothesis Result

			Estimate	S.E.	C.R.	P	Label
ESG	<---	CF	1.000				
ESG	<---	EP	-1.222	.237	-5.157	***	
ESG	<---	AE	.995	.192	5.193	***	
OPER	<---	OP	1.000				
OPER	<---	TM	.878	.311	2.824	.005	
SSCM	<---	ESG	.209	.032	6.536	***	
SSCM	<---	OPER	.140	.039	3.584	***	
SSCM	<---	PI	.441	.036	12.159	***	
SSCM	<---	TD	.377	.033	11.378	***	

Hypothesis Result

According to our SEM Result,

H1: Environment, Social & Governance (ESG) have the effect on Sustainable Supply Chain Management (SSCM).

H2: Operating Model (OPER) have the effect on Sustainable Supply Chain Management (SSCM).

H3: Partnership Initiative (PI) have the effect on Sustainable Supply Chain Management (SSCM).

H4: Technology Development (TD) have the effect on Sustainable Supply Chain Management (SSCM).

5. Discussion

Environmental, Social, and Governance (ESG) and Operating Model (OPER), which are second-order factor of Carbon Footprint (CF), Environmentally Responsible Packages (EP), Alternative Energy (AE), and Organizational Practices (OP), Transportation Model (TM) respectively, seem to have significant effects on Sustainable Supply Chain Management (SSCM) in China due to their p-values are all less than .05. Also the first-order factors Partnership Initiative (PI) and Technology Development (TD) also significantly influence Sustainable Supply Chain Management (SSCM) in China for the same reason. That means if supply chain management companies in China can focus on ESG and their operating model by focusing on Organizational Practices (OP) e.g. using sophisticated business intelligence tools, economic and operational data can be integrated with supply chain goals to optimize day-to-day operations and long-range planning;) and Transportation Model (TM) e.g. consolidating loads and reducing truck idle time by being ready when goods are picked up or delivered, supply chain management companies in China will become more sustainable. This is also true for both Partnership Initiative (PI) e.g. collaboration among supply chain partners can improve supply chain performance, create new capabilities, and increase efficiencies; and Technology Development (TD) e.g. adopting and scaling innovative technologies such as machine learning, blockchain, internet of things (IoT), and 3D printing has potential to improve efficiency through improved visibility, flexibility and decision making across the supply chain.

Recommendations for Future Research

The generalizability of the findings are the limitations of this study. The sample used in this research was targeted on all age groups. So that future research should be choosing the certain age groups. The different viewpoints of confirmatory factor analysis (CFA) can also be applied on the factors which were reviewed in this research to find further inside on the Study of Factors Influencing Sustainable Supply Chain Management (SSCM) in China. Moreover, the different Structural construct and model can be used based on the factors discussed in the paper.

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