



## The Impact of Green Supply Chain Management on Export Performance of Exporters of Guilan Province Due to the Mediating Role of Environmental Performance

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### Abstract

The purpose of this study was to evaluate the effect of environmental performance mediator role on the effect of green supply chain management on export performance of exporting companies in Guilan province. The purpose of the study is applied and descriptive - survey type. The statistical population of the study consisted of sample export companies in 2017 with 38 companies and the whole population method was used due to the limited population size. The data collection tool was a standard questionnaire whose validity was confirmed by content validity and its reliability by Cronbach's alpha test. Structural equation modeling based on partial least squares approach was used for data analysis by Smart PLS3 statistical software. The findings showed that green supply chain management has a positive and significant effect on environmental performance and export performance of exporting companies in Guilan province. The impact of environmental performance on export performance of exporting companies was also confirmed. The mediating role of environmental performance on the impact of green supply chain management on export performance of exporting companies of Guilan province was also proved. Overall, it can be said that by improving environmental performance, the impact of green supply chain management on the export performance of exporting companies in Guilan province will improve.

### Keywords:

Green Supply Chain Management  
Environmental Performance  
Export Performance

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## INTRODUCTION

Corporate export performance is one of the key issues in this area, due to the increasing tendency in the world economy and attention to export development. Investigating the underlying factors of the success and export performance of the company has been the focus of much research, such as the studies of Abby and Steller, Chetty and Hamilton, Ketsix et al, Leonido et al. Influencing export performance provides valuable guidance for public policy makers and decision makers to design and implement effective marketing strategies and public policies (Chin, 2014). Because exports can obtain the foreign exchange resources needed for new investment. A company's export success can be gauged by its export performance. Various studies have been conducted on the factors affecting export performance (Monova & Artas, 2010). In each of these studies, variables were considered that, according to the researcher, directly or indirectly influenced export performance. Export performance is defined as the results for the company of international sales, which include the strategic and financial aspects of the operation (Shehadeh et al., 2018).

Export performance is one of the areas that has received little attention in international business, and there has been disagreement on a single definition. There are also numerous factors affecting it (Singh et al., 2016). Given the urgency of the day, most people in the world today are paying more attention to protecting the environment and bio-resources, a positive sensitivity that has intensified to the point that even industry owners are trying to use it as an effective step towards product acceptance. Take their offer to customers and use environmental considerations as a competitive advantage and create a strong competitive advantage by taking appropriate environmental action (Yu et al., 2014). Environmental performance refers to the consequences of the strategic actions of a company that manages its impact on the natural environment (Shehadeh et al., 2018).

In this regard, companies that consider environmental management or green supply chain management are considered to be socially responsible companies. According to McGuire et al. (1988),

corporate social responsibility is positively correlated with corporate business performance such as: stock market returns and accounting balances, and corporate social responsibility firms are in a better economic position than corporate ones. Are socially unaccountable (Omar et al., 2016).

Indeed, since the issue of the environment became linked to the economy and countries have come to the conclusion that environmental protection can increase efficiency, different approaches have been taken to achieve these goals, including the most recent one. The supply chain is green (Kirchoff, 2016). The purpose of green supply chain management is to adopt eco-friendly supply chain management practices including, internal environmental management, green shopping, customer engagement and environmentally friendly design for company development and operational strategies to Stability is the environment of the organization (Azar et al., 2016).

Singh et al. (2016) found that the adoption of green supply chain management by export firms positively influenced the creation of superior competitiveness in global markets. Altayyeb et al(2011) in a study of ISO14001 certified companies in Malaysia found that green procurement practices in line with environmental standards resulted in superior performance in major export markets such as the USA and the European Union. Many studies have also demonstrated the impact of green supply chain management on environmental actions (Kumar et al., 2017; al-Tayeb et al., 2017).

Monova and Hortas (2010) also found that environmental performance was positively correlated with firm financial performance. In their study, they analyzed the environmental performance of the company in 2004 and the financial performance of the company over the period 2005-2007. The results of these studies show that the environmental performance of the company has improved its internal performance and, in the following period, the financial performance of the company. Chen et al. (2006) also found that improved international business performance leads to improved environmental performance (Shehadeh et al., 2018).

Considering the importance of export problem

and consequently export performance, this study will investigate the mediating role of environmental performance in the relationship between green supply chain management and export performance among exporting companies in Guilan province. Guilan Province, due to its privileged border location through the Caspian Sea and the land border with the Azerbaijan border states, can definitely achieve its export goals with the awareness and attention to environmental issues and importance of the method. Provide very positive green feeds. Anzali Port Free Trade Zone will be one of the potentials of the province for easy and fast access to international markets. Given the important role that environmental issues play in developing European and Asian countries in the neighborhood of Iran, and in particular the land and sea borders of Guilan province, exporting companies in Guilan province can certainly do this. Show the agent as a competitive advantage to better enter and create a positive mental image of their export performance with a view to prioritizing the environment. Accordingly, the main question of the present study is: Does environmental performance mediate the relationship between green supply chain management and export performance of Gilan exporting companies?

Nowadays, green supply chain managers at leading companies seek to provide green logistics and environmental satisfaction across the supply chain to leverage green logistics and improve their environmental performance across the entire supply chain as a strategic asset. And base their goals on three important themes: green design, green production, and product recycling (Larry et al., 2015).

Zhou and Sarkis, (2004) suggest that firms that adopt a higher level of green practices have better environmental performance in manufacturing firms. The scales for green performance of research have been similar to those of Wagner and Schaltzger, (2004); (Ahmadi Noori and Niknejad, 2017). Thus, this study suggests that internal green practices have a positive relationship with the organization's green practices. Companies strategically segment their relationships so they can reach out to more community relationships whereby members of the supply chain partici-

pate. Rao, (2003) points out that organizations in Southeast Asia believe that inbound / outbound logistics leads to the use of environmentally friendly raw materials for green production (Miandehi & Momeni, 2013). Two of the earliest studies of green supply chain management studies are Sarkis et al. (2011) and Sarkis (1995). At this starting point in the history of green supply chain management, we can also cite Sarkis and Rashid's (1995) study that emphasizes the importance of integrating environmental issues into production and operations management in companies (Dubita et al., 2015 ). Wachon and Galsen(2006) also confirm that the goal of green supply chain management is to improve environmental management through environmental collaboration or through the analysis of bilateral issues that reduce environmental risks in supply chains. (Kirchoff et al., 2016).

Shang et al. (2010) conducted a study based on six dimensions of green supply chain management, namely eco-design, green manufacturing and packaging, environmental partnerships, green marketing, inventory and suppliers. The results showed that companies focused on green marketing had a successful competition against competitors (Wong et al., 2015).

Kumar et al. (2012) conducted a study entitled "Green Supply Chain Management: A Case Study on the Indian Electronic and Electrical Industries". This study examines ways of applying green supply chain and environmental performance in the electronic and electrical products industries located in India. Green Supply Chain Management Implementation Methods consist of 5 factors: Eco-shopping, Eco-accounting, Eco-logistics design, Eco-product design, Eco-production, Marketing and Communication, Economic Performance, Environmental Performance, Customer Engagement, Human and Technical Resources, Internal Environmental Management Performance, Operational Performance, Stakeholders, and Vendor Management (Basudia, 2016). Larry et al. (2015) conducted a study examining the relationship between performance of supply chain management activities and environmental performance in production. By studying the research literature, factors such as collaborating with suppliers, collaborating

with customers, monitoring suppliers, and monitoring customers were considered as good management activities. The results show that paying attention to green supply chain management activities will enhance the performance of the organization in environmental dimension. The theoretical model of this research is based on the

theoretical model of Shehadeh et al. (2018). In this model, green supply chain management, independent variable, export performance, dependent variable, and environmental performance, is the mediating variable. The following is the structure of the research model:

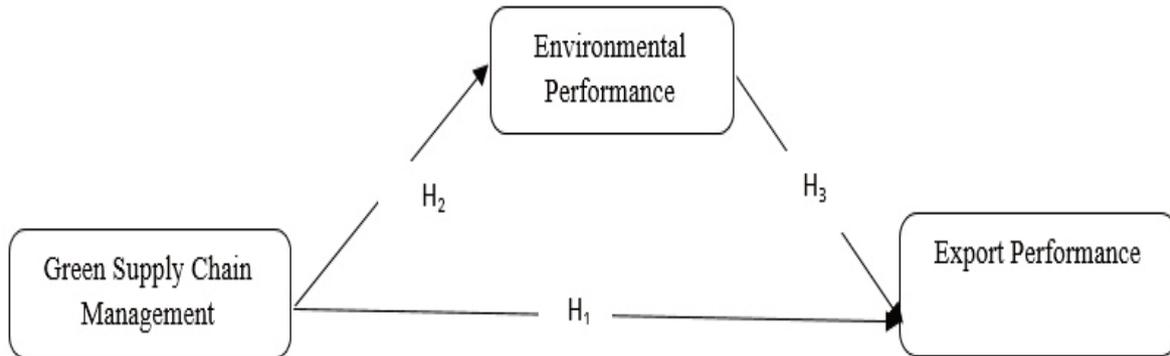


Fig.1. Conceptual Model

### RESEARCH HYPOTHESES

1. Environmental performance mediates the relationship between green supply chain management and export performance of exporting companies in Guilan province.

2. Green supply chain management has a positive and significant impact on the export performance of exporting companies in Guilan province.

3. Green supply chain management has a positive and significant impact on the environmental performance of exporting companies in Guilan province.

4. Environmental performance has a significant positive effect on export performance of exporting companies of Guilan province.

### RESEARCH METHODOLOGY

The purpose of this study is a descriptive-survey method based on data collection method. The statistical population of the study consisted of sample export companies in 2017 with 38 companies and the whole population method was used due to the limited population size. The data collection tool is a standard questionnaire. The reliability of the questionnaires was estimated by

Cronbach's alpha, which was higher than 0.7 and the validity of the questionnaire was confirmed by content validity and convergent and divergent validity. Structural equation modeling based on partial least squares approach was used to analyze the data and investigate the causal relationship between research variables using Smart PLS2 software. Table 1 is information about the questionnaire:

### RESEARCH FINDINGS

In the data analysis section, Structural Equation Modeling (SEM) with partial least squares approach was used and Smart PLS software was used to investigate the conceptual research model. This method is the best tool for analyzing research in which the relationships between complex variables, small sample size, and data distribution are abnormal. In addition, the partial least squares approach is a very good method for measuring causal relationships (Davari & Reza-zadeh, 2013). In the following, the findings of the data analysis are reviewed.

Table 1: Research Questionnaire Information

Variable	Dimensions	Number of questions	Reference
Green supply chain management	Environmental Design	20	Zou et al(2010)
	Green Purchase		
	Collaborate with customers		
	Indoor management		
Environmental performance	6	Chen(2014)	
export performance	5	Karniro et al(2016)	

### Evaluation of measurement model

Indicator reliability, convergent validity and divergent validity were used to assess the fit of the measurement model. The reliability of the index for measuring internal reliability includes three criteria: Cronbach's alpha, composite reliability, and factor loadings coefficients.

### Cronbach's alpha, combined reliability and convergent validity

Cronbach's alpha is an index that provides an estimate of reliability based on the internal consistency of the reagents and the appropriate value is greater than 0.7. In order to calculate reliability, there is another criterion that gives preference to the traditional method of calculation by Cronbach's alpha, which is called compound reliability (CR). The superiority of the composite reliability over alpha is that the reliability of the constructs is calculated not in absolute terms but in relation to the correlation of their structures with each other. Also, to calculate it, the factors with higher factor loadings are more important. As a result, both measures are used to better assess reliability.

For composite reliability above 0.7 it is appropriate. Constant validity is another criterion used to develop measurement models in structural equation modeling. Fornell and Larcker (1981)

have suggested the use of the extracted mean variance as a criterion for convergent validity. The criterion shown to be AVE desirable is higher than 0.5 (Davari & Rezazadeh, 2013).

Considering the Cronbach's alpha values and composite reliability reported in Table 2, as can be seen, all hidden variables have Cronbach's alpha values and composite reliability above 0.7, indicating appropriate model reliability. Also, the median of the variance extracted for the current variables is higher than 0.5; therefore, convergent validity of the measurement models is also desirable. Convergent validity is the second criterion used to fit the measurement model and shows the correlation of each structure with its dimensions. According to Table 2, the mean extracted for all variables and their dimensions is 5 It was greater than 0. This also indicates the validity of the model.

### Evaluation of structural model

After evaluating the validity and reliability of the measurement model, the structural model was evaluated through the existing binary variables relationships. In the present study, three criteria such as coefficient of significance (T-value), coefficient of determination ( $R^2$ ) and predictive power factor ( $Q^2$ ) were used.

Table 2: Describe the research variables

Attributes	Cronbach's alpha	composite reliability	AVE
Green supply chain management	0.773	0.822	0.739
Environmental performance	0.789	0.815	0.651
export performance	0.764	0.827	0.623

### Significant coefficients (T- Values)

The first criterion for fitting the structural model is the significant coefficients. These coefficients are applied to the model and are shown in Fig. (2). Accordingly, all coefficients were significantly higher than 1.96, indicating a significant relationship between the variables at 95% confidence level.

### Determination coefficient ( $R^2$ ) and predictive power factor ( $Q^2$ )

The results of the structural model analysis in the following table show the criterion (R-Squares) for all endogenous variables of the research model. The results of this criterion indicate that the structural model fit between perceived moral leadership, job attachment, and burnout was generally “strong” and in good measure. In addition,  $Q^2$  criterion (Criterion Geisser-Stone) was used to evaluate the predictive power of the model. Based on the results of this criterion in Table 3, it can be concluded that the model has a strong predictive power. After fitting the measurement and structural section of the present model, GOF criterion was used to control the overall fit of the model. Considering that the mentioned criterion

is equal to 0.501 and also according to the research of Watzlis et al. (2009), the general fit of the model is confirmed as “strong”.

### Testing hypotheses

After examining the fit of the measurement models and the structural model and having a good fit of the models, the research hypotheses were tested and tested. In the following, the results of the significant coefficients for each of the hypotheses, the standardized coefficients of paths for each of the hypotheses, and the results of the hypothesis testing are presented in Table 4.

The results of the hypotheses test and the significant coefficients according to Table 4 indicate that all the research hypotheses are confirmed. In Figures (2) and (3), all the research hypotheses are shown in the final model.

### Structural Model of Research

In this section, the structural model of research is presented in a standard and significant way:

Based on the results of Table 2 and Fig.2 and Fig.3, it can be said that all the research hypotheses are confirmed with 95% confidence.

Table 3: Coefficient of determination and power factor of prediction

	Environmental performance	export performance
$R^2$	0.335	0.530
$Q^2$	0.29	0.24

Table 4: Significant study of the path to test research hypotheses

Path	path coefficient	statistic t	Result
Green supply chain management → export performance	0.579	7.149	Meaningful
Green supply chain management → Environmental performance	0.332	4.361	Meaningful
Environmental performance → export performance	0.448	5.217	Meaningful
Green supply chain management → Environmental performance → export performance	0.192	5.783	Meaningful

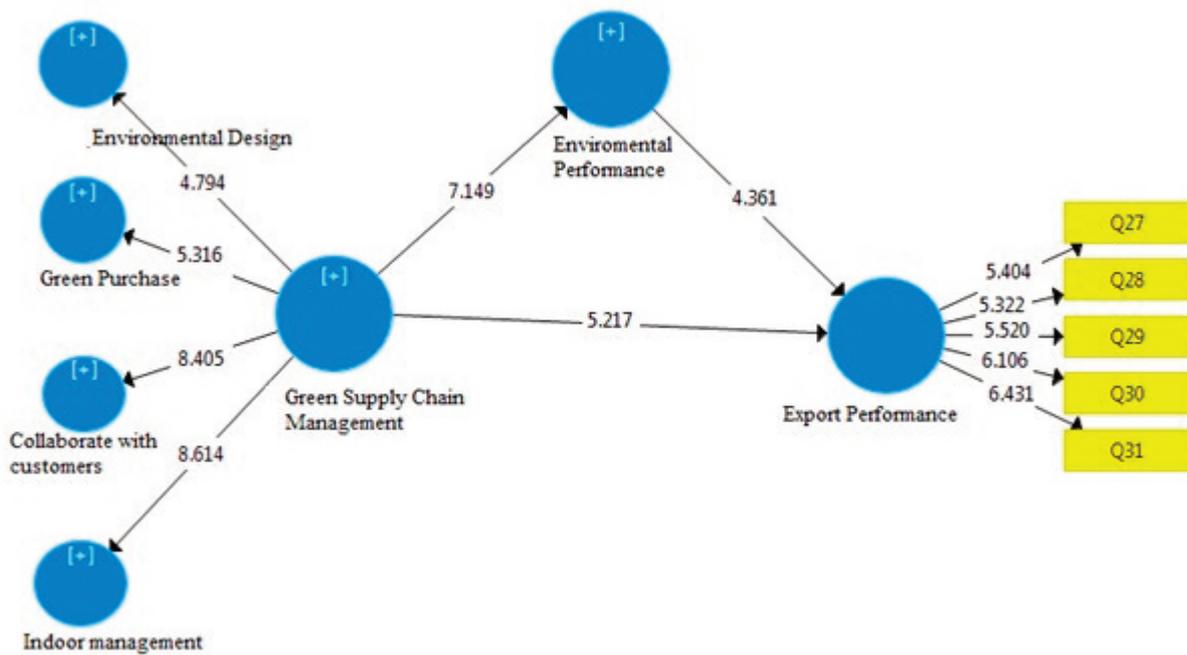


Fig.3. Structural Model of Research in Standard

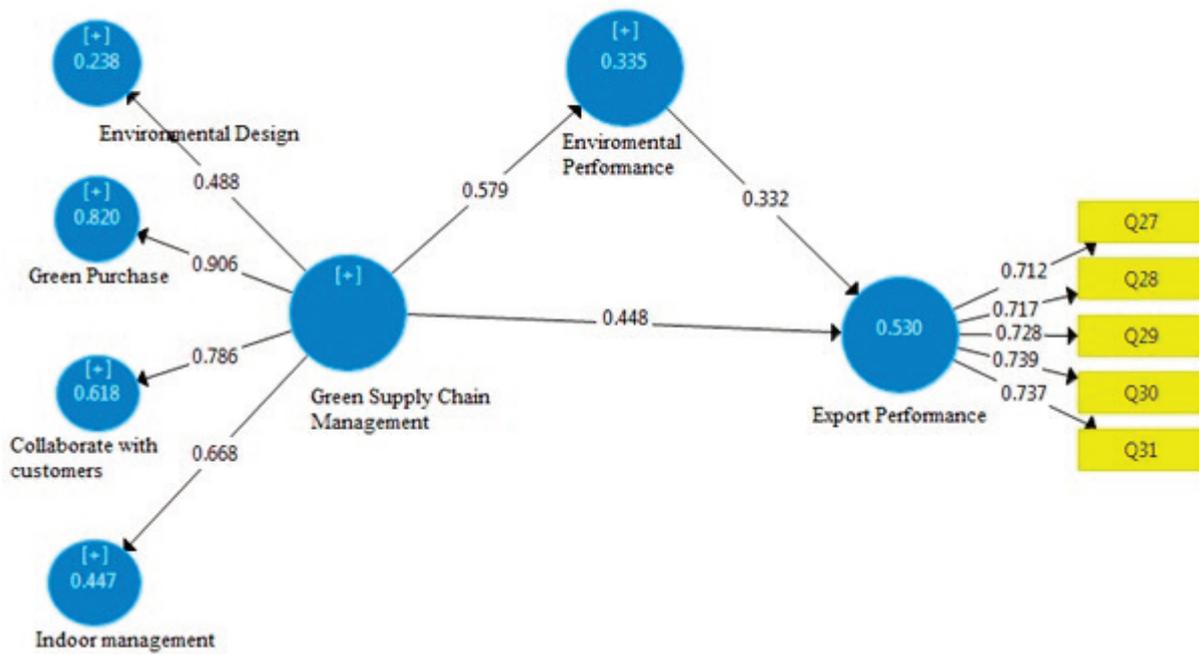


Fig.4. Structural Model of Research in Significance

## DISCUSSION AND CONCLUSION

The present study was conducted based on the theoretical model of Shehadeh et al. (2018) and with the aim of assessing the impact of green supply chain management on export performance of exporting companies in Guilan province, considering the mediating role of environmental performance. In this regard, to test the proposed model, four hypotheses were investigated by Structural Equation Modeling (SEM) using Smart Squares algorithm approach. In the first hypothesis, the effect of green supply chain management on export performance of exporting companies of Guilan province was investigated. By examining this hypothesis, it was found that the path coefficients between the two variables were 0.448 and at the significant level  $t = 5.27$ . Zhou and Sarkis (2004) suggest that firms that adopt a higher level of green practices have better environmental performance in manufacturing firms. The scales for green performance of research have been similar to those of Wagner and Schaltzger (2004) (Ahmadi Noori and Niknejad, 2017). Thus, this study suggests that internal green practices have a positive relationship with the organization's green practices. Also the results of this hypothesis are in line with the results of Ahmadi Noori and Niknejad (1396), Amini Lari and Bi taab (2016), Shehadeh et al., Sarpong et al. (2018), Elias et al. (2018), Kumar et al. (2017), Omar et al (2016), Chin and Solomon (2015) are in line.

In the second hypothesis, the impact of green supply chain management on environmental performance was investigated. Considering the significant coefficient  $t$  in the relationship between the two variables is equal to 7/149 and since this value is out of range (-1.96 & -1.96), it can be concluded that this hypothesis is confirmed and the intensity of this The correlation is 0.579. As a result, with at least 95% confidence, we can conclude: Green supply chain management has a significant positive impact on the environmental performance of exporting companies in Guilan province. The results of this hypothesis are in agreement with the results of Azizi and Moazzez (2018), Amin Tahmasebi et al (2018), Hassan-zadeh and Namdar (2017), Shehideh et al (2018) are in line.

Larry et al.(2015) conducted a study examining the relationship between performance of supply chain management activities and environmental performance in production. By studying the research literature, factors such as collaborating with suppliers, collaborating with customers, monitoring suppliers, and monitoring customers were considered as good management activities. The results show that paying attention to green supply chain management activities will enhance the performance of the organization in environmental dimension.

Considering the hypothesis of partial least squares method, it is observed that there is a significant relationship between environmental performance and export performance and considering the significant coefficient  $t$  in the relationship between two variables is equal to 4.361 and since This value is outside the range (-1.96 & -1.96), it can be concluded that this hypothesis is confirmed and the intensity of this relation is 0.332. As a result, at least 95% confidence can be accepted: Environmental performance has a significant positive effect on the export performance of exporting companies in Guilan. The results of this hypothesis are in line with the results of Sarpong et al. (2018), Elias et al. (2018), Kumar et al. (2017), Amin Tahmasebi et al. (2018), Hassanzadeh and Namdar (2017), Shehideh et al (2018). Is. Companies strategically segment their relationships so they can reach out to more community relationships whereby members of the supply chain participate. Rao (2003) points out that organizations in Southeast Asia believe that inbound / outbound logistics leads to the use of environmentally friendly raw materials, green production (Medi & Momeni, 2013). Two of the earliest studies of green supply chain management studies are Sarkis et al. (2011) and Sarkis (1995). At this starting point in the history of green supply chain management, we can also cite Sarkis and Rashid's (1995) study that emphasizes the importance of integrating environmental issues into production and operations management in companies (Dubita et al., 2015 ). Wachon and Galsen (2006) also confirm that the goal of green supply chain management is to improve environmental management through environmental collabora-

tion or through the analysis of bilateral issues that reduce environmental risks in supply chains. (Kirchoff et al., 2016).

Shang et al., (2010) conducted a study based on six dimensions of green supply chain management, namely eco-design, green manufacturing and packaging, environmental partnerships, green marketing, inventory and suppliers. The results showed that companies focused on green marketing had a successful competition against competitors (Wong et al., 2015). Also, the indirect relationship between green supply chain management and export performance through environmental performance is 0.192 at a significant level of 5.783. Therefore, it can be said that environmental performance plays a mediating role in the effect of green supply chain management on export performance of Gilan exporting companies. has it. Kumaru et al. (2012) conducted a study entitled "Green Supply Chain Management: A Case Study on the Indian Electronic and Electrical Industries". This study examines ways of applying green supply chain and environmental performance in the electronic and electrical products industries located in India. Green Supply Chain Management Implementation Methods consist of 4 factors: Eco-shopping, Eco-accounting, Eco-logistics, Eco-design, Eco-production.

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