

A Stakeholder Approach on the Impacts of Green Innovation on Firm Performance

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Abstract. Aiming to develop sustainably and achieve competitive advantage in a current competitive market, the issue of environmental protection could be seen as the top concern of firms at present. This study determined the role of organizational factors in green innovation in such a competitive market. In addition, this study also finds out the extent to which green innovation practice affects firms' performance including financial and non-financial performance. To examine the impact of each organizational variable on green innovation's intention, this research has utilized the stakeholder theory. A questionnaire survey on manufacturing firms was implemented, and 400 firms were investigated for exploring the influence between green innovation and organizational factors involved in organizational support and the quality of human resources. The result revealed that organizational support and quality of human resources influenced positively green innovation regarding Vietnamese manufacturing enterprises. Furthermore, this study has discovered a positive relationship between green innovation and company performance. Based on the findings, manufacturing enterprises can adjust their business strategies properly to achieve better firms' performance as well as a competitive advantage when implementing green innovation to develop their firms and protect the environment sustainably.

Keywords: Green innovation, Organizational factors, Organizational support, Quality of human resources, financial performance, non-financial performance, SMEs, Vietnam.

1. Introduction

Currently, the issues concerning environmental pollution, greenhouse gas, or climate change are becoming an urgent and global issue that each country has to consider to take responsibility and cooperate with others for solving the consideration effectively. The speedy rise of the economy and the rapid development of industrial parks are also the main reason causing environmental pollution and resource depletion. Manufacturing firms are considered as one of the main causes of environmental problems and many firms are trying to resolve that issue by adopting an active role in environmental management (Walker & Wan, 2012). Greenhouse gas emissions are caused primarily by enterprises, especially manufacturing firms. In addition to causing emissions, these firms are also the main consumers of finite natural resources and cause hazardous substances leading to significant risks to the health of the community and society (Ekins, 1993; Shrivastava & Hart, 1995). The lack of awareness of environmental protection and community benefits and highly considering the importance of immediate economic benefits are those primary inducements damaging the environment. Furthermore, they are afraid of conducting innovation due to the costs that can impact negatively on a firm's profits.

After a period of rapid economic growth, Vietnam has faced the enormous challenge of striking a balance between economic development and environmental sustainability (O'Rourke, 2004). Despite increasing efforts, the available evidence has indicated that environmental regulations in Vietnam have not been very successful in business compliance. Low levels of regulatory compliance are found in many critical sectors due to insufficient capacity of finance and poverty of strict enforcement by Vietnamese authorities (Ho, 2015). Small and medium enterprises often invest in temporary facilities to deal with environmental problems due to insufficient resources and high operating and maintenance costs, most of the waste treatment facilities only temporarily operated whenever the authorities conduct an inspection (Nham, 2012). According to Russo and Fouts (1997), an improvement or innovation in environmentally friendly manufacturing practices is associated with an improvement in corporate reputation and political acumen that helps businesses increase their attractiveness to environmentally conscious consumers and thereby improve sales significantly.

Green innovations that were considered as one of the most effective business strategies aiming to deal with competitive business at present has been becoming the most attractive topic making academics pay the most attention. Green innovations could be seen as new environmental approaches involving new methods or products that help to minimize detrimental environmental impacts of business operations (Ruslan et al., 2014; Seman et al., 2012). Wise enterprises have realized that changing their manufacturing methods can help to reduce the negative impact on the environment and successfully achieve the firms' goal in a highly competitive

market (Walker & Wan, 2012). Christmann (2004) and Bansal (2005) stated that green innovation can help firms to reduce pollution, save their compliance and operating costs, recycle materials or waste as well as increase the social reputation and economic profits.

Understanding the factors affecting green innovation of enterprises is also an attractive topic gaining huge attention from academics. Green innovation can be a process of carrying out a new approach concerning techniques, process, approach, or technical innovation to reduce the harm to the firm (Henriques & Sadorsky, 2007; Khoa, 2021). Many scholars have given various theories as to what factors impact firms' adoption of green initiatives such as stakeholder pressure, technological factors, environmental factors, corporate size, organizational culture, managers' traits, and human resources are key environmental and organizational variables frequently appear in research concerning environmental management, and innovation (Gonzalez-Benito & Gonzalez-Benito, 2006; Etzion, 2007; Gurlek & Tuna, 2017; Zhang & Zhu, 2019; Ha & Nguyen, 2022). In common, organizational support, quality of human resources is two proper characteristics' organizational factors fostering green innovation (Alvarez-Gil et al., 2007; Lee, 2008; Zhu et al., 2008).

This study aims to examine the relationship between organizational factors and green innovation and discover the impact of green innovation on firms' performance in Vietnamese manufacturing enterprises. It is argued that organizational support, quality of human resources are organizational resource-related variables that have been extensively studied in studies on technical innovation and environmental management (Jeyaraj et al., 2006; Lee et al., 2005). The stakeholder theory was utilized to get a holistic view of a company and to look into the effects of each stakeholder on green innovation methods. Freeman's stakeholder theory (1999) for the stakeholders was adopted in this study to explore the effects of internal stakeholders on green practices. Several studies on green issues in developed countries have taken organizational factors into account. However, those factors have not yet been considered in studies of environmental management in the Vietnamese manufacturing industry due to a lack of awareness, responsibility for environmental protection, and a tendency of developing-country enterprises to prioritize immediate economic benefits. There is indeed a lot to be learned empirically about how organizational factors influence green innovation evolution in this context. Therefore, this research will take organizational factors into account in the study. Understanding the determinant factors is critical for practitioners to best implement green practices and researchers to best understand the issues that should be addressed. Additionally, an understanding of the primary determinants is necessary for enterprises' owners and top management to adopt efficiently green innovation for achieving the goal. Recently, studies on the relationship between green innovation and business performance have been gaining

huge interest to researchers and have shown different results on the relationship in related industries. Previous research has recommended that improving firms' green situation in manufacturing processes can increase productivity and opportunities for improved environmental performance, sustainable business development, and a low-carbon economy (Montabon, 2007; Costantini et al., 2017). In addition, leading in innovating green practices could help businesses achieve significant benefits such as increasing product price, corporate image, opportunities in penetrating new markets, sustainable development as well as gaining competitive advantages (Chen et al., 2008). However, the relationship between green innovation and financial performance has not been clear and confirmed. Many studies have revealed that innovation has a positive impact on the financial performance of enterprises, some studies only showed the opposite relationship and no relationship (Naila, 2013). Weng et al. (2015) have called for empirical research to explore the relationship between green innovation and firm performance in different contexts, countries, and fields to compare and evaluate that impact in the new era (Alhadid et al., 2014; Kousar et al., 2017). In addition, Lin and Ho have (2011) called for assessing green innovation by other scales instead of using only the energy saving scale to get more general results. Therefore, this study is going to examine the relationship between green innovation and business performance in the Vietnamese context and apply a new scale for measuring green innovation and business performance.

2. Literature Review

2.1. Organizational factors

Organizational factors frequently appeared in research regarding green innovation. The organizational factor is also very important in the implementation of green innovation for the environment and society because modern humans with high expertise can control and operate the machine as well as organization smoothly and efficiently. In general, two acceptable organizational qualities that might improve green practice adoption are sufficient organizational resources and qualified organizational learning capacities (Lee, 2008; Zhu et al., 2008). So, gaining a holistic view of the implications of each firm's stakeholders on creating green practices is critical. It helps the top management understand the determinant factor that can lead a firm to successfully achieve the final goal and sustainable development (Weng et al., 2015). With sufficient support of the organization, human resources are more likely to adapt to changes, new knowledge to help a business sustain effectively and improve its competitiveness in the market to achieve its goals.

The influence of many organizational variables such as human resource quality, leadership abilities, organizational support, organizational culture, and organizational scale on enterprises' innovative behaviors have been studied (Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990). Organizational support

and the quality of human resources were discussed in this study. The amount to which a firm supports its employees by offering incentives for the adoption of a specific technology or system, as well as assuring the availability of financial and technical resources for effectively embracing innovation, is referred to as organizational support (Lin & Ho, 2011). Organizational support is critical in the growth of environmental management because employees will be more driven to adopt green behavior and the resources needed to adopt green innovation will be more readily available. Gonzalez-Benito and Gonzalez-Benito (2006) have confirmed that green initiatives are frequently sponsored and encouraged by top management to guarantee successful adoption. Top management's main job is to acquire resources and put them together into organizational skills so that the company may adopt green advances and obtain a competitive edge (Zhu et al., 2008). The quality of human resources has a significant impact on green innovation because the application of technical innovation requires employees to be qualified, capable of learning, and creative (Tornatzky et al., 1990; Weng & Lin, 2011). Green innovation adoption is a complicated process that necessitates careful cooperation and discipline (Russo & Fouts, 1997). Human resource expertise is required for innovation, which is dependent on the development and training of implicit skills through employee involvement (Hart, 1995; Del Brio & Junquera, 2003). Employees can increase their receptivity through training programs that can promote successful adoption of green innovation so that companies will gain higher creative capacity because staff capacity is significantly improved due to increased receptivity.

2.2. Green innovation

Faced with pressure from the government, stakeholders, and other institutions, as well as a desire to achieve a successful aim, businesses struggle to strike a balance between output and environmental protection. As a result, green innovation is defined as a novel solution to addressing that problem in various business activities (Berrone et al., 2013). It is critical to identify factors that influence green innovation and the impact of that innovation on enterprise performance to comply with environmental regulations and to develop firms and the environment in a sustainable manner (Salihu, 2016). Additionally, green innovation could be defined as new or improved processes, techniques, practices, systems, and products allowing enterprises to constantly improve their production and business efficiency, while maintaining sustainable development, minimizing raw material costs, increasing energy productive forces, and being socially responsible to avoid and minimize harm to the environment (Kemp et al., 2001; Beise & Rennings, 2005).

Green innovation can categorize into three sections involving green process, green product, and green management. In addition, it can be seen that green product innovation and green manufacturing process had a positive relationship with the competitive advantages of firms. The result of many studies showed that green

products and the green processes have an impact positively on competitive advantages, green image as well as the economic performance of enterprises (Rave et al., 2011; Chiou et al., 2011).

Green innovation seems to focus on cooperation for environmentally sustainable development at every stage in the production of goods and services (Velena & Ellenbecker, 2001). Green consumption, in other words, is ecologically responsible consumption in which consumers consider environmental implications when acquiring, utilizing, disposing of various products, or using other green services (Moisander, 2007). Therefore, enterprises have to pay much attention to the organizational factor for the application of green innovation to increase competitiveness and consumer support.

2.3. Firms' performance

The financial and non-financial performance of a company can use to measure firms' performance (Varnas et al., 2009). Market share, revenue, and profits are typically used to measure financial performance, whereas a company's reputation and competitive advantage are used to measure non-financial performance (Weng et al., 2015). Companies can offset their environmental expenses by boosting resource productivity through green innovation in terms of financial performance (De Burgos-Jimenez et al., 2013). Furthermore, by applying environmental policies, businesses can expand into new areas and enhance their market share (Weng et al., 2015). Improved non-financial performance can help the business gain higher customer loyalty, new customers, and a firm's image and reputation as a long-term operational goal (Blazevic & Lievens, 2004; Chen et al., 2009). Green inventors will gain the "first-mover advantage," according to Chen (2008), which includes higher product prices, a stronger firm image, new market prospects, and competitive advantages.

2.4. Relationship between organizational factors towards green innovation

Academics have examined a variety of organizational elements to analyze how they affected innovation, including human resources quality, top management leadership skills, organizational support, organizational culture, and organizational size (Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990; Etzion, 2007; Gonzalez-Benito & Gonzalez-Benito, 2006). According to previous research, the two organizational qualities most studied in technical innovation and environmental performance are sufficient resources and qualified employees (Damanpour, 1991; Jeyaraj et al., 2006). Available resources, support of the organization, organizational learning capacity, and qualified employees have been confirmed to influence positively on the adoption of green innovations (Lee, 2008; Lin & Ho, 2011). When an organization provides and allocates efficient resources can make employees perceive motivated so that the firm could enable to successfully implement the

green innovation for achieving the final goal. Additionally, employees having competent abilities in learning could be get engaged in training programs of tacit skills to help firms to enhance intention to adopt green innovation (Lin & Ho, 2011). Since the variables related to organizational resources are investigated properly in the study of technical innovation and green management, this study focuses exclusively on the quality of human resources and organizational support (Lee, 2008; Lin & Ho, 2011; Weng et al., 2015). The goal of this paper is to assess the impact of organizational factors on the adoption of green innovation in Vietnamese manufacturing corporations.

2.5. Relationship between green innovation and firms' performance

Green innovation is currently thought of as a new approach that allows organizations to continuously enhance their production and business efficiency while maintaining sustainable development, lowering raw material prices, preserving the natural, and providing more value to their operations. Green innovation, according to King and Lenox (2002), can assist businesses to increase their overall quality and profitability, as well as their operational efficiency. Some researchers have stated that businesses that specialize in green practices can help businesses benefit from higher product prices compared to competitors, increased sales due to greater social acceptance, as well as create a higher production economy and a positive impact on the financial performance of enterprises (Yan & Chien, 2013; Lin et al., 2019; Asadi et al., 2020). Customer satisfaction, product quality, supplier reliability, corporate reputation, and, most importantly, competitive advantage are all part of the non-performance works of art (Dury et al., 1993; Ahmad & Zabri, 2016). Green products and processes not only can reduce the negative impact on the environment, but also can increase a company's competitive advantage (Porter & Van Der Linde, 1995). Other empirical studies also support the findings of the previous study, indicating a favorable association between green innovation and a company's competitive advantage, as well as a greater company image and a higher possibility of expanding into new markets (Chen et al., 2006; Chiou et al., 2011; Gurlek & Tuna, 2017; Kahanaali et al., 2015). Based on the foregoing findings, the purpose of this article is to investigate the impact of green innovation on financial and non-financial performance in Vietnamese manufacturing organizations, although prior research had not conducted so.

2.6. Research Hypotheses

Based on the findings of the preceding research and Freeman's (1999) stakeholders theory, it is predicted that organizational support and human resources quality will also have a strong impact on green innovation in Vietnam's manufacturing industry. In addition, Green innovation is also expected to have a strong impact on business performance. The following are the hypotheses for this study:

H₁: In the industrial sector of Vietnam, there is a strong association between organizational support and green innovation.

H₂: In the industrial sector of Vietnam, there is a strong association between the quality of human resources and green innovation.

H₃: In the industrial sector of Vietnam, there is a strong association between green innovation and firms' performance.

2.7. The Research model of the study

Previous research has focused on a variety of elements that influence green practice innovation, such as organizational characteristics, stakeholder pressure, and environmental concerns (Kimberly & Evanisko, 1981; Aragon-Correa & Sharma, 2003; Lee, 2008; Guo et al., 2018; Borsatto, 2019). This research will focus on and utilize the stakeholder's theory of Freeman (1999) to find out the influence of organizational factors on green innovation in the context of Vietnamese manufacturing enterprises. Furthermore, the association of green innovation and firms' performance will be considered for discovering the level of impact. The research framework of this research is proposed below:

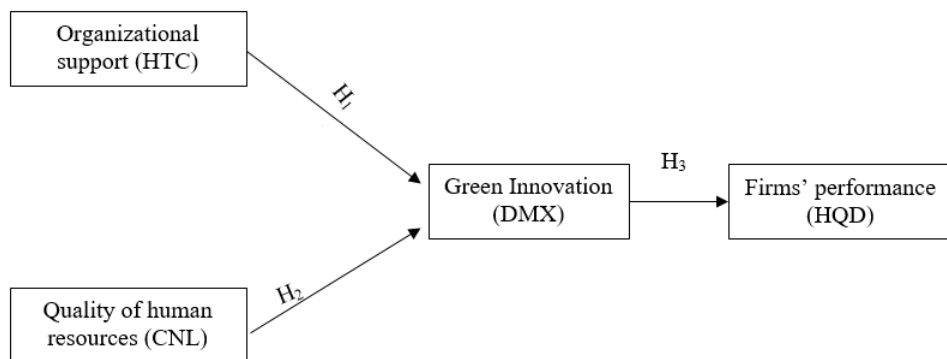


Fig.1: Research framework

3. Research Methods

3.1. Research Method

To determine the impact of organizational factors on green innovation and the relationship between green innovation and firms' performance, this study had adopted the quantitative research method. The next step was the stage of analyzing the data collected from the respondents. In this step, the Exploratory Factor Analysis (EFA) would be used for considering the factor structure of a set of observed variables in the study. Finally, the research models were formulated utilizing Structural Equation Modeling (SEM). In this study, PLS-SEM was used to estimate both the measurement modeling and the structural equation modeling for

the proposed research model of the author. Software SPSS 22.0 is used for descriptive statistics and testing the scale of factors while Smart-PLS 3.3.2 is also used for both measurement modeling and structural equation modeling.

3.2. Sample of the Study

The data for this study were from a questionnaire survey of organizations in the manufacturing sector located in the main industrial zones in Vietnam and was sent directly to respondents. The respondents in this survey were directors of those firms approaching through the focal point of infrastructure companies and industrial park management boards. The reason for choosing the directors as subjects for collecting data is to have a very knowledgeable understanding of the current businesses, involved in the decision-making process. The survey's participants were directors of organizations in the manufacturing industry in Vietnam's large industrial zones. To ensure that the entire population was represented, the survey was done with distinct groups of respondents who varied in gender, educational background, managerial experience, working seniority in the current firm, a form of business, and frequency of adopting green products. Based on the regulation of Hair et al. (2009) for sampling size when using the Structural Equation Modeling, the suitable size for samples was in the range from 300 to 500 to avoid computation difficulties in analyzing data, therefore, the sample of this survey was collected from 400 respondents working in the industrial zones across the country in the North, South and Middle Region of Vietnam. The convenience sampling method was used as this method helped the author collect the data from the population, which could be available to participate in this study. This study uses the software SPSS 22.0 and PLS-Smart 3.3.2 to process quantitative data collected from the collected survey owing to widely use in current studies and accept non-normal distribution data collecting from convenience sampling method.

4. Results

4.1. Descriptive statistics and Measurement modeling

According to Holland (1999), when analyzing data with Smart-PLS, indicators that needed to evaluate in the measurement modeling included outer loadings (relationship between indicators and reflective construct), reliability, convergent validity, and discriminant validity. In this study, the outer loadings of observed variables were all larger than 0.7 (>0.7) shown in table 1 below so that all observed variables had meanings in the modeling.

Table 1. All observed variables

	CNL	DMX	HTC	HQD
CNL1	0,772			
CNL2	0,776			
CNL4	0,822			

CNL7	0,826			
CNL9	0,745			
DQT3		0,838		
DQT6		0,812		
DQT9		0,810		
DSP3		0,855		
DSP6		0,814		
DSP7		0,775		
DSP9		0,800		
HTC1			0,801	
HTC11			0,742	
HTC2			0,752	
HTC5			0,774	
HTC6			0,774	
HTC8			0,825	
HQC1				0,770
HQC4				0,802
HQC6				0,818
HQC9				0,799
HQP1				0,831
HQP2				0,825
HQP3				0,829
HQP12				0,827

Furthermore, all scales had Cronbach's Alpha greater than 0.7 (> 0.7), confirming that they were all reliable. As demonstrated in Table 2, all scales had convergent validity because their Composite Reliability was higher than 0.7 and their Average Variance Extracted was larger than 0.5.

Table 2. Construct Reliability and Validity of factors

Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)	
CNL	0,849	0,859	0,892	0,622
DMX	0,916	0,918	0,933	0,665
HQD	0,927	0,927	0,940	0,661
HTC	0,870	0,874	0,902	0,606

All values of discriminant validity in this study were replied to on the rule of

Fornell et al., (1981) when testing the Measurement modeling with observed variables and measurement error. The minimum square root of AVE was found to be greater than the highest value of correlations among latent variables, as indicated in Table 3 below; therefore, the discriminant validity was ensured.

Table 3. Fornell-Larcker Criterion

	CNL	DMX	HQD	HTC
CNL	0,789			
DMX	0,439	0,815	0,813	
HTC	0,440	0,432	0,300	0,778

4.2. Testing the research hypothesis

In this study, the criterion for measuring the quality of PLS-SEM as well as the processes to test hypotheses relied on Hair et al.'s guidelines (2016). There was no appropriate measurement for the entire PLS-SEM, according to Hair et al. (2016); therefore, the quality of the model was evaluated by R square, Variance Inflation Factor (VIF), Path Coefficients, and Effect Size (f^2). The result in Table 4 showed that R square (R^2) was in the range from 0 to 1 (when approaching closely to 1, it means that independent variables explain more for dependent variables) so that the structural modeling had good quality.

Table 4. R Square

	R Square	R Square Adjusted
DMX	0.263	0.258
HQD	0,389	0,388

From Table 4 above, it can be seen that the R square adjusted of the independent factors green innovation (DMX) and firms' performance (HQD) was 0.258 and 0,388 respectively; therefore, the observed variables explained 25,8% and 38,8% of the upheaval of DMX and HQD respectively.

Table 5. Inner VIF values

	CNL	DMX	HQD	HTC
CNL		1,241		
DMX			1,000	
HTC		1,241		

When assessing PLS-SEM, the author used the result of the Variance Inflation Factor (VIF) to assess multicollinearity. Hair et al. (2016) asserted that a model with a VIF of 5 or higher is more likely to exhibit the multicollinearity phenomena. As

seen in Table 5 above, the research result showed that all VIF indexes were smaller than 5 (< 5); therefore, the author could conclude that there was no multicollinearity in the structural modeling.

The authors used Cohen's criterion (1988) to determine the effect size of factors as follows: if $f^2 < 0.02$: very small or no effect; $f^2 \geq 0.02$: small effect, ≥ 0.15 : medium effects, ≥ 0.35 : large effects.

Table 6. f Square

	CNL	DMX	HQD	HTC
CNL		0,104		
DMX			0,637	
HQD				
HTC		0,094		

With $f^2 > 0.02$ for each component, it can be inferred that organizational support (HTC) and human resource quality (CNL) had a small influence on green innovation in manufacturing enterprises; while green innovation had a larger effect on firms' performance.

Table 7: Result of testing hypotheses

Hypothesis	Hypothesis path	Path coefficients	P Values	Result
H ₁	HTC -> DMX	0,297	0.000	Accepted
H ₂	CNL -> DMX	0,309	0.000	Accepted
H ₃	DMX -> HQD	0,624	0.000	Accepted

After testing the concepts with reliability and validity, the structural modeling was applied to test the relationship among research hypotheses. Table 10 shows that H₁, H₂, and H₃ were accepted after testing the hypothesis with Path coefficients and P values. It was discovered that organizational support and human resource quality both had a positive impact on the firm green innovation, with path coefficients of 0.297 (Sig. = 0.000<0.05) and 0.309 (Sig. = 0.000<0.05), respectively. In addition. The result also indicated that green innovation influence positively on firms' performance with path coefficients of 0.624 (Sig. = 0.000<0.05)

All the path coefficients of factors were shown in the following figure of structural modeling:

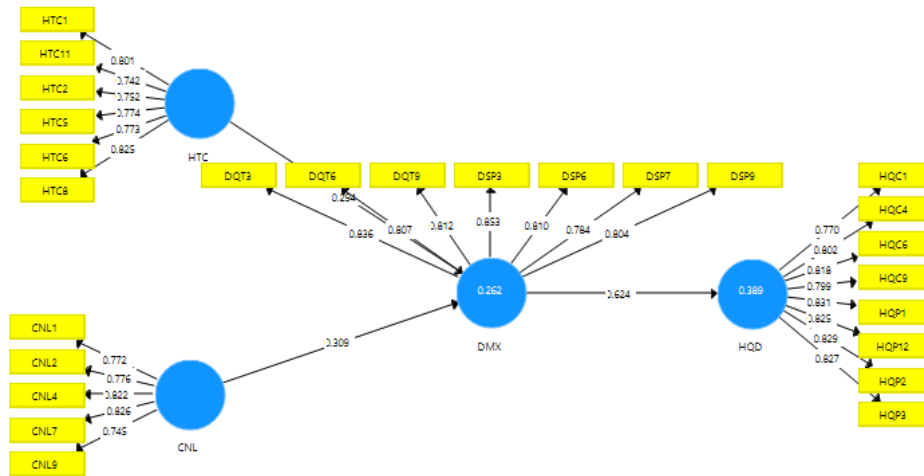


Fig. 2: The structural equation modeling of the study

5. Discussion

With the impact of $\beta = 0.297$ and P values = $0.000 < 0.05$, it can be concluded that H1 was supported which meant Organizational support affected positively green innovation. Organizational support, particularly top management support, is critical to promoting and ensuring successful adoption of green innovation in a competitive environment, according to the findings of previous studies (Lin & Ho, 2011; Zhu et al., 2008), as well as the theory of Stakeholder theory of Freeman (1999). Enterprises carry out strategic activities specifically green innovation to satisfy their stakeholders to achieve successful business goals and competitive advantage. The support of the organization is not only motivation but also a resource for employees to implement green innovation in enterprises. Therefore, manufacturing enterprises, especially small and medium enterprises, have to consider providing better available resources to help employees to improve their ability to perform well.

For Quality of human resources, with an impact of $\beta = 0.309$ and P values = 0.000 , it meant H2 was supported which meant Quality of human resources affected positively on green innovation. The findings of this study are in line with previous findings (Zhu et al., 2008; Christmann (2000), Weng & Lin 2011), as well as Freeman's (1999) Stakeholder Theory, which states that Quality of human resources is essential to promote green innovation, higher creative capacity, and to assist enterprises in more likely to successfully implement an advanced environmental strategy. Furthermore, research has shown that the quality of human resources has a significant impact on technical innovation because the application of technical

innovation requires employees to be qualified and have learning ability and creative capacity (Weng & Lin, 2011; Tornatzky & Fleischer, 1990). Therefore, investment in the quality of human resources has to be considered as a top priority; because without skilled human resources, soft skills, proficient manipulation with new machines and processes, enterprises cannot innovate is possible.

For Green innovation, with an impact of $\beta = 0.624$ and P values = 0.000, it meant H3 was supported which meant Green innovation affected positively on firms' performance. The findings of this study are consistent with the result of previous studies (Porter & Van Der Linde, 1995; Yan & Chien, 2013; Tang et al. 2017, El-Kassar & Singh, 2018; Asadi et al., 2020). The study found that enterprises implementing green innovation practices can reduce negative environmental impacts such as waste, emissions, and related general costs, leading to improved environmental performance, protecting and improving the living environment, and assisting businesses in creating competitiveness and sustainable socio-economic development in the current market. The research findings also support the view that green innovation will increase production efficiency, competitive advantage, and enterprise value, as well as have a positive impact on enterprise financial performance due to product differentiation from competitors and greater societal acceptance of the product (Rivera, 2002; Sher & Yan, 2005). This study found a contrasting result to previous studies in the Vietnamese context (Nham et al., 2012; Pham, 2018), which did not support a positive relationship between green innovation and firm performance. The outcomes of the research can be appropriate to the reality in Vietnam, which is currently entering a new period of development, with a stable and rapidly growing economy in the region and around the world. If businesses do not care about the environment and instead simply focus on profit, they will cause increasingly serious environmental pollution, particularly in industrial parks and densely populated areas, affecting the lives and health of the population as well as their reputation and financial losses.

6. Conclusion

To pursue effective sustainability, environmental aspects are recognized as the primary consideration worldwide. During the operation, manufacturing firms have been causing greenhouse gas emissions as well as hazardous substances. Businesses pay little attention to community and social wellbeing and environment, they mostly focus on organizational profits and are afraid to invest in green technology to protect the environment due to the costs affecting the profits of enterprises (Nham, 2012). To enhance the environmental situation, companies need to consider environmental issues as well as financial performance to have a competitive advantage in the market (Lin & Ho, 2011).

This empirical study was conducted to assess the relationship between organizational factors and green innovation of firms and the association between

green innovation and firms' performance in manufacturing sectors located in the main industrial zones in Vietnam. The results of evaluating the measurement modeling and structural modeling of PLS-SEM revealed that both organizational factors, such as organizational support and human resource quality, had a favorable impact on green innovation. Additionally, the research also found that green innovation had a strong impact on firms' performance. From the result of the study, it can be concluded that the contribution of the study became an important element to motivate Vietnamese enterprises to realize the significance of organizational factors in the adoption of green practice to have a relevant strategy and principal to sustain the firm effectively. The findings also serve as a foundation for demonstrating the consensus influence of green innovation on firm performance; as a result, top management of companies and production units must change the orientation and strategies of production enterprises to implement green innovation by Government and authority regulations to move towards sustainable development, increase reputation, and compete in new markets such as the green product market and climate change worldwide. In addition, it can enhance the self-consciousness of enterprises to actively participate in green innovation, improving their firm performance and environmental performance as well as have a part in protecting the environment and developing a green economy in Vietnam. Moreover, the findings of the study revealed that different sectors might behave differently to environmental challenges to their business success. The author proposed the following strategies for enterprise administrators to improve their performance when implementing green innovation based on the findings of the study: (1) Increasing appropriately the level of employee support, especially top management for promoting and ensuring successful adoption of green innovation to gain competitive advantages in a competitive environment; (2) Improving the quality of human resources through training and retraining or cooperation with domestic and international educational institutions to ensure high-quality human resources for the implementation of the green revolution in production and business (3) Having an appropriate policy on the salary and bonus mechanism, especially for talents as well as establishing and effectively using of "Talent Fund" to encourage talents to develop, dedicate, create, engage with the organization, (4) Having an overview of the impact of green innovation on performance of enterprises to be able to orient the businesses to develop sustainably due to help companies improve the overall quality of their units and achieve profits not only in terms of financial and non-financial efficiency in their production and business activities, but also demonstrate an responsibility with environment and society, (5) applying e-commerce to introduce green products and green services of enterprises to consumers or customers through channels on social networks.

This research, like other studies, had some drawbacks. To start with, the survey only investigated the effect of organizational characteristics on the adoption of

green practices by enterprises in the manufacturing sector in Vietnam, but there are additional elements that can influence green innovation intentions. Future studies should discuss and consider other factors including external factors, environmental factors as well as technical characteristics to discover and compare the impact of each factor on green innovation. Second, this research focuses primarily on the relationship between green innovation and firm performance, whereas environmental performance should be considered to determine the effectiveness of green practices. Future research should consider the impact of green innovation on environmental performance. Third, this survey was conducted only in the manufacturing sector while there are many firms in different business fields. Hence, future studies should be conducted to examine other business fields for getting general evaluations towards green innovation. Fourth, only the convenient sampling method was used to collect data in this study, which is considered a sort of non-probability sampling approach, but other sampling methods have numerous advantages. Finally, future studies may apply the proposed model to different contexts owing to the result varying differently in different countries, industrial sectors, or green practices.

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