THE INFLUENCE OF GREEN CORPORATE IDENTITY AND GREEN SUPPLY CHAIN MANAGEMENT ON PERFORMANCE OF THE INTERNATIONAL BUSINESS

By
MR. Suraporn ONPUTTHA

A Thesis Submitted in Partial Fulfillment of the Requirements
for Doctor of Philosophy (INTERNATIONAL BUSINESS) INTERNATIONAL PROGRAM
Department of INTERNATIONAL BUSINESS
Graduate School, Silpakorn University
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อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการโซ่อุปทานสีเขียวที่มีผลต่อผลการดำเนินงานของธุรกิจระหว่างประเทศ

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นายสุรพร อ่อนพุทธา

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The objectives of this research were 1) to study green corporate identity, employee’s green personal-social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand; 2) to investigate a positive influence of the green corporate identity on employee’s green personal identification, employee’s green social identification, and green supply chain management in automobile manufacturing industry in Thailand; 3) to investigate a positive influence of the employee’s green personal identification on employee’s green social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand; 4) to investigate a positive influence of employee’s green social identification on green supply chain management, and green business performance in automobile manufacturing industry in Thailand; 5) to investigate a positive influence of green supply chain management on green business performance in automobile manufacturing industry in Thailand; and 6) to study a positive influence of green corporate identity on green business performance in automobile manufacturing industry in Thailand through employee’s green personal-social identification and green supply chain management. The data were collected from 400 employees working in international automobile manufacturing companies, by using purposive sampling method to identify the target samples and followed by proportional sampling method to collect data within the purposed areas. Statistics used in the data analysis included descriptive statistics covering frequency, percentage, mean, and standard deviation, and inferential statistics including structural equation modeling.

The findings indicated that employees in automobile manufacturing industry in Thailand had opinion towards green corporate identity, employee’s green personal-social identification, green supply chain management, and green business performance in high and extremely high level. Regarding hypothesis investigation, the study indicated that green corporate identity had standardized direct effects on employee’s green personal identification with the standardized estimate as of 0.664, employee’s green social identification with the standardized estimate as of 0.151, and green supply chain management with the standardized estimate as of 0.823. In the meantime, employee’s green personal identification had standardized direct effects on employee’s green social identification with the standardized estimate as of 0.699, and green business performance with the standardized estimate as of 0.313. In addition, employee’s green social identification had standardized direct effects on green supply chain management with the standardized estimate as of 0.106 and green business performance with the standardized estimate as of 0.115. Lastly, green supply chain management had standardized direct effects on green business performance with the

standardized estimate as of 0.485 at the statistically significant level as of 0.05.

The managerial implication implies that automobile manufacturing industry in Thailand can utilize green corporate communication, visual identity, employee behaviour, culture, policy, forces and drivers and products and service to create green corporate identity and employees' identification, which can finally influence green supply chain management: green design; green procurement; green manufacturing; green reverse; green logistics; and green marketing, and green business performance: economic performance; environmental performance and social performance. In the meantime, theoretical implication advocates that green corporate identity can have an influence on green business performance through employee's green personal-social identification and green supply chain management. Lastly, the policy implication encourages the related governmental agencies to promote automobile manufacturing industry's environmental business operation.

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Suraporn ONPUTTHA

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1
INTRODUCTION

1.1 Research Background

Recently, it is impossible not to notice that international (global) trade across continents has reached critical junctures, playing an important role in increasing local and global competition and fear for many businesses (Cowling et al., 2018). Furthermore, technological advancements in the manufacturing and distribution of goods and services are resulting in increased borderless competition (Dhull & Narwal, 2018). The expansion of international trade not only puts pressure on business owners, but it also has an impact on regulatory bodies in charge of controlling and monitoring international trade flows (Hameri & Hintsa, 2009). With this in mind, and in the face of increasingly competitive and dynamic environments, finding new ways to help business owners increase their local and global competitive advantages is critical (Hameri & Hintsa, 2009; Hausman & Haytko, 2003).

Many researchers have proposed improving organizational performance within the organization by having efficient human management, reducing production costs, and/or attempting to increase product sales and services (Li et al., 2006; Ngniatedema & Li, 2014; Waithaka, 2014; Yamin et al., 1999; Zampese et al., 2016). However, focusing solely on improving organizational performance within the organization is no longer sufficient, and recent research suggests that examining the entire supply chain of the business where the products and services are produced (from upstream line) and distributed to end users (from downstream line) is required (Tan, 2002). There are numerous components encompassing "the systemic, strategic coordination of the traditional business functions and tactics across these businesses functions within a particular organization and across businesses within the supply chain" that run from upstream to downstream of the supply chain (Li et al., 2006; Masoumik et al., 2014; Motwani et al., 1998). Furthermore, many researchers claimed that "effective supply chain management" is very interesting for the purposes of improving the supply chain of the organization as a whole because managing supply chain effectively is the route for improving value stream performance (Towill et al.,

2000) and it can also help create potentially secured competitive advantages and improve organizational performance (Li et al., 2006).

In terms of supply chain management, it is no longer limited to the domestic market; it is now extended to supply chain management cross-border, linked by supply and distribution flows of product, service, and related information, with coordination, relationship and network through integration of functional activities including marketing, logistics, manufacturing, and procurement (Overby & Min, 2001). Indeed, Houlihan (1985) introduced cross-border or international supply chain management (ISCM), but it was not explicitly included in supply chain management definitions. However, ISCM has been the appropriate time to be mentioned and put in the literature (Akkermans et al., 1999) due to many drivers such as technology, firm performance, customer-supplier requirement, international competition, and international trade (Hameri & Hintsa, 2009).

Currently, with the aims of environmental observation and concerns both supported and promoted by country regulation and laws, many businesses improve their management of supply chain by focusing on the environment such as acceptance of ISO 14001 environmental standard (Alhamali, 2019; Aslam et al., 2019; Sari, 2017; Sarkis et al., 2011). This management of supply chain is called "green supply chain management (GSCM)". GSCM has been studied in various dimensions about the importance, driving factors influencing the implementation of GSCM into practice of organization for gaining the competitive advantages (Masoumik et al., 2014) and business performance or green performance including economic, environmental, operational and social performance (Geng et al., 2017; Zhu & Sarkis, 2007; Zhu et al., 2007a, 2012). With unlimited concept of GSCM to the domestic dimensions, international GSCM will be introduced to gain international competitive advantages and international business performance.

To improve the effectiveness of green supply chain management, organizations must have strategies in place to create and develop the organization so that it can be identified and perceived by others. Here, the concept of corporate identity is introduced to oversee communication and visual identity, behaviour, corporate culture, and market and industry condition (Abimbola et al., 2012; Balmer & Dinnie, 1999; Birkigt & Stadler, 1986; Melewar et al., 2005; Melewar &

Karaosmanoglu, 2006). However, corporate identity shows the others with the environmental concern of organization that the organization will be identified and perceived as a green corporate identity (Chang & Chen, 2013; Chen, 2011). Indeed, the organization needs to communicate these characteristics to all the relevant stakeholders in an effective and consistent way. Under these circumstances, corporate identity acts as a powerful tool for successfully managing the international green supply chain, and it can finally generate competitive advantage and green competitive advantages (Rolland & O'Keefe Bazzoni, 2009), creating successful business performance (Maurya et al., 2015). Hence, it is necessary to consider corporate identity that deals with green corporate concept.

Therefore, this research aims to investigate the effects of green corporate identity on green business performance mediated by employees' green personal-social identification and green supply chain management in automobile manufacturing industry in Thailand. The automobile manufacturing industry is selected in this study because they are the early industries that are essential to national development in terms of economy, employment, value creation, and automotive technology development. In 2019, these industries represented the huge value of Thai export, which it was worth about 844,940.9 million baht or 26,933,373,171.74 USD (Dansomboon & Narunart, 2020) and created jobs for more than 700,000 people in this industry (Thailand Board of Investment, 2017; Ploymee, 2020). Also, the automobile industry has a very clear structure of supply chain flowing from the upstream level to downstream level (Boon-itt & Paul, 2006). Moreover, these industries can yield a great number of environmental impacts (García-Machado & Martínez-Ávila, 2019). With that, the research result can be greatly beneficial to organizations, the environment, and the society.

1.2 Research Questions

Because there has been little research on the effects of green corporate identity on green business performance as mediated by employees' green personal-social identification and green supply chain management in Thailand's automobile manufacturing industry, the following research questions were developed:

1) What is green corporate identity, does it have influence on employee's green personal-social identification and green supply chain management in the automotive industry in Thailand, and how?

2) What is employee's green personal-social identification, does it have influence on green supply chain management and green business performance in the automotive industry in Thailand, and how?

3) What is green supply chain management, does it have influence on green business performance in the automotive industry in Thailand, how?

4) How does green corporate identity affect the green organizational performance through employees' personal-social identification and green supply chain management in the automobile manufacturing industry in Thailand?

1.3 Objectives of the Study

The following objectives are being pursued to investigate the impact of green corporate identity and green supply chain management on international business performance:

Objective 1: To study green corporate identity, employee's green personal-social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

Objective 2: To investigate a positive influence of the green corporate identity on employee's green personal identification, employee's green social identification, and green supply chain management in automobile manufacturing industry in Thailand.

Objective 3: To investigate a positive influence of the employee's green personal identification on employee's green social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

Objective 4: To investigate a positive influence of employee's green social identification on green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

Objective 5: To investigate a positive influence of green supply chain management on green business performance in automobile manufacturing industry in Thailand.

Objective 6: To study a positive influence of green corporate identity on green business performance in automobile manufacturing industry in Thailand through employee's green personal-social identification and green supply chain management.

1.4 Conceptual Framework

Figure 1 depicts the theoretical framework of this study. The exogenous variables include green corporate identity, employee's green personal identification, employee's green social identification, and green supply chain management Meanwhile, the endogenous variable includes green business performance.

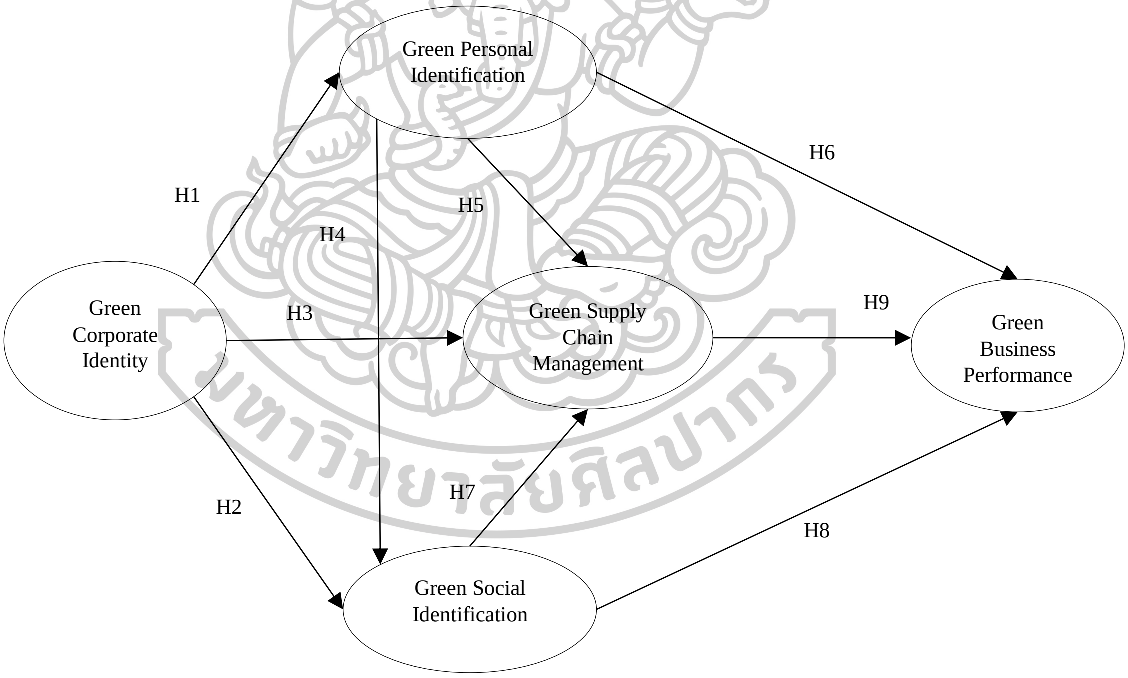

Figure 1 Conceptual framework

1.5 Hypotheses

The researcher specifies the hypotheses to obtain the study objectives with the empirical study on the related theories as follows:

H1: Green corporate identity has a positive influence on employee's green personal identification.

H2: Green corporate identity has a positive influence on employee's green social identification.

H3: Green corporate identity has a positive influence on green supply chain management.

H4: Green personal identification has a positive influence on green social identification.

H5: Green personal identification has a positive influence on green supply chain management.

H6: Green personal identification has a positive influence on green business performance.

H7: Green social identification has a positive influence on green supply chain management.

H8: Green social identification has a positive influence on green business performance.

H9: Green supply chain management has a positive influence on green business performance.

1.6 Research Scopes

1.6.1 Population and Samples

The population will include employees who are working in the area of supply chain management, encountering cross-border procurement, manufacturing, product design, marketing and distribution, logistics, and recovery in Thailand' automobile manufacturing companies that have purchased manufacturing supplies and sold products across the nation's boundary. The study collected approximately 400 samples.

1.6.2 Study Area

The study area includes automobile manufacturing industry located in main industrial estate in Bangkok and other industrial provinces, Thailand. The automobile manufacturing industry is included in this study because they have a significant impact on the Thai economy, including GDP, job creation and employment, and innovation dissemination, etc (Boon-itt & Paul, 2006; Oxford Analytica, 2018; Rito, 2017). In other words, Thailand has been heavily reliant on the production and export of automobiles and automobile spare parts. According to the statistics on Thailand's product export in 2019, Thailand exported automobiles and spare parts worth more than 846,435.2 million baht, ranking first in the world (Information Technology and Communication Center, 2019). Thailand's automobile manufacturing companies have been established in many provinces, including Samut Prakan, Chachoengsao, Chon Buri, Ayutthaya, Prachinburi, and Rayong manufacturing and selling to domestic and international prospects. However, the companies that are selected for the study covered only the companies that have purchased manufacturing supplies and sold products across the nation's boundary.

1.6.3 Variables

There are two main variables: The exogenous variables which include green corporate identity, employee green identification, and green supply chain management. For green corporate identity, it includes green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green corporate policy, green forces and drivers, and green products and services. For employee green identification, it includes green personal identification and green social identification. For green supply chain management, it includes green procurement, green design, green manufacturing, green marketing, green logistics, and green recovery. In the meantime, the endogenous variable includes green business performance: economic performance, environmental performance, and social performance.

1.7 Definition of Terms

Green corporate identity: It refers to the explicit management and strategic tool adopted by the corporate to positively express the distinguished and recognizable identity manifested by corporate value, corporate culture, and corporate behaviour responding towards external and internal forces in the market and industry condition through corporate mission, corporate strategy, corporate communication, visuality, and corporate products and services delivered to related stakeholders, including employees, customers, suppliers, governors, and the community (Abratt, 1989; Balmer, 1995; Balmer & Dinnie, 1999; Balmer & Gray, 1999; Leuthesser & Kohli, 1997; Margulies, 1977; Markwick & Fill, 1997; Maurya et al., 2015; Melewar & Karaosmanoglu, 2006; Melewar & Wooldridge, 2001; Olins, 1990; Otubanjo & Melewar, 2007; Portugal & Halloran, 1986; van Rekom, 1997).

Green corporate communication: It refers to how the corporation has communicated with its internal and external stakeholders about environmental concerns, management, and protection to improve stakeholder relationships and understanding of the corporation's distinguished identity (Balmer, 1995; Balmer & Gray, 1999; Maurya et al., 2015; Melewar, 2003; Melewar & Karaosmanoglu, 2006; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014).

Green corporate visual identity: It refers to how the corporate present the corporate identity in terms of value, philosophy, mission towards environmental concerns, management, and protection with stakeholders through graphic design, color, symbol, logo and typography through possible ways such as product, location, vehicle, printing, and other media channels (Baker & Balmer, 1997; Dowling, 1995; Melewar, 2003; Tourky, 2013).

Green corporate culture: It refers to the pattern of behaving, accomplishing, and learning in the corporate by the corporate members under the vision, shared value, history, philosophy, principles and guidelines related to environmental concerns, management and protection corresponding to external adaptation and internal integration (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Melewar & Wooldridge, 2001; Mohamad et al., 2007; Podnar, 2005; Schein, 1985; Tourky, 2013; Van Riel & Balmer, 1997).

Green employee behaviour: It refers to the pattern of in-role and extra-role working behaviours of the employees in the corporate under the shared values, culture, structure, and strategy related to environmental concerns, management, and protection of the corporate (Boiral & Paillé, 2012; Chun, 1994; Iqbal et al., 2018; Norton et al., 2015; Norton et al., 2014; Safari et al., 2018; Sukortprommee, 2013; Yang et al., 2019).

Green corporate policy: It refers to the commitment statement of the corporate expressing and highlighting the stakeholder objectives and environmental-friendly ways of working and collaborating on how to achieve the corporate goals in the responsiveness towards environmental conservation, management, and protection (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005).

Green forces and drivers: It refers to the external forces concerning environmental issues arising from industrial involvement, internationalization, technological innovation, governmental matters, and society, which require the corporate to confront and be concerned about (Alhamali, 2019; Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Karimi & Rahim, 2015; Maditati et al., 2018; Malviya & Kant, 2017; Mathiyazhagan & Haq, 2013; Melewar, 2003; Melewar & Akel, 2005; Melewar & Wooldridge, 2001; Rashid et al., 2018; Walker et al., 2008).

Green products and services: It refers to the features that are playing a match between the customers' expectations and perceptions of the product, covering products and after-sales services, and building customer relationships (Balmer & Stotvig, 1997; Melewar & Wooldridge, 2001).

Employee green personal-social identification: It refers to the self-reflection or expression that the individuals themselves fit into the organization and society, meaning that the individuals (personality, values, attitudes, image, and practices) match with the organization in terms of culture, values, practices (personal identification) and match with the society in terms of social acceptance, social status, and social role (social identification) (Carroll & Ahuvia, 2006; Lassar et al., 1995; Sukortprommee, 2013).

Green personal identification: It refers to the identification of the employee's self-expression indicating that he or she feels a sense of belonging to the organization in the way that the organization's identity and management on environmental awareness and protection match her or his individual personality, attitudes, values, and practices (Lassar et al., 1995; Sukortprommee, 2013).

Green social identification: It refers to the employee's expression indicating that the organization influences him/her/ in terms of status, role, and image to be matched and accepted by the group of people or society intending to conform the management related to environmental concerns and protection (Carroll & Ahuvia, 2006; Sukortprommee, 2013).

Green supply chain management: It refers to the management of supply chain done by the organization and its members with the purposes to obtain better management and environmental friendliness, which the related supply chain activities include inputs purchasing, product and service designing, product manufacturing, product and service marketing, logistics, and investment recovery. Each activity concerns green concepts (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Rajendran, et al., 2015; Govindan, Soleimani, et al., 2015; Green et al., 2012; Kuei et al., 2015; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu et al., 2007a).

Green design: It refers to the design and requirements of manufacturing the products together with minimizing the negativity on the ecological environment, which supports the products and its components to be potentially reused, recycled, and recovered. In addition, the green design can also include the design that help save energy, promote friendly usage, and reduce pollution corresponding to the needs of customers through manufacturer-customer collaboration (Arena et al., 2003; Beamon, 1999a, 1999b; Eltayeb et al., 2011; Fiksel, 1996; Green et al., 2012; Gungor & Gupta, 1999; Lin, 2013; Tseng & Chiu, 2013; Zhu et al., 2007a).

Green procurement: It focuses on the ways the organization cooperates and purchases the inputs, material, equipment, technology, and other supplies from domestic or internal suppliers that involve the provision of environmental supplies that are of environmental standard, requirements, and objectives (Çankaya & Sezen, 2019; Carter et al., 1998; Green et al., 1998; Green et al., 2012; Jabbour et al., 2013; Kannan et al., 2014; Yang et al., 2013; Zhu et al., 2008a).

Green manufacturing: It refers to the production or manufacturing process of the products with the aims and requirements of reducing hazardous-chemical inputs, wastes, air-noise-water-soil pollutions, production costs, and energy consumption through efficient production, manufacturing improvements, proper technology section, strategic planning, and standard acceptance (Kuei et al., 2015; Nawrocka et al., 2009; Prajogo & Olhager, 2012; Prajogo et al., 2012; Prajogo et al., 2018; Robèrt, 2000; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007).

Green marketing: It refers to the activities of marketing the products to the customers. It includes marketing strategies, marketing process and marketing activities. Additionally, the green marketing extends to market segment, market positioning, pricing, and advertising (Chan et al., 2012; Zampese et al., 2016).

Green logistics: It refers to logistics activities such as transportation, information flows, logistics planning, and product delivery being done effectively through the requirement of environmental concerns and management such as discharged pollution reduction, time-saving, and energy consumption reduction etc, by having a good planning, practices and policy (Enarsson, 1998; Green et al., 2012; Kuei et al., 2015; Salimifard et al., 2012; Tippayawong et al., 2015).

Green recovery: It refers to the organization's action of determining the value remaining in no-longer-used manufacturing inputs and materials, old and/or used products and inventories, old and/or used materials, equipment, and machines, and converting them into cash, assets, or equity. In other words, they can include, for example, excess inventory sales, scrap and used materials, and excess capital equipment (Büyüközkan & Çifçi, 2012; Govindan, Soleimani, et al., 2015; Green et al., 2012; Tseng & Chiu, 2013; Zhu et al., 2008a, 2008b).

Green business performance: It refers to corporate contributions regarding economic aspect (what the organization receive in terms of financial perspectives), environmental aspect (what the environment benefits), and social aspect (what the internal and external society receives) when it runs their business to respond to and benefit customers, suppliers, employees, community, and other related stakeholders (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Kafa et al., 2013; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2008a, 2008b).

Economic performance: It refers to the evaluation of the organization by considering the business success mainly based on reduction in purchasing and delivering cost, reduction in energy usage, reduction in waste discharge and treatment payments, reduction in payments related to environmental accidents, increase in revenues and profits, increase in market share and sales growth, and increase in organizational competitiveness (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Kafa et al., 2013; Kuei et al., 2015; Ngniatedema & Li, 2014; Zhu et al., 2007a, 2007b, 2008a, 2008b).

Environmental performance: It refers to the outcomes derived from the organization benefiting ecology, environmental systems, and the organization's reputation by focusing on resource utilization, waste and pollution reduction, environmental accident reduction, the improvement of the organization's environmental image, more environmentally friendly production and processes, and the adoption of recycling and reusing (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Fernando et al., 2019; Green et al., 2012; Rawashdeh, 2018; Zhu et al., 2007a, 2007b, 2008a, 2008b).

Social performance: It refers to corporate management in terms of environmental concerns, protection, and management, and the benefits that result include social satisfaction, social relationships, social participation, social collaboration, social life quality, and social services to both internal and external society members such as employees, customers, suppliers, community, and governmental agencies (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Kafa et al., 2013; Kuei et al., 2015; Leonidou et al., 2017; Zampese et al., 2016).

1.8 Research Contribution

1.8.1 Theorical Contribution

Firstly, the study identifies the model measurement of green corporate identity consisting of green corporate identity, green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers, green products and services, based on the concepts of corporate identity management and reveals the relationship between the green corporate identity and the other variables.

Secondly, the study identifies the model measurement of employee’s green identification based on self-perception and indicates the relationship between the employee’s green identification consisting of green personal and social identification and the other variables.

Thirdly, the study identifies the model measurement of the green supply chain management and reveals the relationship between green supply chain management and the other variables.

1.8.2 Practical Contribution

1) The model can be used by the automobile manufacturing industry to emphasize how to create the green corporate identity as the explicit management and strategic tool to positively express the distinguished and recognizable identity by using corporate value, corporate culture, and corporate behaviour responding towards external and internal forces in the market and industry condition through corporate mission, corporate strategy, corporate communication, corporate visuality, and corporate products and services delivered to related stakeholders in order to create employees' identification toward environmental concerns leading to better green supply chain practices and business performance in terms of financial, social, and environmental aspects.

2) The model can guide the automobile manufacturing industry to design and conduct the activities that can promote employees' self-reflection or expression in terms of personality, values, attitudes, image, and practices that fits into the organization and society in aspects of social acceptance, social status, and social role. This can link to create successful green supply chain practices and business performance in their organization.

3) The model can be applied by the automobile manufacturing industry to better manage the green supply chain which emphasizes on green procurement, green design, green manufacturing, green marketing and distribution, green logistics, green recovery to create the green business performance including financial, social, and environmental aspects.

4) The model can be used by the automobile manufacturing industry to measure the corporate performance that can link to sustainable and environmental issues responding to and benefiting customers, suppliers, employees, community, and other related stakeholders, which they are significant for creating business competitiveness and reputation.

1.8.3 Policy Contribution

Firstly, this study can promote government agencies to enact and implement regulations and laws, as well as environmental standards to ensure the efficient operation of the automobile manufacturing industry.

Secondly, this study presents the importance of the government agencies in providing automobile manufacturing industry proper knowledge regarding conducting business in compliance with environmental laws, regulations and standards. With clear knowledge and understanding, they are able to effectively operate their businesses related to the environment.

Thirdly, this study can emphasize the cooperation role between the government agencies and related stakeholders in utilizing and implementing green management in conducting environmental activities in either business sectors or other public sectors.

Lastly, the study also pinpoints the necessary of employing related environment measurements, monitoring process and evaluation process in order that the governmental agencies can provide, develop, and improve the environmental related policies and strategies to better economic, environmental and social performance.

CHAPTER 2
LITERATURE REVIEWS

This chapter aims at clarifying related concepts, theories, and previous researches that covers all aspects of the study. The first part of this chapter explains issues and conditions pertaining to the automobile industry in Thailand as well as green adjustments from the related entrepreneurs are presented. The next part explains green corporate identity with its concepts and theories alongside various previous researches. For green corporate identity, there are seven sub-points, including green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green corporate policy, green forces and drivers, and green products and services. Further, the concepts and theories as well as previous researches are described in relation to employee's identification, which comprises of self-identity and self-category theories reflecting personal and social identification. Thereafter, the concepts and theories related to green supply chain management which involves green procurement, green design, green marketing, green marketing, green logistics, and green recovery are examined. Lastly, previous researches associated with concepts and theories related to green business performance reporting green organizational economics, green society and green environment together with previous researches are mentioned. This empirical literature review can help portray the study background and strengthen the conceptual model used in this research.

2.1 Information of Automobile Industry in Thailand

2.1.1 Background of Thai Automobile Industry

The automotive industry is an early industry that is essential to national development in terms of economy, employment, value creation, and automotive technology development. Many countries such as Japan and United State of America selected Thailand as a major offshore base for international automotive manufacturers (Laosirihongthong & Dangayach, 2005). Jankaweekool et al. (2019) advocated that the automotive industry can generate economic value for the country, which accounted for 10% of gross domestic product originating from manufacturing and source of employment for over 500,000 direct jobs of skilled workers excluding the workers in relevant industries, such as finance, insurance and after-sales services are positively affected by the increase in automotive industry sector. For Thai automobile industry, there are three levels of manufacturers, which include passenger and commercial vehicle assemblers, component manufacturers, and supporting/equipment manufacturers (Laosirihongthong & Dangayach, 2005). There were eighteen (23) car manufacturers and nine (12) motorcycle manufacturers. There were also 720 auto parts companies in Tier I and more than 1,100 companies in Tiers II, III and local raw material producers. Tier II comprised about 58% of foreign companies, 3% of joint venture companies and 39% of Thai companies. It created jobs for more than 700,000 people in this industry: 100,000 people in automotive assemblers, 275,000 people in Tier I and 250,000 in Tier II and local raw material producers (Thailand Board of Investment, 2017; Ploymee, 2020).

Thailand has a policy in place to ensure that this industry is constantly developed in order to gain more competitiveness in the region and respond to increasing demand from global customers as well as to attract more foreign investment by improving cost, quality, management, and time performance in the comparison of automotive industry in other countries (Laosirihongthong & Dangayach, 2005). Most companies in automotive industry in Thailand have implemented certain international standards such as ISO 9001: 2000; QS-9000: 1996; ISO/TS16949: 2002; technology and infrastructures such as new/advanced manufacturing technology, clean technology and digital platform; business strategies and management such as just-in-time production systems, total quality management, logistics management model, and green supply chain management (Dansomboon & Narunart, 2020; Jaroenchai et al., 2017; Laosirihongthong & Dangayach, 2005; Ploymee, 2020).

Accordingly, Thailand Board of Investment (2017) reported that, in 2016, the Thai automotive industry was named the first in Southeast Asia, the second in the world for one-ton pickups, the sixth in the world for commercial vehicles, and the 12th in the world for automotive production. Thai's automotive situation is discussed as follows.

Automobile Production

Mreport (2019) reported that in December 2018, 67,451 units of passenger cars were produced, accounting for 4.19% increase from December 2017. However, from January to December 2018, 884,609 passenger vehicles were produced, amounting to 40.8% of the total production, and a 6.99% increase from January – December 2017. Meanwhile, passenger cars under 10 tons and more than 10 tons or more accounted for 34 cars produced in December 2018, a 70% increase in December 2017. From January-December 2018, a total of 529 vehicles were produced, accounting for 93.07% increase from January to December 2017. Truck production in December, 2018 totaled 101,870 units, an increase of 10.19% over December, 2017.From January to December 2018, total production was 1,282,556 units, an increase of 10.4% from January to December 2017. Meanwhile, total production of 1-ton pickup trucks in December 2018 was 99,295 units, up from 10.54% in December 2017. From January to December 2018, total production was 1,250,483 units, accounting for 57.68% of total production, up 10.66% from January to December 2017. Finally, trucks weighing less than 5 tons to more than 10 tons were produced in December 2018, totaling 2,575 units, a 1.64% decrease from December 2017. From January to December 2018, 32,073 units were produced, a 1.16% increase from January to December 2017.

Automobile Manufacturing for Export

In December 2018, 85,612 units of automobile were produced, equal to 50.55% of total production, an increase of 4.43% from December 2017; while in January-December 2018, automobile production for export was 1,142,733 units, equal to 52.71% of total production, an increase of 1.45% from January-December, 2017. Meanwhile, 33,227 passenger cars were produced for export in December 2018, an increase of 0.04% from December 2017. From January to December 2018, 416,184 passenger cars were produced for export, accounting for 47.04% of total passenger car production, which decreased by 0.35% from January to December 2017. In addition, 52,385 1-ton pickup trucks were produced in December, 2018, an increase of 7.42% from December 2017. From January to December, 2018, they produced 726,549 units for export, accounting for 58.1% of total pickup truck manufacturing sales, which increased by 2.51% from January to December, 2017 (Mreport, 2019; Yongpisanphob, 2020).

Automobile Manufacturing for Domestic Sales

In December 2018, production was 83,743 units, representing 49.44% of total production, an increase of 11.32% from December, 2017, and during January-December, 2018, automobile production was 1,024,961 units, representing 47.28% of total production, an increase of 18.85% from January to December in 2017. Furthermore, 34,224 passenger cars were produced for domestic sales in December 2018, an 8.55% increase from December, 2017. From January to December, 2018, 468,425 passenger cars were produced for domestic sales, accounting for 52.95% of total passenger car production. Furthermore, when comparing domestic sales from January to December of 2017, sales increased by 14.49%. Meanwhile, 1-ton pickup truck production in December, 2018, with 46,910 units produced for domestic sales, increased by 14.24% from December, 2017, and from January to December, 2018, a total of 523,934 units was produced, accounting for 41.89% of pickup truck production, an increase of 24.36% from January to December, 2017 (Mreport, 2019; Yongpisanphob, 2020).

Market Share of Automobile Sector in 2017

In the Thai automobile market in 2017 (from January to October), the car brand with the highest volume of production, sales, and exports was Toyota. Toyota is the most successful brand. However, in terms of automobile production, the top five brands were 1) Toyota, 2) Mitsubishi, 3) Isuzu, 4) Honda, and 5) Mazda, with respective production proportions of 26.47, 17.65, 12.41, 11.26, and 7.03%, respectively. Furthermore, the five most successful domestic brands were 1) Toyota, 2) Isuzu, 3) Honda, 4) Mitsubishi, and 5) Nissan, with sales proportions of 27.43, 19.25, 15.14, 8.01, and 6.94%, respectively. Finally, the top five brands in terms of export volume were 1) Toyota, 2) Mitsubishi, 3) Ford, 4) Isuzu, and 5) Mazda, with export values of 26.05, 24.99, 11.30, 11.03, and 8.42%, respectively (Mreport, 2019; Yongpisanphob, 2020).

According to information from Business Online Public Company Limited in the Decision Support System (DSS) reported on December 20, 2017, a total of 196 entrepreneurs were involved in the production of motor vehicles and engines. Toyota Motor (Thailand) Company Limited, Auto Alliance (Thailand) Co., Ltd., Mitsubishi Motors (Thailand) Co., Ltd., Isuzu Motors (Thailand) Co., Ltd., and Honda Automobile (Thailand) Co., Ltd. were the top five major companies producing vehicles and engines, with market shares of 23.60, 11.31, 10.76, 9.68, and 9.60%, respectively. There was a total of 4,016 entrepreneurs in the automotive wholesale sector, with a market value of more than 226,924 million baht. 1) Isuzu Motors International Operation (Thailand) Co., Ltd., 2) Mercedes-Benz (Thailand) Co., Ltd., 3) Ford Sales and Service (Thailand) Co., Ltd., 4) Mazda Sales (Thailand) Co., Ltd., and 5) BMW (Thailand) Co., Ltd. were among the top five companies, with a market share of 7.49, 3.73, 3.20, 2.82 and 2.37%, respectively. Finally, there were a total of 134 entrepreneurs selling vehicles in the automotive retail sector. These were 1) Phra Nakhon Yontrakarn Co., Ltd., 2) Charoen Thai Motor Sales Co., Ltd., 3) Mitsu Chon Buri Co., Ltd., 4) V&C Automobile Co., Ltd., and 5) KrisdaKamol (Thailand) Co., Ltd., with respective market shares of 12.74, 6.36, 4.39, 4.37, and 3.59%, respectively (Mreport, 2019; Yongpisanphob, 2020).

Table 1 Top five companies in automotive production, wholesale and retail section

Company Name	**Value**	
	Net sale (Million)	**Market Share (%)**
Production of Motor Vehicles and Engines		
1) Toyota Motor (Thailand) Company Limited	413,370	23.60%
2) Auto Alliance (Thailand) Co., Ltd.	198,073	11.31%
3) Mitsubishi Motors (Thailand) Co., Ltd.	188,522	10.76%
4) Isuzu Motors (Thailand) Co., Ltd.	169,458	9.68%
5) Honda Automobile (Thailand) Co., Ltd.,	168,146	9.60%
Total (as of 5 top ranked companies)	1,137,569	64.95%

Company Name	Value	
	Net sale (Million)	Market Share (%)
Automotive Wholesale Sector		
1) Isuzu Motors International Operation (Thailand) Co., Ltd.	86,652	7.49%
2) Mercedes-Benz (Thailand) Co., Ltd.	43,228	3.73%
3) Ford Sales and Service (Thailand) Co., Ltd.	36,987	3.20%
4) Mazda Sales (Thailand)) Co., Ltd.	32,598	2.82%
5) BMW (Thailand) Co., Ltd.,	27,459	2.37%
Total (as of 5 top ranked companies)	226,924	19.61
Automotive Retail Sector		
1) Phra Nakhon Yontrakarn Co., Ltd.	3,623	12.74%
2) Charoen Thai Motor Sales Co., Ltd.	1,808	6.36%
3) Mitsu Chon Buri Co., Ltd.	1,248	4.39%
4) V&C Automobile Co., Ltd.	1,244	4.37%
5) Krisda Kamol (Thailand) Co., Ltd.,	1,020	3.59%
Total (as of 5 top ranked companies)	8,943	31.45

Source: Business and Grassroot Economics Research Center of GSB (2018)

2.1.2 Supply Chain of Thai Automobile Industry

With 23 car manufacturers and 12 motorcycle manufacturers, Thailand's automobile industry is structured as the location of automobile assembly factories for almost all leading manufacturers from around the world. Furthermore, there are over 720 companies, with 1st-tier manufacturers being the leading automotive parts manufacturers from Japan, the European Union, and the United States. Denso, Aisin Seiki, Toyota Boshoku, Yazaki, Sumitomo, Hitachi, Calsonic Kansei, and JTEKT are examples of Japanese manufacturers. Meanwhile, manufacturers from the European Union and the United States include Robert Bosch, Continental, Johnson Control, Delphi, ZF, TRW, Valeo, BASF, Autoliv, Michelin, and 3M, among others. The second and third tiers (local suppliers) were made up of approximately 1,100 companies. The figure below depicts the people involved in the automobile industry (Thailand Board of Investment, 2017; Ploymee, 2020).

Automotive industry structure was divided into 2 main activities, namely; core and supportive (Jaddee, 2016). 1) Core activities include automobile operators and car parts manufacturers that can be classified according to the production structure and hierarchy, consisting of the 1st tier, 2nd and lower tier, or 3rd tier. The first tier (Tier I) is the supplier or manufacturer of parts and equipment types, delivered directly to the automotive assembly plant. In this tier, technological capability is required to produce parts that meet the standards specified by the car manufacturers. The second tier (Tier II) is the supplier or manufacturer of the part (individual part) delivered to the 1st tier manufacturers and may involve technology transfer from the 1st component manufacturers. Lastly, the third-tier manufacturer (Tier III) is the supplier and manufacturer of raw materials that are further delivered to the suppliers in the 1st and 2nd tiers. In relations to technology used in automotive industry, Laosirihongthong et al. (2003) revealed that there are several ones including computer numerical control, computer aided design, pneumatic hydraulic equipment, computer aided manufacturing, electronic data interchange, material resource planning, computerized statistical process control, automated inspection system, automated assembly system, computer aided process planning, automated material handling, barcode system, flexible manufacturing center, pick and place robot, automated storage/retrieval system. Specifically, Jaroenchai et al. (2017) advocated that logistics management models for competitive advantage of the automobile and auto parts industry in Thailand can include demand forecasting, purchasing, facility management, logistic information, warehousing, materials handling, packaging management, inventory management, order processing, transportation, and customer service.

2) Support activities consist of upstream industry, service industry and policies and supportive groups. The upstream industrial groups are the manufacturers of raw materials like steel, glass, leather, and plastic, etc., which are produced according to the needs of parts manufacturers in terms of quantity, standards, and quality. In addition, there are groups of machine manufacturers like mold, jig and fixture, and tools. The service industry comprises service providers, distribution of products,

finance service, inspection and testing, and insurance services, etc. The last is the policy and supportive organizations which consist of 3 members. The first is the government sector which is saddled with planning and formulating of national policies. It involves governmental organizations like the Ministry of Industry, the Ministry of Commerce, and the Ministry of Science and Technology etc. Kasikorn Research Center (2018) reported that Thai automotive industry was supported by the government a lot; for example, in 2017, the government had set the policy to promote Eastern Economic Corridor (EEC) where there were many automobile spare part being produced. In addition, in the same year, the government promoted the power of automobile production, especially, of the next generation of automobile vehicles. Also, the study done by Munkongtum et al. (2017) revealed that the supportive policy from the government can affect the success of the management of automotive industry in the eastern seaboard.

The second is the Automotive Institute and Entrepreneur's Association which plays an important role in creating cooperation between the government and the private sector. Organizations in this group include the Thai Automotive Industry Association (TAIA), Thai Auto Parts Manufacturers Association and others. For Thai Automotive Industry Association (TAIA), Somsawat and Chiang-ngeam (2014) pinpointed out that it has the roles to promote, support, and link government agencies, sources of suppliers, and other significant players such as business partners with automotive and parts industry in order to lead Thai automotive and parts industry to be the top of the world.

The third is the educational institutions, technical institutes, and research institutions, which comprises organizations like the National Science and Technology Development Agency, Universities, and National Productivity Institute etc. (Thailand Board of Investment, 2017). Also, the study done by Munkongtum et al. (2017) advocated about the collaboration with the educational institutions for future research and training programs is needed for the industry.

In relations to supply chain management of automotive industry in Thailand, Boon-itt and Paul (2006) proposed that the effective and efficient management of supply chain needs the work integration from all related processes from purchasing, operating, and servicing under the environmental uncertainty from supplier uncertainty such as delivery performance is unpredictable, quality performance is unpredictable, or product design is unpredictable; customer uncertainty such as customers change their order size, or customers change their delivery date; competitor uncertainty such as competitors' action towards marketing demand is unpredictable, or competitors often introduce new products/ parts/features; and technology uncertainty such as technologies are new and complex, or companies often change the technology. If there is a supply chain integration in Thai automotive industry, it can accordingly link to the competitive capability such as product quality, production flexibility, production innovation, delivery capability, and production cost. Importantly, Wong and Boon-Itt (2008) supported that in managing the environmental uncertainty for bettering the effective and efficient management of supply chain in automotive industry in Thailand, it required to understand the institutional norms referring to the expectations of the behaviours or practices that are acceptable with the organizations.

Similarly, Jankaweekool et al. (2019) revealed that managing risks that occurred in automotive industry in Thailand can increase firm capability. These risks included demand risk such as inaccurate demand forecasts, demand uncertainty (bullwhip effect), deficient customer relation management, or highly required services from customers; supply risk such as supplier incapacity, incorrect supplier selection/outsourcing, misappropriate supply product monitoring (quality), or sourcing flexibility risk; process risk such as product quality risk, manufacturing unreadiness, production/technology incapability, error on safety inventory, or process design risk; financial risk such as financial liquidity, economic recession, or exchange rate risk; information technology risk such as technology error on IT to make decision and execute processes, information system security risk and disruption, or intellectual property unprotection; and disruptive risk such as natural disaster, fire and accidents, or volatile government regulations (tax and law). When the risk can be eliminated, there will be a positive outcome towards firm capability enhancement in Thailand automotive industry.

2.1.3 Thai Automobile Industry and Green Orientation

Global automotive technology and manufacturing are increasingly focusing on developing more environmentally friendly products and manufacturing processes. The vision of Master Plan for Thai Automotive Industry (2012-2016) focuses on producing green and eco-friendly vehicles by stating that "Thailand is the world's automotive manufacturing base with a supply chain and the ability to create added value domestically while being eco-friendly" (Thailand Board of Investment, 2017). Furthermore, the international trend of eco-friendly vehicle regulations, including Thailand, is becoming more stringent (Dansomboon & Narunart, 2020). Thai auto parts manufacturers may lose the opportunity to develop eco-friendly products as well as their competitiveness in the future unless they adapt or adjust to the trend. The following are some examples of eco-friendly technology and production trends that the Thai automotive industry should be aware of and implement:

1) Environmental Standards and Production Processes Improvement

The legal measures and environmental regulations that control automotive industry tend to be stricter. For example:

End of Life Vehicles Standard (ELVs)

ELVs standard is compulsory in Europe. Due to ELVs regulations, entrepreneurs in automotive industry have to elevate their production process to produce recyclable, reusable and recoverable products. The objective of this measure is (1) to reuse and recover as much as 85% of the product's weight, and reuse / recycle as much as 80% of the product's weight, beginning from January 1, 2006, and (2) to reuse and recover as much as 95% of the product's weight, and reuse / recycle as much as 85% of the weight, beginning from January 1, 2015. Moreover, ELVs standard also bans motor vehicles and their parts with lead (Pb), mercury (Hg), cadmium (Cd) and hexavalent chromium (Cr-VI) component in any form from July 1, 2003, except for specific uses defined as an exception. Since ELVs standard applies to all vehicles exported to EU countries, vehicle as well as auto parts manufacturers have to adapt their production process and act in accordance with this standard (Bunpradit, 2017).

European Emission Standard

European emission standards are generally stricter and widely used around the world. Thailand, the ASEAN country's car manufacturing leader, also has the most stringent standards. Most companies in automotive industry in Thailand have implemented certain international standards such as ISO 9001: 2000; QS-9000: 1996; ISO/TS16949: 2002 (Dansomboon & Narunart, 2020; Jaroenchai et al., 2017; Laosirihongthong & Dangayach, 2005; Ploymee, 2020). As a result, automotive parts must be manufactured to meet the stricter standard's requirements. Similarly, various research advocated being green industry was forced and driven by the international regulations, laws, and standards such as ISO 14000 (Çankaya & Sezen, 2019; Green et al., 2012; Zhu et al., 2008b). For example, the fuel injection system must be capable of withstanding increased pressure. Because of the increased standard, raw materials and production technology must be modified. Automobile part manufacturers must modify their production processes to accommodate the aforementioned new technology (Bunpradit, 2017).

Safety Standards

Thailand and ASEAN countries tend to adopt more European safety standards (Bunpradit, 2017). Safety is an the bis issues in manufacturing firms since it can link to life safety. Importantly, Jankaweekool et al. (2019) revealed that managing risks such as accidents process design risk, technology risk and other risks that occurred in automotive industry in Thailand can increase firm capability.

Policy for Energy-Saving Cars (Eco Car)

The Thai government has an investment promotion policy that includes the production and use of energy-saving vehicles, or eco car. The eco car production requirements include a fuel consumption of no more than 4.3 L per 100 km, a Euro 5 emission standard, exhaust pipe emissions of not more than 100 g/km, front-side collision protection, an Anti-lock braking system (ABS), and an electronic stability control (ESC). As a result, automotive parts manufacturers must act in accordance with safety and environmental regulations (Bunpradit, 2017). Accordingly, many companies in automotive industry in Thailand adopt green environmental management concept in their practices in order to achieve energy-saving production. To respond energy-saving cars, there should be a consideration of good product design which it is needed to discuss and collaborate with suppliers and customers (Green et al., 2012; Zhu et al., 2007b, 2008b). In addition, the products should be designed for reuse, recycle, and/or recovery (Green et al., 2012).

Excise Tax Policy

The new excise tax policy, which went into effect in 2016, also focuses on CO2 emissions by increasing the use of ethanol and emphasizing new vehicle technologies such as hybrid electric vehicles, which are powered by both fuel and electricity (Bunpradit, 2017). For tax subsidy policy, it is very important for many automotive companies since it can motivate companies to adopt and invest in green business practices (Green et al., 2012; Zhu et al., 2007b, 2012). Supportively, Somsawat and Chiang-ngeam (2014) found that the way which the government supports Thai automotive industry can increase the potential of the automotive industry in Thailand under the ASEAN economic community.

Quality System and Environmental Standards

ISO 14001, which is the international standard for environmental management system, reflects the development of the quality system and environmental standards. With clear structure, function and action, ISO 14000 is a guideline for organizations or agencies to manage their systems and achieve their environmental development goal. Besides the standard for environmental management system, there is ISO 50003, which is a standard for energy management system (Bunpradit, 2017). Corresponding to the study done by Laosirihongthong and Dangayach (2005) who revealed that many companies in automotive industry in Thailand have implemented certain international standards such as ISO 9001: 2000; QS-9000: 1996; ISO/TS16949: 2002.

In addition to the aforementioned standards, there are also ‘Green Label’ guidelines and promotion to purchase green products from the government sector. For example, Honda implemented ‘Green Label’ for Honda’s car models and it is a private organization that is aware of environmental issues and produce environmental-friendly products with sustainability (Checkraka, 2015). As a result, automobile and parts manufacturers need to change the technology used in their production process.

2) Development of Green Automotive Technology and Production Process Adjustment

It is critical to align the manufacturing process with the advancement of green automotive technology. If entrepreneurs fail to adapt to changing times, their products will no longer meet the needs of customers. As a result, they are unable to sell their products (Bunpradit, 2017). Examples of the development of green automotive technology are as follows:

- Lighter vehicles and automotive parts have been developed with similar or better specifications. Original materials will be thinner or replaced by other alternative materials. The features of the vehicles, as well as production of high tensile strength steel, polymer, composite materials, and nanotechnology will also be improved (Bunpradit, 2017).

- Electric vehicles, such as hybrid electric vehicles, plug in hybrid electric vehicles, and electric control systems with sensors have been developed. This development leads to more use of electric power. Relevant automotive parts and manufacturing processes must be developed concurrently (Bunpradit, 2017). Kasikorn Research Center (2018) reported that the electric car production requires more about the battery and electric propulsion system as well as internal combustion-driven car, engine, coolant system, and other specific powering devices which the suppliers should adjust and develop themselves in order to respond the electric car production trend. However, there are still a lot of problems and obstacles for electric vehicles to be produced in Thailand since all related infrastructures such as charging station and other technologies are limited. Similarly, Kanitong (2018) studied about competitiveness of Thailand's electric vehicle industry and additionally advocated that the electric vehicle production in Thailand also encounters with the problems related to human power with specific and advanced working skills due to the fact that the educational institutes in Thailand do not provide specific skills for the learners and there are insufficient numbers of specific knowledge and skill training programs in urban area. Accordingly, to increase competitiveness of Thailand's electric vehicle industry, there should be a collaboration and supports from the related stakeholders; for example, the government should establish, tax credits, subsidies, and other non-monetary incentives for the automobile makers to decide making electric vehicles. In addition, the educational institutes should also offer the study curriculum that can respond to the needs of the industry (Kanitong, 2018). In 2017, in Thailand, Toyota, Honda, Nissan, Mazda, and Suzuki were planned to produce hybrid electric vehicle (HEV). Meanwhile, Bayerische Motoren Werke AG (BMW), Mercedes Benz, Toyota, Morris Garages (MG), and Mitsubishi were planned to produce plug-in hybrid electric vehicle (PHEV). In addition, FOMM, Audi, Mercedes Benz, BMW, MG, and Mitsubishi were planned to produce battery electric vehicle (BEV). Lastly, Toyota, Mercedes Benz, BMW, Energy Absolute, Beta Energy Solution, and Global Power Synergy were planned to produce electric vehicle battery (Yongpisanphob, 2020).

- Technology for automated vehicle systems have been developed and is widely used. The target for domestic vehicle production in 2017 was 3,000,000, while labor shortages were also a major issue in Thailand's automotive industry, despite the presence of foreign laborers. As a result, this technology for automated vehicle systems was introduced. The manufacturing process will be modified moderately in the future (Bunpradit, 2017). Most companies in automotive industry in Thailand have implemented certain technology and infrastructures such as new/advanced manufacturing technology, clean technology and digital platform (Dansomboon & Narunart, 2020; Jaroenchai et al., 2017; Laosirihongthong & Dangayach, 2005; Ploymee, 2020).

3) Higher Competition in Automotive Industry

Due to higher competition in the automotive industry, automotive operators have to increase efficiency and productivity. Moreover, it is necessary to reduce costs and wastes in the production process. These are trends in technology and automotive manufacturing. In the near future, the manufacturing process will be modified to be more environmentally friendly (Bunpradit, 2017). As a result, Thai entrepreneurs, particularly auto parts manufacturers, must develop environmentally friendly products or risk losing competitiveness. Thailand's main competitor among ASEAN members is Indonesia. Indonesia, with a population of approximately 240 million people, aspires to be the top manufacturer in ASEAN as well. Thailand will be able to maintain its leadership in automotive manufacturing in ASEAN despite its smaller population by continuously strengthening entrepreneurs, personnel, and production processes to be in line with eco-friendly technology trends, developing the supply chain, and cooperating with CLMV countries to promote investment-friendly tax policies. Furthermore, the Thai automotive industry will play an important role in mitigating global warming and protecting the environment. Thailand Automotive Institute is more than willing to assist in the advancement of the Thai automotive industry (Bunpradit, 2017). To achieve environmental goals in Thai Automotive Industry, Dansomboon and Narunart (2020) suggested to develop green logistics and supply chain management such as green logistics, reverse logistics, or green manufacturing which finally it can create the performance outcomes.

4) Green Business Management and Operation of Thai Automotive Industry

Thai automotive industry envisages to adopt the green business management into their business operation because it has been forced and driven by major forces such as industrial involvers, internationalization, technology innovation, governmental matters, and society that requires the corporation to get involved with and show concern for corporate management (Alhamali, 2019; Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Karimi & Rahim, 2015; Maditati et al., 2018; Malviya & Kant, 2017; Mathiyazhagan & Haq, 2013; Melewar & Wooldridge, 2001; Rashid et al., 2018; Walker et al., 2008). For bettering business performance in Thai automotive industry, Dansomboon and Narunart (2020) studied about the green logistics and supply chain management affecting performance outcomes and found that using green logistics and supply chain management including green logistics (such as purchasing, transporting, packaging), reverse logistics (such as material management, waste management, recovery, recycle, reuse) and green manufacturing (such as resources utilization, production management, technology application, production cost reduction) can have positive impacts on firm outcomes.

Furthermore, company's activities and management such as corporate social responsibility (CSR) can also be considered for business operation (Ariyaworanant et al., 2020; Eamlaorpakdee, 2011). CSR refers to the way the business run their business activities starting from ordering and purchasing from suppliers, operating, and delivering and servicing to customers and ended customers with considering not harming the environment and society (Eamlaorpakdee, 2011). For example, Toyota firstly operated the business in 1962 with the aim to run the business together with caring society and environment. In 1963, it established the "Production Environment Committee" and in 1973, created "Environmental Product Design Assessment Committee". In addition, Toyota also manage the business with following principles: 1) good corporate governance, 2) fair operating practices, 3) respect of human rights and employment and labour practices, 4) consumer rights, 5) community involvement and society development, 6) the environment, 7) dissemination of innovation from social responsibility operations in conducting business, and 8) social and environment reporting (Ariyaworanant et al., 2020). For another example, A.P. Honda Co. Ltd. (2016) reported that Honda also runs the business with care of society and environment by looking at its implemented activities such as green product, green workplace, green dealer, green transportation, fair employment, knowledge and potential development, freedom of association and collective bargaining, occupational health and society as well as social activities to develop society. For Nissan, Prachachat Online (2021) reported that Nissan has recently conducted the project "Just the Heart Is Enough" promoting innovation for society by working with the community of Phetchaburi Province with the aim to manage the recycling waste and to generate income for the community through waste recycling process. In the meantime, Isuzu also has shown their commitments in participating to manage their business in align with environmental and societal care with more than 50 years in driving Thai society towards sustainable development, such as sharing the automobile manufacturing knowledge as well as work philosophy to the Thai people and foreign visitors from all over the world for their own benefits and appreciation of the value of our products (Isuzu Motors Co. (Thailand) Ltd., 2019).

2.2 Green Corporate Identity

2.2.1 Definition of Green Corporate Identity and Its Importance

Definition of Green Corporate Identity

Green corporate identity management is fundamentally developed based on the corporate identity management. This study related to corporate identity is well known and interesting for many scholars, as it encourages many of them to get acquainted with the related matters. Portugal and Halloran (1986) studied and advocated that corporate identity was about communication, delivering the essence of the firm in terms of distinguishing company procedure and direction to outsiders with the purpose of making them aware of the companies. Later, Abratt (1989) emphasized on the importance of studying corporate identity and discovered that corporate identity is similar to communication, but it also visualizes both physical and behavioural aspects representing or symbolizing an organization to be recognizable and distinguishable from others. Additionally, Olins (1990) advocated that corporate identity is partial or full explicit management that has been performed to promote the corporation activities to be perceived, which represents "who you are", "what you do", and "how you do it". In 1993, the well-known scholar, Balmer (1995) understood that creating corporate identity requires a blend of organizational strategy, behaviour and culture, along with communication presented through organizational philosophy, differentiating a particular organization from others.

Similarly, Leuthesser and Kohli (1997) emphasized on strategically studying an organization's philosophy through communication, behaviour, and symbolism, presenting the organization's identity. In the meantime, Margulies (1977) expanded the study of corporate identity to the way that the organization expresses itself to its stakeholders including community, customer, employees, press, and investor, etc. Through this presentation, the firm is perceived as distinguishable from the others by focusing on both its visual identity and behaviours and using varied means including corporate identity program, advertisement, clothes, and customer contact etc (Markwick & Fill, 1997). After this era, corporate identity tends to be developed based on the management of the corporate's internality for good perception of the corporate externality. For instance, Van Riel and Balmer (1997) mentioned that corporate identity refers to presentation of the company (firm's) "sameness over time", "distinctiveness", and "centrality" for internal and external audiences through firm symbolism and behaviour. Also, Balmer and Dinnie (1999) pinpointed that corporate identity and communication must be managed with good management time and attention, and are also important for a situation like merger.

However, in creating corporate identity, the business environment should also be taken into consideration. Balmer and Gray (1999) advocated that corporate identity refers to the firm's communication of its reality and uniqueness to its external and internal audience under the business environment to present its positive image and reputation by using effective management in a strategic framework. This was similar to the report of Melewar and Wooldridge (2001) who mentioned that corporate identity could be interpreted as strategic manifestation of corporate level vision and mission, underpinned by the strategies which a corporation employs in its operation or production; the marketing strategy and mix which determines the product/services; and the human resources strategy which affects the manner in which the product or service are delivered. Its dimension consists of communication and design, corporate behaviour, corporate culture, market conditions, products and services. Also, Melewar and Karaosmanoglu (2006), Otubanjo and Melewar (2007) and Maurya et al. (2015) opined that corporate identity refers to the strategic tool in providing competitive advantages and trust-based relationship with the stakeholders alongside consideration of corporate communication, corporate design, corporate culture, behaviour, corporate structure, industry identity, and corporate strategy.

Accordingly, green corporate identity management, fundamentally developed based on the corporate identity management (Van Riel & Balmer, 1997), refers to the explicit management and strategic tool adopted by the corporation to positively express the distinguished and recognizable identity manifested by corporate value, corporate culture and corporate behaviour (Melewar & Jenkins, 2002), responding towards external and internal forces in the market and industry condition (Chidchob & Pianthong, 2020; Jabbour et al., 2013; Singh & Misra, 2020) through corporate mission, corporate strategy, corporate communication, visuality, and corporate products and services delivered to related stakeholders including employees, customers, suppliers, governors and community (Chidchob & Pianthong, 2020).

Green corporate identity management aims to create an environmental reputation of the organization to all stakeholders, including employees, suppliers, customers, business partners, governors, as well as competitors. It is expected that if the organization has potentials to create environmental-friendly perceptions to the stakeholders, then it will be possible for the organizations to receive interests from the stakeholders in the form of products/services purchase, hardworking attitude from internal employees and more investment from shareholders or outsiders. Therefore, the organization must identify the green corporate identity, which can be used as response to organization's external and internal environment. The external environment can refer to technology, society, economy, and governmental policy, and regulation in the aspect of natural environment conservation, while the internal environment means the set of business strategy, mission, vision, culture, and practices that supports natural environmental issues. Green et al. (2000) suggest that in greening the organizations, the concepts of supply chains can be adopted. The organization is responsible for managing the business context in response to changes in environmental pressure on suppliers and consumers. Their study also strongly indicates building strength from inside the organization, which can be internal company management, policy, regulation, and practices.

Importance of Green Corporate Identity

Recently, many organizations have become aware of the importance of having a good image related to environmentally friendly management because having a good image can lead to good business performance in terms of both financial and non-financial benefits(Balmer & Gray, 1999; Van den Bosch et al., 2005; Waithaka, 2014). However, a good image cannot directly generate benefits for the organization unless it is recognized by stakeholders (Maurya et al., 2015; Melewar & Karaosmanoglu, 2006). As a result, many successful organizations have made it a point to include green corporate identity in their plans (Chen, 2011). Furthermore, the green corporate identity can assist the organization in navigating organizational changes, particularly those caused by the external competitive environment (Harrison, 2009). In fact, there are two main reasons for having good green corporate identity in the organization plan. The first is that the organization is a newly established organization, has a lot of competitors in the market, and therefore wants to create an identity for itself responding to environmental issues. In the meantime, the second is that the organization has been established for a long time and realized the needs to develop a new corporate identity which is related to environmentally friendly management to maintain the organizational lifecycle and respond to the internal and external forces and drives such as government's regulations, customers' requirements, suppliers, community's environmental concerns or competitors from both domestic and international level (Chen, 2011; Goodman et al., 2009). Indeed, the appropriate timing for corporate identity changes depends on the characteristics of each type of business. Therefore, the marketing plans of the organizations must be included in a long-term management plan as well as maintain a continuous corporate identity with a clear direction (Abratt, 1989).

In addition to creating a meaningful green corporate identity, the study done by Chandler (2007) suggests five stages of developing corporate identity, which are also adapted by Otubanjo and Melewar (2007). These five stages include (1) identifying the clear and recognized text, (2) examining the channels to cover, reach, and target the stakeholders, (3) discussing the relationship between text and channels, (4) determining the importance of signifiers indicating the corporate system, and (5) identifying the signifier and the signified in the advertisement. To implement these five stages of creating the meaningful green corporate identity, the chief executive needs to play a significant role in creating the good corporate image related to environmental issues which must be parallel with the corporation's objectives or goals and is consistent with corporate mission (Chun, 1994; Harris & Crane, 2002). Additionally, the chief executive should present the company's objectives, goals or mission through a good corporate name and reflective logo which help create a good memory for the corporate's internal and external customers, as well as, other stakeholders (Balmer & Greyser, 2006; Hynes, 2009). As a result, they will acknowledge the corporate ability and potential and will remember the corporate identity for a long time. As a result, clear communication with the target internal and external customers, as well as other stakeholders, must be considered (Balmer & Dinnie, 1999; Balmer & Greyser, 2006; Balmer & Gray, 1999). Indeed, it not only involves providing knowledge and information related to the corporation to the target stakeholders in a bid to make them truly understand corporate's objectives, goals, mission or policy, but the corporate identity also involves creating understanding about the corporation's uniqueness and personality which describes how the corporation looks like (Biloslavo & Trnavčevič, 2009; Dowling, 1995; Goodman et al., 2009). Corporate personality refers to personification of the individuals in the organization, cultivated and symbolized by policy, mission, and vision and natural behaviour of a person to act and respond to the needs of the internal and external customers as well as all stakeholders (Thakur & Singh, 2018).

Consequently, successful green corporate identity can create positive effects on organizations. Goodman et al. (2009) investigated the way the companies become green organization and how they convey meaningful messages regarding environmental concerns, based on Chandler (2007), by reporting corporate social responsibility in the aspects of environmental practices. Significant findings from this study indicate that reporting of environmental corporate social responsibility can engage the stakeholders in acknowledging the green identity. Chen (2011) adapted the concept of corporate identity from Gioia and Thomas (1996) to study the green organizational identity. His study indicates that the green organizational identity must be crucially related to company history, goals, and missions, traditional and culture, along with management and protection regarding environmental concerns. There are also similar management in green corporate identity management from other recent scholars (Chang & Chen, 2013; Mushtaq et al., 2019; Xing et al., 2019).

2.2.2 Components of Green Corporate Identity

Green corporate identity measurements were developed based on the corporate identity measurement. From many corporate identity measurements, one can include corporate visual identity. Balmer and Stotvig (1997) and Arendt and Brettel (2010) studied about the visual image, which can help the organization represent the messages that it needs to distinguish itself from the others. Melewar and Wooldridge (2001) then studied communication and design to understand the ways and channels that the corporation communicates and delivers the corporate messages and activities. Meanwhile, Alessandri (2001) concentrated on researching visual identity and how to use visuals to present identity. However, communication design and visual identity had been integrated to strengthen the corporation's communication (Arendt & Brettel, 2010; Atakan & Eker, 2007; Foroudi, 2015; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Mohamad et al., 2007; Simões et al., 2005)

Another important component of corporate identity is corporate culture. This is critical for the organization because it provides an overview of the management on various parts of the organization under the direction, mission, and vision from within the organization. Balmer (1995) had been interested in studying corporate strategy and corporate culture. Corporate strategies can include marketing strategies like 4Ps or 7ps (Podnar, 2005), and innovation (Hoholm & Strønen, 2011). Also, the other researchers mentioned corporate behaviour, strategy, design, and structure (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Melewar & Karaosmanoglu, 2006; Melewar & Wooldridge, 2001). Corporate behaviour can include personality studied by Podnar (2005), founder leadership studied by Tourky (2013), and management intervention and leadership studied by Balmer (2017). Meanwhile, Podnar (2005), Mohamad et al. (2007), and Tourky (2013) argued that mission, value, philosophy, and vision can generate norms and disciplines to which organizational members can practically conform.

In addition, external forces like competitors, customers, suppliers, and community villagers have been included as dimensions for building corporate identity. This is the belief that the corporate image expected to be presented to viewers must be responding to both internal and external involvers. For instance, Balmer (2017) presented external stakeholder behaviour as one of such dimensions. In addition, the business environment such as social and cultural dimension, technological and innovation dimension, and industrial dimension, etc., are also important. Schein (1985), Melewar and Jenkins (2002), Melewar and Akel (2005) and Mohamad et al. (2007) studied about market condition and industry identity. Meanwhile, Balmer (2017) advocated that to run effectively, businesses should consider and analyze its environment. Table 2 shows the summary of variable reviews related to corporate identity.

Accordingly, green corporate identity in this study consisted of green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers and green product, and serviced. The associated details together with definition, previous researches and components are subsequently described and portrayed.

Table 2 Summary of variable reviews related to corporate identity

Part 1

Dimension	1	2	3	4	5	6	7	8	9	10	11	12
Symbol	√		√	√						√	√	
Behaviour/ corporate behaviour	√		√	√			√	√	√			√
Communication /corporate communication	√	√		√		√				√	√	√
Communication and Design							√					
Communication and culture			√									
Strategy/ corporate strategy		√								√	√	
Culture/ corporate culture		√					√		√	√	√	√
Market/ market condition			√						√			√
Product and Service			√				√					
Total service quality					√							
Marketing condition							√					
Communication and Visual identity									√			√
Visual identity								√				
Visual image					√							
Corporate design										√	√	
Corporate structure					√					√	√	
Industry identity										√	√	
Mission and Value								√				
Philosophy												
4p-7p												
Personality												
Vision												
Founder leadership												
External stakeholder behaviour												
Analysis of business environment												
Management intervention and leadership												
Innovation												

Part 2

Dimension	13	14	15	16	17	18	19	20	21	22	23
Symbol				√					√		
Behaviour/ corporate behaviour	√			√	√			√	√		√
Communication /corporate communication	√			√				√	√		
Communication and Design											
Communication and culture											
Strategy/ corporate strategy							√				
Culture/ corporate culture	√				√			√			
Market/ market condition					√						
Product and Service											
Total service quality											
Marketing condition											
Communication and Visual identity		√	√		√	√				√	
Visual identity								√			
Visual image						√					
Corporate design											
Corporate structure											
Industry identity											
Mission and Value	√	√	√			√		√		√	
Philosophy	√	√	√							√	
4p-7p	√										
Personality	√										
Vision	√										
Founder leadership								√			
External stakeholder behaviour											√
Analysis of business environment											√
Management intervention and leadership											√
Innovation							√				

Note: 1: Birkigt and Stadler (1986), 2: Balmer (1995), 3: Schein (1985), 4: Van Riel and Balmer (1997), 5: Balmer and Stotvig (1997), 6: Balmer and Gray (1999), 7: Melewar and Wooldridge (2001), 8: Alessandri (2001), 9: Melewar and Jenkins (2002), 10: Melewar (2003), 11: Melewar and Karaosmanoglu (2006), 12: Melewar and Akel (2005), 13: Podnar (2005), 14: Simões et al. (2005), 15: Atakan and Eker (2007), 16: Otubanjo and Melewar (2007), 17: Mohamad et al. (2007), 18: Arendt and Brettel (2010), 19: Hoholm and Strønen (2011), 20: Tourky (2013), 21: Maurya et al. (2015), 22: Foroudi (2015), 23: Balmer (2017)

Green Corporate Communication

Green corporate communication was developed from the corporate communication, which, in this study, refers to the way that the corporation has directly and indirectly communicated with its internal and external stakeholders about the environmental concerns, management, and protection to enhance the stakeholder relationship and understanding toward the distinguished identity of the corporation (Balmer, 1995; Balmer & Greyser, 2006; Balmer & Gray, 1999; Birkigt & Stadler, 1986; Maurya et al., 2015; Melewar et al., 2005; Melewar, 2003; Melewar & Karaosmanoglu, 2006; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014). It can be classified into two dimensions including controlled and uncontrolled communication.

Melewar (2003) defined controlled communication as the process by which a corporation can control the quality and mixture of communicated channels, statements, and events to influence corporate action on environmental issues and concerns. Meanwhile, uncontrolled communication refers to the way that the corporation responds to the unplanned communication about the environmental issues and concerns created by uncontrolled stakeholders classified into three sources of uncontrolled mention including interpersonal such as speaking from friends and relatives, intermediate such as competitors and press agency and intrapersonal - such as customer experiences, feeling and expectation (Cornelissen, 2000; Melewar, 2003; Melewar & Akel, 2005; Stuart, 1999).

Nevertheless, corporate communication can also be classified as internal and external communication. For internal communication, it refers to the way the corporation can communicate the policy, mission, goal, vision as well as identity towards the corporate action on environmental issues and concerns to the employees as internal stakeholders of the organization, so that they can have awareness and employee behaviour for green activities (Tourky, 2013; Waithaka, 2014). Internal communication, in particular, focuses on both formal and informal methods of conveying messages related to environmental awareness, concerns, and protection, as well as, related knowledge and information to employees, such as morning meetings, and annual meetings, etc (Grandien & Johansson, 2012; Monteiro de Carvalho, 2014; Spaho, 2012; Tourky, 2013; Waithaka, 2014). In fact, the corporation can use various channels like e-mail, new boards, and circulated etc., to communicate with employees about corporate policy, guideline or goal related to environmental awareness, concern, and protection (Monteiro de Carvalho, 2014; Tourky, 2013; Waithaka, 2014). Similarly, Emanoil et al. (2013) and Ahmed Malik and Ur Rehman (2017) suggested that information technology, as well as, the internet of things can be useful for organization to implement in management. Moreover, corporate communication must put emphasis on welcoming and receiving any comments and suggestions towards improving environmental actions from the employees, which can reflect the down-to-top communication (Tourky, 2013; Waithaka, 2014). This can be used to motivate employees to participate in the organization and raise environmental awareness (Genç, 2017). Furthermore, Luu (2020) stated that communicating with employees through a training program can be another way to encourage employees to work harder on environmental tasks. Table 3 shows the summary of variable reviews related to internal green communication.

Table 3 Summary of variable reviews related to internal green communication

Internal Green Communication	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Formal and informal communication to employees	√	√		√	√	√			√
Opening for comment and suggestion from employees	√			√	√				
Using internal communication channels such as website, e-mail, news board				√	√	√			√
Keeping employees informed about news and company activities			√	√	√			√	
Sharing knowledge, information, and news		√	√	√	√	√			
Using information technology			√				√		
Communication department within the organizational structure		√							
Verbal communication	√								
Motivating employees	√								
Internet of things							√		
Raising awareness								√	
Communication to employees through training program									√

Note: 1: Spaho (2012), 2: Grandien and Johansson (2012), 3: Emanoil et al. (2013), 4: Tourky (2013), 5: Waithaka (2014), 6: Monteiro de Carvalho (2014), 7: Ahmed Malik and Ur Rehman (2017), 8: Genç (2017), 9: Luu (2020)

Meanwhile, external communication refers to how a corporation communicates and conveys messages about its products, values, identity, and business activities concerning environmental issues and concerns (Tourky, 2013). External communication focused on using various channels such as website, email, product packages, social media, and TV program, etc., to send message about environmental care and corporate action to all stakeholders (Colleoni, 2013; Dwyer et al., 2009; Leonidou et al., 2011; Tourky, 2013). Similarly, Ahmed Malik and Ur Rehman (2017)suggested that using information technology and internet of things can be the effective way in the current situation. In addition, to communicate with organizational outsiders, the organization can also create the visualization that is consistent with facilities, equipment's, and staff such as logo t-shirt, and colour of the company tag (Tourky, 2013). Furthermore, the organization can employ a word-of-mouth strategy to help disseminate corporate environmental care and action so that all stakeholders can receive information and news about company products and activities (Aslam et al., 2019; Genç, 2017; Tourky, 2013). In line with this, it can be argued that this is the best way to keep stakeholders informed and involved in environmental events alongside the company. Table 4 shows the summary of variable reviews related to external green communication.

Table 4 Summary of variable reviews related to external green communication

External Green Communication	1	2	3	4	5	6	7	8
Using various channels such as website, email, product packages, social media, TV program, and etc.	√	√	√	√	√			
Participating into promoted environmental events such as being a sponsorship, CSR, etc.				√			√	√
Publicizing news and information about the environmental actions	√	√				√		√
Content is consistent visual presentations through facilities, equipment's, and staff.			√					
Implementing word-of-mouth in helping disseminate corporate's environmental care and action.			√					
Using information technology and Internet of things					√			

External Green Communication	1	2	3	4	5	6	7	8
Communication with customers, suppliers, community	√	√				√		√
Promote product and green information								√
Building tie with society				√				
Provide explicit information	√	√						

Note: 1: Dwyer et al. (2009), 2Leonidou et al. (2011), 3: Tourky (2013), 4: Colleoni (2013), 5: Ahmed Malik and Ur Rehman (2017), 6: Genç (2017), 7: Nielsen and Thomsen (2018), 8: Aslam et al. (2019).

Green Corporate Visual Identity

Green corporate visual identity was developed by corporate identity. Corporate visual identity is a term used to describe what and who the corporate is, by using the organization's name, slogan, logotype/symbol, colour and typography (Dowling, 1995; Melewar & Saunders, 1998; Topalian, 1984). In addition, the visual identity can be conveyed through the companies' products and vehicles and the location, as well as architecture of its buildings and organizational environment (Olins, 1990). In general, the mention of corporate identity creation is a strategic advertisement that will lead to the company's goal achievement and can be a tool that will influence the companies to be perceived in the public sector according to what the company is doing (Leonidou et al., 2011; Pomering, 2017). As a result, the organization executives are required to play a role in being responsible for identifying the organization's objectives and goals with obligations that the organization must continue to do in the future because the success of the institutional advertising campaign will depend on the high-level executives appropriately defining the organization's main objectives (Jasmi & Fernando, 2018).

Accordingly, the green corporate visual identity refers to the way the corporation present the corporate identity in terms of value, philosophy, mission towards environmental concerns, management and protection with stakeholders through graphic design, color, symbol, logo, and typography through possible ways such as product, location, vehicle, printing, and other media channels (Baker & Balmer, 1997; Dowling, 1995; Melewar, 2003; Tourky, 2013). In this study, there are six components, including graphic design, color, symbol, logo, slogan, and typography. The detail is described as follows.

Green graphic design refers to the way the corporation designs the related recognizable graphics and cues associated with environmental concerns intentionally brought by the corporation. The green graphic design was developed from the corporate identity (Melewar et al., 2005; Melewar, 2003; Melewar & Karaosmanoglu, 2006). Graphic design is crucial for an organization because it can contribute to effective communication (Borba et al., 2015). To have effective communication using graphic design, other components such as symbol, text, and others must be considered (Green & Loveluck, 1994). Relatively, Van den Bosch et al. (2005) revealed that corporate visual identity including symbol and graphic design can support reputation in terms of visibility, distinctiveness, authenticity, transparency, and consistency. Furthermore, the graphic design should reflect the organization's policy, mission, goal, philosophy, and vision as the essence of an organization in the eyes of its internal and external stakeholders to improve stakeholder relationships and understanding (Van den Bosch et al., 2005). Since graphic design can identify corporate identity, the green graphic design consistent with environmental concerns, management, and protection together with organization's policy, mission, goal, philosophy, and vision can be accordingly developed to convey and represent environmental care from the corporation. Moreover, appropriate graphics should be used for making vivid guidelines for implementing environmental impact statements from the National Environmental Policy Act (Gallagher & Jacobson, 1993).

Green colour is developed from the concepts of colour used in identifying corporate identity reflecting the corporate philosophy (Alessandri, 2001; Melewar, 2003; Melewar & Akel, 2005). After the application of colour concept with green concept to recognize the environmental-friendly concern (Dwyer et al., 2009; Miller & Francisco, 1995), this study can then refer to the way the corporation use the colour that can represent the corporate identity towards environmental concerns. Based on the colour concept, the selection of the colour to reflect the organization's greenness is important for the organization because it can help all stakeholders to recognize the corporate image related to what they are doing. According to a study conducted by Chang and Lin (2010), approximately 67% of consumers who responded to their study decided to involve themselves in the purchasing process by using colors designed by the company; they were reminded, however, that the use of inappropriate colour can cause difficulty in recognizing corporate brands, which can be linked to brand image recognition and corporate profit. Furthermore, the green colour is a popular tool that can link the stakeholders to understand and perceive the corporation's contribution towards environmental concerns (Hynes, 2009).

However, in representing corporate identity, the colour is required to work together with graphic design, symbol, logo, slogan, and typography (Hynes, 2009; Oswal et al., 2013). Therefore, the green corporate colour on all visual materials can be easily recognized about the environmental care from the corporate. In the meantime, Flores (2017) advocated that the colour is very important for the consumers to be interested in the corporation's brand personality including excitement, sophistication, and ruggedness, leading to corporate recognition.

Green symbol refers to how a corporate corporation uses a symbol to express its corporate identity in relation to environmental concerns, which was developed from the concepts of a symbol that has been used to reflect the corporate identity (Birkigt & Stadler, 1986; Melewar, 2003; Melewar & Wooldridge, 2001). The symbol usage in the organization can be important for the organization because it can be the source of identity-creation that is capable of creating corporate recognition and have good impact on corporate's competitive advantage (Fiol, 2001; Hatch, 1993). To have more understanding from the symbol viewers, the three primary factors including the objective of the communication, complimentary of graphical design and the context in which the symbol is seen must be considered (Green & Loveluck, 1994). Van den Bosch et al. (2005) revealed that corporate visual identity, including symbol graphic design can support reputation in terms of visibility, distinctiveness, authenticity, transparency, and consistency. Recently, Chen (2011) advocated that using symbolic material to represent the meaning of corporate management towards environmental issues can improve green corporate identity. Therefore, the corporation uses the environmental caring symbol that can express the corporate's awareness and protection manner towards environmental issues.

Green logo applies the concept of logo usage used in describing the corporate identity from (Alessandri, 2001; Melewar, 2003; Melewar & Akel, 2005; Melewar & Wooldridge, 2001), as well as, the challenging green concept from the report of Miller and Francisco (1995), and Dwyer et al. (2009); therefore, the green logo here refers to the way the corporation use the logo to represent the corporation’s identity towards environmental concerns. Effectiveness of the logo can be considered from the simplicity, versatility, memorability, relevance, timelessness, quality, and appropriateness together with front and human perception factors (Oswal et al., 2013). (Hynes, 2009) studied the designing of a company's logo so as to link and create a corporate visual identity in establishing and maintaining a company's corporate image and found that consumers will judge the company’s image from viewing the logo design. Meanwhile, Bresciani and Del Ponte (2017) discovered that logos can elicit affective reactions in viewers before they encounter promotional activity conducted by the corporation. Similarly, Flores (2017) advocated that the logo design is very important for attracting consumers towards perceiving the products and brand personality including excitement, sophistication, and ruggedness.

However, Bresciani and Del Ponte (2017) also found that the logos with brand icon and/or name can be more interestingly seen by the viewers compared to the logos displayed alone. As a result, the green logo was chosen to be studied as one of the green corporate identities because it can help to strengthen the other visual identity components such as the green symbol, green slogan, or green typography that identify the corporate contributions.

Green slogan refers to the way corporations use the slogan that can convey the messages about environmental concerns, which was developed from the study of corporate identity concept (Adhikari, 2018; Alessandri, 2001; Melewar, 2003; Melewar & Akel, 2005). The slogan is a short message or statement that can display the mission, vision, goal, and basic strategic direction. It is important to carefully consider the use of the slogan because it can positively or negatively influence the corporate recognition from the perspectives of the stakeholders (Dejanović et al., 2014). Similarly, Adhikari (2018) also defined the slogan as the short message that can influence the corporate branding. A good slogan should be simple, creative, corporate-identical, visionary, and trustworthy (Kohli et al., 2007)). To communicate with stakeholders through the company's fixed assets, such as buildings, vehicles, and other business collateral, the slogan can be accompanied by a name, symbol, and/or logo, typography, and colour (Melewar & Saunders, 2000). Abdi and Irandoust (2013) found that the slogans can enable companies to introduce themselves, their products, or services through brand awareness, brand recognition, as well as brand image. When applied to the green concept (Miller & Francisco, 1995); (Dwyer et al., 2009), the green slogan can be used to identify the green corporate identity and create green corporate performance.

Green typography refers to the way a corporation uses typography to convey messages and identity about environmental concerns. The term typography refers to written language, which serves as a conduit for verbal narrative, visual element, and semiotic resource, each with its own meaning potential (Serafini & Clausen, 2012). Green typography evolved from the concept of corporate visual identity systems, which advocate that typography is one of the components that has a significant impact on effective corporate marketing communication (Melewar & Wooldridge, 2001); (Melewar, 2003). The study, like Flores (2017), indicated that the font design could aid consumers in understanding the corporate brand and personality, which can lead to corporate recognition. Keyes (1993) advocated that typography can be more effective in significantly influencing the communication effectiveness of technical documents when applied together with color. Not only that, but when used in conjunction with a corporate logo, typography can provide better results in terms of communication effectiveness (Oswal et al., 2013).

Green typology has a significant impact on environmental protection because it is an environmentally friendly trend, particularly in the Post-Modern era in Asia when the green design concept was adopted (Hsueh & Peng, 2010).

According to Gallagher and Jacobson (1993), the typography used to describe the environmental impact statement should be of typographic quality because there was a problem with unreadability when the typography on the environmental impact statement was limited to public review; therefore, all agencies involved in publicizing the environmental impact statement should be serious on using the typography for the public participation programs. Similarly, (Ku, 2016) argued that the green typographer can play a role in moving problem solving in the design industry to meet today's environmental needs. Table 5 shows the summary of variable reviews related to green corporate visual identity.

Table 5 Summary of variable reviews related to green corporate visual identity

Green Corporate Visual Identity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Graphic design			√	√				√	√	√			√	√		√			
Color					√	√		√			√		√	√			√		
Symbol	√			√	√		√	√		√			√	√					
Logo					√	√	√	√			√		√	√			√	√	
Slogan					√	√		√			√	√	√	√	√				√
Typography		√	√	√	√		√	√					√	√			√		

Note: 1: Birkigt and Stadler (1986), 2: Keyes (1993), 3: Gallagher and Jacobson (1993), 4: Green and Loveluck (1994), 5: Melewar and Saunders (1998), 6: Alessandri (2001), 7: Melewar and Wooldridge (2001), 8: Melewar (2003), 9: Melewar and Karaosmanoglu (2006), 10: Van den Bosch et al. (2005), 11: Melewar and Akel (2005), 12: Kohli et al. (2007), 13: Hynes (2009), 14: Oswal et al. (2013), 15: Dejanović et al. (2014), 16: Borba et al. (2015), 17: Flores (2017), 18: Bresciani and Del Ponte (2017), 19: Adhikari (2018)

Green Corporate Culture

Given to the definition, corporate culture is defined as the mutual understanding, agreement, and execution of organizational activities in the respects of group's shared experience and integration to external and internal parties (Schein, 1985). It can help both inside and outside the organization understand who they are. In addition, the corporate culture can also announce what the company stands for. There are various components of corporate culture studied by many scholars. They can consist of the corporate history because it can tell the story of the corporation: corporate's mission, individual interaction, corporate success, reward presenting what the corporate has been executing for a long time (Balkaran, 1995; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Rowlinson & Procter, 1999). The history is a wonderful asset that the organization can use to present to customers, employees, and competitors, etc. As a result, effectively managing corporate history telling can aid the organization's success. Literally, Simões et al. (2005) and Atakan and Eker (2007) added that the philosophy can also be one of the corporate cultures since it can inform about the corporate mission and values (Alessandri, 2001; Podnar, 2005) manifested by the top-level managerial persons or executives with embodying corporate values and assumptions (Foroudi, 2015; Tourky, 2013) concerning how and what the corporation is currently doing and will be doing.

Furthermore, Olins (1990), Deal and Kennedy (1983) and Melewar (2003) pinpointed that the organization founder can be added to one of components of corporate culture since the vision and behaviour of the founder concerns business direction and philosophy that links and drives the success of the corporation; it can also help form the belief and admiration of corporate members, act as corporate direction, and contributes to corporate culture. However, some scholars such as Melewar (2003), Melewar and Karaosmanoglu (2006) and Stephan (2005) also added corporate structure because it is believed that the corporate structure can help understand the organization structure which include management paths, layers of management level, and company types (monolithic, diversified, or conglomerate). Additionally, corporate strategy (Melewar, 2003; Melewar & Karaosmanoglu, 2006) such as product and service (Melewar & Wooldridge, 2001; Schein, 1985), total service quality (Balmer & Stotvig, 1997), marketing strategies (Podnar, 2005) and innovation (Hoholm & Strønen, 2011) can also be accounted for as the corporate culture, which finally can create good corporate identity. Singh (2007) studied about the impact of organization culture on organizational commitment in the automobile industry in India by collecting the data from 382 executives from five automobile companies and revealed that the organizational culture can have positive and significant impact on organizational commitment.

Meanwhile, Iljins et al. (2015) studied about the impact of organizational culture on organizational climate during the time that the organization is in the change process by applying the case-study research technique and collecting data from medium-sized company from Latvian capital and international capital, and the result revealed that the organizational culture can influence organizational climate during the process of change. In addition, Gochhayat et al. (2017) studied about organizational culture, organizational communication, and organizational effectiveness by collecting data from 334 subordinates from Indian technical higher educational institutions, and their result revealed that the organizational culture mediated by organizational communication can have an influence on organizational effectiveness.

According to the study, the green corporate culture is developed based on corporate culture, which refers to the pattern of behaving, accomplishing, and learning in the corporate by the corporate members under the vision, shared value, history, philosophy, principles and guidelines related to environmental concerns, management and protection corresponding to external adaptation and internal integration, which was developed from the concept of corporate identity (Birkigt & Stadler, 1986; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Melewar & Wooldridge, 2001; Mohamad et al., 2007; Podnar, 2005; Schein, 1985; Tourky, 2013; Van Riel & Balmer, 1997). Tahir et al. (2019) defined green organizational culture as the attempts of the organization to create the pro-environmental value to drive the organization to sustainable development in both perspectives of economic and social goals, including organizational learning, organizational knowledge, and relationship with all stakeholders. For the study conducted by García-Machado and Martínez-Ávila (2019) in Automotive Industry using partial least squares structural equation modeling (PLS-SEM), the result revealed that green culture described as employees' involvement, value consistency, organizational adaptability to possible challenges, and clear mission establishment through green innovation, can have positive relationship with environmental performance.

Further, Hardika et al. (2019) studied about the green organizational culture, green innovation, competitive advantage and environmental performance in Malaysian manufacturing company by using PLS-SEM and found that, green organizational culture involving creative strategies, ecological policy, and sustainable practices, positively and significantly influenced green product innovation, green process innovation, competitive advantages and environmental performance. Consequently, the green culture consists of five components, including green vision, green values, green principle, green guideline, and green mission. The details are mentioned as follows.

Literally, the green vision is defined as the corporation's expectation to play a role in addressing and protecting environmental issues, which stems from the concept of corporate identity (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005). Green vision has been used interchangeably with environmental vision (Pitts, 1993), which refers to the emphasis on the concepts and methods that can be used to solve problems related to the environment through the interaction of people's eyes and vision. Green or environmental vision also refers to environmental thinking that affirms, protects, and conserves the full diversity of landscape for community living (Dickerson & Evans, 2006). The environmental vision has been implemented by current business such as Panasonic who decided to be the ‘No.1 Green Innovation Company in the Electronics Industry’ in 2018 (Miyai, 2012). A clear vision of the environment's role has a significant impact on the country's long-term development. In Malaysia, Foo (2013) found that the higher education institutes with good vision on environment problem solving and thoughts to prepare the student’s skills and spread the environmental conservation knowledge for their students together with the supports from both government and non-governmental organizations (NGOs), can provide the future sufficient human power for building a strong socio-economic development with maintenance of environmental conditions, thus contributing to sustainable development in Malaysia.

Similarly, Yuen (2014) discovered that the development of an environmental vision necessitated the implementation of practically strategic solutions by collaborating government, non-governmental organizations, and educational institutions to generate a healthy working and living environment through a plan emphasizing environmental awareness and conservatism, as well as, the enforcement of environmental protection rules. Recently, the study of green vision has been expanded to include green shared vision, where the term "shared vision" refers to vision that extends beyond the alone vision established for individuals.

According to Chen et al. (2014), a shared vision is a vision that was created and collectively shared with the other members to express the direction for the organization in the future, and it can help to improve their green radical and incremental innovation performance. Correspondingly, Hoe (2007) mentioned that the idea of shared vision can promote organizational learning from either internal or external environment. Furthermore, Chen et al. (2015) investigated the green shared vision and green creativity: the mediation roles of green mindfulness and green self-efficacy and discovered that the green shared vision can positively influence green mindfulness, green self-efficacy, and green creativity, implying that the firm should increase their green shared vision in organizational members. Meanwhile, Alt et al. (2015) demonstrated that shared vision can be a powerful tool for advancing the corporate greening agenda through proactive environmental strategies like corporate social responsibility. As a result, the company's vision of environmental management and protection can be linked to improved corporate performance.

Meanwhile, the green value is defined as a belief in the corporate embedded by corporate language, rituals, attitudes, and ideologies that direct the corporate and its members to perform works related to environmental concerns, which has evolved from the corporate identity concept (Arendt & Brettel, 2010; Atakan & Eker, 2007; Foroudi, 2015; Podnar, 2005; Simões et al., 2005; Tourky, 2013; Van Riel & Balmer, 1997)

Green corporate value is the sub-set of the green corporate culture that can identify the action of the members in organization to perform the tasks related to environmental-friendly guidelines and obligations (Harris & Crane, 2002). Literally, the value or corporate value refers to personal or social belief and attitudes of the corporate members towards preferable actions interacting among the corporate members (Rokeach, 1973). Meanwhile, Conklin et al. (1992) defined corporate value as the belief and attitudes of corporate members behaving in the corporate that shape the corporate philosophy, management, and goals. Indeed, corporate values generally imply an organization's statement that can have a feel-good meaning and can influence the betterment of the company's operations (Palmisano et al., 2004).

Accordingly, the study done by Donker et al. (2008) attempted to explore the link of corporate value vital for management, employees, shareholders, stakeholders, and the community at large on firm performance. Nevertheless, Sheehan and Isaac (2014) advocated that the corporate value can be fully utilized in improving business performance when they are implemented together with corporate principle that top leaders or executives can interpret into action and clearly and effectively communicate to ensure that all members in the organization understands and also shares this understanding among them. In fact, the pro-environmental value has a significant impact on integrating with the environmental corporate culture, which leads to a long-term business performance. As a result, the corporate should foster a culture that is consistent with the corporate value of environmental protection and awareness, and that motivates employees to engage in environmental activities.

For the green principle, it is defined as the standard related to environmental concerns ruling the corporate members' actions and underlying right or wrong basis for all corporate members, which was developed from the concept of corporate identity (Fritz et al., 1999; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Schein, 1985). The corporate principle has a positive impact on corporate values and corporate culture because it provides effective guidance and standardization in directing the actions that organization members must take to achieve business goals and missions (Sheehan & Isaac, 2014). So, the corporation sets the corporate standards and principles that govern corporate members to perform the environmental actions.

Furthermore, the green guideline is defined as the interpretation and actualization of the principle for guiding corporate members in acting and performing work in the context of environmental concerns, which was derived from the concept of corporate identity (Melewar, 2003; Schein, 1985) Indeed, the guideline is linked to corporate principles because the company must set the principles and interpret them into the work (Sheehan & Isaac, 2014). As a result, the corporate interprets environmental principles to guide corporate members in carrying out environmental actions.

Finally, the green mission is defined as a statement that was developed from the concept of corporate identity to present the reason why the corporate is still existing for environmental concerns and protection (Atakan & Eker, 2007; Foroudi, 2015; Podnar, 2005; Simões et al., 2005). According to Podnar (2005), the corporate mission can have a positive impact on the company's acceptance as a subject in society. Simões et al. (2005), on the other hand, argued that the corporate mission, along with employee behaviour and well-designed organizational symbols and communication, can pursue brand and image consistency. Additionally, Atakan and Eker (2007) studied about corporate identity of a socially responsible university in Turkish and found that during the high degree of competitive environment the university need to establish its mission to strengthen the corporate identity with the purposes of being perceived positively from the internal and external stakeholders, with the university having altruistic motives for its social responsibility initiatives. Notably, the corporate must establish an environmental mission statement that is both clear and attainable. Furthermore, the company's mission must be clearly communicated to organizational members and related to stakeholders. Table 6 shows the summary of variable reviews related to green corporate culture.

Table 6 Summary of variable reviews related to green corporate culture

Green Corporate Culture	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Vision	√					√				√		√	√	√				
Values			√			√	√		√		√				√			
Principle		√		√	√			√										
Guideline		√			√													
Mission						√	√		√						√		√	
Goal																√		
Strategy																		√

Note: 1: Denison and Mishra (1995), 2: Schein (1985), 3: Van Riel and Balmer (1997), 4: Fritz et al. (1999), 5: Melewar (2003), 6: Podnar (2005), 7: Simões et al. (2005), 8: Melewar and Akel (2005), 9: (Atakan & Eker, 2007), 10: Miyai (2012), 11: Tourky (2013), 12: Yuen (2014), 13: Chen, Chen et al. (2014), 14: Küçükoğlu and Pınar (2015a), 15: Foroudi (2015), 16: Athar, Tahir et al. (2019), 17: García-Machado and Martínez-Ávila (2019), 18: Hardika et al. (2019)

Green Employee Behaviour

Originally, corporate behaviour was focused on the study of corporate identity, which refers to the pattern of working behaviours of employees, managers, and executives in the corporate under the corporate's shared values, culture, structure, and strategy (Alessandri, 2001; Balmer, 2017; Birkigt & Stadler, 1986; Maurya et al., 2015; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Mohamad et al., 2007; Podnar, 2005; Schein, 1985; Tourky, 2013; Van Riel & Balmer, 1997). There are three corporate behaviour measurements: corporate behaviour, management behaviour, and employee behaviour. From the literature review, the corporate behaviour as a sub-dimension of the main corporate behaviour to identify the corporate identity refers to the top management level interpreting and implementing the business strategy, policy and mission by motivating and reinforcing employees to perform the works (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002). The motivation from the organization can be working welfares, benefits, and relationship buildings.

Additionally, the provision such as education, training, and development to perform the works can be other examples of corporate behaviour. Meanwhile, management behaviour refers to the actions of managers at the management level in managing, leading, and supervising their employees as they carry out their responsibilities in the organization (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002). For example, the managers can lead and supervise the employees in the organization to perform the works according to the statement, and vision, etc. For employee behaviour, it was defined as the working behaviour of employees in the corporation under corporate intention and direction (Alessandri, 2001; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002). For example, the employee performs the works to achieve the goal as stated by the corporation. In terms of the employee behaviour, Chun (1994) categorized the employee behaviour into two groups including in-role and extra-role behaviour. In-role behaviour refers to the behaviour of the employees in the organization that complete and fulfill the work according to work description, responsibility and requirement, while extra-role behaviour refers to the behaviour of the employees in the organization that work beyond the requirement and description in the job details. These employee's extra-role behaviours can consist of altruism, peacemaking, cheering, conciseness, civic virtue, courtesy, sportsmanship, and compliance (Batool, 2013; Chun, 1994; Truckenbrodt, 2001). However, Sukortprommee (2013) had similar study by focusing on two types of behaviours including prescribed role and extra role behaviour. His study defined prescribed role as the behaviour of the employees in the organization that work according to the task description and requirement, while the extra role behaviour was defined as the behaviour of the employees that will be willingly to work beyond the job described in the job description.

Meanwhile, Hsu et al. (2017) defined in-role behaviour as employee's behaviour on job completion, responsibility fulfillment, task obligation responsiveness and requirement, while extra-role behaviour refers to the employee behaviours like helping behaviour (willing to assist other members in the team) and voice behaviour (idea sharing, informing and exchanging). Their research discovered that both in-role and extra-role behaviours can have an impact on the completion of projects from 1000 Taiwanese companies. Claudia (2018) further defined extra-role behaviour as employees' organizational citizenship behaviour such as helping, sportsmanship, organizational loyalty, organizational compliance, individual initiative, civic-virtue, and self-development. For this study, the corporate behaviour with in-role and extra-role behaviour has been used to develop green employee behaviour. The green employee behaviour, therefore, refers to the pattern of green in-role and green extra-role working behaviours of the employees in the corporation under the shared values, culture, structure, and strategy related to environmental concerns, management, and protection of the corporation. Green in-role and green extra-role behaviours are the two main dimensions.

For green in-role behaviour, Norton et al. (2014) termed the green in-role behaviour as ‘employee’s task-related green behaviour, which refers to the way the employees in the organization perform the work to fulfill their responsibility. Similarly, Norton et al. (2015) conducted a study on employee green behaviour, coining the term ‘required employee green behaviour' to reflect in-role behaviour. Their study identified that the accomplishment of core tasks and the response to employer’s requirements can help measure the in-role behaviour. Likewise, Yang et al. (2019) used employee task-related green behaviour to refer to in-role behaviour and used three measurements to measure the employee task-related green behaviour: adequate assignment completion, responsibility fulfillments and expected task performance. Their finding indicated that the organization is required to have corporate green policy to create employee task-related green behaviour. Consequently, the green in-role employee has its importance since it can create organizational citizenship behaviour and create green business performance, as indicated by Pham et al. (2020) who studied the relationship among employee motivation, employees’ in-role green performance, and organizational citizenship behaviour in three- to five-star hotels. Therefore, this study defines the green in-role behaviour as the behaviour of employee in the organization that work according to the required works, tasks or roles regarding environmental concerns, management and protection of the corporation given or prescribed by the company, which involves performing the expected tasks, meeting organization requirement, fulfilling responsibility, adequately completing assignment, and fulfilling job description. Table 7 shows the summary of variable reviews related to green in-role behaviour.

Table 7 Summary of variable reviews related to green in-role behaviour

Green In-Role Behaviour	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Task Performance			√				
Requirement meet	√	√	√	√			
Responsibility fulfillment	√	√	√	√	√		√
Expected task performance			√				√
Adequate assignment completion			√				√
Job description fulfillment			√				
Job completion	√	√		√			
Task obligation responsiveness		√		√			
Core task						√	
Employer's Requirement						√	

Note: 1: Dyne (1994), 2: Chun (1994), 3: Sukortprommee (2013), 4: Hsu et al. (2017), 5: Norton et al. (2014), 6: Norton et al. (2015), 7: Yang et al. (2019)

Meanwhile, green extra-role behaviour is defined as the behaviour of employees in an organization who willingly and voluntarily work, initiate, help, share, afford, and inspire others about environmental concerns, corporate management, and corporate protection (Iqbal et al., 2018; Weerarathna et al., 2017). The term extra-role behaviour can refer to several terms like organizational citizenship behaviour for the environment (Boiral & Paillé, 2012), pro-environmental behaviour at work (Paillé & Boiral, 2013), proactive behaviour (Norton et al., 2014), voluntary employee green behaviour (Norton et al., 2015), employee pro-environmental behaviour (Warrick, 2016), employee green behaviour (Bohlmann et al., 2018; Iqbal et al., 2018; Weerarathna et al., 2017), pro-environmental behaviours (Tseng & Chiu, 2013), and green behaviour (Yang et al., 2019). Boiral and Paillé (2012) and Priyankara et al.

(2018) defined the extra-role behaviour as organizational citizenship behaviour for environment, referring to employees with initiative, engagement and helping behaviours for environmental concern. Similarly, Paillé and Boiral (2013), Tsai et al. (2016), and Warrick (2016) defined the green extra-role behaviour as pro-environmental behaviour at work which indicates that the employee behaves as a person who leads to share ideas and thoughts, involves in organization's environmental activities and assists other employees when they have problems related to environmental practices. Meanwhile, Paillé and Boiral (2013) defined the green extra-role behaviour by using organizational citizenship behaviour for the environment, referring to the employee who behaves as an individual, with voluntary and informal initiatives. In addition, Norton et al. (2014) defined the green extra-role behaviour as employee green proactive behaviour, referring to ability to take initiatives. Also, Norton et al. (2015) defined the green extra-role behaviour as voluntary employee green behaviour in which the employees exhibit citizenship behaviour and the required initiative. Moreover, Safari et al. (2018) included idea suggestion, part taking, knowledge sharing, questioning and extra-role working as the measurement tool for green behaviour.

Meanwhile, Iqbal et al. (2018) employed conserving category, working sustainably, avoiding harm, influencing others and taking initiative to study the employees' green behaviours. Lastly, Yang et al. (2019) included workplace involvement, initiative, and extra-role working in defining the green extra-role behaviour. As a result, Tseng et al. (2019) demonstrated examples of pro-environmental behaviour related to environment-related task behaviour, such as recycling, using scarp paper, printing double sided paper, and turning off electric devices, etc.

This study chose five sub-dimensions: green civic virtue, green helping, green initiative, green sportsmanship, and green influencing. Green civic virtue can refer to the behaviour of employees who actively participate in company environmental activities and voice their opinions on the company's environmentally operational improvement (Iqbal et al., 2018; Weerarathna et al., 2017). Meanwhile, green helping refers to employees who are willing to assist their colleagues in dealing with problems or obstacles related to environmental issues that they encounter, even if it is not their responsibility, by sharing related knowledge on environmental action (Iqbal et al., 2018; Tsai et al., 2016; Warrick, 2016). In addition, green initiative is the behaviour of employees that can voluntarily take environmental actions and initiatives in their routine works (Boiral & Paillé, 2012; Paillé & Boiral, 2013). Green sportsmanship refers to the behaviour of employees who are patient with any difficulties, problems, or obstacles that arise while implementing environmental action into their work (Chun, 1994). Finally, green influencing refers to the behaviour of employees who can inspire, encourage, and speak to their co-workers about environmental concerns (Chun, 1994; Iqbal et al., 2018). It is believed that when employees actively participate, are willing to help their colleagues, take voluntary environmental action, are patient with any difficulties, and are inspired by their colleagues to take environmental concerns, they can positively link to create a green corporate identity and, ultimately, a green business performance for the organization.

According to the reviews of the literature, green extra-role behaviour has a positive and significant effect on business management, production productivity, supply chain management, competitive advantages, and business performance. Table 8 shows the summary of variable reviews related to green extra-role behaviour.

Table 8 Summary of variable reviews related to green extra-role behaviour

Green Extra-Role Behaviour	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Altruism	√	√	√																
Peace making	√																		
Cheering	√																		
Conciseness	√		√																
Civic virtue	√		√	√	√	√				√	√		√			√			
Courtesy	√		√																
Sportsmanship	√		√	√															
Compliance		√		√															
Helping				√	√	√				√	√		√		√	√			
Organizational loyalty				√															
Individual initiative				√	√	√		√			√		√			√	√		√
Self-development				√			√												
Voluntary							√												

Green Extra-Role Behaviour	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Informal initiatives							√												
Citizenship behaviour									√										
Required initiative									√										
Environmental concern										√									
Idea suggestion / voice												√			√				
Part taking												√							
Knowledge sharing												√							
Questioning												√							
Extra-role working												√							√
Conserving category																	√		
Working sustainably																	√		
Avoiding harm																	√		
Influencing others																	√		
Environmental related task behaviour														√				√	

Note: 1: Chun (1994), 2: Truckenbrodt (2001), 3: Batool (2013), 4: Claudia (2018), 5: Boiral and Paillé (2012), 6: Paillé and Boiral (2013), 7: Paillé and Boiral (2013), 8: Norton et al. (2014)Norton, Zacher, & Ashkansy (2014), 9: Norton et al. (2015), 10: Tsai et al. (2016), 11: Warrick (2016), 12: Safari et al. (2018), 13: Weerarathna et al. (2017), 14: Bohlmann et al. (2018), 15: Hsu et al. (2017), 16: Priyankara et al. (2018), 17: Iqbal et al. (2018), 18: Tseng et al. (2019), 19: Yang et al. (2019)

Green Corporate Policy

The term "green policy" refers to a corporate commitment statement that expresses and highlights to stakeholders the objectives and environmentally friendly ways of working and collaborating on how to achieve the corporate goals in terms of environmental conservation, management, and protection (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005). There are five issues, including green knowledge provision, green collaboration, green agreement establishment, green change and adjustment, and green responsiveness. First, the green knowledge provision is defined as the commitment statement of the corporate on the importance of the knowledge related to environmental management and protection (Küçükoğlu & Pınar, 2015a; Monteiro de Carvalho, 2014; Waithaka, 2014). Second, the green collaboration is defined as the commitment statement of collaborating and networking with the stakeholders regarding environmental management and protection (Denison & Mishra, 1995; Huang et al., 2017; Küçükoğlu & Pınar, 2015a; Podnar, 2005). Third, the green agreement establishment is defined as the commitment statement of establishing or setting the agreement related to environmental management and protection with relevant stakeholders (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005). Fourth, green change and adjustment is defined as a commitment statement of changing or adjusting the corporate ways of establishing or setting the agreement related to environmental management and protection with relevant stakeholders (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005). The organization needs more internal motivation and awareness (Genç, 2017; Maditati et al., 2018). Lastly, the green responsiveness is defined as the commitment statement of the corporation in response to the external forces regarding environmental management and protection (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005).

Consequently, the corporation provides and collaborate the knowledge of environmental management and protection with the stakeholders. Additionally, the corporation establishes environmental agreements with the stakeholders, as well as changes and adjusts corporate manners, practices and activities regarding environmental management and protection. Lastly, the corporation responds to the issues related to environmental management and protection. Table 9 shows the summary of variable reviews related to green corporate policy.

Table 9 Summary of variable reviews related to green corporate policy

Green Corporate Policy	1	2	3	4	5	6	7	8	9
Knowledge provision	√	√	√	√	√		√		
Collaboration	√	√			√			√	
Agreement establishment	√	√			√				
Change and adjustment	√	√			√				
Responsiveness	√	√			√				
Internal motivation									√
Raising awareness						√			

Note: 1: Denison and Mishra (1995), 2: Podnar (2005), 3: Waithaka (2014), 4: Monteiro de Carvalho (2014), 5: Küçükoğlu and Pınar (2015a), 6: Genç (2017), 7: Safari et al. (2018), 8: Huang et al. (2017), 9: Maditati et al. (2018)

Green Forces and Drivers

Green forces and drivers are defined as the external forces concerning environmental issues from industrial involvers, internationalization, technology innovation, governmental matters, and society that requires the corporation to get involved with and show concern for corporate management (Alhamali, 2019; Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Karimi & Rahim, 2015; Maditati et al., 2018; Malviya & Kant, 2017; Mathiyazhagan & Haq, 2013; Melewar & Wooldridge, 2001; Rashid et al., 2018; Walker et al., 2008). There are sub-categories under this dimension, which include green industrial force, green internationalization force, green technology innovation force, green societal force, and green governmental regulation and law. For green industrial force, it refers to the forces from external parties including customers, competitors, and suppliers aimed at promoting environmental concerns and protection (Melewar, 2003; Melewar & Wooldridge, 2001). It means that customers, competitors, and suppliers force the corporation to show concern about environmental matters.

Meanwhile, the green internationalization force refers to the degree with which the corporation becomes an international company (Karimi & Rahim, 2015). Profoundly, being in the international level forces the corporation to show concern about environmental matters. Another is green technology innovation force, which refers to the supports of technology and innovation in promoting and managing the environmentally friendly works, products, and services (Malviya & Kant, 2017; Rashid et al., 2018). Here, the technology and innovation are very important since they can assist the corporation to promote and produce works, products, and services. In addition, the green societal force refers to the forces from the society and the community concerning promoting of environmental awareness and protection (Alhamali, 2019; Malviya & Kant, 2017; Walker et al., 2008). Recently, the society and community forced the corporation to show concern about environmental matters. Lastly, the green governmental regulation and law refer to the matters from the governmental regulations and laws driving and forcing the corporation to conform to environmental relatedness (Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Maditati et al., 2018). Various researchers revealed that governmental regulations and laws can strongly force and support the corporation to conform to environmental relatedness (Chidchob & Pianthong, 2020; Kerdpitak, 2019; Singh & Misra, 2020). From the literature review, this study will consequently conclude that stakeholder forces from customers, competitor, and suppliers compels the corporation to show concern about environmental matters; forces from international level competition and market; technology and innovation can also assist the corporation in promoting and producing works, products, and services; forces from society and community can also make corporation to show concern about environmental matters; and governmental regulations and laws can support the corporation to conform to environmental relatedness. Table 10 shows the summary of variable reviews related to green forces and drivers.

Table 10 Summary of variable reviews related to green forces and drivers

Green forces and drivers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Organizational factors	√												√							
Customers/consumer/ Green consumers	√	√				√	√	√		√		√	√	√				√	√	√
Competitors	√											√		√						
Society	√																			
Supplier/ strong tiers and players	√			√		√				√			√	√						√
Regulatory/ government policies and regulations/ green regulation	√	√						√	√			√			√	√		√	√	√

Green forces and drivers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Competitive institutional pressures		√					√													
Ethics			√																	
Commercialization			√																	
Product recycling				√																
Organization involvement				√																
Life cycle management				√																
Size of the company					√															
Previous experience with environmental management					√															
Global competitiveness						√														
External factors						√										√	√			
Financial factors						√					√									
Operation factors/flexible manufacturing						√					√									
Internationalization								√						√						
Strong public awareness									√							√				
Internal organizational policy										√										
Board and top management support										√					√		√	√		√
Corporate social responsibility										√										
Partner collaboration												√								
Flexible and green product design											√									
Logistics optimization											√									
Strategic outsourcing											√									
Strategy enablers													√							√
Social-culture enabler													√							√
Technical enabler													√							
Green initiative															√					
Security															√					
Internal motivation																√				
Image																				√

Note: 1: Walker et al. (2008), 2: Zhu et al. (2007b), 3: Testa and Iraldo (2010), 4: Hu and Hsu (2010), 5: Jabbour et al. (2013), 6: Mathiyazhagan and Haq (2013), 7: Hoejmose et al. (2014), 8: Karimi and Rahim (2015), 9: Dhull and Narwal (2018), 10: Niemann et al. (2016), 11: Shibin et al. (2016), 12: Huang et al. (2017), 13: Malviya and Kant (2017), 14: Rashid et al. (2018), 15: Jasmi and Fernando (2018), 16: Maditati et al. (2018), 17: Alhamali (2019), 18: Kerdpitak (2019), 19: Singh and Misra (2020), 20: Chidchob and Pianthong (2020)

Green Products and Services

Green products and services refer to the features displaying the relationship between the customers' expectation and perception towards product and service quality, which can come from the connection between functional quality and technical quality from the process to the end products and services, and the way to maintain customers satisfaction, good experience and loyalty through environmentally conservative and protective products and services (Balmer & Stotvig, 1997; Grönroos, 1984; Melewar & Wooldridge, 2001). The study conducted by Segev et al. (2016) analyzing 433 unique ads from approximately 8 magazine titles that had been presented in 2009 and 2010, found that there was high demand for green products and services, addressing the growth for environmental concern.

In the green products and services, it is necessary to consider product and service, functional quality and technical quality, customer relationship building and customer's expectation and perception (Grönroos, 1984). By greening products and services, it means the overall products and services interweaving between process and finish of products and services in a way that contributes to positive impacts on environment and reputation of the corporation (Balmer & Stotvig, 1997; Grönroos, 1984; Melewar & Wooldridge, 2001). The next is the functional quality and technical quality, which means that the products and services to be offered must be delivered with high customer satisfaction and expectation considering environmental concerns (Balmer & Stotvig, 1997; Grönroos, 1984). Green corporate identity is created when the corporation deliver the products and services with acceptable and standardized quality. Therefore, the corporation must produce the products and services with high quality and representing the environmental matters, to create green corporate identity (Hoholm & Strønen, 2011; Ko et al., 2013). Another is customer relationship building, which refers to the way the corporation emphasizes on prolonging the relationship with customers by satisfying, perceiving good experience and deciding to continue using, and visiting the corporate products and services (Balmer & Stotvig, 1997). The customer relationship has been used as one of the measurements of corporate identity because the relationship with customers can improve the understanding of the corporation, as well as, satisfy and prolong the decision to continue using and visiting the corporate products and services (Grönroos, 1984;

Melewar & Wooldridge, 2001; Podnar, 2005). Expectedly, if the corporation can create a relationship with customers by implementing environmental concerns; this will facilitate the green corporate identity. Lastly, the customer's expectation and perception can be defined as the understanding towards customers' need and the accurate response of the customers' needs within the time and conditions (Balmer & Stotvig, 1997; Shibin et al., 2016) by using the right marketing strategies (Podnar, 2005). Therefore, the green products and services with functional quality and technical quality, customer relationship building, and customer's expectation and perception can be used to measure green corporate identity. Table 11 shows the summary of variable reviews related to green products and services.

Table 11 Summary of variable reviews related to green products and services

Green products and services	1	2	3	4	5	6	7	8	9
Product and Service	√	√	√	√					
Customer response		√							
Total service quality		√							
Functional quality and technical quality			√						
Corporate reputation				√					
Marketing strategies (4ps-7ps)					√				
Product innovation						√			√
Flexible green Product design								√	
Demand of green products and services							√		
Customer relationship building		√	√	√					

Note: 1: Abdelzaher and Newburry (2016), 2: Balmer and Stotvig (1997), 3: Grönroos (1984), 4: Melewar and Wooldridge (2001), 5: Podnar (2005), 6: Hoholm and Strønen (2011), 7: Segev et al. (2016), 8: Shibin et al. (2016), 9: Rashid et al. (2018)

2.3 Employee Green Personal-Social Identification

2.3.1 Definition of Employee Green Personal-Social Identification and Its Importance

Employee green identification refers to the self-reflection or expression that the individuals themselves fit in the organization and society, meaning that the individuals (personality, values, attitudes, image, and practices) match with the organization in terms of culture, values, practices (personal identification) and match with the society in terms of social acceptance, social status, and social role (social identification) (Carroll & Ahuvia, 2006; Lassar et al., 1995; Sukortprommee, 2013). There are 2 sub-dimensions, including green personal identification and green social identification. Each dimension with definition and related questions are detailed as follows.

2.3.2 Components of Green Personal-Social Identification

Green Personal Identification

Erikson (1968) studied and developed the concept of identity by defining identity as one's feelings about oneself, especially according to her/his character, goals, and origins. Many researchers explained the construction of the identities, concluding that it is involved with self-presentation of how he/she internalizes others' perspectives (Collier & Thomas, 1988; Mead, 1934; Ting-Toomey, 2005). In addition, identity is the integration of how he/she sees him/herself, how others see him/herself, as well as how he/she present him/herself towards others (Izumi, 2010a). (Fearon, 1999) identified two components of identity, which are personal identity and social identity. The personal identity means the set of individual's attributes, beliefs, desires, or principles of action that distinguish the individual's uniqueness.

Meanwhile, social identity means the ways the individuals represents his/her uniqueness at the social level (Fearon, 1999; Ting-Toomey, 2005). Similarly, Han et al. (2005) defined personal identity as the perception that a person's belief fits with his/her identity and the recognition and verification of this identity that has been looked by other community members (social identity). Due to the individual unique attributes, the personality includes both acquired attributes (e.g., capability) and inborn attributes (e.g., eye and skin color). The inborn attribute in some part overlaps with the social identity (e.g., skin colour and ethnicity). However, the difference between them is a group membership (Izumi, 2010a). The personal identity concept is often encountered with the questions such as "who am I?" and "where did I come from?". The definitions of personal identity include personal information given at birth (such as name, date, and place of birth), personal identifiers (such as social security number and passport number), physical descriptions (such as height and weight), and biometric information (such as fingerprint and DNA) (Li & Valliant, 2011).

Additionally, (Izumi, 2010b) mentioned that people begin to think about their self-perceived identities when they become conscious about themselves, which can be viewed in differently, and is referred to as contrastive cognition (Li & Valliant, 2011). Many researchers proclaimed that similarity categorization of individuals towards the group and classification can help predict and view the behaviour of members in the group, society, or organization (Halliday & Kuenzel, 2008; Tajfel, 1981; Turner, 1985).

Green personal identification concept was developed from personal identity or identification. It refers to the outcome of what people feel about the organizational brand, logo or images that is matched between group members and organizations (Keller, 1993) and is related to green concept or environmental issue. Meanwhile, the green personal identification refers to the idea and perception of employees identifying themselves with their green or environmental organization vision and missions by developing their feelings and running parallel with it (Graeff, 1996). In addition, it refers to the attributes, beliefs, desires, and action distinguishing him/her in a way similar to individual unique attributes (Fearon, 1999; Ting-Toomey, 2005), which must be related to green concept or environmental issue. Furthermore, the green social identification refers to the degree with which organization makes employees in the organization define him/herself (to be integrated or dissociated) from the group of individuals that makes up the social environment (Long & Schiffman, 2000) and is related to green concept or environmental issue. When the employees in the organization understand what the environmental or green direction of their organization aims forward for, they will identify themselves to respond to their green corporate identity. In addition, the employees who can identify themselves to respond to the green concept, vision, mission, and culture etc., will additionally create the social identification which the employees in the organization will truly understand and work together closely to obtain their goals. In this case, they will encourage themselves to work well on international green supply chain management.

Based on literature reviews, the green personal identification then refers to the identification of the employee’s self-expression, the feeling that she/he belongs to the organization in the way that the organization’s identity and management on environmental awareness and protection match her/his role, individual personality, attitudes, values, and practices (Lassar et al., 1995; Sukortprommee, 2013).

Green Social Identification

The social identity is studied to explain social identification. Social identification, or sometimes called “social identity”, is essentially a perception of oneness with a group of persons (Ashforth & Mael, 1989). Tajfel (1981) defined social identity as the efforts to explain and categorize the cognitions and behaviours into various categories which can be based on religious membership, age group, and organizational association (Tajfel, 1981; Tajfel et al., 1979), presenting both in similarity or discrimination ways, which can be part of social identity (Abrams & Hogg, 1988). Ashforth and Mael (1996) defined social identity as ongoing relationships, interactions, and comparisons with various out-groups. Dutton et al. (1994) and Halliday and Kuenzel (2008) defined social identification as the degree or level with which the members defines him or herself towards the same attributes in the society or organizations. Many researchers proclaimed that if individuals categorize themselves and identify with the group and classification, sharing similarities of identity could predict the behaviour of the group members (Halliday & Kuenzel, 2008; Tajfel, 1981; Turner, 1985)

Organizational identity could also refer to social identity since it creates a group of individuals. There were some researchers who also opined that organizational identity is not only created by history, experience and feeling of company and its members, but is also involved multi-interactions from outsiders of the company such as its client, rivals, and supplier (Ashforth & Mael, 1996; Gioia & Thomas, 1996). Additionally, social identity is seen as the process that changes interactively into inter-group behaviour (Turner et al., 1987; Turner & Onorato, 1999). Turner (1985) and Hogg (1992) gave a different view but similar to the previous definition of social identity. The researchers defined the concept using the concept of the theorists, that is, the concept of “depersonalization” to explain the motivation to conform to group standards. Depersonalization results from social identification and occurs when individuals see themselves as “the interchangeable exemplars of a social category” rather than having unique attributes (Turner, 1985). Hence, depersonalization motivates individuals to imitate themselves as the representatives of their respective groups (Tajfel et al., 1979). Therefore, the green social identification refers to the employee’s expression identifying that the organization, in the way of considering environmental awareness, protection, and management influences her/him, in terms of status, role, and image, to be matched and accepted by the group of people or society intending to conform to the management related to environmental concerns and protection (Carroll & Ahuvia, 2006; Sukortprommee, 2013). Consequently, the green corporate identity provides employee social recognition and respect, enhances employee social status, and contributes to employee’s image, add employees to the social role where they play, and improves the society’s perception of employees.

2.4 Green Supply Chain Management

2.4.1 Definition of Green Supply Chain Management and Its Importance

Quinn (1997) defined the supply chain as the combination of all activities and the distribution of information to each other. Cooper et al. (1997) defined supply chain as a combination of organizations linking the information, products and services such as purchasing, manufacturing, transportation and packaging, and reverse products, which has a complex network of activities involved in delivering finished products to the end-users or customers (Ninlawan et al., 2010). These activities consist of information flow, finance, and physical supports. It also includes planning, controlling and managing activities which are done and extended across organizations. The users of the supply chain have used this method to create customer’s responses toward the products and services. Alternatively, it can be said that supply chain covers a life cycle process (Ayers, 2001). Stock and Lambert (2001) advocated that supply chain managements (SCM) can also help create competitive advantages in the dynamic business world. To identify an effect of SCM practices, Li et al. (2006) used strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing and postponement.

Recently, global environmental issues affecting the quality of water, air or land becomes crucial because a good environment can create good future and sustainability (Alghababsheh & Gallear, 2020; Alhamali, 2019; Aslam et al., 2019; Banihashemi et al., 2019). The term environmental issues have been interchangeably replaced with ‘green’ and its concept also emphasizes on running any activities with the consideration of environment harmfulness (Dwyer et al., 2009; Miller & Francisco, 1995). With the importance of the aforementioned issues, various organizations both profitable and non-profitable forms, therefore, need to consider how to reduce negative impacts derived from organizational activities on the nature (Green et al., 2012; Zhu et al., 2008a). In terms of profit-making organizations, which refers to industrial organizations conducting business activities such as production, transportation and marketing and advertising, it is necessary to profoundly consider the environmental issues by attempting to reduce negative impacts on environment such as air, water and soil and waste reduction (Kuei et al., 2015). As one of greatest business activities, supply chain management in both domestic and international level has been necessarily adopted with green concepts, since the organizations are pressured by various great drivers such as environmental problems, global environmental issue collaboration, international and domestic regulatory control, international and national governmental policies, and environmentally conscious customer’s demand (Laari et al., 2016; Sarkis, 2003).

Given to green adoption in supply chain management, generally, the green supply chain management refers to all supply chain activities including logistics, manufacturing, product design, material sourcing, selection, consumption, and recycling with the green concept (Rao & Holt, 2005). In other words, all the stages of a product’s life cycle, such as from resource to manufacturing, usage and reuse, final recycling, or waste can be accounted for as part of green supply chain’s environment burden (Zhu et al., 2007b). Furthermore, it also refers to management of forward and backward chain with the consideration of negative impact on the environment (Olugu et al., 2011). Green et al. (2012) supported the organizations to work with suppliers and customers to improve environmental sustainability of the supply chain, which correspond with the report of Caniëls et al. (2013) who advocated that the relationship between supplier readiness and customer requirements can be drivers in greening supply chain management for larger suppliers.

Additionally, the green supply chain management also covers the management of internal green practices referring to employees in all levels and external green integration referring to the stakeholders such as suppliers, customers, and governors (Yang et al., 2013). Also, Seman et al. (2019) found that GSCM has a relationship with product innovation, green process innovation, and green managerial innovation. Based on the definition, green supply chain management can be categorized into various parts. Zhu et al. (2007b); Green et al. (2012) and Zhu et al. (2012) advocated that the components of green supply chain management include green purchase, cooperation with customers, eco-design and investment recovery. Meanwhile, Yang et al. (2019) added that green supply chain management also includes green collaboration with suppliers, collaboration with customers and green shipping. Additionally, Tippayawong et al. (2015) categorized green supply chain management into green manufacturing practice, green logistics practice, and green sourcing.

Consequently, from the literature review, this study implies that green supply chain management is the management of supply chain done by the organization and its members with the purposes of obtaining better management together with being environmentally friendly. The related supply chain activities include inputs purchasing, product and service designing, product manufacturing, product and service marketing, logistics, and investment recovery. Each activity is related to green concepts (Azevedo et al., 2011; Çankaya & Sezen, 2019; Green et al., 2012; Huang et al., 2017; Kuei et al., 2015; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007). In implementing green supply chain, Yang et al. (2013) advocated that green supply chain management can affect firm competitiveness. Furthermore, economic, social, and environmental sustainability of the industry can be generated through green supply chain management (Luthra et al., 2014; Tippayawong et al., 2015). The manufacturers with strong internal GSCM practices combined with arm's length environmental monitoring of suppliers are likely to perform well in environmental issues. If a firm seeks to improve its financial performance, it needs to form more collaborative relationships with customers to achieve environmental goals (Laari et al., 2016).

Nevertheless, in the study, there are 6 sub-dimensions, including green design, green purchasing, green manufacturing, green marketing, green logistics, and green recovery. Each dimension with definitions is detailed as follows.

2.4.2 Components of Green Supply Chain Management

Green Design

Green design refers to the design and requirements of manufacturing the products together with minimizing the negativity on the ecological environment, which can support the products and its components to be potentially reused, recycled, and recovered. In addition, the green design can also include the design that help save energy, promote friendly usage, and reduce pollution, corresponding to the needs of customers through manufacturer-customer collaboration (Arena et al., 2003; Azevedo et al., 2011; Beamon, 1999a; Eltayeb et al., 2011; Gonzalez-Torre et al., 2004; Green et al., 2012; Lin, 2013; Tseng & Chiu, 2013; Wu & Dunn, 1995; Zhu & Sarkis, 2007; Zhu et al., 2007a). Commonly, the green design was by various researchers in the study of green supply chain management. One of the most interesting study about green design is green design in materials/energy reduction, which refers to the design of products for reduced consumption of materials/energy (Green et al., 2012; Lin, 2013; Tseng & Chiu, 2013).

In addition, Wu and Dunn (1995) and Arena et al. (2003) focused on environment impact reduction in which the organization intends to reduce products' negative effects on the environment during its entire life cycle. Nevertheless, the measures of customers collaboration, reuse; recycle; and recovery, friendly usage, and waste and chemical usage can be added to the study of green design in supply chain management (Green et al., 2012; Zhu & Sarkis, 2007; Zhu et al., 2007a, 2008a). Furthermore, Lin (2013) focused on the design of products for reduced consumption of materials/energy and collaboration with both domestic and international customers for eco-design, packages, and environmental management solution. Table 12 shows the summary of variable reviews related to green design.

Table 12 Summary of variable reviews related to green design

Green Design	1	2	3	4	5	6	7	8	9	10	11	12
Design of products for reduced consumption of materials/energy.		√	√		√	√	√		√	√	√	√
Intend to reduce products' negative effects on the environment during its entire life cycle.	√			√	√	√	√	√		√		
Collaboration with both domestic and international customers for eco-design, packages, and environmental management solution					√	√	√			√		√
Design of products for reuse, recycle, recovery of materials, component parts.					√	√				√		
Designing the products to be easily set up for the users in the most energy saving ways.					√	√	√			√		
Design for reduction of environmentally hazardous substances, design for recycling waste, and design for remanufacturing aimed at returning it to a better condition.					√	√	√			√		

Note: 1: Wu and Dunn (1995), 2: Beamon (1999a), 3: Arena et al. (2003), 4: Gonzalez-Torre et al. (2004), 5: Zhu and Sarkis (2007), 6: Zhu et al. (2007a), 7: Zhu et al. (2008b), 8: Azevedo et al. (2011), 9: Eltayeb et al. (2011), 10: Green et al. (2012), 11: Tseng and Chiu (2013), 12: Lin (2013)

Green Procurement

Green procurement focuses on the ways the organization cooperates and purchases the inputs, material, equipment, technology, and other supplies from domestic or internal suppliers who involve with provision of environmental supplies under environmental standards, requirements and objectives (Çankaya & Sezen, 2019; Carter & Ellram, 1998; Kannan et al., 2014; Yang et al., 2013; Zhu et al., 2008a, 2012). Previously, green procurement was measured by choice of suppliers considering the environmental criteria, buying environment-friendly raw materials, and pressuring supplier(s) to take environmental actions (Carter & Ellram, 1998; Kannan et al., 2014; Yang et al., 2013).

Moreover, environmental design specification and requirements to suppliers, cooperation with suppliers for environment objectives, environmental audit for suppliers' inner management, suppliers' ISO14000 certificate and second-tier supplier environmentally friendly practice evaluation, can be also used to measure green purchasing (Çankaya & Sezen, 2019; Green et al., 2012; Zhu & Sarkis, 2007; Zhu et al., 2007a, 2008a). Table 13 shows the summary of variable reviews related to green procurement.

Table 13 Summary of variable reviews related to green procurement

Green Procurement	1	2	3	4	5	6	7	8
Choice of suppliers by considering the environmental criteria.	√	√	√		√			√
Buying environment-friendly raw materials.	√	√	√		√			
Pressuring supplier(s) to take environmental actions.	√	√	√		√			
Providing design specification to suppliers that include environmental requirements fir purchased item				√	√	√	√	√
Cooperation with suppliers for environment objectives				√	√	√	√	√
Environmental audit for suppliers' inner management				√	√	√	√	√
Suppliers' ISO14000 certificate				√	√	√	√	√
Second-tier supplier environmentally friendly practice evaluation				√	√	√	√	

Note: 1: Carter and Ellram (1998), 2: Yang et al. (2013), 3: Kannan et al. (2014), 4: Zhu and Sarkis (2007), 5: Zhu et al. (2007a), 6: Zhu et al. (2008a), 7: Green et al. (2012), 8: Çankaya and Sezen (2019)

Green Manufacturing

Green manufacturing refers to the production or manufacturing process of the products with the aims and requirements of reducing hazardous-chemical inputs, wastes, air-noise-water-soil pollutions, production costs, and energy consumption through efficient production, manufacturing improvements, proper technology section, strategic planning, and standard acceptance (Kuei et al., 2015; Nawrocka et al., 2009; Prajogo et al., 2012; Robèrt, 2000; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007).

The green manufacturing was generally measured by hazardous and waste reduction, re-manufacturing and lean production, clean manufacturing technologies, green capacity utilization, and green production efficiency (Tseng & Chiu, 2013; van Hoek, 1999; Zhu & Sarkis, 2007). Hazardous and waste reduction refers to the origination activity that does not use hazardous or restricted materials during manufacturing and minimizes waste during production. Re-manufacturing and lean production refer to the situation where the organization has a system for re-manufacturing and lean production.

Meanwhile, clean manufacturing technologies refers to a situation where the organization applies clean manufacturing technologies for clean production. Moreover, green capacity utilization refers to a situation where the organization has improved capacity utilization. Lastly, green production efficiency refers to a situation where the organization has ability to reduce raw material costs, gain production efficiency, and improve their corporate image.

Nevertheless, Tippayawong et al. (2015) added green maintenance, a situation where the company should create strategic planning for the preventive maintenance of machines, which should be considered for measuring green manufacturing. Moreover, green production standard, for example, the manufacturing is certified and standardized by international level such as ISO 14000, and can also be used to study green manufacturing (Kuei et al., 2015; Nawrocka et al., 2009; Prajogo & Olhager, 2012; Robèrt, 2000; Zampese et al., 2016). Table 14 shows the summary of variable reviews related to green manufacturing.

Table 14 Summary of variable reviews related to green manufacturing

Green Manufacturing	1	2	3	4	5	6	7	8	9
Does not use hazardous or restricted materials during manufacturing and minimize waste during production.	√				√	√		√	
Re-manufacturing and lean production.	√				√	√		√	
The clean manufacturing technologies are applied for clean production.	√				√	√		√	
Improved capacity utilization.	√				√	√			
Lower raw material costs, gain production efficiency, and improve their corporate image.	√				√	√		√	
Strategic planning the preventive maintenance of machines.								√	
The manufacturing is certified and standardized by international level such as ISO 14000.		√	√	√			√		√

Note: 1: van Hoek (1999), 2: Robèrt (2000), 3: Nawrocka et al. (2009), 4: Prajogo et al. (2012), 5: Tseng and Chiu (2013), 6: Zhu and Sarkis (2007), 7: Kuei et al. (2015), 8: Tippayawong et al. (2015), 9: Zampese et al. (2016).

Green Marketing

Green marketing refers to the activities of marketing the products to the customers and it can have relationship with green supply chain management. Liu et al. (2017) advocated that green marketing practices can be accounted as one of the significant activities in green supply chain management since it can guide customers green consumption and enhance the environmental performance of the entire supply chain. Chan et al. (2012) included market segment by looking for customers interested in green specifications (e.g. market research), market positioning by applying the tool to define the market positioning of green product company, pricing strategies by adopting pricing strategies based on differentials in green product, and product advertising by adopting green features in the product advertising (website, advertising in specialized media), to measure the green marketing. In additionally, Azad et al. (2013) studied about factors affecting green marketing by using questionnaire including 23 questions distributed 200 people who were visiting organic product exhibition and found that four major factors including green labeling, compatibility, product value and marketing component, and size could attract new customers and customer retention. In their study, green labeling refers to the simplicity of detecting green product, understandable and sufficient information on label and relative product and service information. In the meantime, compatibility dimension includes important information on labels, emotional relationship building with customers, importance of recyclable products and trust green product and packaging. Also, value of product presents attractiveness, suitability, and availability according to the customer needs. Lastly, green advertisement component consists of advertisement aided green purchasing and exaggeration on marketing green products.

Abzari et al. (2013) studied about the effects of green marketing mix on market share increase by obtaining the data from 159 managers and employees of Pouyesh Chap Company and revealed green marketing as the important factor affecting an increase in market share, vocal share, and research and development share. In terms of green marketing, Abzari et al. (2013) found that green price, green products, green distribution and green promotion were significant. Similarly, Fahimnia et al. (2015) advocated the importance of green marketing to the purchase decision of the customers and developed green marketing from marketing mix factors. Their study from collecting data from 384 respondents on Shiraz city concluded that green marketing influencing customers' decision towards green products can include green price which goods and prices are matched reasonably, green products which are free from harmfulness and recyclable, green promotion activities which involve green lifestyle promotion and company environmental concerns, green distribution which refers to product availability, green budget which refers to the price the customers are willing to pay for the products, and brand reference which refers to the brand recognition and awareness.

Suki et al. (2016) studied about green marketing awareness, corporate social responsibility and consumer purchase intentions by collecting data from 200 green product buyers in Malaysia and found that green marketing awareness containing the distribution of eco-friendly published fliers, usage of green label, provision of eco-friendly shopping space, brand improvement as well as offering of eco-friendly products can influence consumer purchase intentions through corporate social responsibility.

Nevertheless, Zampese et al. (2016) argued that green marketing can extend to corporate image by adopting green features to improve the corporate image and applying monitoring tool by using the market monitoring tool with the aim of adopting green-competitive practices. Meanwhile, Çankaya and Sezen (2019) added that green marketing can also include supplying customers and institutions with regular voluntary information about environmental management, sponsoring environmental events/collaborations with ecological organizations, using natural environmental arguments in marketing, periodically updating company's website on environmental issues, labeling products with environmental purposes, as well as, considering eco products, and all these can boost the consumers' willingness to purchase.

Lastly, Gelderman et al. (2021) added that green marketing can be environmental practices that can influence green satisfaction and green loyalty. In their study, green marketing covers green product quality, green product prices, green corporate image, and salespersons' green expertise. Accordingly, green marketing is important for green supply chain management. Table 15 shows the summary of variable reviews related to green marketing.

Table 15 Summary of variable reviews related to green marketing

Green Marketing	1	2	3	4	5	6	7	8
Adopting green features to improve the corporate image and brand.				√	√	√		
Use of market monitoring tool aiming to follow green-competitive practices						√		
Market segment looking for customers interested in green specifications (e.g. market research)	√	√				√		
Applying tool to define the market positioning of green product company	√					√		
Adopting pricing strategies based on differentials in green product			√	√		√		√

Green Marketing	1	2	3	4	5	6	7	8
Adopting green features in the product advertising (website, advertising in specialized media.	√	√	√	√		√	√	
Providing sufficient and trust information on label		√			√		√	
Developing valuable and attractive products		√	√	√				
Building Customer Relationship		√						
This store operates eco-shops to sell eco-friendly products			√	√	√			
This store distributes eco -friendly published fliers.				√	√			
Customer willing to pay more for green product				√				
Green products are available and distributed.			√	√			√	
Being responsible for public, provide, volunteer			√					
Sponsoring environmental events/collaborations with ecological organizations							√	
Supplying customers and institutions with regular voluntary information about environmental management							√	
Salesperson’s green expertise								√
Green product quality								√
Green corporate image								√

Note: 1: Chan et al. (2012), 2: Azad et al. (2013), 3: Abzari et al. (2013), 4: Fahimnia et al. (2015), 5: Suki et al. (2016), 6: Zampese et al. (2016), 7: Çankaya and Sezen (2019), 8: Gelderman et al. (2021)

Green Logistics

Green logistics refers to logistics activities such as transportation, information flows, logistics planning, and product delivery done effectively through the requirement of environmental concerns and management, such as discharged pollution reduction, time-saving, and energy consumption reduction etc. by having a good planning, practices and policy (Enarsson, 1998; Green et al., 2012; Kuei et al., 2015; Murphy & Poist, 2000; Salimifard et al., 2012; Tippayawong et al., 2015). Generally, the green logistics were measured by green transportation that refers to environmentally friendly transportation, and green cost and alternative fuels that refers to the use of green fuels such as low sulfur content and alternative fuels such as liquid natural gas (Enarsson, 1998; Murphy & Poist, 2000; Salimifard et al., 2012).

Meanwhile, Tippayawong et al. (2015) argued that green logistics can consider green check and maintenance, green truck load system, green delivering routes, and green cost, and alternative fuels. For example, the organization should check and maintain the delivering vehicles. Additionally, the full truck load system can be used in the transportation system to increase the effectiveness of product delivery (Tippayawong et al., 2015). In the meantime, there should not be any release of pollution and fuel waste (Tippayawong et al., 2015).

Lastly, the organization should use the green fuels that contain low sulfur content and alternative fuels such as liquid natural gas (Salimifard et al., 2012; Tippayawong et al., 2015). Nevertheless, the concept of just-in-time logistics and green information technology referring to the application of information technology to track the transportation time, and pollution emission can be included in studying green logistics (Green et al., 2012; Kuei et al., 2015). Table 16 shows summary of variable reviews related to green logistics.

Table 16 Summary of variable reviews related to green logistics

Green Logistics	**1**	**2**	**3**	**4**	**5**	**6**
Environmentally friendly transportation.	√	√	√			
The delivering vehicles are well checked and maintenance plan are available					√	
The full truck load system is applied to increase the effectiveness of product delivering.					√	
The delivering routes are determined to safe the fuel and reduce the pollution.					√	
Using green fuels such as low sulfur content and alternative fuels such as liquid natural gas.	√	√	√		√	
Adopting just-in-time logistics						√
Applying information technology to track the transportation time, and pollution emission.				√		

Note: 1: Enarsson (1998), 2: Murphy and Poist (2000), 3: Salimifard et al. (2012), 4: Green et al. (2012), 5: Tippayawong et al. (2015), 6: Kuei et al. (2015)

Green Recovery

Green recovery refers to the action of the organization in considering the value remained in the no-more-use manufacturing inputs and material, old and/or used products and inventories, old and/or used materials, equipment, and machines, and reversing them into organization cash, assets, or equity. In other words, for example, they can include excess inventory sales, scrap and used materials, and excess capital equipment.

Generally, the recovery of end-of-life items can be used for studying the green recovery (Büyüközkan & Çifçi, 2012; Govindan, Rajendran, et al., 2015; Green et al., 2012; Tseng & Chiu, 2013; Zhu & Sarkis, 2007; Zhu et al., 2007b, 2008a). However, Büyüközkan and Çifçi (2012), Tseng and Chiu (2013) and Govindan, Rajendran, et al. (2015) added that the green recovery should include resale or reuse, which refers to the resale or reuse of used parts or components; replacement, which refers to the old/obsolete items that can be replaced; and lastly, recondition and refurbishing, which refers to the organization reconditioning and refurbishing the used parts or components. Table 17 shows the summary of variable reviews related to green recovery.

Table 17 Summary of variable reviews related to green recovery

Green Recovery	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Recovery of the company's end-of-life items	√	√	√	√	√	√	√
Resale or reuse of used parts or components				√		√	√
Old/obsolete items being used or replaced.				√		√	√
Recondition and refurbishing of used parts or components				√		√	√

Note: 1: Zhu and Sarkis (2007), 2: Zhu et al. (2007b), 3: Zhu et al. (2008a), 4: Büyüközkan and Çifçi (2012), 5: Green et al. (2012), 6: Tseng and Chiu (2013),7: Govindan, Rajendran, et al. (2015)

2.5 Green Business Performance

2.5.1 Definition of Green Business Performance and Its Importance

The concept of business performance is derived from the notion of performance measurement. Performance is an interesting theme for academicians and organization managers because it has been used mostly in relation to management and strategic management (Connolly et al., 1980). Meanwhile the understanding of performance measurement is recognized extensively, and organizational performance is being developed. Organizational performance is designed to measure how successful the organization is. There are two concepts to measure whether the organization activities can achieve their satisfied performance: by using the idea of market–orientation or with financial terms (Yamin et al., 1999). Considering improving organizational performance within the organization is not enough, therefore using the whole supply chain of the business from upstream to downstream is recommended (Tan, 2002). Adopting the concept of organizational performance in the notion of supply chain management can help the organization both in short and long terms. An assessment of organizational performance for short-term includes an increase of productivity, inventory reduction, and cycle time and for long-term it includes an increase in market share and profits for all members of the supply chain (Tan et al., 1998).

In addition, Holmberg (2000) supports that various organizations have used financial metrics as a tool to evaluate their organization's behaviour. Any organizational initiative, including supply chain management, should ultimately lead to enhanced organizational performance. Zhang and Li (2001) used both financial and market criteria, including return on investment (ROI), market share, profit margin on sales, the growth of ROI, the growth of sales, the growth of market share, and overall competitive position to measure organization's performance.

Given to the adoption of green concept into business management in responding to recent environmental forces and drivers, the green business performance was developed, which refers to corporate contributions regarding economic aspect (what the organization receive in terms of financial perspectives), environmental aspect (what the environment benefits) and social aspect (what the internal and external society receives) when it runs their business to respond to and benefit customers, suppliers, employees, community and other related stakeholders (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Kafa et al., 2013; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2008a). There are 3 sub-dimensions, including economic performance, environmental performance, and social performance. Each dimension with definition and related researches are detailed as follows.

2.5.2 Components of Green Corporate Identity

Economic Performance

The term of green concept has been used to study and measure the green business performance and it can consequently result in creating economic performance. Generally, economic performance refers to the evaluation of the organization by considering profit margin (Stanwick & Stanwick, 1998). Additionally, the concept of cost reduction in material purchasing, inventory, energy consumption, waste treatment, and waste discharges have been added to measure the economic performance since these costs can create an increase or decrease in business growth (Green et al., 2012; Zhu et al., 2007a, 2008a). Similarly, Kafa et al. (2013) advocated that when the organizations would like to achieve economic performance, they also have to reach both the cost reduction by considering the reduced cost of information sharing, ordering cost, associated environmental compliances, and business competitive advantages, including delivery unreliability, demand flexibility, delivery flexibility, manufacturing lead time, product return lead-time, as well as, scrap and rework.

Meanwhile, Ngniatedema and Li (2014) added that economic performance can be measured using financial measurements, including higher return on investment (ROA), profit margin, debt ratio, and market to book ratio. Related to financial improvement for measuring organization' economic performance, higher return on equity (ROE), increase in revenue due to voluntary action, and increase in revenue due to compliance action can be adopted (Kuei et al., 2015; Ngniatedema & Li, 2014; Zampese et al., 2016). Moreover, Leonidou et al. (2017) indicated that the market share, sales growth, and market development referring to an increase in sales growth, sales volume and market share growth can also be used to measure the economic performance. Given to the literature review, the concept of cost reduction, market improvement and sales and profit growth have been interestingly studied (Çankaya & Sezen, 2019; Fernando et al., 2019). However, Banihashemi et al. (2019) opined that economic performance measurement related to environmental improvement can also be related to value recapturing and enhanced company market competitiveness.

Accordingly, economic performance can include the reduction in purchasing and delivering cost, the reduction in energy usage, reduction in waste discharge and treatment payments, reduction in payments related to environmental accidents, increase in revenues and profits, increase in market share and sales growth, and the increase in organizational competitiveness. Table 18 shows the summary of variable reviews related to economic performance.

Table 18 Summary of variable reviews related to economic performance

Economic Performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Decrease of cost for materials purchasing		√	√	√	√					√	√	
Reduction in inventory investment											√	
Recapturing value											√	
Delivery cost					√							
Inventory cost		√	√	√	√							
Information sharing cost					√							
Ordering cost					√							
Purchasing lead time					√							
Decrease of cost for energy consumption		√	√	√	√			√		√		
Decease of fee for waste treatment		√	√	√								
Decrease of fee for waste discharge		√	√	√						√		
Cost associated with environmental compliance					√							
Disposal costs					√							
Decrease of fine for environmental accident		√	√	√				√				
ROA is higher						√	√		√			
ROE is higher							√					
Green technology generated revenues							√					

Economic Performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Revenue increases due to the voluntary action							√					
Revenue increases due to compliance action							√	√				
Financial result improvement								√				
Improvement in earnings per share										√		
Improvement in return on investment (over three years)			√	√					√	√	√	
Profits growth		√	√	√					√	√	√	
Recovery asset											√	
Profit margin (over three years)	√		√	√		√			√			√
Increase scrap rate		√	√	√								
Average return on sales over the past three years.			√	√								
Cash flow									√			
Debt ratio						√						
Market to book ratio						√						
Sales growth (over three years)			√	√					√	√		
Market share growth (over three years)			√	√				√	√		√	
Sales volume (over three years)			√	√				√	√			√
Market share in the last two years									√			√
Rate of market development									√			
Enhanced company market competitiveness											√	
On time delivery		√	√	√	√							
Delivery unreliability					√							
Demand flexibility					√							
Delivery flexibility					√							
Manufacturing lead time					√							
Product return lead-time					√							
Scrap and rework					√							

Note: 1: Stanwick and Stanwick (1998), 2: Zhu et al. (2007a), 3: Zhu et al. (2008a), 4: Green et al. (2012), 5: Kafa et al. (2013), 6: Ngniatedema and Li (2014), 7: Kuei et al. (2015), 8: Zampese et al. (2016), 9: Leonidou et al. (2017), 10:Çankaya and Sezen (2019), 11: Banihashemi et al. (2019), 12: Fernando et al. (2019)

Environmental Performance

Fundamentally, the environmental performance considers reduction in pollution from the operation (Stanwick & Stanwick, 1998). Additionally, various researchers included reduction in waste (water and/or solid), reduction in air emission, and decrease in consumption for hazardous/harmful/toxic materials (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Zhu et al., 2007a, 2008a). Meanwhile, Kafa et al. (2013) advocated that the waste reduction, level of pollution control, and level of waste and emissions can also be considered for measuring the environmental performance. However, Banihashemi et al. (2019) argued that the greenhouse gas emissions level is also necessary when measuring the environmental performance. Consequently, reduction in pollution, emission, waste, and toxic usage can be accounted for in this study.

Indeed, not only reduction in pollution and waste, but also the resources maximization such as improving capacity utilization on organizational resources can be considered (Green et al., 2012; Zhu et al., 2007a, 2008a). Additionally, Kafa et al. (2013) advocated that the organization can use the level of clean technologies, amount of energy consumption during the recycling, and amount of energy consumption to evaluate environmental performance. However, Kuei et al. (2015) argued that to accomplish the environmental performance, the organization should reduce energy consumption and increase ability to optimally utilize resource.

Similarly, Rawashdeh (2018) revealed that an increased use of renewable energy and sustainable fuel and reductions in the consumption of electric energy can be utilized to assess environmental performance for the organization. Recently, land use and biodiversity has been proposed to study the environmental performance as well (Banihashemi et al., 2019). In conclusion, resources and technology utilization, consumption, and maximization can be used in this study.

Another indicator of whether the organization can approach its environmental performance includes the reduction in environmental accidents and risks such as decrease in frequency of environmental accidents (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Zhu et al., 2007a), and reduction in the risk of environmental accidents (Kuei et al., 2015). These studies revealed that if the organizations can reduce such environmental accidents, they can increase organizational reputation and organization performance. Moreover, various studies indicated that an improvement in production and service process related to environmental concerns can also be accounted for as environmental measure of organization performance. The study by Kafa et al. (2013) discovered that the organizations that develop the level of process optimization for waste reduction, increase the availability of eco-labeling, improve the level of usage of design-for-assembly, that occupy the number of new products and process as well as the number of environmental management initiatives, can be applied for measuring the environmental performance.

The study by Kuei et al. (2015) indicated that environmental performance requires improved ability to learn and share green knowledge, improved ability to access environmentally conscious market as well as availability of control environmental systems, and all these are the significant outcomes gained from adopting green concept in the business management. Given to the green process improvement, Zampese et al. (2016) proposed to reduce purchase of non-renewable products, while Rawashdeh (2018) discovered that environmental performance indicators concerns the improvement and development of organization services given to customers and stakeholders. Moreover, Banihashemi et al. (2019) and Fernando et al. (2019) extended the ideas that the organization with environmental commitment and stretched environmental impact beyond compliance can help reach the environmental goals. Accordingly, reduction in environmental accidents and risks and improvement in production and service process related to environmental concerns are necessary for studying green business performance in terms of environmental performance.

Furthermore, environmental performance assessment, reputation of the company related to environmental improvement and protection can be referred to as one of the environmental achievements (Leonidou et al., 2017; Rawashdeh, 2018). Based on the literature review, many researchers considered the company’s environmental reputation (Çankaya & Sezen, 2019; Green et al., 2012; Zhu et al., 2007a, 2008a). In various studies, the reputation is accounted for as the crucial way to communicate with the customers and other stakeholders about the organization’s environmental image (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Mutingi et al., 2014; Zampese et al., 2016). The reputation of the organization can be deeply involved with improved product and service quality (Green et al., 2012; Mutingi et al., 2014; Rawashdeh, 2018; Zhu et al., 2007a, 2008a). Nevertheless, Fernando et al. (2019) argued that not only giving such environmental improvement and protection, as well as, product and service quality can be important indicators for environmental performance, but also the transparency of organization’s provided information related to environmental protection and prevention must be considered. Respectively, increase in environmental improvement, reputation, image, and quality associated with environmental concerns can be significantly used for measuring environmental performance.

Moreover, green adoption of material recycling and reusing can be additionally utilized for measuring the environmental performance of the organization. Kafa et al. (2013) and Fernando et al. (2019) referred to green adoption as the ability of the organization to have better recycling time and level of recycled material in the product. Meanwhile, materials recycling and waste reduction can be significant (Rawashdeh, 2018). However, Banihashemi et al. (2019) additionally proposed that recycle efficiency can have crucial role in measuring the organization’s environmental performance. Based on the literature review, recycling and reusing adoption can be used in this study.

Given to the definition and importance, environmental performance can then refer to the outcomes derived from the organization benefitting ecology environmental systems and organization reputation by resources utilization, waste and pollution reduction, environmental accidents reduction, organization’s environmental reputation improvement, better environmental-friendly production and process, and recycling and reusing adoption. They are essential and identifiable for environmental performance measurements. Table 19 shows the summary of variable reviews related to environmental performance.

Table 19 Summary of variable reviews related to environmental performance

Environmental Performance	1	2	3	4	5	6	7	8	9	10	11	12	13
Land use and biodiversity												√	
Increased use of renewable energy and sustainable fuel										√			
Level of clean technologies					√								
Amount energy consumption during the recycling					√								
Amount of energy consumption					√								
Reductions in the consumption of electric energy										√			
Reduce energy consumption							√						
Improve capacity utilization		√	√	√									
Ability to optimally utilize resource is improved							√						
Reduce pollution from operation	√						√					√	
Reduce impact on natural habitats							√						
Reduction in waste (water and/or solid)		√	√	√							√	√	
Reduction in air emission		√	√	√							√		
Decrease of consumption for hazardous/harmful/toxic materials		√		√							√		
Reduced energy and resources												√	
Waste reduction					√								√
Greenhouse gas emissions levels													√
Level of pollution control					√								
Level of waste and emissions					√								
Reduce the risk of environmental accidents							√						
Decrease of frequency for environmental accidents											√	√	
Decrease of frequency for environmental accidents		√		√									
Improvement of an enterprise's		√	√	√							√		

Environmental Performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
environmental situation													
Firm’s environmental image						√		√			√	√	
Improvement of organization reputation									√	√			
Improved product and service quality		√	√	√		√				√			
Transparency of information provided by the firm													√
Reduce purchase of non-renewable products								√					
Environmental commitment												√	√
Environmental improvement													√
Help organization develop/ design better service										√			
Level of process optimization for waste reduction					√								
Availability of eco-labeling					√								
Level of usage of design-for-assembly					√								
Number of new products and process					√								
Stretching environment impact beyond compliance												√	
Ability to learn and share green knowledge is improved							√						
Ability to access environmentally conscious market is improved							√						
Improvement of company operation								√					
Operational management of the supply chain improvement								√					
Availability of control environmental systems							√						
Number of environmental management initiatives					√								
Recycling time					√								
Level of recycled material in product					√								

Environmental Performance	1	2	3	4	5	6	7	8	9	10	11	12	13
Materials recycling and reduce waste										√			
Level of recycling													√
Recycle efficiency												√	

Note: 1: Stanwick and Stanwick (1998), 2: Zhu et al. (2007a), 3: Zhu et al. (2008a), 4: Green et al. (2012), 5: Kafa et al. (2013), 6: Mutingi et al. (2014), 7: Kuei et al. (2015), 8:Zampese et al. (2016), 9: Leonidou et al. (2017), 10: Rawashdeh (2018), 11: Çankaya and Sezen (2019), 12: Banihashemi et al. (2019), 13: Fernando et al. (2019)

Social Performance

By adopting green concept, social performance generally refers to the corporate management that can have a positive impact on the community and the society, especially in terms of social participation and collaboration such as customers' participation and collaboration in environmental activities (Azevedo et al., 2011; Banihashemi et al., 2019; Green et al., 2012; Kuei et al., 2015; Lin, 2013; Zhu & Sarkis, 2007; Zhu et al., 2007a, 2008b) and supplier's participation and collaboration (Banihashemi et al., 2019; Gunasekaran et al., 2008; Kuei et al., 2015; Vachon & Klassen, 2006). In addition, Kafa et al. (2013) advocated that the level of effort to raise consumer awareness of sustainability and the level of effort to motivate employees in the organization can be a part of green business performance in terms of social performance. However, Zampese et al. (2016) argued that social participation and collaboration should also include the participation and collaboration with governmental and non-governmental organization. Similarly, Banihashemi et al. (2019) and Çankaya and Sezen (2019) revealed that employees' participation, community' participation, governmental and non-governmental organization's participation can be used to measure social performance in terms of social participation and collaboration. Accordingly, the result of the corporation receiving good participation from and collaborating with employees, customers, community, governments, and suppliers, in achieving corporate goals and mission can be selected as measurement of social performance.

However, the social performance can also refer to the outcome of the organization on socially servicing the suppliers by sharing knowledges, technology, information, as well as, academic services. For example, Vachon and Klassen (2006) and Gunasekaran et al. (2008) revealed that sharing knowledge and techniques related to environmental management with suppliers can be one of the indicators of social performance. Furthermore, Kafa et al. (2013) and Çankaya and Sezen (2019) included improvement in investments on social projects such as education, culture, sports, donation, social development, as an indicator of social performance. However, Çankaya and Sezen (2019) extended that servicing employee by providing training and education to improve employee's knowledge and skills can also be accounted for as social performance measurement. Accordingly, social performance can be measured in the way that the organization provides social services by sharing knowledges, technology, information, as well as, academic services to customers, community, governments, and suppliers.

In addition, social performance can also be measured by social satisfaction and social relationship. For social satisfaction, it refers to the employees, customers, community, governments, suppliers being satisfied with the corporate' activities and management related to green adoption. For example, Kafa et al. (2013) portrayed that when the organization adopts the environmental practices on product and service development and delivery, it can create customer satisfaction and loyalty, customer interest in green products, and significant reduction in community complaint. Similarly, Leonidou et al. (2017), Banihashemi et al. (2019), and Çankaya and Sezen (2019) mentioned that customer satisfaction and loyalty, customer retention, and amount of community complaint can also be used to measure the social performance. Meanwhile, social relationship refers to the situation that the organization has good relationship with employees, customers, community, governments, and suppliers. For example, Kuei et al. (2015) mentioned that a good relationship with customers, community, as well as, external stakeholders can be used to measure the social performance; this corresponds with the study of Fernando et al. (2019). Additionally, Leonidou et al. (2017) stated that the social relationship can specifically be extended to the relationship with supplier's relationship. Meanwhile, Çankaya and Sezen (2019) advocated that it is also important to consider the improvement in relations with community stakeholders, non-governmental organizations (NGOs), as well as community activists, who act as the voices of the community. Regarding this, the situation which the organization can create the satisfaction of employees, customers, community, governments, suppliers and has good relationship with them, can be accounted for as social performance.

Lastly, the concept of social performance indicating green business performance can include the study related to social quality. Social quality refers to the way the employees, customers, community, governments, and suppliers have better quality of life influenced by the corporate business operation. Banihashemi et al. (2019) refers to social quality as the situation in which the organization can improve customer health and safety, improve occupational health and safety of employees, increase employment stability and job creation or preservation. A similar study was conducted by Çankaya and Sezen (2019) who also mentioned that employees who can have occupational health and safety can be part of social performance indicator. Moreover, Fernando et al. (2019) added that better quality of life for customers can also be considered as an indicator of social performance. Accordingly, employees, customers, community, governments, and suppliers have better quality of life influenced by the corporate business operation.

Given to the definition and importance, social performance refers to the corporate' management related to environmental concerns, protection, and management and its results contribute good things such as social satisfaction, social relationship, social participation, social collaboration, social life quality, and social services to both internal and external society, including employees, customers, suppliers, community and governmental agency. Table 20 shows the summary of variable reviews related to social performance.

Table 20 Summary of variable reviews related to social performance

Social Performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Customer satisfaction and loyalty								√				√	√	√	
Customer retention												√			
Customer interest in green products								√							
Level of employee								√							

Social Performance	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
satisfaction															
Community complain reduction								√					√		
Increase in customer’s relationship										√					
Improvement in community relationship										√				√	√
Good creation of supplier’s relationship												√			
Improvement in relations with community stakeholders, e.g., nongovernmental organizations (NGOs) and community activists														√	
Ability to engage in and sustain external relationships with stakeholders is improved										√					
Level of effort to raise consumer awareness of sustainability								√							
Employees’ participation													√		
Community’ participation													√		
Governmental and non-governmental organization’s participation													√	√	
Level of effort to motivate employees								√							
Improved awareness and protection of the claims and rights of people in community served														√	
There is a collaboration with											√				

Social Performance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
governmental and non-governmental organization															
Supplier's participation and collaboration	√				√					√			√		
Customers' participation and collaboration in environmental activities		√	√	√		√	√		√	√			√		
Customer health and safety													√		
Better quality of life for customers															√
Improvement in occupational health and safety of employees													√	√	
Employment stability													√		
Job creation or preservation													√		
Increase in employment rate															√
Quality of employee's life															√
Quality of community's life															√
Improvement in employee training and education														√	
Improvement in investments on social projects (education, culture, sports, donation, social development)								√						√	
Knowledge and techniques related to environmental management shared with suppliers	√				√										

Note 1: Vachon and Klassen (2006), 2: Zhu and Sarkis (2007), 3: Zhu et al. (2007a);4: Zhu et al. (2008b); 5: (Gunasekaran et al., 2008), 6: Azevedo et al. (2011), 7: Green et al. (2012), 8: Kafa et al. (2013), 9: Lin (2013), 10: Kuei et al. (2015), 11: Zampese et al. (2016), 12: Leonidou et al. (2017), 13: Banihashemi et al. (2019), 14: Çankaya and Sezen (2019), 15: Fernando et al. (2019)

2.6 Hypothesis Development

2.6.1 Relationship among Green Corporate Identity, Green Personal Identification, Green Social Identification, and Green Supply Chain Management

It is undeniable to mention that the corporate image driven and forced by internal and external industrial environments related to environmental friendliness is important for various organization. The internal forces can be related to the forces from the management level such as executive attitudes and visions or the operational level such as employee's mindsets, behaviours and knowledge (Alhamali, 2019; Kerdpitak, 2019), while the external forces can include technology, suppliers, customers, governments, competitors, internationalization and others towards environmental concerns and protection (Karimi & Rahim, 2015; Malviya & Kant, 2017; Rashid et al., 2018; Zhu & Sarkis, 2007). This could lead them to finding ways to create the corporate identity representing green thoughts, visions, missions, and goals. Based on the literature reviews, the green corporate identity refers to the organization that has been managing their identity through its management regarding green corporate identity, green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers, green product and service quality regarding the environmental concerns (Balmer, 1995; Balmer & Gray, 1999; Birkigt & Stadler, 1986; Maurya et al., 2015; Melewar et al., 2005; Melewar, 2003; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014). When their corporate identity is well managed, their employees at both individual level and collective level, will attempt to understand and interpret it into their actions by matching themselves, in terms of employee's personal attitudes; personality; value; in-role and extra-role practices, with the organizational objectives, value, culture, policy and guideline (Lassar et al., 1995; Sukortprommee, 2013) and society' norms, principles, and influence (Carroll & Ahuvia, 2006; Sukortprommee, 2013). After they associate with the corporate identity, the corporate identity will create improved working mindset (Chen, 2011), as well as, encourage the employee's awareness on environmental problems and protection (Sharma, 2000). As a result, it can lead to economic, environmental, and social performance related to both financial and non-financial indicators

(Banihashemi et al., 2019; Çankaya & Sezen, 2019; Fernando et al., 2019; Kuei et al., 2015; Leonidou et al., 2017). Therefore, the following hypothesis was proposed.

H1: Green corporate identity has a positive influence on employee's green personal identification.

H2: Green corporate identity has a positive influence on employee's green social identification.

H3: Green corporate identity has a positive influence on green supply chain management.

2.6.2 Relationship among Green Personal Identification, Green Social Identification, and Green Supply Chain Management, and Green Business Performance

The corporate' management decides to create corporate identity that emphasizes on reducing harmfulness and create the link between corporate and employees so that the corporate can create working guidelines and encourage employee behaviours to be better (Chen, 2011; Sharma, 2000). When the employees in the organization understand what the environmental requirements and objectives or green directions of their organization stands for, they will identify themselves and respond to their green corporate identity (Karaosmanoglu et al., 2016). In addition, the employees who can identify themselves to respond to the green concept, vision, mission, and culture generated by the organization, will additionally create the social identification which the employees in the organization will understand truly and work together closely to obtain their goals (Carroll & Ahuvia, 2006; Sukortprommee, 2013). Herewith in this case, they will encourage themselves to work well on green supply chain management such as inputs purchasing, product and service designing, product manufacturing, product and service marketing, logistics, and investment recovery. Each activities deals with green concepts (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Soleimani, et al., 2015; Kuei et al., 2015; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007) and create green business performance, including economic performance focusing on cost reduction and returns, environmental performance focusing on environmental friendliness and corporate image improvement, and social performance benefiting the employee (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Zampese et al., 2016; Zhu et al., 2012). Therefore, the following hypotheses were proposed as follows:

H4: Green personal identification has a positive influence on green social identification.

H5: Green personal identification has a positive influence on green supply chain management.

H6: Green personal identification has a positive influence on green business performance.

2.6.3 Relationship among Green Social Identification, Green Supply Chain Management, and Green Business Performance

After the self-expression of the employee that she/he feels belonging to the organization in the way that the organization's identity and management on environmental awareness and protection fit and correspond with her/his individual personality; attitudes; values; and practices (Lassar et al., 1995; Sukortprommee, 2013), they will be able to perform the work related to environmental assignments in a better way because of the commitment in their mindset to environmental problems in to and requirements to match the corporate's green identity (Chen, 2011; Sharma, 2000). The green corporate identity can be created through various components, including green communication, visualization, culture, employee behaviour, policy, forces and drivers, and products and services (Balmer, 1995; Balmer & Dinnie, 1999; Birkigt & Stadler, 1986; Maurya et al., 2015; Melewar et al., 2005; Melewar, 2003; Podnar, 2005; Tourky, 2013; van Rekom, 1997; Waithaka, 2014). Additionally, the employees who can identify themselves to respond to the corporate's green identity, will additionally create the social identification which the employees in the organization will understand truly and work together closely to obtain their goals (Chen, 2011; Sharma, 2000). They will understand that their ways in working on environmental assignments encouraged by their corporate's green identity can also match with the society (organization), which finally influence them to be accepted as a part in their society in line with organizational norms, values, and culture (Carroll &

Ahuvia, 2006; Sukortprommee, 2013). Lastly, when each employee can identify herself or himself that she or he has become a part of society in the organization, she or he will be willing to work together effectively with other people in the society in the supply chain from up-stream to down-stream, including, purchasing, designing, manufacturing, marketing, logistics, and investment recovery (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Rajendran, et al., 2015; Kuei et al., 2015; Van den Bosch et al., 2005; Zampese et al., 2016; Zhu & Sarkis, 2007). Later, the effective green management will yield corporate's green business performance including economic performance focusing on cost reduction and returns, environmental performance focusing on environmental friendliness and corporate image improvement, and social performance benefiting employees, community, customers, and suppliers etc (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Zampese et al., 2016; Zhu et al., 2012). Therefore, the following hypotheses were proposed as follows:

H7: Green social identification has a positive influence on green supply chain management.

H8: Green social identification has a positive influence on green business performance.

2.6.4 Relationship between Green Supply Chain Management and Green Business Performance

It is very important to consider the effectiveness of green supply chain management. The green supply chain management was developed from the traditional supply chain management concept covering the products and services produced from upstream line and distributed into the end users which is called downstream line (Tan, 2002). Due to the forces and drivers from the environmental concerns from different stakeholders in industrial level such as customers, suppliers, and competitors (Chidchob & Pianthong, 2020; Walker et al., 2008), and macro level such as governmental regulations, technology changes, social behaviours, and economic conditions (Mathiyazhagan & Haq, 2013; Rashid et al., 2018; Walker et al., 2008), the organization decided to develop and better the management of supply chain by emphasizing on more environmental issues.

Accordingly, the organization greens the supply chain activities such as adjusting organizational strategies and practices as well as collaborating with employees, customers, suppliers, and others in various activities such as purchasing, designing, manufacturing, marketing, logistics, and investment recovery (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Rajendran, et al., 2015; Kuei et al., 2015; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007) to respond to the changes in industrial and macro level. Once the supply chain becomes green or environmentally friendly, it can then positively affect business performance including economic performance, environmental performance and social performance, such as cost reduction and returns, corporate image improvement, benefits for employees, community, customers, suppliers and others (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Zampese et al., 2016; Zhu et al., 2012). Therefore, the following hypothesis was proposed as follows:

H9: Green supply chain management has a positive influence on green business performance.

CHAPTER 3
RESEARCH METHODOLOGY

In this section, research procedures and research framework displaying the influence of green corporate identity on employee green identification, green supply chain management, and green business performance are presented. Later, the population, sample size, sampling method, and study area were determined. Another important aspect is the design and development of questionnaires, as well as the verification and validation of research instruments using content verification, content validity, question reliability, and model purification. Furthermore, the data collection process was mentioned and explained. Finally, this section discussed data analysis techniques, which included descriptive statistics and multivariate statistics.

3.1 Research Procedure

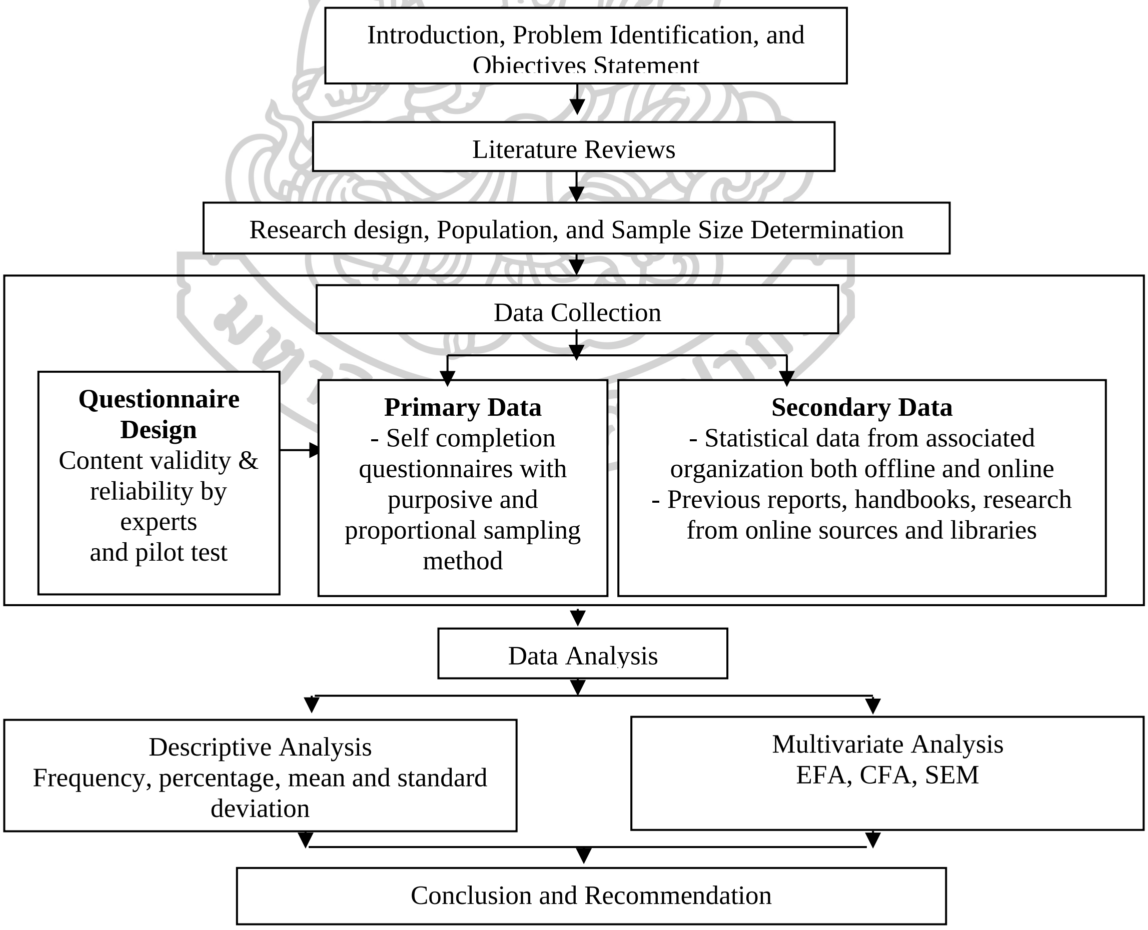

Figure 2 Research procedure

3.2 Research Framework

Figure 3 shows the theoretical framework of this study. The exogenous variables include green corporate identity (green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green corporate policy, green forces and drivers, and green products and services), employee's green personal-social identification (green personal identification and green social identification), and green supply chain management (green procurement, green design, green manufacturing, green marketing, green logistics, and green recovery). Meanwhile, the endogenous variable includes green business performance (economic performance, environmental performance, and social performance).

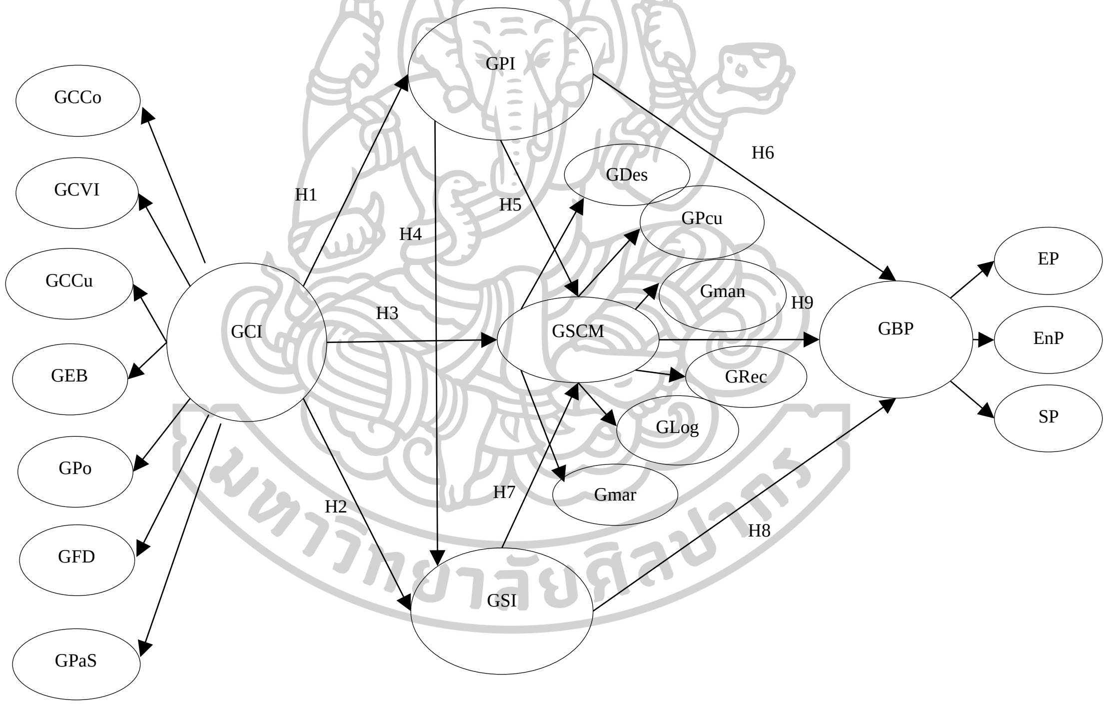

Figure 3 Conceptual framework

Note: GCI: Green Corporate Identity, GCCo: Green Corporate Communication, GCVI: Green Corporate Visual Identity, GCCu: Green Corporate Culture, GEB: Green Employee Behaviour, GPo: Green Corporate Policy, GFD: Green Forces and Drivers, GPaS: Green Products and Services, GPI: Green Personal Identification, GSI: Green Social Identification, GSCM: Green Supply Chain Management, GPcu: Green Procurement, GDes: Green Design, GMan: Green Manufacturing, GRec: Green Recovery, GLog: Green Logistics, GMar: Green Marketing, GBP: Green Business Performance, EP: Economic Performance, EnP: Environmental Performance, SP: Social Performance

3.3 Hypotheses

The researcher specifies the hypotheses to obtain the study objectives with the empirical study on the related theories as follows:

H1: Green corporate identity has a positive influence on employee’s green personal identification.

H2: Green corporate identity has a positive influence on employee’s green social identification.

H3: Green corporate identity has a positive influence on green supply chain management.

H4: Green personal identification has a positive influence on green social identification.

H5: Green personal identification has a positive influence on green supply chain management.

H6: Green personal identification has a positive influence on green business performance.

H7: Green social identification has a positive influence on green supply chain management.

H8: Green social identification has a positive influence on green business performance.

H9: Green supply chain management has a positive influence on green business performance.

3.4 Population, Sample Size, Sampling Method and Study Area

3.4.1 Population

To test green corporate identity on employee green identification, green supply chain management and green business performance in automobile manufacturing industry in Thailand, the population will include employees who are working in Thailand’s automobile manufacturing industry. Thailand Board of Investment (2017) and Ploymee (2020) presented data on automobile manufacturers and assemblers, stating that there are 23 automobile assemblers, while GSB Researcher Center (2019) stated that there are approximately 100,000 labors. These auto assemblers include Toyota Motor (Thailand) Co., Ltd producing Toyota; Mitsubishi Motors (Thailand)

Co., Ltd. producing Mitsubishi; Thai Rung Union Car Public Co. Ltd. producing Isuzu; Honda Automobile (Thailand) Co., Ltd., producing Honda; Auto Alliance (Thailand) Co., Ltd. producing Mazda and Ford; Nissan Motor (Thailand) Co., Ltd. producing Nissan; BMW manufacturing (Thailand) Co., Ltd. producing BMW; Thonburi Automotive Assembly Plant Company producing Mercedes-Benz and TATA; Thai Swedish Assembly Co, Ltd producing Volvo; a joint venture of Charoen Pokphand Group and Shanghai Automotive Industry Corporation producing MG; General Motors Thailand producing Chevrolet; Hino Motor Company producing Hino; Yontrakit Motors producing Peugeot, Citroën and Volkswagen; and Vera Automotive producing Vera.

3.4.2 Sample Size

The researcher used the sample size calculation recommended by (Krejcie & Morgan, 1970), resulting in a sample size of 384 based on a population size of 100,000. However, due to the sample size appropriateness proposed by Yuan and Bentler (2000) and Savalei and Bentler (2005), the sample size should be greater than 400 samples for data analysis using the structural equation model (SEM). Furthermore, Nevitt and Hancock (2001), Fritz et al. (2012), and Creedon and Hayes (2015) suggested that sample size can range between 500 and 1000 samples. However, because of the high cost and difficulty of the COVID19 virus outbreak in Thailand, this study decided to limit the sample size to 400 people.

3.4.3 Sampling Method

Due to an estimation of 400 samples from automotive companies which manufacture the automobiles in Thailand, the researcher selected purposive and proportional sampling methods to collect the data. The detail of each sampling method is described below.

The study area was determined using the purposive sampling method. The study area was chosen by the researcher based on companies with manufacturing plants in Thailand, a high volume of manufactured vehicles, and activities related to international transactions such as exporting products to countries other than Thailand. This means that the auto spare producers from Tiers 1, 2 and 3 were not accounted for in this study. Furthermore, the study aimed to investigate manufacturing plants that have environmental activities and missions (environmentally friendliness).

Additionally, employees who were asked to fill out questionnaires must be knowledgeable about procurement, marketing, finance, human resource management, and production on a domestic and international scale, as well as involvement in environmentally friendly activities or participation.

Table 21 shows the names of the automobile assemblers and auto makers, number of employees in company, number of sampled employees receiving questionnaire, and number of employees returning questionnaire. The proportional sampling method was used to assign the number of sampled employees who were chosen to receive the questionnaires. The calculated samples were counted based on the number of total employees in the companies. For example, Company A has more employees compared to the other brands; therefore, it needed more selected employees. With that, the questionnaires were distributed in the target companies.

Table 21 Selected brands and samples

Selected Brand	Number of Employees in Company	Number of Sampled Employees Receiving Questionnaire	Number of Employees Returning Questionnaire
Company A	16,000	157	199
Company B	6,000	59	25
Company C	5,600	55	60
Company D	6,000	59	50
Company E	2,800	27	-
Company F	3,000	29	54
Company G	400	4	12
Company H	1,000	10	-
Total	40,800	400	400

According to the above Table, the number of employees returning questionnaires did not match with number of sampled employees receiving questionnaires. This is because of the difficult time in collecting the data which was caused by the outbreak of COVID 19 in Thailand. As a result, the concern of sample selection bias occurs. In order to analyze the bias issue, sample group difference using One-way ANOVA (Tourky, 2013) and correlation between the variables using bivariate correlation (Wallmann-Sperlich et al., 2014) were conducted. The result of One-way ANOVA analysis revealed statistically significant difference of companies on studied variables, but bivariate correlation revealed less degree of correlation between companies and studied variables (correlation coefficient: $r < 0.45$). This showed that the respondents from different companies had different opinion towards the studied variables, but the studied variables were correlated with each other's with least degree of correlation. Align with this, it means that the answers towards studied variables are free from the company difference factor. Therefore, the data collected in this time can be proceeded to have further analysis.

3.4.4 Study Area

In the study related to green corporate identity on green personal and social identification, green supply chain management and green business performance, the automobile manufacturing industry was selected. Various scholars being interested in supply chain management mainly selected the automobile industry because of its good connection of supply chain, which requires a lot of auto-parts from different tiers (Boon-itt & Paul, 2006). Furthermore, Thailand's automobile industry was chosen because Thailand is Asia's second largest automobile exporter, primarily to Australia, the Philippines, Indonesia, Japan, and Malaysia (Thailand Board of Investment, 2017). The selected companies must be involved in cross-border transaction and environmental concerns. Initially, eight international automobile manufacturers were selected, but only six companies returned the responses. With the computation of sample size, Table 22 shows the number of samples to be expectedly and actually collected, and location.

Table 22 Number of samples and location.

Selected Brand	Number of Samples		Location
	Expected Collection	Actual Collection	
Company A	157	199	Samut Prakan and Chachoengsao
Company B	59	25	Chon Buri
Company C	55	60	Chachoengsao
Company D	59	50	Ayutthaya and Prachinburi
Company E	27	-	Rayong
Company F	29	54	Samut Prakan
Company G	4	12	Rayong Province
Company H	10	-	Samut Prakan
Total	400	400	

3.4.5 Respondent's Bias Analysis

Bias analysis is necessary to be mentioned since the concern of misrepresentation of target population about which conclusions are to be drawn occurs. In this study, the analysis of respondents' bias on different characteristics: gender, age, marital status, educational level, monthly income, working experience, position and department was performed using independent sample t-test and One-way ANOVA (Tourky, 2013). The performance was aimed to test whether there were the significant differences in the mean score between respondents' different characteristics and all variables: green corporate identity, employees' green personal and social identification, green supply chain management, and green business performance. The result of the test should indicate no difference. In addition, Pearson bivariate correlation was also conducted in order to investigate and analyze the relationship between respondents' different characteristics and studied variables (Wallmann-Sperlich et al., 2014). The result should indicate there were no correlation between the studied variables. If there is no correlation at all, meaning that the answers are free from any demographic factors.

3.5 Questionnaires Design and Development

3.5.1 Questionnaires Design Procedures

The questionnaires were chosen to be used as a research tool to collect data from employees working in supply chain management, dealing with cross-border procurement, manufacturing, product design, marketing and distribution, logistics, and recovery in Thailand's automobile manufacturing industry. To obtain appropriate questionnaires and measurements, the researcher creates the questionnaire using the processes outlined below:

Step 1: The researcher studied the related concepts and theories of green corporate identity on green personal and social identification, green supply chain management, and green business performance from research sources such as ProQuest, ScienceDirect, Google Scholar, and various university libraries, and defined the conceptual framework for the research.

Step 2: The researcher studied more information about green corporate identity on green personal and social identification, green supply chain management and green business performance from related books, documents, articles and researches obtained from research sources such as ProQuest, ScienceDirect, Google Scholar, and various university libraries to receive a guideline for creating questions.

Step 3: The researcher used related concepts and theories and sample questions to create the first draft of the questionnaire. In this step, the researcher created the questions by referring to previous sample questions. In this step, back-translation technique was used (Maneesriwongul & Dixon, 2004). If any usable question was in English, the researcher translated that question into Thai and invited related experts to discuss its meaning to prevent confusion in language translation. Moreover, the researcher also ensured that all Thai questions can be correctly reconverted into English version. Then, the researcher sent out the first daft to the advisors and received the comments and recommendation from the advisors.

Step 4: The researcher edited the first draft of the questionnaire by referring to the comments and recommendations from the advisors from Step 3 and resubmitted to the advisor to see the second questionnaire evaluation.

Step 5: After the researcher received the approval from the advisors about the questionnaires and questions, the researcher sent out the questionnaires to the experts who are knowledgeable and experienced about green corporate identity, green supply chain management and green business performance to receive the experts' opinions and suggestions. In this step, seven experts were selected based on the recommendation from Yaghmaei (2003). To consider and verify the questions in the questionnaire, the content validity index (CVI) was employed because it can help check the reflection of the adequate, relevant, objective, and comprehensive measurements, operational definition, and construct (Shrotryia & Dhanda, 2019). The CVI investigation consists of 4 inspection dimensions: relevance, clarity, simplicity, and ambiguity (Yaghmaei, 2003). Herewith, both content validity index for item (I-CVI) and content validity index for scale (S-CVI) were inspected (Yusoff, 2019). The score of I-CVI and S-CVI for item and scale should be averagely greater than 0.70. If any item and score were rated below 0.70, they must be eliminated or reconsidered. The detailed scores were reported in the section of content validity and Appendix C.

Step 6: The researcher took the comments from 7 experts in Step 5 into account and modified the questions in the questionnaire. After the questions were reconsidered and modified, the researcher sent out the questionnaire to the employees who were working in the automobile manufacturing industry. A total of 40 sets of questionnaires were sent out. After the 40 sets of questionnaires were returned, the researcher then used Cronbach Alpha Coefficient to test the reliability of the questionnaire and questions. The score of Corrected Item-Total Correlation in each question should be greater than 0.20 (Faleye, 2008). Meanwhile, the Cronbach Alpha Coefficient of each dimension should be greater 0.70 (DeVellis, 2016; Hajiar, 2014). The detailed scores were reported in the section of reliability assessment.

Step 7: After testing the questionnaire' reliability, the researcher then distributed 400 sets of questionnaires to the selected study area.

3.5.2 Measurement Development

Green Corporate Identity

Green corporate identity refers to the explicit management and strategic tool adopted by the corporate to positively express the distinguished and recognizable identity manifested by corporate value, corporate culture and corporate behaviour responding towards external and internal forces in the market and industry condition through corporate mission, corporate strategy, corporate communication, visuality, and corporate products and services delivered to related stakeholders including employees, customers, suppliers, governors and community (Abratt, 1989; Balmer, 1995; Balmer & Dinnie, 1999; Balmer & Gray, 1999; Leuthesser & Kohli, 1997; Margulies, 1977; Markwick & Fill, 1997; Maurya et al., 2015; Melewar & Karaosmanoglu, 2006; Melewar & Wooldridge, 2001; Olins, 1990; Otubanjo & Melewar, 2007; Portugal & Halloran, 1986; van Rekom, 1997). There are 7 sub-dimensions including green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers and green products and services. Each dimension with definition and related questions are detailed as follows.

Green Corporate Communication

The green corporate communication refers to the way that the corporate has directly and indirectly communicated with its internal and external stakeholders about the environmental concerns, management, and protection in order to better the stakeholder relationship and understanding toward the distinguished identity of the corporate (Balmer, 1995; Balmer & Gray, 1999; Maurya et al., 2015; Melewar, 2003; Melewar & Karaosmanoglu, 2006; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014). It was divided into 2 sub-dimensions, which are internal communication and external communication. The internal communication refers to the way the corporate can communicate the policy, mission, goal, vision as well as identity towards the corporate action on environmental issues and concerns to the employees as internal stadtholders of the organization so that they can have awareness and employee behaviour for green activities (Tourky, 2013; Waithaka, 2014). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. There are five items including as follows.

1) The company conveys the messages related to environmental awareness at work to employees.

2) The company welcomes any comments and suggestions towards improving environmental actions from the employees.
3) The company uses various channels to communicate with employees about the corporate policy, guideline or goal related to environmental awareness.
4) The company keeps employees informed about environmental awareness at work.
5) The company delivers knowledge, information, and news related to environmental awareness that is beneficial for work to employees.

In the meantime, the external communication refers to the way that the corporate communicates and conveys messages related to corporate product, value, identity, and business activities about the environmental issues and concerns (Tourky, 2013). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. There are five items including as follows.

1) The company uses various channels, such as website, email, product packages, social media, TV program, and others to send message about environmental care and action of the corporate to all stakeholders.
2) The company participates and promotes environmental events, such as offering a sponsorship, CSR, etc.
3) The company regularly publicizes its environmental activities in order to keep all stakeholders informed.
4) The company publicizes its green activities news through its facilities, equipment's, and staff.
5) The company implement word-of-mouth to publicize news related to the corporate's environmental care and activities.

Green Corporate Visual Identity

The green corporate visual identity refers to the way the corporate present the corporate identity in terms of value, philosophy, mission towards environmental concerns, management and protection with stakeholders via graphic design, color, symbol, logo and typography through possible ways such as product, location, vehicle, printing, and other media channels (Baker & Balmer, 1997; Dowling, 1995; Melewar, 2003; Tourky, 2013). There are six components including graphic design, color, symbol, logo, slogan, and typography. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) The company’s graphics, such as logos are designed to consistently convey and represent its green business activities.
2) The company uses the (green) colour to be a part of the message, parts, materials, buildings, cars, employees to reflect its green business activities.
3) The company uses the environmental caring symbol that represents its green business activities.
4) The company’s logo reflects the corporate’s green business activities.
5) The company’s slogan reflects the corporate’s green business activities.
6) The company’s typography and font used in various media reflect the corporate’s green business activities.

Green Corporate Culture

The green corporate culture refers to the pattern of behaving, accomplishing, and learning in the corporate by the corporate members under the vision, shared value, history, philosophy, principles and guidelines related to environmental concerns, management and protection corresponding to external adaptation and internal integration (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Melewar & Wooldridge, 2001; Mohamad et al., 2007; Podnar, 2005; Schein, 1985; Tourky, 2013; Van Riel & Balmer, 1997). It consists of 5 components including green vision, green values, green principle, green guideline, and green mission. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Therefore, the question items used in this study consisted of six items as follows.

1) The company concentrates on the vision of green business operation.
2) The company creates culture and value on green business operation among employees.
3) The company sets the corporate standards and principles for corporate members to work with environmental awareness.
4) The company has a clear guideline for corporate members to work with environmental awareness.
5) The company's mission reflects its green business operation.
6) The company's mission is clearly communicated to corporate members and related to stakeholders.

Green Employee Behaviour

The green employee behaviour refers to the pattern of in-role and extra-role working behaviours of the employees in the corporate by under the shared values, culture, structure, and strategy related to environmental concerns, management, and protection of the corporate (Boiral & Paillé, 2012; Chun, 1994; Iqbal et al., 2018; Norton et al., 2015; Norton et al., 2014; Safari et al., 2018; Sukortprommee, 2013; Yang et al., 2019). Herewith, there are two main components: green in-role behaviour and green extra-role behaviour. For green in-role behaviour, it was defined as the behaviour of employee in the organization that willingly and voluntarily work, initiate, help, share, afford and inspire others about environmental concerns, management and protection of the corporate (Boiral & Paillé, 2012; Chun, 1994; Iqbal et al., 2018; Safari et al., 2018). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of five items as follows.

1) I perform the works with environment awareness as assigned.
2) My work performance meets the environmental criteria as required by the company.
3) I can successfully perform my work related to the environmental protection as assigned by the company.

4) I can perform the tasks related to the environmental protection as expected by the company.
5) I can perform the tasks related to the environmental protection as specified in the job description.

In the meantime, the green extra-role behaviour is defined as the behaviour of employee in the organization that willingly and voluntarily work, initiate, help, share, afford and inspire others about environmental concerns, management and protection of the corporate (Boiral & Paillé, 2012; Chun, 1994; Iqbal et al., 2018; Safari et al., 2018). Hereinafter, there are 5 sub-dimensions: green civic virtue, green helping, green initiative, green sportsmanship, and green influencing. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Consequently, the question items used in this study consisted of six items as follows.

1) I participate in company environmental activities and voice opinion for company's environmentally operational improvement.
2) I am willing to help my colleagues to manage problems or obstacles related to environmental issue that they encounter even though it is not my responsibility.
3) I voluntarily apply the principles of eco-friendly work into my regular work.
4) I am patient with difficulties at work when performing tasks with environmental awareness.
5) I inspire and encourage my colleagues to take environmental concern into account.
6) I share my knowledge related to environmental work with my colleagues.

Green Corporate Policy

The green corporate policy refers to the commitment statement of the corporate expressing and highlighting the stakeholder the objectives and environmental-friendly ways of working and collaborating on how to be able to achieve the corporate goals in the responsiveness towards environmental conservation, management, and protection (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015a; Podnar, 2005). It includes five issues including green knowledge provision, green collaboration, green agreement establishment, green change and adjustment, and green responsiveness. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Consequently, the question items used in this study consisted of five items as follows.

1) The company has a policy to share and provide environmental management techniques to suppliers, customers and other stakeholders.
2) The company has a policy to collaborate with suppliers, customers and other stakeholders to do green activities.
3) The company establishes the environmental agreements with suppliers, customers and other stakeholders.
4) The company has a policy to change and adjust its corporate activities and business to be green.
5) The company has a policy that responds to green business and activities.

Green Forces and Drivers

Green forces and drivers are defined as the external forces concerning the environmental issues from industrial involvers, internationalization, technology innovation, governmental matters, and society that require the corporate to encounter and concern for corporate management (Alhamali, 2019; Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Karimi & Rahim, 2015; Maditati et al., 2018; Malviya & Kant, 2017; Mathiyazhagan & Haq, 2013; Melewar, 2003; Melewar & Akel, 2005; Melewar & Wooldridge, 2001; Rashid et al., 2018; Walker et al., 2008). There are five sub-categories under this dimension, which they are green industrial force, green internationalization force, green technology innovation force, green societal force, and green governmental regulation and law. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of five items as follows.

1) External stakeholders, such as customers, competitor, and suppliers force the company to concern environmental matters.
2) Being an internationalized company forces the company to concern environmental matters.
3) Technology and innovation can assist the company to promote and produce products and services.
4) Society and community force the company to concern environmental matters.
5) Governmental regulations and laws force the company to concern environmental matters.

Green Products and Services

Green products and services measurement refers to the features displaying the match between the customers' expectation and perception towards product and service quality, which it can come from the joint between functional quality and technical quality from the process to the end products and services, and the way to keep customers satisfaction, good experience and loyalty through environmentally conservative and protective products and services (Balmer & Stotvig, 1997; Melewar & Wooldridge, 2001). In this dimension, it has 4 categories reflecting the green products and services, which encompassing with product and service, functional quality and technical quality, customer relationship building and customer's expectation and perception. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of four items as follows.

1) The products and services represent the corporate's concerns on environmental matters.
2) The company can produce green products and provide green services.

3) The company builds relationship with customers to satisfy them and prolong their decision to continue using the products and services provided by the company.
4) The company accurately respond the customer's needs in terms of green products.

Employee Green Personal-Social Identification

Employee green identification refers to the self-reflection or expression that the individuals themselves are fit to the organization and society, meaning that the individuals (personality, values, attitudes, image, and practices) match with organization in terms of culture, values, practices (personal identification) and match with society in terms of social acceptance, social status, social role (social identification) (Carroll & Ahuvia, 2006; Lassar et al., 1995; Sukortprommee, 2013). There are 2 sub-dimensions including green personal identification and green social identification. Each dimension with definition and related questions are detailed as follows.

Green Personal Identification

Based on literature reviews, the green personal identification refers to the identification of the employee's self-expression identifying that she/he feels belonging to the organization in the way that the organization's identity and management on environmental awareness and protection match her/his individual personality, attitudes, values, and practices (Lassar et al., 1995; Sukortprommee, 2013). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the questions used in this study consisted of six items as follows.

1) The green corporate identity is consistent my lifestyle.
2) The green corporate identity is consistent with my role.
3) The green corporate identity is consistent with my value.
4) The green corporate identity symbolizes my identity.
5) The green corporate identity reflects my personality.

6) The green corporate identity extends my green role.

Green Social Identification

For another dimensions, the green social identification refers to the employee's expression identifying that the organization in the way of considering environmental awareness, protection, and management influence her/him, in terms of status, role, and image, to be matched and accepted by the group of people or society intending to conform the management related to environmental concerns and protection (Carroll & Ahuvia, 2006; Sukortprommee, 2013). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of five items as follows.

1) The green corporate identity provides me social recognition and respect.
2) The green corporate identity enhances my social status.
3) The green corporate identity enhances my image.
4) The green corporate identity increases my "social role".
5) The green corporate identity influences the society to view me in a better way.

Green Supply Chain Management

Green supply chain management refers to the management of supply chain done by the organization and its members with the purposes to obtain better management together with being environmental friendliness, which the related supply chain activities include inputs purchasing, product and service designing, product manufacturing, product and service marketing, logistics, and investment recovery. Each activity concerns with green concepts (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Rajendran, et al., 2015; Govindan, Soleimani, et al., 2015; Green et al., 2012; Kuei et al., 2015; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu et al., 2007a). There are 6 sub-dimensions including green design, green purchasing, green manufacturing, green marketing, green logistics, and green recovery. Each dimension with definition and related questions are detailed as follows.

Green Design

Green design refers to the design and requirements of manufacturing the products together with minimizing the negativity on the ecological environment, which it can support the products and its components to be potentially reused, recycled, and recovered. In addition, the green design can also include the design that help save energy, promote friendly usage, and reduce pollution, corresponding the needs of customers through manufacturer-customer collaboration (Arena et al., 2003; Beamon, 1999a, 1999b; Eltayeb et al., 2011; Fiksel, 1996; Green et al., 2012; Gungor & Gupta, 1999; Lin, 2013; Tseng & Chiu, 2013; Zhu et al., 2007a). Here, there are six components building green design in the green supply chain management: materials/energy reduction, environment impact reduction, customers collaboration, reuse, recycle, and recovery, friendly usage and waste and chemical usage. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) The company designs products and services that help reduce unnecessary energy and raw materials usage.
2) The company intends to reduce product components that give negative effects on the environment.
3) The company collaborates with both domestic and international customers for green design, packages, and management solution.
4) The company designs the products with reusable, recyclable materials.
5) The company designs the green products to be easily used.
6) The company designs products that can reduce the use of hazardous substances and reduce production waste.

Green Procurement

Green procurement focuses on the ways the organization cooperates and purchases the inputs, material, equipment, technology, and other supplies from domestic or internal suppliers who involve provide environmentally supplies under the environmental standard, requirements and objectives (Çankaya & Sezen, 2019; Carter et al., 1998; Green et al., 1998; Green et al., 2012; Jabbour et al., 2013; Kannan et al., 2014; Yang et al., 2013; Zhu et al., 2008a). Here, there are six components building green purchasing in the green supply chain management: green criteria for supplier section, green related raw materials, specific green requirements, supplier's green cooperation, environmental audit for supplier and supplier green recognizable standard. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) The company chooses either domestic or international suppliers based on its green criteria.
2) The company purchases green raw materials.
3) The company has a green design specification as a requirement for domestic and international suppliers.
4) The company has a cooperation with both domestic and international suppliers for delivering green raw materials.
5) The company monitors both domestic and international suppliers' internal green management prior to any purchase.
6) The domestic and international supplier of the company is required to have recognizable green certificates or standard.

Green Manufacturing

Green manufacturing refers the production or manufacturing process of the products under the aims and requirements of reducing hazardous-chemical inputs, wastes, air-noise-water-soil pollutions, production costs, and energy consumption through efficient production, manufacturing improvements, proper technology section, strategic planning, and standard acceptance (Kuei et al., 2015; Nawrocka et al., 2009; Prajogo & Olhager, 2012; Prajogo et al., 2012; Prajogo et al., 2018; Robèrt, 2000; Tippayawong et al., 2015; Tseng & Chiu, 2013; van Hoek, 1999; Zampese et al., 2016; Zhu & Sarkis, 2007). Here, there are seven components building green manufacturing in the green supply chain management: hazardous and waste reduction, re-manufacturing and lean production, clean manufacturing technologies, green capacity utilization, green production efficiency, green maintenance, and green production standard. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of seven items as follows.

1) The company minimizes using chemical substances and pollution.
2) The company applies re-manufacturing and lean production to reduce waste.
3) The company applies clean manufacturing technologies for green production.
4) The company optimizes its manufacturing process for highest efficiency.
5) The company utilizes raw materials effectively.
6) The company strategically plans to repair machines and supplies.
7) The company's manufacturing process is certified and standardized at international level.

Green Marketing

Green marketing refers to the activities of marketing the products to the customers. It includes marketing strategies, marketing process and marketing activities (Chan et al., 2012). In addition, the green marketing extends to market segment, market positioning, pricing, advertising (Chan et al., 2012; Zampese et al., 2016). Here, there are six components building effective green marketing in the green supply chain management: green corporate image, green monitoring tool, green market segment, green market positioning, green pricing strategies and green product advertising. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) The company adopts green features to improve its image.
2) The company uses marketing principles as a tool to create competitive advantages.
3) The company conducts a market research and studies customers’ behaviour towards green specifications.
4) The company positions its green products.
5) The company set reasonable prices for green products.
6) The company publicizes its green products in various channels.

Green Logistics

Green logistics refers to logistics activities such as transportation, information flows, logistics planning, and product delivery being done effectively through the requirement of environmental concerns and management such as discharged pollution reduction, time-saving, energy consumption reduction and others by having a good planning, practices and policy (Enarsson, 1998; Green et al., 2012; Kuei et al., 2015; Salimifard et al., 2012; Tippayawong et al., 2015). Here, there are seven components building green logistics in the green supply chain management: green transportation, green check and maintenance, green truck load system, green delivering routes, green cost and alternative fuels, just-in-time system, and green information technology. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Accordingly, the question items used in this study consisted of seven items as follows.

1) The company provides green transportation.
2) The company uses the delivery route that can reduce the pollution.
3) The company determines delivery routes prior to any delivery.
4) The company applies full truck load system for effective delivery.

5) The company uses delivery method with alternative energy to save energy and expenses.
6) The company adopts just-in-time logistics.
7) The company applies information technology to track delivery services.

Green Recovery

Green recovery refers the action of the organization to consider the value remained in the no-more-use manufacturing inputs and material, old and/or used products and inventories, old and/or used materials, equipment, and machines, and reverse them into organization cash, assets, or equity. In other words, they can include excess inventory sales, scrap and used materials, and excess capital equipment, as for instance (Büyüközkan & Çifçi, 2012; Govindan, Soleimani, et al., 2015; Green et al., 2012; Tseng & Chiu, 2013; Zhu et al., 2008a, 2008b). Here, there are four components building green recovery in the green supply chain management: recovery of end-of-life items, resale/reuse, replacement, and recondition and refurbishment. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of four items as follows.

1) The company repairs and reuses end-of-life materials, parts and components.
2) The company resells end-of-life materials, parts and components for money or assets of the company.
3) The company prolongs the use of materials, parts and components by maintenance.
4) The company reconditions and refurbishes used parts or components.

Green Business Performance

Green business performance refers to corporate contributions regarding economic aspect (what the organization receive in terms of financial perspectives), environmental aspect (what the environment is benefited) and social aspect (what the internal and external society receives) when it runs their business to respond and benefit customers, suppliers, employees, community and other related stakeholders (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Kafa et al., 2013; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2008a, 2008b). There are 3 sub-dimensions including economic performance, environmental performance, and social performance. Each dimension with definition and related questions are detailed as follows.

Economic Performance

Economic performance refers to the evaluation of the organization by considering the business success mainly based on reduction in purchasing and delivering cost, reduction in energy usage, reduction in waste discharge and treatment payments, reduction in payments related to environmental accidents, increase in revenues and profits, increase in market share and sales growth, and increase organizational competitiveness (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Green et al., 2012; Kafa et al., 2013; Kuei et al., 2015; Ngniatedema & Li, 2014; Zhu et al., 2007a, 2007b, 2008a, 2008b). Here, there are four issues: cost reduction, revenues and profits increase, market share and sales growth and increase in competitive advantages. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from “strongly disagree” to “strongly agree,” respectively. Accordingly, the question items used in this study consisted of seven items as follows.

1) The company’s raw material cost decreases.
2) The company’s energy usage decreases.
3) The company’s expenses on waste discharge decrease.
4) The company’s fines and compensation caused by environmental accidents decrease.
5) The company’s revenues increase.
6) The company’s market share increases.
7) The company’s domestic and international competitive advantages increase.

Environmental Performance

Environmental performance refers to the outcomes derived from the organization benefitting ecology environmental systems and organization reputation by making on resources utilization, waste and pollution reduction, environmental accidents reduction, organization's environmental image improvement, better environmental-friendly production and process, and recycling and reusing adoption (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Fernando et al., 2019; Green et al., 2012; Rawashdeh, 2018; Zhu et al., 2007a, 2007b, 2008a, 2008b). Here, there are six issues: resources maximization, reduction in pollution and waste, reduction accidents and risks, reputation increase, green process improvement, and green adoption. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) Technology and resources are effectively utilized.
2) The level of pollution, toxic and harms due to chemical substances are decreased.
3) Environmental accidents and risks are reduced.
4) Reputation, image, and quality of the company is improved.
5) The quality of green product and services are improved.
6) The company has the ability to recycle and reuse parts, component or raw materials more.

Social Performance

Social performance refers to the corporate' management related to environmental concerns, protection, and management and it results contribute good things such as social satisfaction, social relationship, social participation, social collaboration, social life quality, and social services to both internal and external society including employees, customers, suppliers, community and governmental agency (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Kafa et al., 2013; Kuei et al., 2015; Leonidou et al., 2017; Zampese et al., 2016). Here, there are six issues:

social satisfaction, social relationship, social participation, social collaboration, social life quality and social services. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5 where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Accordingly, the question items used in this study consisted of six items as follows.

1) Employees, customers, community, suppliers, and governmental agencies are satisfied with the process of the company.
2) The company has better relationship with employees, customers, community, suppliers and governmental agencies.
3) Employees, customers, community, suppliers, and governmental agencies participate in expressing ideas and making a decision on activities that benefit the society.
4) The company has a collaboration with employees, customers, community, suppliers and governmental agencies in achieving corporate goals that also benefit the society.
5) Employees, customers, community, suppliers, and governmental agencies regularly obtain beneficial knowledge, news, donation, as well as CSR from the company.
6) Employees, customers, community, suppliers, and governmental agencies have better quality of life.

3.5.3 Research Instrument

General Information of Respondents

General information of respondents refers to information identifying the reliability provided by the respondents. Table 23 shows the question, measurement type described.

Table 23 Items and its measurement of respondents' general information

Item	Measurement
Gender	Nominal
Age	Ordinal
Marital status	Nominal
Education level	Ordinal
Monthly income	Ordinal
Working experience	Ordinal
Position	Nominal
Department	Nominal

Green Corporate Identity (GCI)

Green corporate identity refers to the explicit management and strategic tool adopted by the corporate to positively express the distinguished and recognizable identity manifested by corporate value, corporate culture and corporate behaviour responding towards external and internal forces in the market and industry condition through corporate mission, corporate strategy, corporate communication, visuality, and corporate products and services delivered to related stakeholders, including employees, customers, suppliers, governors and the community. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from 1 to 5, where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Table 24 shows the variables, number of items, and measurement type described.

Table 24 Variables, number of items, and its measurement type of green corporate identity

Variables	Numbers of Items	Measurement
Green corporate communication (GCCo)	10	Scale
Green corporate visual identity (GCVI)	6	Scale
Green corporate culture (GCCu)	6	Scale

Variables	Numbers of Items	Measurement
Green employee behaviour (GEB)	11	Scale
Green corporate policy (GPo)	5	Scale
Green forces and drivers (GFD)	5	Scale
Green product (GPaS)	4	Scale

Employee Green Personal-Social Identification (GPSI)

Employee green personal and social identification refers to the self-reflection or expression that the individuals themselves fit into the organization and society, meaning that the individuals (personality, values, attitudes, image, and practices) match with the organization in terms of culture, values, and practices (personal identification) and match with the society in terms of social acceptance, social status, and social role (social identification). The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from a scale of 1 to 5, where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Table 25 shows the variables, number of items, and measurement type described.

Table 25 Variables, number of items, and its measurement type of employee green personal-social identification

Variables	Numbers of Items	Measurement
Green personal identification (GPI)	6	Scale
Green social identification (GSI)	5	Scale

Green Supply Chain Management (GSCM)

Green supply chain management (GSCM) refers to the management of supply chain done by the organization and its members, with the purposes of obtaining better management together with being environmentally friendly, whose activities include inputs purchasing, product and service designing, product manufacturing, product and service marketing, logistics, and investment recovery. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from a scale of 1 to 5, where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Table 26 shows the variables, number of items, and measurement type described.

Table 26 Variables, number of items, and its measurement type of green supply chain management

Variables	Numbers of Items	Measurement
Green procurement (GPcu)	6	Scale
Green design (GDes)	6	Scale
Green manufacturing (GMan)	7	Scale
Green marketing (GMar)	6	Scale
Green logistics (GLog)	7	Scale
Green recovery (GRec)	4	Scale

Green Business Performance

Green business performance refers to corporate contributions regarding economic aspect (what the organization receive in terms of financial perspectives), environmental aspect (what the environment benefits) and social aspect (what the internal and external society receives) when it runs their business to respond to and benefit customers, suppliers, employees, community, and other related stakeholders. The questionnaire type to be used is the five-point rating scale. Each respondent from the field is asked the questions to share their opinion based on each statement by choosing only one from a scale of 1 to 5, where the meaning ranges from "strongly disagree" to "strongly agree," respectively. Table 27 shows the variables, number of items, and measurement type described.

Table 27 Variables, number of items, and its measurement type of green business performance

Variables	Numbers of Items	Measurement
Economic performance (EP)	7	Scale
Environmental performance (EnP)	6	Scale
Social performance (SP)	6	Scale

3.4.4 Research Instrument Verification and Validation

Instrument Validity

All instruments including green corporate identity, employees' green personal and social identification, green supply chain management and green business performance, used in this study have been referred to previous measurements from other researches which were published and used worldwide. After the instruments were found, the researcher used back translation techniques to translate English statements as original version converted into Thai and later reconverted into English in order to avoid a bias of language and content confusion. In addition, the English expert who translates the questions from English into Thai is different from the one who translates Thai back into English in order that there is the right mutual understanding (Maneesriwongul & Dixon, 2004). All translation versions were done by English translators and approved by English experts.

Content Validity

After that, the researcher employed the score of content validity index (CVI): content validity index for item (I-CVI) and content validity index for scale (S-CVI), provided by experts to present the appropriateness and representativeness of measurements, items and constructs (Shrotryia & Dhanda, 2019; Yusoff, 2019). There are four dimensions of validity dimensions consisting of relevance, clarity, simplicity, and ambiguity and four rating scores ranging from a scale of 1 to 4 given to its degrees (Yaghmaei, 2003). Nevertheless, the score from four rating scale representing the required dimensions checked was converted into 0 and 1 for further analysis of the measurement and content validity (Zamanzadeh et al., 2015), and the details are presented in Table 28.

Table 28 Dimensions and score of content validity index (CVI)

Aspect	Score and Meaning	Conversion
Relevance	1 = This item is not relevant. 2 = This item needs some revision. 3 = This item is relevant; however, it needs minor revision. 4 = This item is fully relevant.	Score 1 and 2 = 0 3 and 4 = 1
Clarity	1 = This item is not clear. 2 = This item needs some revision. 3 = This item is clear; however, it needs minor revision. 4 = This item is fully clear.	Score 1 and 2 = 0 3 and 4 = 1
Simplicity	1 = This item is not simple. 2 = This item needs some revision. 3 = This item is simple; however, it needs minor revision. 4 = This item is fully simple.	Score 1 and 2 = 0 3 and 4 = 1
Ambiguity	1 = This item is doubtful. 2 = This item needs some revision. 3 = This item is doubtful; however, it needs minor revision. 4 = This item is fully doubtful.	Score 1 and 2 = 0 3 and 4 = 1

To investigate the content validity index (CVI) from both content validity index for item (I-CVI) and content validity index for scale (S-CVI), the researcher invited seven experts in related fields to inspect and comment on the proposed research tool (Yaghmaei, 2003). They were provided with the CVI test form which was returned to the researcher within the appropriate time frame. After the items were sent to seven experts to inspect and give some comments using four rating scale, the researcher placed the four-rating scale into 0 and 1. The score of 1-2 was only converted into 0, while score of 3-4 was converted into 1 (Zamanzadeh et al., 2015). These 0 and 1 were used to compute the analysis of CVI. Furthermore, the score computation of CVI was derived from the score computation of content validity index for item (I-CVI) and content validity index for scale (S-CVI). The I-CVI is computed by the number of experts scoring each item as “relevant” divided by the total number of invited experts. The mark gained from the experts for I-CVI can be from 0 to 1. When I-CVI > 0.79, it means that the item is relevant. When I is between 0.70 and 0.79, it means that the item should be revised. When I-CVI < 0.70, it means that the item must be eliminated (Halek et al., 2017; Polit & Beck, 2006; Rodrigues et al., 2017). Therefore, I-CVI can be accepted when the I-CVI score is greater than or equal to 0.70.

In the meantime, the S-CVI was computed by two concepts: chance disagreement using S-CVI/UA and average proportion by using S-CVI/Ave. The S-CVI/UA refers to the proportion of the number of agreeable experts (universal agreement: UA) among the total number of invited experts. Meanwhile, S-CVI/Ave refers to the proportion calculation by bringing the sum of the I-CVIs divided by the total number of items. The acceptable standard for the S-CVI/UA and the S-CVI-Ave is 0.8 (Polit & Beck, 2006). Literally, the SCVI/UA is sensitive to the study since the volatile accepted degree is based on the number of invited experts. Then, the S-CVI/Ave is more acceptable (Polit & Beck, 2006). However, this study employed both SCVI/UA and S-CVI/Ave (Halek et al., 2017; Rodrigues et al., 2017).

After CVI investigation, the result showed that the questionnaire with 113 questions had I-CVI score that ranged from a scale of 0.71 to 1.00, which is higher than 0.70 (shown in appendix section), as it was recommended. Additionally, the study also found that S-CVI/UA ranged from a scale of 0.36 to 0.80, while S-CVI/Ave ranged from 0.88 to 0.98 as shown in Table 29. From the study, the score of S-CVI/UA did not pass the criteria. However, the score of I-CVI and S-CVI/Ave passed the criteria, which were sufficient for considering the validity of the content (Halek et al., 2017; Polit & Beck, 2006; Rodrigues et al., 2017).

Table 29 S-CVI/UA, S-CVI/Ave and I-CVI

<table>
<tr><th>Variables</th><th>S-CVI/UA</th><th>S-CVI/Ave</th><th>I-CVI</th></tr>
<tr><td>Green Corporate Identity</td><td>0.80 (80%)</td><td>0.98</td><td rowspan="5">0.71 to 1.00</td></tr>
<tr><td>Employee Green Personal-Social Identification</td><td>0.36 (36%)</td><td>0.88</td></tr>
<tr><td>Green Supply Chain Management</td><td>0.52 (52%)</td><td>0.95</td></tr>
<tr><td>Green Business Performance</td><td>0.73 (73%)</td><td>0.96</td></tr>
<tr><td>Overall</td><td>0.66 (66%)</td><td>0.96</td></tr>
</table>

Remark: All related score is presented in Appendix C

Reliability Assessment

Reliability assessment is very important when deciding to use the questionnaire for further analysis because it can help ensure the usability of the measurements in the questionnaires (Sud-on, 2014). Herewith, Cronbach Alpha Coefficient was used to test the reliability of the questionnaire and questions. The score of Corrected Item-Total Correlation in each question should be greater than 0.20 (Faleye, 2008). Meanwhile, the Cronbach Alpha Coefficient of each dimension should be greater than 0.70 (DeVellis, 2016; Hajiar, 2014). The result can examine the reliability of the properties of measurement scales and the items providing information about the relationships between individual items in the scale.

In this study, 40 sets of questionnaires were distributed to similar studied samples in the automobile industry, from which usable data for descriptive and multivariate analysis were excluded. The findings are presented in the appendices. However, to ensure that the data are usable after additional data collection according to the designed sample using the described random sampling method, a second round of reliability assessment was decided to be retested, the results of which were shown in the following chapter.

Dimensionality Assessment

After the questionnaires are given by respondents, exploratory factor analysis (EFA) is employed using principal axis factoring and varimax rotation with Eigen Value greater than or equal to one (1) to determine and purify scale dimensionality. It is necessary to assess the dimensionality because it can help ensure that the measured items can reflect the constructs effectively derived from the theory and literatures. Anderson and Gerbing (1988) suggested that the items with the factor loading should have an appropriate value. Field (2009) suggested that for the factor loading, if the sample size is greater than 200, it should be higher than 0.40 at a statistically significant level of 0.05. When the study sample is less than 200, the factor loading must not be less than 0.50. As a result, any item with a value less than the suggested one should be removed from the construct. The sample can be either higher or less than 200 and the sample size must be referred to as the variable number. (Hair Jr et al., 2016). suggested that the proportion of the case be suitable with the number of variables, with the case being equal to 5 per variable (5:1).

Additionally, Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity were employed for exploratory factor analysis. For its usage, Kaiser-Meyer-Olkin can help to overlook the appropriateness of the sample used in exploratory factor analysis, which should be higher than 0.50. According to Kaiser and Michael (1975) and Hair Jr et al. (2016), if the Kaiser-Meyer-Olkin value is less than 0.50, the data are not yet ready for exploratory factor analysis and more data should be collected. Furthermore, to have a higher level of acceptable rate of appropriateness data, the Kaiser-Meyer-Olkin should be between 0.70 and 0.80. Furthermore, if the Kaiser-Meyer-Olkin coefficient is greater than 0.80 or 0.90, the data is more magnificent and meritorious. Meanwhile, Bartlett's Test of Sphericity is used to investigate the correlation matrix of an observed variable to the identity matrix to determine whether there is any redundancy between variables that can be recognized by a small number of factors. Data suitable for exploratory factor analysis should pass the Bartlett's Test of Sphericity with a significant value less than 0.05 (Sig. < 0.05).

Convergent and Discriminant Validity

When analyzing data using structural equation modeling (SEM), a study of convergent and discriminant validity is required because they can identify the validity of the constructs and help confirm the ability to proceed with the data analysis. In studying about them, the researcher used confirmatory factor analysis (CFA) to test the convergent and discriminant validity (Fornell & Larcker, 1981). Convergent validity is important because it can help determine whether or not the items in the construct can share a proportion of the variance in common and thus be used for further analysis (Hair Jr et al., 2016).

To investigate the convergent validity, several values of the measures are being employed. The first is about the goodness-of-fit measure, which the researcher considers as Chi-square Probability Level (p-value), Relative Chi-square (CMIN/df), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Root mean square residual (RMR), Tucker Lewis Index (TLI), Normed Fit Index (NFI) and Adjusted Goodness of Fit (AGFI) as suggested by Hair Jr et al. (2016) and Arbuckle (2011). In running the confirmatory factor analysis (CFA), the modification indices (MLs) are hired to modify the construct when the construct is not fit with goodness-of-fit measure (Sukortprommee, 2013).

The second deals with square multiple correlation (SMC), which it defined as the reliability of the proportion of the total variation and estimates of the communality of a variable explained by the model. The square multiple correlation considers standardized estimate which should be above 0.30 (Aykan & Nalçacı, 2018; Sukortprommee, 2013).However, the preferred value should be above 0.50 to identify the construct validity and item reliability (Hair Jr et al., 2016).

The third deals with the average variance extracted (AVE), which is used for studying the measure of the amount of variance compared to the total amount of variance within the factor due to measurement error with the purpose of identifying the construct validity. The average variance extracted value should be greater than 0.50, which refers to the accountability of measurement item (Hajiar, 2014).

The fourth deals with standardized factor loading indication, which refers to the correlation coefficients between observed variables and latent common factors, and it is used for describing the variability among observed variables and for indicating the construct validity. The term standardized factor loading can also be referred to as standardized regression coefficients or regression weights. The value of standardized factor loading should be greater than or equal to 0.30 (Kim & Mueller, 1978). In the meantime, Ertz et al. (2016) considered that standardized factor loading should be more greater than 0.40 and Truong and McColl (2011) considered that standardized factor loading should be greater than 0.50.

However, (Hair Jr et al., 2016), Holmes-Smith (2010) and Sud-on (2014) considered that standardized factor loading should be greater than 0.70. The last is the construct reliability (CR), which refers to the investigation of internal consistency of the item in the construct. Sometimes, it is referred to as composite reliability. Sud-on (2014) used construct reliability to identify the construct validity. The construct reliability (CR) value should be greater than 0.50 (Dilekli & Tezci, 2019). However, (Hair Jr et al., 2016), Holmes-Smith (2010) and Sud-on (2014) suggested that the construct reliability (CR) value should be greater than 0.60 for more acceptable point.

Discriminant validity has also been used to investigate the construct validity by determining the discrimination between measures of dissimilar constructs (Hubley & Zumbo, 1996), and the measures of constructs derived from the theoretical literature should not be closely related to each construct (Cronbach & Meehl, 1955). In other words, the discriminant validity can provide the evidence that each construct in the study is unique and different, capturing the unlikely phenomenon that cannot be seen from the other construct (Sud-on, 2014). To use discriminant validity to validate the study's constructs, confirmatory factor analysis is used to produce the average variance extracted (AVE) and compare its AVE estimates from the factor with the associated estimates of squared inter-factor correlation. The value of AVE estimates should be greater than squared inter-factor correlation estimates (Hair Jr et al., 2016; Holmes-Smith, 2010).

3.6 Data Collection

3.6.1 Primary Data

Due to the primary data, the researcher used the questionnaire as a research instrument for data collection. International automobile manufacturers received 400 copies of the questionnaires. Before distributing the questionnaires to companies, the university attached a cover letter requesting permission to answer the questionnaires. In this study, the data collection channel would be less reliant on online platforms because the response rate is lower when compared to traditional data collection methods. It means that the researcher would mail the questionnaire to the companies or drop it off in person at the businesses listed in the study area section. All questionnaires were used to ask employees who are working in the area of supply chain management, encountering with cross-border procurement, manufacturing, product design, marketing and distribution, logistics and recovery. Regarding the questionnaire, it was divided into five parts consisting of 1) green corporate identity, 2) employee green personal and social identification, 3) green supply chain management, 4) green business performance, and 5) general information of respondents. When the questionnaires were completed, the researcher requested that they be returned to the university and picked up if necessary.

3.6.2 Secondary Data

Due to the secondary data, the researcher collected required information such as journals, documents, magazines, the Internet, and other sources relating to the study of the effects of green corporate identity on green business performance mediated by employees' green personal-social identification and green supply chain management in automobile manufacturing industry in Thailand to support some missing points. This is an important concept because some data of someone else for some other purposes would help fulfill the points. Sources of the secondary data included the university library, online sources (ProQuest), governmental websites, and automotive company profile websites, etc. Furthermore, secondary data would aid analysis in relations to quantitative analysis.

3.7 Data Analysis

3.7.1 Descriptive Statistics

The research used descriptive statistics including frequency, percentage, mean, standard deviation, skewness, and kurtosis for data analysis of variables (Kline, 2011; Kline, 2005), related to 1) green corporate identity, 2) employee green personal and social identification, 3) green supply chain management, 4) green business performance, and 5) general information of respondents.

These statistics were used to study the discrete variables to count how many respondents agreed on the provided statement in the questionnaires and converted into relative frequency, which can mean proportion or percentage of the total number of observations (Larson, 2006). They can be employed to analyze the data related to respondent's general information: gender, age, marital status, education level, monthly income, working experiences, position, and department. The results of the studied variables were displayed in tabulated forms and described using descriptive writing pattern.

In the meantime, mean is used for studying the central tendency, providing the information about the value distribution given by the respondents (Larson, 2006). Herewith, the researcher implemented mean statistics to study the level of employees' opinion towards questioned statements in the questionnaires. The studied variables include 1) green corporate identity (10 items of green corporate communication; 6 items of green corporate visual identity; 6 items of green corporate culture; 11 items of green employee behaviour; 5 items of green corporate policy; 5 items of green forces and drivers and 4 items of green products and services), 2) employee green personal-social identification (6 items of green personal identification and 5 items of green social identification), 3) green supply chain management (6 items of green procurement; 6 items of green design; 7 items of green manufacturing; 6 items of green marketing; 7 items of green logistics; 4 items of green recovery) and 4) green business performance (7 items of economic performance; 6 items of environmental performance and 6 items of social performance). The results of the studied variables displayed with data translation based on Best and Kahn (2006) as well as described by descriptive writing pattern. The translation was based on Best and Kahn (2006), using (5-1)/5=0.80 as shown in Table 30.

Table 30 Opinion degree interpretation

Range of Mean	**Interpretation**
Between 1.00 – 1.80	Employee strongly disagrees with the statement
Between 1.81 – 2.60	Employee disagrees with the statement.
Between 2.61 – 3.40	Employee is neutral with the statement.
Between 3.41 – 4.20	Employee slightly agrees with the statement.
Between 4.21 – 5.00	Employee strongly agrees with the statement.

Another important statistic is standard deviation, which is essential when studying continuous variables (Larson, 2006; Marshall & Jonker, 2010). This statistic was used by many scholars in their research. The researcher also used standard deviation in this study. The standard deviation was also used to investigate the following variables: 1) green corporate identity, 2) green personal-social identification, 3) green supply chain management, and 4) green business performance. The number of questions to be tested by the standard deviation was the same as stated in the preceding section. Furthermore, the results of the variables studied were presented in tabular form as well as described using a descriptive writing pattern.

This study also used skewness and kurtosis to investigate continuous variables, which are shape statistics (Larson, 2006; Marshall & Jonker, 2010). These two statistics were important for the study related to structural equation modeling (SEM). The skewness is used to investigate whether the data is systematically distributed and the kurtosis is used to study the peakedness of the distribution, informing positive or negative data shape (Larson, 2006; Marshall & Jonker, 2010). The skewness and kurtosis were also used to investigate the following variables: 1) green corporate identity, 2) green personal-social identification, 3) green supply chain management and 4) green business performance. Some values must be taken into account in the study of skewness and kurtosis. The variables investigated by skewness should be between -3 and +3, meanwhile the variables investigated by kurtosis should be between -3 and +3 as well (Kline, 2011; Kline, 2005).

3.7.2 Multivariate Statistics

In the hypothesis testing, the researcher analyzed the data obtained from the questionnaires using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) using analysis of moment structure (AMOS) 4.0, with a maximum likelihood to test the correlation of independent variables and latent factors hypothesized in the section of conceptual model. The obtained data must be usable by taking into account the basic requirement that the weight be greater than 0.30 or greater (Kim & Mueller, 1978). In the meantime, Ertz et al. (2016) considered that standardized factor loading should be greater than 0.40, while Truong and McColl (2011) considered that standardized factor loading should be greater than 0.50.

However, Hair Jr et al. (2016), Holmes-Smith (2010) and Sud-on (2014) considered that standardized factor loading should be greater than 0.70. Additionally, the standardized residuals should be below ± 2.58, T-value should be greater than 1.96, while the model suitability should be below the good-fit model indices (Arbuckle, 2011; Hair Jr et al., 2016; Holmes-Smith, 2010; Raines-Eudy, 2000). If the model is not fit, the modification indices should be considered (Oort, 1998; Sanders et al., 2015). Table 31 shows the model-fit indices.

Table 31 Model-fit indices

Model-fit indices	**Condition**	**Description**
Chi-square Probability Level (p-value)	p > 0.05	The p-value must be greater than 0.05. The higher the p-value is, the better the model suitability is.
Relative Chi-square (CMIN/df)	< 3 or not over than 5	CMIN / df must be less than 3, or not over than 5; if closer to 0, the suitability of the model is increased.
Goodness of Fit Index (GFI)	> 0.90	GFI must be greater than 0.90, which if it is closer to 1, the model suitability increases.
Adjusted Goodness of Fit (AGFI)	> 0.90	AGFI must be greater than 0.90.
Root Mean Square Error of Approximation (RMSEA)	< 0.08	RMSEA must be less than 0.08, which if it is closer to 0, the model suitability increases.
Root mean square residual (RMR)	< 0.08	RMR must be less than 0.08.
Comparative Fit Index (CFI)	> 0.90	CFI must be greater than 0.90.
Tucker Lewis Index (TLI)	> 0.90	TLI must be greater than 0.90.
Normed Fit Index (NFI)	> 0.90	NFI must be greater than 0.90

CHAPTER 4
RESEARCH RESULT

The study related to the influence of green corporate identity and green supply chain management on performance of the international business consists of objectives: 1) to study green corporate identity, employee's green personal-social identification, green supply chain management, and green business performance; 2) to investigate a positive influence of the green corporate identity on employee's green personal identification, employee's green social identification, and green supply chain management; 3) to investigate a positive influence of the employee's green personal identification on employee's green social identification, green supply chain management, and green business performance; 4) to investigate a positive influence of employee's green social identification on green supply chain management, and green business performance; 5) to investigate a positive influence of green supply chain management on green business performance; and 6) to study a positive influence of green corporate identity on green business performance in automobile manufacturing industry in Thailand through employee's green personal-social identification and green supply chain management. Accordingly, the researcher divided research result presentation into the following parts:

Part 1: Symbols and meanings

Part 2: Profiles of respondents

Part 3: Employees' opinion towards green corporate identity, employee's green personal-social identification, green supply chain management and green business performance

Part 4: Data preparation before analysis of structural equation modeling

Part 5: Measurement analysis through EFA

Part 6: Model purification through CFA

Part 7: Final model investigation and its findings

Part 8: Hypothesis investigation

Part 9: Mediation Analysis

4.1 Symbols and Meanings Used in the Study

Table 32 Symbols and meanings used in the study

Symbol	**Meaning**
$\bar{X}$	Arithmetic Mean
S.D.	Standard Deviation
Min	Minimum
Max	Maximum
C.R.	Critical Ratio
SE	Standard Error
FL	Factor Loading
Sk	Skewness
Ku	Kurtosis
r	Pearson Product Moment Correlation Coefficient
CV	Coefficient of Variation
C.R.	Construct Reliability
AVE	Average Variance Extracted
TE	Total Effects
IE	Indirect Effects
DE	Direct Effects
df	Degree of Freedom
R^2	Coefficient of Determination (r-squared)
p-value	Statistically significant level
N	Number of Samples
CFI	Comparative Fit Index
GFI	Goodness of Fit Index
CMIN/df	Relative Chi-square
AGFI	Adjusted Goodness of Fit
RMSEA	Root Mean Square Error of Approximation
RMR	Root mean square residual
TLI	Tucker Lewis Index
NFI	Normed Fit Index

H_0	Null Hypothesis
H_1	Alternative Hypothesis
SMC	Squared Multiple Correlation
GCI	Green Corporate Identity
GCCo	Green Corporate Communication
GCVI	Green Corporate Visual Identity
GCCu	Green Corporate Culture
GEB	Green Employee Behaviour
GPo	Green Corporate Policy
GFD	Green Forces and Drivers
GPaS	Green Products and Services
GPSI	Green Personal-Social Identification
GPI	Green Personal Identification
GSI	Green Social Identification
GSCM	Green Supply Chain Management
GPcu	Green Procurement
GDes	Green Design
GMan	Green Manufacturing
GMar	Green Marketing
GLog	Green Logistics
GRec	Green Recovery
GBP	Green Business Performance
EP	Economic Performance
EnP	Environmental Performance
SP	Social Performance
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis

4.2 Profiles of Respondents

Table 33 Frequency and percentage of respondents' profiles

General Information	**Frequency**	**Percentage**
Gender		
- Male	256	66.3
- Female	135	33.8
Age		
- Below 20 years old	-	
- Between 21-30 years old	187	46.8
- Between 31-40 years old	89	22.3
- Between 41-50 years old	65	16.3
- Above 51 years old	59	14.8
Marital Status		
- Single	181	45.3
- Married	212	53.0
- Divorced/Separated	7	1.8
Education Level		
- Lower than bachelor's degree	56	14.0
- Bachelor's degree	251	62.7
- Master's degree	86	21.5
- Higher than master's degree	7	1.8
Monthly income		
- Lower than 15,001 baht	43	10.8
- Between 15,001-25,000 baht	145	36.3
- Between 25,001-35,000 baht	47	11.8
- Between 35,001-45,000 baht	39	9.8
- Higher than 45,001 baht	126	31.5
Work experience		
- Less than 1 year	28	7.0
- Between 1-5 years	127	31.8
- Between 6-10 years	112	28.0

General Information	Frequency	Percentage
- Between 11-15 years	81	20.3
- More than 15 years	52	13.0
Position		
- Executive/Board	47	11.8
- Manager/Department Head/ Division Head	149	37.3
- Operational Staff	204	51.0
Department		
- Production Department	191	47.8
- Purchasing Department	54	13.5
- Marketing/Public Relation Department	46	11.5
- Finance Department	11	2.8
- Human Resource Department	90	22.5
- Others	8	2.0

From the study, respondents' profiles including gender, age, marital status, education level, monthly income, work experience, position, and department are studied, and the results are indicated as follows.

In terms of gender of respondents, it is found that most of the respondents are male (256 persons or 66.3%) and it is then followed by female (135 persons or 33.8%), respectively.

In terms of age, most of the respondents have age between 21-30 years old (187 persons or 46.8%), then it is followed by age between 31-40 years old (89 persons or 22.3%), age between 41-50 years old (65 persons or 16.3%), and age above 51 years old (59 persons or 14.8%), respectively.

In terms of marital status, the study finds that most of the respondents are married (212 persons or 53.0%), then it is followed by single (181 persons or 45.3%) and divorced/separated (7 persons or 1.8%), respectively.

In terms of education level, the study finds that most of the respondents graduated from the bachelor's degree (251 persons or 62.7%), then it is followed by the master's degree (86 persons or 21.5%), the degree lower than bachelor's degree

(56 persons or 14.0%), and the degree higher than master's degree (7 persons or 1.8%), respectively.

In terms of monthly income, the study finds that most of the respondents receive salary rate between 15,001-25,000 baht (145 persons or 36.3%), then it is followed by salary rate higher than 45,001 baht (126 persons or 31.5%), between 25,001-35,000 baht (47 persons or 11.8%), lower than 15,001 baht (43 persons or 10.8%), and between 35,001- 45,000 baht (39 persons or 9.8%), respectively.

In terms of work experience, the study finds that most of the respondents have working experiences between 1-5 years (127 persons or 31.8%), then it is followed by the experiences between 6-10 years (112 persons or 28.0%), between 11-15 years (81 persons or 20.3%), more than 15 years (52 persons or 13.0%), and less than 1 year (28 persons or 7.0%), respectively.

In terms of position, the study finds that most of the respondents work as operational staff (204 persons or 51.0%), then it is followed by manager/department head/ division head (149 persons or 37.3%), and executive/board (47 persons or 1.8%), respectively.

In terms of department, the study finds that most of the respondents work in production department (191 persons or 47.8%), human resource department (90 persons or 22.5%), purchasing department (54 persons or 13.5%), marketing/public relation department (46 persons or 11.5%), finance department (11 persons or 2.8%), and others (8 persons or 2.0%), respectively.

4.3 Employees' Opinion Towards Studied Variables

4.3.1 Green Corporate Identity

In this study, there are 400 employees from automobile manufacturing industry answering the questions regarding green corporate identity, which consists of 7 sub-dimensions including green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers and green products and services. Each dimension was analyzed by descriptive statistics including min-max value, missing value, mean, and standard deviation. In addition, there is an interpretation of the data that all are detailed as follows.

Green Corporate Communication

Table 34 Descriptive statistics describing green corporate communication

Green Corporate Communication	Mean	S.D.	Interpretation
GCCoI1: The company conveys the messages related to environmental awareness at work to employees.	4.435	0.626	Strongly agreeable
GCCoI2: The company welcomes any comments and suggestions towards improving environmental actions from the employees.	4.218	0.705	Strongly agreeable
GCCoI3: The company uses various channels to communicate with employees about the corporate policy, guideline or goal related to environmental awareness.	4.323	0.632	Strongly agreeable
GCCoI4: The company keeps employees informed about environmental awareness at work.	4.295	0.734	Strongly agreeable
GCCoI5: The company delivers knowledge, information, and news related to environmental awareness that is beneficial for work to employees.	4.308	0.670	Strongly agreeable
GCCoE1: The company use various channels, such as website, email, product packages, social media, TV program, and others to send message about environmental care and action of the corporate to all stakeholders.	4.270	0.723	Strongly agreeable
GCCoE2: The company participates and promotes environmental events, such as offering a sponsorship, CSR, etc.	4.360	0.657	Strongly agreeable
GCCoE3: The company regularly publicizes its environmental activities in order to keep all stakeholders informed.	4.303	0.661	Strongly agreeable

Green Corporate Communication	Mean	S.D.	Interpretation
GCCoE4: The company publicizes its green activities news through its facilities, equipment's, and staff.	4.233	0.738	Strongly agreeable
GCCoE5: The company implement word-of-mouth to publicize news related to the corporate's environmental care and activities.	4.020	0.849	Agreeable
Overall	4.276	0.552	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees have opinion towards overall green corporate communication in strongly agreeable level with mean score as of 4.276 and S.D. as of 0.552. When considering into each aspect related to internal communication, the result revealed that employees had opinion in strongly agreeable level towards "the company conveys messages related to environmental awareness at work to employees", "the company uses various channels to communicate with employees about the corporate policy, guideline or goal related to environmental awareness", "the company delivers knowledge, information, and news related to environmental awareness that is beneficial for work to employees", "the company keeps employees informed about environmental awareness at work", and "the company welcomes any comments and suggestions towards improving environmental actions from the employees" with mean score as of 4.435, 4.323, 4.308, 4.295, and 4.218, and S.D. as of 0.626, 0.632, 0.670, 0.734, and 0.705, respectively.

In relation to external communication, the result revealed that employees had opinion in strongly agreeable level towards "the company participates and promotes environmental events, such as offering a sponsorship, CSR, etc.", "the company regularly publicizes its environmental activities in order to keep all stakeholders informed", "the company use various channels, such as website, email, product packages, social media, TV program, and others to send message about environmental care and action of the corporate to all stakeholders", "the company publicizes its green activities news through its facilities, equipment's, and staff" and "the company implements word-of-mouth to publicize news related to the corporate's environmental care and activities" with the mean score as of 4.360, 4.303, 4.270, 4.233, and 4.020, and S.D. as of 0.657, 0.661, 0.723, 0.738, and 0.849, respectively.

Moreover, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Corporate Visual Identity

Table 35 Descriptive statistics describing green corporate visual identity

Green Corporate Visual Identity	Mean	S.D.	Interpretation
GCVI1: The company's graphics, such as logos are designed to consistently convey and represent its green business activities.	4.103	0.802	Agreeable
GCVI2: The company uses the (green) colour to be a part of the message, parts, materials, buildings, cars, employees to reflect its green business activities.	4.133	0.715	Agreeable
GCVI3: The company uses the environmental caring symbol that represents its green business activities.	4.132	0.722	Agreeable
GCVI4: The company's logo reflects the corporate's green business activities.	4.008	0.806	Agreeable
GCVI5: The company's slogan reflects the corporate's green business activities.	4.090	0.754	Agreeable
GCVI6: The company's typography and font used in various media reflect the corporate's green business activities.	4.043	0.779	Agreeable
Overall	4.085	0.617	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green corporate visual identity in agreeable level with mean score as of 4.085, and S.D. as of 0.617. When considering into each aspect, the result revealed that employees had opinion in agreeable level towards “the company uses the (green) colour to be a part of the message, parts, materials, buildings, cars, employees to reflect its green business activities”, “the company uses the environmental caring symbol that represents its green business activities”, “the company’s graphics, such as logos are designed to consistently convey and represent its green business activities”, “the company’s slogan reflects the corporate’s green business activities”, “the company’s typography and font used in various media reflect the corporate’s green business activities”, and “the company’s logo reflects the corporate’s green business activities” with mean score as of 4.133, 4.132, 4.103, 4.090, 4.043, and 4.008, and S.D. as of 0.715, 0.722, 0.802, 0.754, 0.779, and 0.806, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Employee Behaviour

Table 36 Descriptive statistics describing green employee behaviour

Green Employee Behaviour	Mean	S.D.	Interpretation
GEBR1: I perform the works with environment awareness as assigned.	4.228	0.709	Strongly agreeable
GEBR2: My work performance meets the environmental criteria as required by the company.	4.253	0.674	Strongly agreeable
GEBR3: I can successfully perform my work related to the environmental protection as assigned by the company.	4.163	0.687	Agreeable
GEBR4: I can perform the tasks related to the environmental protection as expected by the company.	4.125	0.745	Agreeable
GEBR5: I can perform the tasks related to the	4.118	0.678	Agreeable

Green Employee Behaviour	Mean	S.D.	Interpretation
environmental protection as specified in the job description.			
GEBE1: I participate in company environmental activities and voice opinion for company's environmentally operational improvement.	3.985	0.788	Agreeable
GEBE2: I am willing to help my colleagues to manage problems or obstacles related to environmental issue that they encounter even though it is not my responsibility.	4.198	0.707	Agreeable
GEBE3: I voluntarily apply the principles of eco-friendly work into my regular work.	4.228	0.665	Strongly agreeable
GEBE4: I am patient with difficulties at work when performing tasks with environmental awareness.	4.148	0.705	Agreeable
GEBE5: I inspire and encourage my colleagues to take environmental concern into account.	4.063	0.725	Agreeable
GEBE6: I share my knowledge related to environmental work with my colleagues.	4.050	0.771	Agreeable
Overall	4.144	0.588	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green employee behaviour in agreeable level with mean score as of 4.144, and S.D. as of 0.588. When considering into each aspect related to in-role behaviour, the result revealed that employees had opinion in strongly agreeable level towards "my work performance meets the environmental criteria as required by the company", and "I perform the works with environment awareness as assigned", respectively. In the meantime, employees had opinion in agreeable level towards "I can successfully perform my work related to the environmental protection as assigned by the company", "I can perform the tasks related to the environmental protection as expected by the company", and "I can perform the tasks related to the environmental protection as specified in the job description" with mean score as of 4.253, 4.228, 4.163, 4.125, and 4.118, and S.D. as of 0.674, 0.709, 0.687, 0.745, and 0.678, respectively.

In relation to extra-role behaviour, the result revealed that employees had opinion in strongly agreeable level towards “I voluntarily apply the principles of eco-friendly work into my regular work” with mean score as of 4.228, and S.D. as of 0.665. In the meantime, employees had opinion in agreeable level towards “I am willing to help my colleagues to manage problems or obstacles related to environmental issue that they encounter even though it is not my responsibility”, “I am patient with difficulties at work when performing tasks with environmental awareness”, “I inspire and encourage my colleagues to take environmental concern into account”, “I share my knowledge related to environmental work with my colleagues”, and “I participate in company environmental activities and voice opinion for company’s environmentally operational improvement” with the mean score as of 4.198, 4.148, 4.063, 4.050, and 3.985, and S.D. as of 0.707, 0.705, 0.725, 0.771, and 0.788, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Corporate Culture

Table 37 Descriptive statistics describing green corporate culture

Green Corporate Culture	Mean	S.D.	Interpretation
GCCu1: The company concentrates on the vision of green business operation.	4.285	0.693	Strongly agreeable
GCCu2: The company creates culture and value on green business operation among employees.	4.260	0.677	Strongly agreeable
GCCu3: The company sets the corporate standards and principles for corporate members to work with environmental awareness.	4.277	0.642	Strongly agreeable

Green Corporate Culture	Mean	S.D.	Interpretation
GCCu4: The company has a clear guideline for corporate members to work with environmental awareness.	4.255	0.715	Strongly agreeable
GCCu5: The company's mission reflects its green business operation.	4.200	0.708	Agreeable
GCCu6: The company's mission is clearly communicated to corporate members and related to stakeholders.	4.248	0.695	Strongly agreeable
Overall	4.254	0.639	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green corporate culture in agreeable level with mean score as of 4.254 and S.D. as of 0.639. When considering into each aspect, the result revealed that employees had opinion towards "the company concentrates on the vision of green business operation." in strongly agreeable level with mean score as of 4.285 and S.D. as of 0.693. It is followed by "the company sets the corporate standards and principles for corporate members to work with environmental awareness", "the company creates culture and value on green business operation among employees.", "the company has a clear guideline for corporate members to work with environmental awareness.", and "the company's mission is clearly communicated to corporate members and related to stakeholders." in strongly agreeable level with mean score as of 4.277, 4.26, 4.255, and 4.248, and S.D. as of 0.642, 0.677, 0.715, and 0.695, respectively. In the meantime, employees had opinion towards "the company's mission reflects its green business operation." in agreeable level with mean score as of 4.2 and S.D. as of 0.708, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0

meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Corporate Policy

Table 38 Descriptive statistics describing green corporate policy

Green Corporate Policy	Mean	S.D.	Interpretation
GPo1: The company has a policy to share and provide environmental management techniques to suppliers, customers and other stakeholders.	4.168	0.708	Agreeable
GPo2: The company has a policy to collaborate with suppliers, customers and other stakeholders to do green activities.	4.210	0.680	Strongly agreeable
GPo3: The company establishes the environmental agreements with suppliers, customers and other stakeholders.	4.175	0.693	Agreeable
GPo4: The company has a policy to change and adjust its corporate activities and business to be green.	4.260	0.673	Strongly agreeable
GPo5: The company has a policy that responds to green business and activities.	4.283	0.662	Strongly agreeable
Overall	4.219	0.632	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green corporate policy in strongly agreeable level with mean score as of 4.219 and S.D. as of 0.632. When considering into each aspect, the result revealed that employees had opinion towards "the company has a policy that responds to green business and activities.", "the company has a policy to change and adjust its corporate activities and business to be green.", and "the company has a policy to collaborate with suppliers, customers and other stakeholders to do green activities." in strongly agreeable level with mean score as of 4.283, 4.26, 4.21 and S.D. as of 0.662, 0.673, and 0.68, respectively. In the meantime, the study revealed that employees had opinion towards “the company establishes the environmental agreements with suppliers, customers and other stakeholders.” and “the company has a policy to share and provide environmental management techniques to suppliers, customers and other stakeholders.” in agreeable level with mean score as of 4.175 and 4.168 and S.D. as of 0.693, and 0.708, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Forces and Drivers

Table 39 Descriptive statistics describing green forces and drivers

Green Forces and Drivers	Mean	S.D.	Interpretation
GFD1: External stakeholders, such as customers, competitor, and suppliers force the company to concern environmental matters.	4.215	0.693	Strongly agreeable
GFD2: Being an internationalized company forces the company to concern environmental matters.	4.290	0.687	Strongly agreeable
GFD3: Technology and innovation can assist the company to promote and produce products and services.	4.320	0.651	Strongly agreeable
GFD4: Society and community force the company to concern environmental matters.	4.312	0.641	Strongly agreeable
GFD5: Governmental regulations and laws force the company to concern environmental matters.	4.303	0.676	Strongly agreeable
Overall	4.288	0.613	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green forces and drivers in strongly agreeable level with mean score as of

4.288 and S.D. as of 0.613. When considering into each aspect, the result revealed that employees had opinion towards “technology and innovation can assist the company to promote and produce products and services.”, “ society and community force the company to concern environmental matters.”, “governmental regulations and laws force the company to concern environmental matters.”, “being an internationalized company forces the company to concern environmental matters.”, and “External stakeholders, such as customers, competitor, and suppliers force the company to concern environmental matters.” in strongly agreeable level with mean score as of 4.32, 4.312, 4.303, 4.29, and 4.215 and S.D. as of 0.651, 0.641, 0.676, 0.687, and 0.693, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Products and Services

Table 40 Descriptive statistics describing green products and services

Green Products and Services	Mean	S.D.	Interpretation
GPaS1: The products and services represent the corporate’s concerns on environmental matters.	4.228	0.680	Strongly agreeable
GPaS2: The company can produce green products and provide green services.	4.245	0.672	Strongly agreeable
GPaS3: The company builds relationship with customers to satisfy them and prolong their decision to continue using the products and services provided by the company.	4.260	0.670	Strongly agreeable
GPaS4: The company accurately respond the customer’s needs in terms of green products.	4.278	0.679	Strongly agreeable
Overall	4.253	0.625	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green products and services in strongly agreeable level with mean score as of 4.253 and S.D. as of 0.625. When considering into each aspect, the result revealed that employees had opinion towards" the company accurately respond the customer's needs in terms of green products.", "the company builds relationship with customers to satisfy them and prolong their decision to continue using the products and services provided by the company.", " The company can produce green products and provide green services.", and "the products and services represent the corporate's concerns on environmental matters." in strongly agreeable level with mean score as of 4.278, 4.26, 4.245, and 4.228 and S.D. as of 0.679, 0.670, 0.672, and 0.680, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

4.3.2 Employee Green Personal-Social Identification

In this study, there are 400 employees from automobile manufacturing industry answering the questions regarding employee green identification, which consists of 2 sub-dimensions including green personal identification and green social identification. Each dimension was analyzed by descriptive statistics including min-max value, missing value, mean, and standard deviation. In addition, there is an interpretation of the data that all are detailed as follows.

Employees' Green Personal Identification

Table 41 Descriptive statistics describing employees' green personal identification

Employees' Green Personal Identification	Mean	S.D.	Interpretation
GPI1: The green corporate identity is consistent my lifestyle.	4.008	0.734	Agreeable
GPI2: The green corporate identity is consistent with my role.	4.053	0.697	Agreeable
GPI3: The green corporate identity is consistent with my value.	4.103	0.695	Agreeable
GPI4: The green corporate identity symbolizes my identity.	3.983	0.734	Agreeable
GPI5: The green corporate identity reflects my personality.	3.978	0.747	Agreeable
GPI6: The green corporate identity extends my green role.	4.093	0.711	Agreeable
Overall	4.036	0.652	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall employees' green personal identification in agreeable level with mean score as of 4.036 and S.D. as of 0.652. When considering into each aspect, the result revealed that employees had opinion towards "the green corporate identity is consistent with my value.", "the green corporate identity extends my green role.", "the green corporate identity is consistent with my role.", "the green corporate identity is consistent my lifestyle.", "the green corporate identity symbolizes my identity.", and "the green corporate identity reflects my personality." in agreeable level with mean score as of 4.103, 4.093, 4.053, 4.008, 3.983, and 3.978, and S.D. as of 0.695, 0.711, 0.697, 0.734, 0.734, and 0.747, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0

meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Employees' Green Social Identification

Table 42 Descriptive statistics describing employees' green social identification

Employees' Green Social Identification	Mean	S.D.	Interpretation
GSI1: The green corporate identity provides me social recognition and respect.	3.998	0.703	Agreeable
GSI2: The green corporate identity enhances my social status.	3.958	0.779	Agreeable
GSI3: The green corporate identity enhances my image.	4.015	0.766	Agreeable
GSI4: The green corporate identity increases my "social role.	3.958	0.779	Agreeable
GSI5: The green corporate identity influences the society to view me in a better way.	4.053	0.722	Agreeable
Overall	3.996	0.691	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall employees' green social identification in agreeable level with mean score as of 3.996 and S.D. as of 0.691. When considering into each aspect, the result revealed that employees had opinion towards "the green corporate identity influences the society to view me in a better way.", "the green corporate identity enhances my image.", "the green corporate identity provides me social recognition and respect.", "the green corporate identity enhances my social status.", and "the green corporate identity increases my "social role." in agreeable level with mean score as of 4.053, 4.015, 3.998, 3.958, and 3.958, and S.D. as of 0.722, 0.766, 0.703, 0.779, and 0.779, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0

meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

4.3.3 Green Supply Chain Management

In this study, there are 400 employees from automobile manufacturing industry answering the questions regarding green supply chain management, which consists of 6 sub-dimensions including green design, green procurement, green manufacturing, green marketing, green logistics, and green recovery. Each dimension was analyzed by descriptive statistics including min-max value, missing value, mean, and standard deviation. In addition, there is an interpretation of the data that all are detailed as follows.

Green Design

Table 43 Descriptive statistics describing green design

Green Design	Mean	S.D.	Interpretation
GDes1: The company designs products and services that help reduce unnecessary energy and raw materials usage.	4.182	0.664	Agreeable
GDes2: The company intends to reduce product components that give negative effects on the environment.	4.228	0.680	Strongly agreeable
GDes3: The company collaborates with both domestic and international customers for green design, packages, and management solution.	4.170	0.684	Agreeable
GDes4: The company designs the products with reusable, recyclable materials.	4.130	0.724	Agreeable
GDes5: The company designs the green products to be easily used.	4.208	0.645	Strongly agreeable
GDes6: The company designs products that can reduce the use of hazardous substances and reduce production waste.	4.190	0.667	Agreeable
Overall	4.185	0.614	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green design in agreeable level with mean score as of 4.185 and S.D. as of 0.614. When considering into each aspect, the result revealed that employees had opinion towards “the company intends to reduce product components that give negative effects on the environment.” and “the company designs the green products to be easily used.” in strongly agreeable level with mean score as of 4.228, 4.208 and S.D. as of 0.68 and 0.645, respectively. In the meantime, the study revealed that employees had opinion towards “the company designs products that can reduce the use of hazardous substances and reduce production waste.”, “the company designs products and services that help reduce unnecessary energy and raw materials usage.”, “the company collaborates with both domestic and international customers for green design, packages, and management solution.”, and “the company designs the products with reusable, recyclable materials.” in agreeable level with mean score as of 4.190, 4.182, 4.170, and 4.130 and S.D. as of 0.667, 0.664, 0.684, and 0.724, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Procurement

Table 44 Descriptive statistics describing green procurement

Green Procurement	Mean	S.D.	Interpretation
GPcu1: The company chooses either domestic or international suppliers based on its green criteria.	4.060	0.673	Agreeable
GPcu2: The company purchases green raw materials.	4.140	0.649	Agreeable
GPcu3: The company has a green design specification as a requirement for domestic and international suppliers.	4.113	0.686	Agreeable
GPcu4: The company has a cooperation with both	4.095	0.665	Agreeable

Green Procurement	Mean	S.D.	Interpretation
domestic and international suppliers for delivering green raw materials.			
GPcu5: The company monitors both domestic and international suppliers' internal green management prior to any purchase.	4.080	0.678	Agreeable
GPcu6: The domestic and international supplier of the company is required to have recognizable green certificates or standard.	4.118	0.667	Agreeable
Overall	4.101	0.620	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green procurement in agreeable level with mean score as of 4.101 and S.D. as of 0.620. When considering into each aspect, the result revealed that employees had opinion towards “the company purchases green raw materials.”, “the domestic and international supplier of the company is required to have recognizable green certificates or standard.”, “the company has a green design specification as a requirement for domestic and international suppliers.”, “the company has a cooperation with both domestic and international suppliers for delivering green raw materials.”, “the company monitors both domestic and international suppliers’ internal green management prior to any purchase.”, and “the company chooses either domestic or international suppliers based on its green criteria.” in agreeable level with mean score as of 4.140, 4.118, 4.113, 4.095, 4.080, and 4.060 and S.D. as of 0.649, 0.667, 0.686, 0.665, 0.678, and 0.673, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Manufacturing

Table 45 Descriptive statistics describing green manufacturing

Green Manufacturing	Mean	S.D.	Interpretation
GMan1: The company minimizes using chemical substances and pollution.	4.180	0.662	Agreeable
GMan2: The company applies re-manufacturing and lean production to reduce waste.	4.217	0.633	Strongly agreeable
GMan3: The company applies clean manufacturing technologies for green production.	4.220	0.635	Strongly agreeable
GMan4: The company optimizes its manufacturing process for highest efficiency.	4.305	0.631	Strongly agreeable
GMan5: The company utilizes raw materials effectively.	4.288	0.625	Strongly agreeable
GMan6: The company strategically plans to repair machines and supplies.	4.258	0.576	Strongly agreeable
GMan7: The company's manufacturing process is certified and standardized at international level.	4.300	0.645	Strongly agreeable
Overall	4.252	0.571	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green manufacturing in strongly agreeable level with mean score as of 4.252 and S.D. as of 0.571. When considering into each aspect, the result revealed that employees had opinion towards "the company optimizes its manufacturing process for highest efficiency.", "the company's manufacturing process is certified and standardized at international level.", " the company utilizes raw materials effectively.", "the company strategically plans to repair machines and supplies.", "the company applies clean manufacturing technologies for green production.", and "the company applies re-manufacturing and lean production to reduce waste." in strongly agreeable level with mean score as of 4.305, 4.300, 4.288, 4.258, 4.220, and 4.217, and S.D. as of 0.631, 0.645, 0.625, 0.576, 0.635, and 0.633, respectively. In the meantime, the study revealed that employees had opinion towards "the company minimizes using chemical substances and pollution." in agreeable level with mean score as of 4.180 and S.D. as of 0.662.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Recovery

Table 46 Descriptive statistics describing green recovery

Green Recovery	Mean	S.D.	Interpretation
GRec1: The company repairs and reuses end-of-life materials, parts, and components.	4.005	0.776	Agreeable
GRec2: The company resells end-of-life materials, parts and components for money or assets of the company.	4.025	0.825	Agreeable
GRec3: The company prolongs the use of materials, parts, and components by maintenance.	4.023	0.747	Agreeable
GRec4: The company reconditions and refurbishes used parts or components.	4.000	0.813	Agreeable
Overall	4.013	0.712	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green recovery in agreeable level with mean score as of 4.013 and S.D. as of 0.712. When considering into each aspect, the result revealed that employees had opinion towards "the company resells end-of-life materials, parts and components for money or assets of the company.", "the company prolongs the use of materials, parts and components by maintenance.", "the company repairs and reuses end-of-life materials, parts and components.", and "the company reconditions and refurbishes used parts or components." in agreeable level with mean score as of 4.025, 4.023, 4.005, and 4.000 and S.D. as of 0.825, 0.747, 0.776, and 0.813, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Logistics

Table 47 Descriptive statistics describing green logistics

Green Logistics	Mean	S.D.	Interpretation
GLog1: The company provides green transportation.	4.030	0.735	Agreeable
GLog2: The company uses the delivery route that can reduce the pollution.	4.055	0.706	Agreeable
GLog3: The company determines delivery routes prior to any delivery.	4.200	0.657	agreeable
GLog4: The company applies full truck load system for effective delivery.	4.173	0.681	Agreeable
GLog5: The company uses delivery method with alternative energy to save energy and expenses.	4.098	0.707	Agreeable
GLog6: The company adopts just-in-time logistics.	4.270	0.673	Strongly agreeable
GLog7: The company applies information technology to track delivery services.	4.245	0.690	Strongly agreeable
Overall	4.153	0.596	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion toward overall green logistics with mean score as of 4.153, and S.D. as of 0.596. When considering into each aspect, the result revealed that employees had opinion towards “the company adopts just-in-time logistics.”, and “the company applies information technology to track delivery services.” in strongly agreeable level with mean score as of 4.245, and 4.270, and S.D. as of 0.690, and 0.673, respectively. In the meantime, the result discovered that employees had opinion towards “the company determines delivery routes prior to any delivery”, “the company applies full truck load system for effective delivery”, “the company uses delivery method with alternative energy to save energy and expenses”, “the company uses the delivery route that can reduce the pollution”, and “the company provides green transportation” in agreeable level with mean score as of 4.200, 4.173, 4.098, 4.055, and 4.030, and S.D. as of 0.657, 0.681, 0.707, 0.706, and 0.735, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Green Marketing

Table 48 Descriptive statistics describing green marketing

Green Marketing	Mean	S.D.	Interpretation
GMar1: The company adopts green features to improve its image.	4.260	0.677	Strongly agreeable
GMar2: The company uses marketing principles as a tool to create competitive advantages.	4.278	0.661	Strongly agreeable
GMar3: The company conducts a market research and studies customers’ behaviour towards green specifications	4.180	0.699	Agreeable
GMar4: The company positions its green products.	4.210	0.687	Strongly agreeable
GMar5: The company set reasonable prices for green products.	4.168	0.725	Agreeable
GMar6: The company publicizes its green products	4.233	0.663	Strongly

Green Marketing	Mean	S.D.	Interpretation
in various channels.			agreeable
Overall	4.221	0.625	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall green marketing in agreeable level with mean score as of 4.221 and S.D. as of 0.625. When considering into each aspect, the result revealed that employees had opinion towards "the company uses marketing principles as a tool to create competitive advantages.", "the company adopts green features to improve its image.", "the company publicizes its green products in various channels.", and "the company positions its green products." in strongly agreeable level with mean score as of 4.278, 4.260, 4.233, and 4.210 and S.D. as of 0.661, 0.677, 0.663, and 0.687, respectively. In the meantime, the study revealed that employees had opinion toward "the company conducts a market research and studies customers' behaviour towards green specifications", and "the company set reasonable prices for green products." in agreeable level with mean score as of 4.18 and 4.168, and S.D. as of 0.699 and 0.725, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

4.3.4 Green Business Performance

In this study, there are 400 employees from automobile manufacturing industry answering the questions regarding green business performance, which consists of 3 sub-dimensions including economic performance, environmental performance, and social performance. Each dimension was analyzed by descriptive statistics including min-max value, missing value, mean, and standard deviation. In addition, there is an interpretation of the data that all are detailed as follows.

Economic Performance

Table 49 Descriptive statistics describing economic performance

Economic Performance	Mean	S.D.	Interpretation
EP1: The company's raw material cost decreases.	4.085	0.784	Agreeable
EP2: The company's energy usage decreases.	4.197	0.693	Agreeable
EP3: The company's expenses on waste discharge decrease.	4.163	0.740	Agreeable
EP4: The company's fines and compensation caused by environmental accidents decrease.	4.125	0.739	Agreeable
EP5: The company's revenues increase.	4.113	0.762	Agreeable
EP6: The company's market share increases.	4.115	0.754	Agreeable
EP7: The company's domestic and international competitive advantages increase.	4.145	0.714	Agreeable
Overall	4.135	0.673	Agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall economic performance in agreeable level with mean score as of 4.135 and S.D. as of 0.673. When considering into each aspect, the result revealed that employees had opinion towards "the company's energy usage decreases.", "the company's expenses on waste discharge decrease.", "the company's domestic and international competitive advantages increase.", "the company's fines and compensation caused by environmental accidents decrease.", "the company's market share increases.", "the company's revenues increase.", and "the company's raw material cost decreases." in agreeable level with mean score as of 4.197, 4.163, 4.145, 4.125, 4.115, 4.113, and 4.085, and S.D. as of 0.693, 0.740, 0.714, 0.739, 0.754, 0.762, and 0.784, respectively. In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Environmental Performance

Table 50 Descriptive statistics describing environmental performance

Environmental Performance	Mean	S.D.	Interpretation
EnP1: Technology and resources are effectively utilized.	4.305	0.658	Strongly agreeable
EnP2: The level of pollution, toxic and harms due to chemical substances are decreased.	4.300	0.701	Strongly agreeable
EnP3: Environmental accidents and risks are reduced.	4.262	0.685	Strongly agreeable
EnP4: Reputation, image, and quality of the company is improved.	4.328	0.645	Strongly agreeable
EnP5: The quality of green product and services are improved.	4.315	0.683	Strongly agreeable
EnP6: The company has the ability to recycle and reuse parts, component or raw materials more.	4.250	0.699	Strongly agreeable
Overall	4.293	0.611	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall environmental performance in strongly agreeable level with mean score as of 4.293 and S.D. as of 0.611. When considering into each aspect, the result revealed that employees had opinion towards “reputation, image, and quality of the company is improved.”, “the quality of green product and services are improved.”, “technology and resources are effectively utilized.”, “the level of pollution, toxic and harms due to chemical substances are decreased.” , “environmental accidents and risks are reduced.”, and “the company has the ability to recycle and reuse parts, component or raw materials more. ” in strongly agreeable level with mean score as of 4.328, 4.315, 4.305, 4.300, 4.262, and 4.250, and S.D. as of 0.645, 0.683, 0.658, 0.701, 0.685, and 0.699, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

Social Performance

Table 51 Descriptive statistics describing social performance

Social Performance	Mean	S.D.	Interpretation
SP1: Employees, customers, community, suppliers and governmental agencies are satisfied with the process of the company.	4.273	0.703	Strongly agreeable
SP2: The company has better relationship with employees, customers, community, suppliers and governmental agencies.	4.323	0.671	Strongly agreeable
SP3: Employees, customers, community, suppliers and governmental agencies participate in expressing ideas and making a decision on activities that benefit the society.	4.253	0.735	Strongly agreeable
SP4: The company has a collaboration with employees, customers, community, suppliers and governmental agencies in achieving corporate goals that also benefit the society.	4.310	0.678	Strongly agreeable
SP5: Employees, customers, community, suppliers, and governmental agencies regularly obtain beneficial knowledge, news, donation, as well as CSR from the company.	4.285	0.700	Strongly agreeable
SP6: Employees, customers, community, suppliers and governmental agencies have better quality of life.	4.260	0.741	Strongly agreeable
Overall	4.284	0.658	Strongly agreeable

Note: Min-Max = 1-5; N = 400; Missing Value = 0

From the above table, the study indicated that employees had opinion towards overall social performance in strongly agreeable level with mean score as of 4.284 and S.D. as of 0.658. When considering into each aspect, the result revealed that employees had opinion towards “the company has better relationship with employees, customers, community, suppliers and governmental agencies.”, “the company has a collaboration with employees, customers, community, suppliers and governmental agencies in achieving corporate goals that also benefit the society.”, “employees, customers, community, suppliers and governmental agencies regularly obtain beneficial knowledge, news, donation, as well as CSR from the company.” , “employees, customers, community, suppliers and governmental agencies are satisfied with the process of the company. ”, “employees, customers, community, suppliers and governmental agencies have better quality of life.”, and “employees, customers, community, suppliers and governmental agencies participate in expressing ideas and making a decision on activities that benefit the society.” in strongly agreeable level with mean score as of 4.323, 4.310, 4.285, 4.273, 4.260 and 4.253, and S.D. as of 0.671, 0.678, 0.700, 0.703, 0.741, and 0.735, respectively.

In addition, the study also employed Min-Max value and missing value in order to inspect whether there are possible mistakes disturbing the data accurateness. Regarding this, Min-Max value is in range between 1 and 5 and missing value is 0 meaning that there is no unanswered response. Accordingly, the data here can be taken for further analysis.

4.4 Data Preparation Before Analysis of Structural Equation Modeling

4.4.1 Assessment of Missing Value

Missing data is commonly found in all research fields. Missing data occurs due to several reasons, such as the participants do not know the answers, the questions do not cover all issues, the questions are unclear, or there is a database error while inputting the data to the computer for processing. It is vital to prevent missing data. To deal with this issue, it is necessary to apply an appropriate measure, otherwise the data analysis may be distorted (Kline, 2011). In case missing data occurs, its effects should be minimized. The cause of such missing data must be investigated in order to improve the structured research plan to be consistent with the objectives of the study.

With clear research plan, the findings to the research questions can be completely obtained. Thus, the researcher tried to examine and monitor the completion of questionnaires and carefully filled the data in the database. To verify the integrity of data, fundamental statistical analysis, including frequency, percentage, mean, maximum, minimum and missing value were utilized (Sud-on, 2014). Missing value was accepted when its value ranged between 5-25%. The study found that the missing value was zero; therefore, the data could be used for further analysis.

4.4.2 Assessment of Outliers

Outlier refers to the data that has a different value that are greater or lesser from the data in the same set, which it is identified as abnormal until and suspected whether it belongs to the same group or not and whether it can cause the error of the measurement. The outlier can be investigated by employing DFFITS, which it is diagnostic to evaluate whether the data points were subjective and explain how much leverage each potential outlier had on the results data (Alkasadi et al., 2019; Belsley et al., 2005). It is calculated by using DFFITS which can be drawn from statistical software packages for data analysis. A general cutoff to consider DFFITS is 2 (Li & Valliant, 2011). After using DFFITS test, the result indicated that there are no cases being displayed as outlier, meaning that their data were suspected whether it belong to the same group, or it can cause the error of the measurement or not. Consequently, the data set can be used for further analysis.

4.4.3 Respondent's Bias Analysis

Analysis of respondents' bias on different characteristics including gender, age, marital status, educational level, monthly income, working experience, position and department was needed to be performed (Tourky, 2013). In this study, independent sample t-test and One-way ANOVA were conducted to test the significant differences in the mean score of all variables including green corporate identity, employees' green personal and social identification, green supply chain management and green business performance. Consequently, the result of independent sample t-test on testing the difference between male and female was found no difference because p-value was higher than 0.05 ($p>0.05$). In addition, the result of One-way ANOVA in investigating the difference between groups in aspects of age, marital status, educational level, monthly income, working experience, position and department also revealed that there were no statistically significant differences between the group because p-value was higher than 0.05 ($p>0.05$). Furthermore, the Pearson bivariate correlation was also conducted in order to investigate and analyze the relationship bias between respondents' different characteristics and studied variables, the result indicated that most of all variables were not correlated and correlated with correlation coefficient (r) less than 0.40 (related values are presented in Appendix G). This means that answers to the questions are free from any demographic factors (Wallmann-Sperlich et al., 2014). Accordingly, the data in this study can be used for further analysis.

4.4.4 Assessment of Normality

Assessment of normality is very important to be studied in order to know whether the data that has been collected has normal distribution and can be employed for further study or not. The statistics hired for testing normality can include Skewness, Kurtosis, and percentage of coefficient of variation (%CV). The skewness is used to investigate whether the data is systematically distribution and the kurtosis is used to study the peakedness of the distribution, informing positive or negative data shape (Larson, 2006; Marshall & Jonker, 2010). The variables investigated by skewness should be between -3 and +3 meanwhile the variables investigated by kurtosis should be between -3 and +3 as well (Kline, 2005). In addition, the coefficient of variation (CV) has been used for measuring the dispersion of data points by considering the standard deviation to the mean, which normally will be computed in terms of percentage. For use, the CV value should not be higher than 0.30; if the CV is higher than 0.30, the data can be interpreted as high different degree (Brown, 1998). The skewness, kurtosis, and %CV were similarly used to study studied variables include 1) green corporate identity, 2) employee green identification, 3) green supply chain management and 4) green business performance. Detail has been portrayed as follows.

Green Corporate Identity

Table 52 Assessment of normality of green corporate identity variables

Variables	N	%CV	Skewness	Kurtosis		Variables	N	%CV	Skewness	Kurtosis
GCCoI1	400	14.113	-0.893	0.947		GEBE5	400	17.834	-0.532	0.285
GCCoI2	400	16.706	-0.550	-0.067		GEBE6	400	19.030	-0.977	1.953
GCCoI3	400	14.622	-0.505	-0.049		GCCu1	400	16.168	-0.856	1.007
GCCoI4	400	17.099	-1.098	1.932		GCCu2	400	15.896	-0.760	0.940
GCCoI5	400	15.557	-0.702	0.447		GCCu3	400	14.997	-0.441	-0.137
GCCoE1	400	16.943	-0.739	0.213		GCCu4	400	16.804	-0.832	0.791
GCCoE2	400	15.066	-0.645	-0.126		GCCu5	400	16.857	-0.562	0.043
GCCoE3	400	15.366	-0.578	0.016		GCCu6	400	16.353	-0.466	-0.507
GCCoE4	400	17.439	-0.962	1.591		GPo1	400	16.979	-0.464	-0.173
GCCoE5	400	21.128	-0.803	0.746		GPo2	400	16.146	-0.624	0.574
GCVI1	400	19.555	-0.890	1.299		GPo3	400	16.605	-0.611	0.513
GCVI2	400	17.302	-0.324	-0.586		GPo4	400	15.809	-0.612	0.316
GCVI3	400	17.471	-0.807	1.518		GPo5	400	15.468	-0.593	0.227
GCVI4	400	20.104	-0.678	0.813		GFD1	400	16.437	-0.632	0.421
GCVI5	400	18.432	-0.997	2.208		GFD2	400	16.016	-0.867	1.106
GCVI6	400	19.276	-1.000	2.251		GFD3	400	15.067	-0.597	0.119
GEBR1	400	16.760	-0.782	0.796		GFD4	400	14.864	-0.563	0.184
GEBR2	400	15.860	-0.549	0.070		GFD5	400	15.715	-0.649	0.141
GEBR3	400	16.510	-0.594	0.566		GPaS1	400	16.076	-0.413	-0.428
GEBR4	400	18.073	-1.045	2.456		GPaS2	400	15.822	-0.484	-0.138
GEBR5	400	16.469	-0.584	0.776		GPaS3	400	15.721	-0.609	0.355
GEBE1	400	19.780	-0.868	1.469		GPaS4	400	15.884	-0.746	0.733
GEBE2	400	16.842	-0.772	1.391						
GEBE3	400	15.724	-0.652	0.814						
GEBE4	400	16.998	-0.863	1.919						

From the study, the result indicated that green corporate communication (GCCoI1, 2, 3, 4, 5 and GCCoE1, 2, 3, 4, 5) has %CV value from 14.113 to 21.128, Skewness value from -0.505 to -1.098, and Kurtosis value from -0.049 to 1.591. Next, green corporate visual identity (GCVI1, 2, 3, 4, 5, 6) has %CV value from 17.302 to 20.104, Skewness value from -0.324 to -1.000, and Kurtosis value from -0.586 to 2.251. In the meantime, green employee behaviour (GEBR1, 2, 3, 4, 5 and GEBE1, 2, 3, 4, 5, 6) has %CV value from 15.724 to 19.780, Skewness value from -0.584 to -1.045, and Kurtosis value from 0.070 to 2.456 as well as green corporate culture (GCCu1, 2, 3, 4, 5, 6) has %CV value from 14.997 to 16.857, Skewness value from -

0.441 to -0.856, and Kurtosis value from 0.043 to 1.007. Another dimension, green corporate policy (GPo1, 2, 3, 4, 5) has %CV value from 15.468 to 16.979, Skewness value from -0.464 to -0.624, and Kurtosis value from -0.173 to 0.574. In addition, green forces and drivers (GFD1, 2, 3, 4, 5) has %CV value from 14.864 to 16.437, Skewness value from -0.563 to -0.867, and Kurtosis value from 0.119 to 1.106. Lastly, green products and services (GPaS1, 2, 3, 4) has %CV value from 15.721 to 16.076, Skewness value from -0.413 to -0.746, and Kurtosis value from -0.138 to 0.733. Consequently, the data has systematical distribution and good shape since the skewness and kurtosis is in between -3 and +3 and percent of coefficient of variation (%CV) is under 30 percent as recommendation (Brown, 1998; Larson, 2006; Marshall & Jonker, 2010).

Employee's Green Personal and Social Identification

Table 53 Assessment of normality of green personal and social identification variables

Variables	N	%CV	Skewness	Kurtosis		Variables	N	%CV	Skewness	Kurtosis
GPI1	400	18.316	-0.967	2.372		GSI1	400	17.577	-0.345	0.030
GPI2	400	17.202	-0.830	2.011		GSI2	400	19.690	-0.597	0.575
GPI3	400	16.944	-0.905	2.276		GSI3	400	19.070	-0.732	0.986
GPI4	400	18.427	-0.967	2.346		GSI4	400	19.690	-0.597	0.575
GPI5	400	18.787	-0.941	2.104		GSI5	400	17.812	-0.561	0.868
GPI6	400	17.368	-1.019	2.922						

From the study, the finding indicated that employee's green personal identification (GPI1, 2, 3, 4, 5, 6) has %CV value from 16.944 - 18.787, Skewness value from -0.830 to -1.019, and Kurtosis value from 2.011 to 2.922. In the meantime, employee's green social identification (GSI1, 2, 3, 4, 5) has %CV value from 17.577 to 19.690, Skewness value from -0.345 to -0.732, and Kurtosis value from 0.030 to 0.986. Consequently, the data has systematical distribution and good shape since the skewness and kurtosis is in between -3 and +3 and percent of coefficient of variation (%CV) is under 30 percent as recommendation (Brown, 1998; Larson, 2006; Marshall & Jonker, 2010).

Green Supply Chain Management

Table 54 Assessment of normality of green supply chain management variables

Variables	N	%CV	Skewness	Kurtosis		Variables	N	%CV	Skewness	Kurtosis
GDes1	400	15.865	-0.376	-0.118		GRec1	400	19.365	-1.078	2.491
GDes2	400	16.076	-0.558	0.196		GRec2	400	20.504	-1.149	2.356
GDes3	400	16.393	-0.844	2.129		GRec3	400	18.577	-0.978	2.240
GDes4	400	17.534	-0.799	1.467		GRec4	400	20.336	-1.011	1.859
GDes5	400	15.320	-0.393	0.074		GLog1	400	18.242	-0.732	1.269
GDes6	400	15.921	-0.390	-0.146		GLog2	400	17.407	-0.465	0.243
GPcu1	400	16.569	-0.319	0.050		GLog3	400	15.633	-0.449	0.187
GPcu2	400	15.681	-0.421	0.439		GLog4	400	16.324	-0.517	0.292
GPcu3	400	16.688	-0.382	-0.033		GLog5	400	17.244	-0.526	0.329
GPcu4	400	16.237	-0.365	0.188		GLog6	400	15.766	-0.630	0.337
GPcu5	400	16.619	-0.341	0.016		GLog7	400	16.256	-0.686	0.522
GPcu6	400	16.198	-0.341	0.001		GMar1	400	15.896	-0.663	0.498
GMan1	400	15.846	-0.476	0.323		GMar2	400	15.447	-0.686	0.733
GMan2	400	15.018	-0.452	0.460		GMar3	400	16.726	-0.661	0.621
GMan3	400	15.036	-0.456	0.448		GMar4	400	16.320	-0.764	1.065
GMan4	400	14.654	-0.588	0.567		GMar5	400	17.399	-0.980	2.028
GMan5	400	14.581	-0.485	0.292		GMar6	400	15.664	-0.608	0.617
GMan6	400	13.534	-0.318	0.795						
GMan7	400	15.000	-0.546	0.137						

From the study, the finding indicated that green design (GDes1, 2, 3, 4, 5, 6) has %CV value from 15.320 to 17.534, Skewness value from -0.376 to -0.844, and Kurtosis value from -0.118 to 2.129. Next, green procurement (GPcu1, 2, 3, 4, 5, 6) has %CV value from 15.681 to 16.688, Skewness value from -0.319 to -0.421, and Kurtosis value from -0.033 to 0.439. In the meantime, green manufacturing (GMan1, 2, 3, 4, 5, 6, 7) has %CV value from 13.534 to 15.846, Skewness value from -0.318 to -0.588, and Kurtosis value from 0.137 to 0.795. Another dimension, green recovery (GR1, 2, 3, 4), has %CV value from 18.577 to 20.504, Skewness value from -0.978 to -1.149, and Kurtosis value from 1.859 to 2.491. Furthermore, green logistics (GL1, 2, 3, 4, 5, 6, 7) has %CV value from 15.633 to 18.242, Skewness value from -0.449 to -0.732, and Kurtosis value from 0.187 to 1.269. Lastly, green marketing (GMar1, 2, 3, 4, 5, 6) has %CV value from 15.447 to 17.399, Skewness value from -0.608 to -0.980, and Kurtosis value from 0.498 to 2.028. Consequently, the data has systematical distribution and good shape since the skewness and kurtosis is in between -3 and +3 and percent of coefficient of variation (%CV) is under 30 percent as recommendation (Brown, 1998; Larson, 2006; Marshall & Jonker, 2010).

Green Business Performance

Table 55 Assessment of normality of green business performance variables

Variables	N	%CV	Skewness	Kurtosis		Variables	N	%CV	Skewness	Kurtosis
EP1	400	19.187	-0.527	-0.221		EnP4	400	14.909	-0.602	0.173
EP2	400	16.500	-0.466	-0.168		EnP5	400	15.836	-0.731	0.335
EP3	400	17.776	-0.530	-0.192		EnP6	400	16.449	-0.874	1.705
EP4	400	17.909	-0.390	-0.505		SP1	400	16.459	-0.611	-0.142
EP5	400	18.539	-0.670	0.654		SP2	400	15.513	-0.585	-0.266
EP6	400	18.318	-0.440	-0.403		SP3	400	17.282	-0.855	1.103
EP7	400	17.233	-0.510	0.035		SP4	400	15.737	-0.667	0.138
EnP1	400	15.286	-0.685	0.567		SP5	400	16.336	-0.987	2.014
EnP2	400	16.300	-0.975	1.856		SP6	400	17.390	-0.941	1.347
EnP3	400	16.080	-0.672	0.410						

From the study, the finding indicated that economic performance (EP1, 2, 3, 4, 5, 6, 7) has %CV value from 16.500 to 19.187, Skewness value from -0.390 to -0.530, and Kurtosis value from -0.168 to 0.654. Another dimension, environmental performance (EnP1, 2, 3, 4, 5, 6), has %CV value from 14.909 to 16.449, Skewness value from -0.975 to -0.602, and Kurtosis value from 0.335 to 1.856. Furthermore, social performance (SP1, 2, 3, 4, 5, 6) has %CV value from 15.513 to 17.390, Skewness value from -0.611 to -0.987, and Kurtosis value from -0.142 to 2.014. Consequently, the data has systematical distribution and good shape since the skewness and kurtosis is in between -3 and +3 and percent of coefficient of variation (%CV) is under 30 percent as recommendation (Brown, 1998; Larson, 2006; Marshall & Jonker, 2010).

4.4.5 Reliability Test

Reliability assessment is very important for deciding to use the questionnaire for further analysis because it can help ensure the usability of the measurements in the questionnaires (Sud-on, 2014). The study employed two values: corrected item-total correlation and Cronbach's alpha coefficient. The score of corrected item-total correlation in each question should be greater than 0.20 (Faleye, 2008) and the Cronbach's alpha coefficient of each dimension should be greater 0.70 (DeVellis, 2016; Hajiar, 2014). The result can examine the reliability of the properties of measurement scales and the items providing information about the relationships between individual items in the scale (Nunnally, 1994). The detail is shown below.

Table 56 Reliability test of studied variables

Variables/Indicator	**Corrected Item-Total Correlation**	**Cronbach's alpha**
Green Corporate Identity		
GCCoI1, 2, 3, 4, 5 and GCCoE1, 2, 3, 4, 5	0.723, 0.563, 0.769, 0.779, 0.803 0.716, 0.787, 0.832, 0.803, 0.593	0.931
GCVI1, 2, 3, 4, 5, 6	0.781, 0.855, 0.835, 0.887, 0.880, 0.799	0.947
GEBR1, 2, 3, 4, 5 and GEBE1, 2, 3, 4, 5, 6	0.769, 0.782, 0.839, 0.827, 0.834, 0.697	0.952
GCCu1, 2, 3, 4, 5, 6	0.883, 0.910, 0.914, 0.897, 0.885, 0.886	0.968
GPo1, 2, 3, 4, 5	0.837, 0.915, 0.893, 0.900, 0.858	0.957
GFD1, 2, 3, 4, 5	0829, 0.887, 0.900, 0.785, 0.846	0.952
GPaS1, 2, 3, 4	0.851, 0.881, 0.981, 0.846	0.945
Employees' Green Personal-Social Identification		
GPI1, 2, 3, 4, 5, 6	0.899, 0.837, 0.832, 0.889, 0.887, 0.836	0.957
GSI1, 2, 3, 4, 5,	0.877, 0.912, 0.863, 0.905, 0.822	0.955
Green Supply Chain Management		
GDes1, 2, 3, 4, 5, 6	0.862, 0.898, 0.876, 0.798, 0.877, 0.872	0.956
GPcu1, 2, 3, 4, 5, 6	0.864, 0.868, 0.911, 0.899, 0.926, 0.879	0.966
GMan1, 2, 3, 4, 5, 6, 7	0.860, 0.886, 0.859, 0.923, 0.917, 0.753, 0.892	0.963
GRes1, 2, 3, 4	0.847, 0.784, 0.791, 0.865	0.922

Variables/Indicator	Corrected Item-Total Correlation	Cronbach's alpha
GLog1, 2, 3, 4, 5, 6, 7	0.739, 0.792, 0.808, 0.892, 0.807, 0.796, 0.820	0.942
GMar1, 2, 3, 4, 5, 6	0.858, 0.888, 0.890, 0.905, 0.829, 0.862	0.959
Green Business Performance		
EP1, 2, 3, 4, 5, 6, 7	0.853, 0.829, 0.900, 0.899, 0.879, 0.875, 0.884	0.965
EnP1, 2, 3, 4, 5, 6	0.855, 0.847, 0.861, 0.843, 0.880, 0.840	0.953
SP1, 2, 3, 4, 5, 6	0.883, 0.894, 0.928, 0.901, 0.927, 0.894	0.971

From the study, it was found that corrected item-total correlation and Cronbach's alpha from all variables from green corporate identity, employees' green personal and social identification, green supply chain management, and green business performance were in acceptable level, which the score of corrected item-total correlation of each it was greater than 0.20 (Faleye, 2008) and the Cronbach's alpha coefficient of each dimension was 0.70 (DeVellis, 2016; Hajiar, 2014). Accordingly, it can be concluded that the data here can be utilized for further analysis.

4.5 Assessment of Dimensionality Via EFA Method

4.5.1 Assessment of Green Corporate Identity

The scales for measuring green corporate identity consist of green corporate communication (GCCo), green corporate visual identity (GCVI), green corporate culture (GCCu), green employee behaviour (GEB), green corporate policy (GPo), green forces and drivers (GFD) and green products and services (GPaS). The study used principal axis factoring as extraction method and varimax with Kaiser normalization as rotation method in order to determine the scale dimensionality. After running the data through the aforementioned method, these values: Kaiser-Meyer-Olkin (KMO) of Bartlett's test of sphericity with its value higher than 0.50 at the significant value less than 0.05 (Hair Jr et al., 2016), Eigen value higher or equal to one (Hair Jr et al., 2016), factor loading with its value higher 0.40, and Cronbach's alpha with its value higher than 0.70. All value did not fall into mentioned criteria cannot be considered as good components, which some of them must be deleted. The study result is shown in the below tables.

Table 57 Dimensionality assessment of green corporate identity via EFA method

Item	GCCo	GCVI	GCCu	GEB	GPo	GFD	GPaS
GCCoI1	0.750						
GCCoI2	0.607						
GCCoI3	0.803						
GCCoI4	0.810						
GCCoI5	0.845						
GCCoE1	0.749						
GCCoE2	0.815						
GCCoE3	0.866						
GCCoE4	0.837						
GCCoE5	0.626						
GCVI1		0.802					
GCVI2		0.885					
GCVI3		0.863					
GCVI4		0.921					
GCVI5		0.912					
GCVI6		0.819					
GCCu1			0.902				
GCCu2			0.930				
GCCu3			0.933				
GCCu4			0.915				
GCCu5			0.901				
GCCu6			0.900				
GEBR1				0.796			
GEBR2				0.806			
GEBR3				0.864			
GEBR4				0.857			

Item	GCCo	GCVI	GCCu	GEB	GPo	GFD	GPaS
GEBR5				0.860			
GEBE1				0.711			
GEBE2				0.711			
GEBE3				0.844			
GEBE4				0.762			
GEBE5				0.814			
GEBE6				0.821			
GPo1					0.857		
GPo2					0.941		
GPo3					0.919		
GPo4					0.926		
GPo5					0.882		
GFD1						0.717	
GFD2						0.808	
GFD3						0.815	
GFD4						0.791	
GFD5						0.763	
GPaS1							0.882
GPaS2							0.916
GPaS3							0.928
GPaS4							0.876
Eigenvalues	6.329	4.762	5.173	7.489	4.277	4.199	3.432
Percentage Variance Explained	63.289	79.367	86.216	68.078	85.531	83.990	85.808
Cronbach's alpha	0.931	0.947	0.968	0.952	0.957	0.952	0.945

Note: Extraction method: Principal axis factoring; Rotation method: Varimax rotation

From the study, it was found that green corporate identity consists of green corporate communication (GCCo), green corporate visual identity (GCVI), green corporate culture (GCCu), green employee behaviour (GEB), green corporate policy

(GPo), green forces and drivers (GFD) and green products and services (GPaS). For green corporate communication (GCCo), it consists of 10 indicators with KMO as of 0.920, Eigenvalues as of 6.329, factor loading as of 0.607 - 0.866, and Cronbach's alpha as of 0.931. Another dimension, green corporate visual identity (GCVI), consists of 6 indicators with KMO as of 0.894, Eigenvalues as of 4.762, factor loading as of 0.802 - 0.912, and Cronbach's alpha as of 0.947. Next, green corporate culture (GCCu) has 6 items with KMO as of 0.867, Eigenvalues as of 5.173, factor loading as of 0.900 - 0.933, and Cronbach's alpha as of 0.968. In the meantime, green employee behaviour (GEB) contains 11 items with KMO as of 0.922, Eigenvalues as of 7.489, factor loading as of 0.711 - 0.864, and Cronbach's alpha as of 0.952. Another aspect, green corporate policy (GPo), consists of 5 items with KMO as of 0.832, Eigenvalues as of 4.277, factor loading as of 0.857 - 0.941, and Cronbach's alpha as of 0.957. Furthermore, green forces and drivers (GFD) has 5 items with KMO as of 0.890, Eigenvalues as of 4.199, factor loading as of 0.852 - 0.930, and Cronbach's alpha as of 0.952. Lastly, green products and services (GPaS) has 4 items with KMO as of 0.861, Eigenvalues as of 3.432, factor loading as of 0.876 - 0.928, and Cronbach's alpha as of 0.945. Accordingly, the study can be concluded that data involving these dimensions were acceptable for further analysis.

4.5.2 Assessment of Employees' Green Personal-Social Identification

Table 58 Dimensionality assessment of green personal-social identification via EFA method

Item	GPI	GSI
GPI1	0.925	
GPI2	0.859	
GPI3	0.852	
GPI4	0.914	
GPI5	0.912	
GPI6	0.856	
GSI1		0.901
GSI2		0.941
GSI3		0.886
GSI4		0.932
GSI5		0.843
Eigenvalues	4.929	4.245
Percentage Variance Explained	82.146	84.904
Cronbach's alpha	0.957	0.955

Note: Extraction method: Principal axis factoring; Rotation method: Varimax rotation

From the study, it was found that employees' green personal-social identification consists of green personal identification (GPI) and green social identification (GSI). For green personal identification (GPI), it contains 6 items with KMO as of 0.884, Eigenvalues as of 4.929, factor loading as of 0.852-0.925, and Cronbach's alpha as of 0.957. Another dimension, green social identification (GPI), contains 5 items with KMO as of 0.874, Eigenvalues as of 4.245, factor loading as of 0.843-0.941, and Cronbach's alpha as of 0.955. Accordingly, the study can be concluded that data involving these dimensions were acceptable for further analysis.

4.5.3 Assessment of Green Supply Chain Management

Table 59 dimensionality assessment of green supply chain management via EFA method

Item	GDes	GPcu	GMan	GRec	GLog	Gmar
GDes1	0.891					
GDes2	0.923					
GDes3	0.895					
GDes4	0.816					
GDes5	0.902					
GDes6	0.897					
GPcu1		0.880				
GPcu2		0.884				
GPcu3		0.931				
GPcu4		0.919				
GPcu5		0.947				
GPcu6		0.896				
GMan1			0.877			
GMan2			0.904			
GMan3			0.877			
GMan4			0.945			
GMan5			0.939			
GMan6			0.767			
GMan7			0.911			
GRec1				0.894		
GRec2				0.820		
GRec3				0.829		
GRec4				0.921		
GLog1					0.756	
GLog2					0.807	
GLog3					0.845	
GLog4					0.932	

Item	GDes	GPcu	GMan	GRec	GLog	Gmar
GLog5					0.831	
GLog6					0.830	
GLog7					0.853	
GMar1						0.883
GMar2						0.912
GMar3						0.911
GMar4						0.926
GMar5						0.841
GMar6						0.884
Eigenvalues	4.939	5.137	5.745	3.250	5.204	4.995
Percentage Variance Explained	82.315	85.614	82.069	81.253	74.337	83.251
Cronbach's alpha	0.956	0.966	0.963	0.922	0.942	0.959

Note: Extraction method: Principal axis factoring; Rotation method: Varimax rotation

From the study, it was found that green supply chain management consists of green design (GDes), green procurement (GPcu), green manufacturing (GMan), green recovery (GRec), green logistics (GLog), and green marketing (GMar). For green design (GDes), it contains 6 items with KMO as of 0.864, Eigenvalues as of 4.493, factor loading as of 0.816-0.923, and Cronbach's alpha as of 0.956. Next, green procurement (GPcu) contains 6 items with KMO as of 0.918, Eigenvalues as of 5.137, factor loading as of 0.880-0.947, and Cronbach's alpha as of 0.966. In the meantime, green manufacturing (GMan), consists of 7 items with KMO as of 0.921, Eigenvalues as of 5.745, factor loading as of 0.767-0.945, and Cronbach's alpha as of 0.963. Another dimension, green recovery (GRec), consist of 4 items with KMO as of 0.824, Eigenvalues as of 3.250, factor loading as of 0.820-0.921, and Cronbach's alpha as of 0.922. Furthermore, green logistics (GLog) consists of 7 items with KMO as of 0.867, Eigenvalues as of 5.204, factor loading as of 0.756-0.932, and Cronbach's alpha as of 0.942. Lastly, green marketing (GMar) consists of 6 items with KMO as of 0.892, Eigenvalues as of 4.995, factor loading as of 0.847-0.926, and Cronbach's alpha as of

0.959. Accordingly, the study can be concluded that data involving these dimensions were acceptable for further analysis.

4.5.4 Assessment of Green Business Performance

Table 60 Dimensionality assessment of green business performance via EFA method

Item	EP	EnP	SP
EP1	0.870		
EP2	0.846		
EP3	0.920		
EP4	0.919		
EP5	0.897		
EP6	0.894		
EP7	0.902		
EnP1		0.880	
EnP2		0.870	
EnP3		0.887	
EnP4		0.860	
EnP5		0.908	
EnP6		0.862	
SP1			0.898
SP2			0.910
SP3			0.945
SP4			0.916
SP5			0.944
SP6			0.910
Eigenvalues	5.780	7.866	5.237
Percentage Variance Explained	82.575	81.099	87.286
Cronbach's alpha	0.965	0.953	0.971

Note: Extraction method: Principal axis factoring; Rotation method: Varimax rotation

From the study, it was found that green business performance consists of economic performance (EP), environmental performance (EnP), and social performance (SP). For economic performance (EP), it consists of 7 items with KMO as of 0.932, Eigenvalues as of 5.780, factor loading as of 0.846-0.920, and Cronbach's alpha as of 0.965. Another dimension, environmental performance (EnP), consists of 6 items with KMO as of 0.899, Eigenvalues as of 4.866, factor loading as of 0.862-0.908, and Cronbach's alpha as of 0.953. Lastly, social performance (SP) consists of 6 items with KMO as of 0.914, Eigenvalues as of 5.237, factor loading as of 0.898-0.945, and Cronbach's alpha as of 0.971. Accordingly, the study can be concluded that data involving these dimensions were acceptable for further analysis.

4.6 Assessment of Construct Validity Via CFA Method

Each dimension of green corporate identity, employee's green personal-social identification, green supply chain management, and green business performance model was assessed by confirmatory factor analysis (CFA) in order to identify whether the indicators can belong to the dimension. Under the conduction of CFA, important value such as fit-model indices, factor loading (FL), squared multiple correlation (SMC), construct reliability (CR), and average variance extracted (AVE) were considered. The fit-model indices should pass the criteria and be acceptable (Arbuckle, 2011). In the meantime, factors loading should be more than 0.50 (Hair Jr et al., 2016). The t-value (t) should be higher than 1.96 (Raines-Eudy, 2000). Moreover, the squared multiple correlation (SMC) should be higher than 0.50, but not lower than 0.30 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016) as well as the construct reliability (C.R.) should be higher than 0.50 (Dilekli & Tezci, 2019). Lastly, average variance extracted (AVE) should be higher than 0.50 (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). Once the data-fit model does not fall within the criteria, it means that the current studying model is not acceptable. In relation to unfit-model occurrence, the model modification and decoration such as dropping the problematic items or correlating items by using modification indices can be carefully considered (Oort, 1998; Sanders et al., 2015).

4.6.1 Confirmatory Factor Analysis on Green Corporate Identity

Regarding analysis of confirmatory factor on green corporate identity, seven dimensions including green corporate communication (GCCo), green corporate visual identity (GCVI), green corporate culture (GCCu), green employee behaviour (GEB), green corporate policy (GPo), green forces and drivers (GFD), and green products and services (GPaS) were performed. All detail is shown as follows.

4.6.1.1 First-order CFA of Green Corporate Identity

Green Corporate Communication (GCCo)

Green corporate communication (GCCo) consisting of 10 items including GCCoI1, 2, 3, 4, 5 and GCCoE1, 2, 3, 4, 5 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 61 Model-fit indices of initial and modified model regarding green corporate communication (GCCo)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.063
CMIN/df	**12.765**	CMIN/df	1.800
GFI	**0.785**	GFI	0.990
AGFI	**0.662**	AGFI	0.960
RMSEA	**0.172**	RMSEA	0.045
RMR	0.033	RMR	0.007
CFI	**0.864**	CFI	0.997
TLI	**0.825**	TLI	0.991
NFI	**0.855**	NFI	0.994

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 10 initial items (GCCoI1, 2, 3, 4, 5 and GCCoE1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 12.765, GFI of 0.785, AGFI of 0.662, RMSEA of 0.172, CFI of 0.864, TLI of 0.825, and NFI of 0.855. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.063, CMIN/df of 1.800, GFI of 0.990, AGFI of 0.960, RMSEA of 0.045, RMR of 0.007, CFI of 0.997, TLI of 0.991, and NFI of 0.994. Moreover, the adjusted model remained 8 items (GCCoI1, 3, 4, 5 and GCCoE1, 2, 3, 4). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

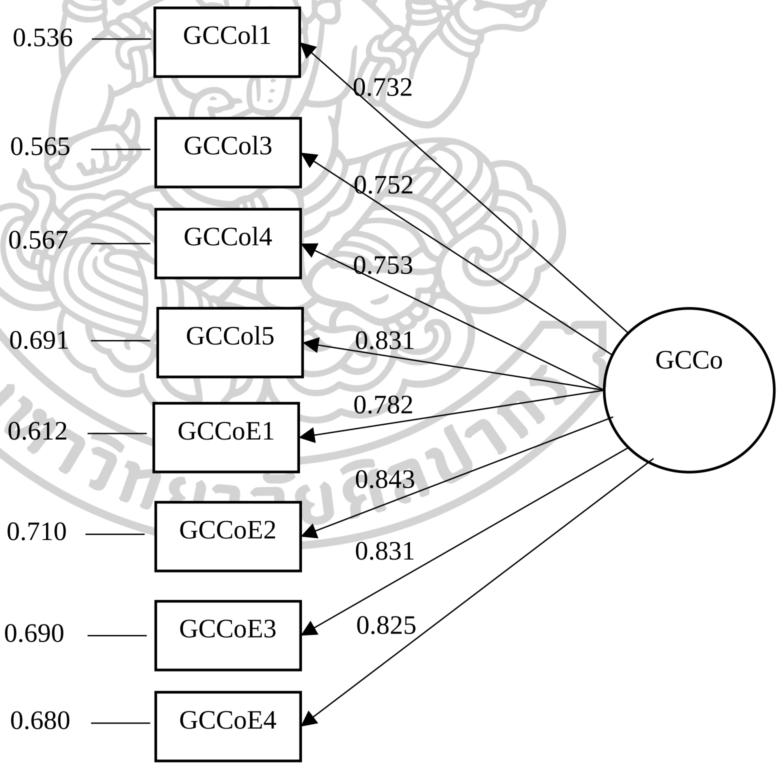

Figure 4 Adjusted model of green corporate communication (GCCo)

Table 62 Analysis result of model measurement of green corporate communication (GCCo)

Indicators	FL	t	SMC	Error
GCCoI1	0.732	16.342	0.536	0.464
GCCoI3	0.752	19.616	0.565	0.435
GCCoI4	0.753	21.175	0.567	0.433
GCCoI5	0.831	N/A	0.691	0.309
GCCoE1	0.782	17.405	0.612	0.388
GCCoE2	0.843	19.374	0.710	0.290
GCCoE3	0.831	18.036	0.690	0.310
GCCoE4	0.825	17.024	0.680	0.320
α = 0.935, CR = 0.932, AVE = 0.631				

Note: GCCoI5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.732 to 0.843, which are higher than 0.50 (Hair, 2010); t-value (t) ranged from 16.342 to 21.175, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.542 to 0.720, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016) Cronbach's Alpha (α) was 0.935, which is higher than 0.70 (Hair Jr et al., 2016) construct reliability (CR) was 0.932, which is higher than 0.50 (Dilekli & Tezci, 2019) and average variance extracted (AVE) was 0.631, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Corporate Visual Identity (GCVI)

Green corporate visual identity (GCVI) consisting of 6 items GCVI1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 63 Model-fit indices of initial and modified model regarding green corporate visual identity (GCVI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.269
CMIN/df	**12.526**	CMIN/df	1.295
GFI	0.926	GFI	0.996
AGFI	**0.828**	AGFI	0.977
RMSEA	**0.170**	RMSEA	0.027
RMR	0.018	RMR	0.004
CFI	0.956	CFI	0.999
TLI	0.926	TLI	0.998
NFI	0.952	NFI	0.998

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 6 initial items (GCVI1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 12.526, AGFI of 0.828, and RMSEA of 0.170. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.269, CMIN/df of 1.295, GFI of 0.996, AGFI of 0.977, RMSEA of 0.027, RMR of 0.004, CFI of 0.999, TLI of 0.998, and NFI of 0.998. Moreover, the adjusted model remained 6 items (GCVI1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

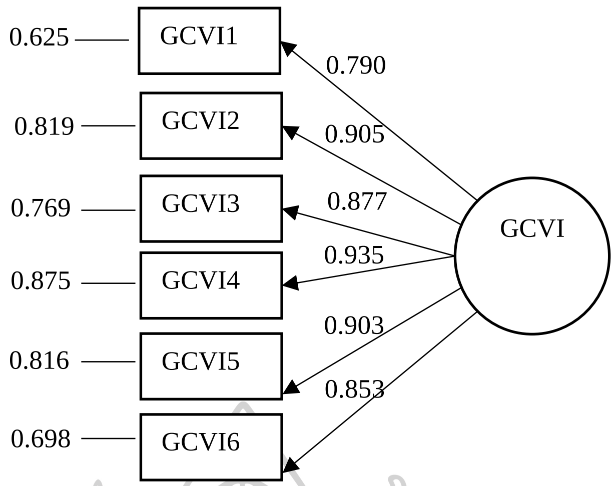

Figure 5 Adjusted model of green corporate visual identity (GCVI)

Table 64 Analysis result of model measurement of green corporate visual identity (GCVI)

Indicators	FL	t	SMC	Error
GCVI1	0.790	21.045	0.625	0.375
GCVI2	0.905	27.989	0.819	0.181
GCVI3	0.877	26.887	0.769	0.231
GCVI4	0.935	31.458	0.875	0.125
GCVI5	0.903	N/A	0.816	0.184
GCVI6	0.835	23.564	0.698	0.302
α = 0.947, CR = 0.952, AVE = 0.767				

Note: GCVI5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.790 to 0.935, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 21.045 to 31.458, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.625 to 0.875, which are higher than 0.50

(Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.947, which is higher than 0.70 (Aykan & Nalçacı, 2018); construct reliability (CR) was 0.952, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.767, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Corporate Culture (GCCu)

Green corporate culture (GCCu) consisting of 6 items including GCCu1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 65 Model-fit indices of initial and modified model regarding green corporate culture (GCCu)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.516
CMIN/df	**42.701**	CMIN/df	0.760
GFI	**0.762**	GFI	0.998
AGFI	**0.445**	AGFI	0.987
RMSEA	**0.323**	RMSEA	0.000
RMR	0.018	RMR	0.001
CFI	**0.887**	CFI	1.000
TLI	**0.812**	TLI	1.000
NFI	**0.885**	NFI	0.999

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 6 initial items (GCCu1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 42.701, GFI of 0.762, AGFI of 0.445, RMSEA of 0.323, CFI of 0.887, TLI of 0.812, and NFI of 0.885. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.516, CMIN/df of 0.760, GFI of 0.998, AGFI of 0.987, RMSEA of 0.000, RMR of 0.001, CFI of 1.000, TLI of 1.000, and NFI of 0.999. Moreover, the adjusted model remained 6 items (GCCu1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

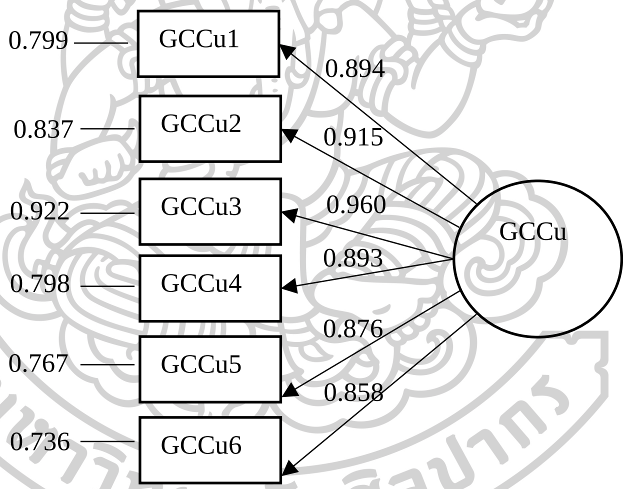

Figure 6 Adjusted model of green corporate culture (GCCu)

Table 66 Analysis result of model measurement of green corporate culture (GCCu)

Indicators	FL	t	SMC	Error
GCCu1	0.894	25.840	0.799	0.201
GCCu2	0.915	27.293	0.837	0.163
GCCu3	0.960	30.171	0.922	0.078
GCCu4	0.893	27.732	0.798	0.202

Indicators	FL	t	SMC	Error
GCCu5	0.876	N/A	0.767	0.233
GCCu6	0.858	36.852	0.736	0.264
α = 0.968, CR = 0.962, AVE = 0.810				

Note: GCCoI5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.858 to 0.960, which are higher than 0.50 (Hair, 2010); t-value (t) ranged from 25.840 to 36.852, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.736 to 0.922, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.968, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.962, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.810, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Employee Behaviour (GEB)

Green employee behaviour (GEB) consisting of 11 items including GEBR1, 2, 3, 4, 5 and GEBE1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 67 Model-fit indices of initial and modified model regarding green employee behaviour (GEB)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.298
CMIN/df	**18.946**	CMIN/df	1.166
GFI	**0.680**	GFI	0.992
AGFI	**0.520**	AGFI	0.971
RMSEA	**0.212**	RMSEA	0.020
RMR	0.036	RMR	0.005
CFI	**0.815**	CFI	0.999
TLI	**0.769**	TLI	0.998
NFI	**0.807**	NFI	0.996

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 11 initial items (GEBR1, 2, 3, 4, 5 and GEBE1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 18.946, GFI of 0.680, AGFI of 0.520, RMSEA of 0.212, CFI of 0.815, TLI of 0.769, and NFI of 0.807. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.298, CMIN/df of 1.166, GFI of 0.992, AGFI of 0.971, RMSEA of 0.020, RMR of 0.005, CFI of 0.999, TLI of 0.998, and NFI of 0.996. Moreover, the adjusted model remained 9 items (GEBR1, 2, 3, 4, 5 and GEBE3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

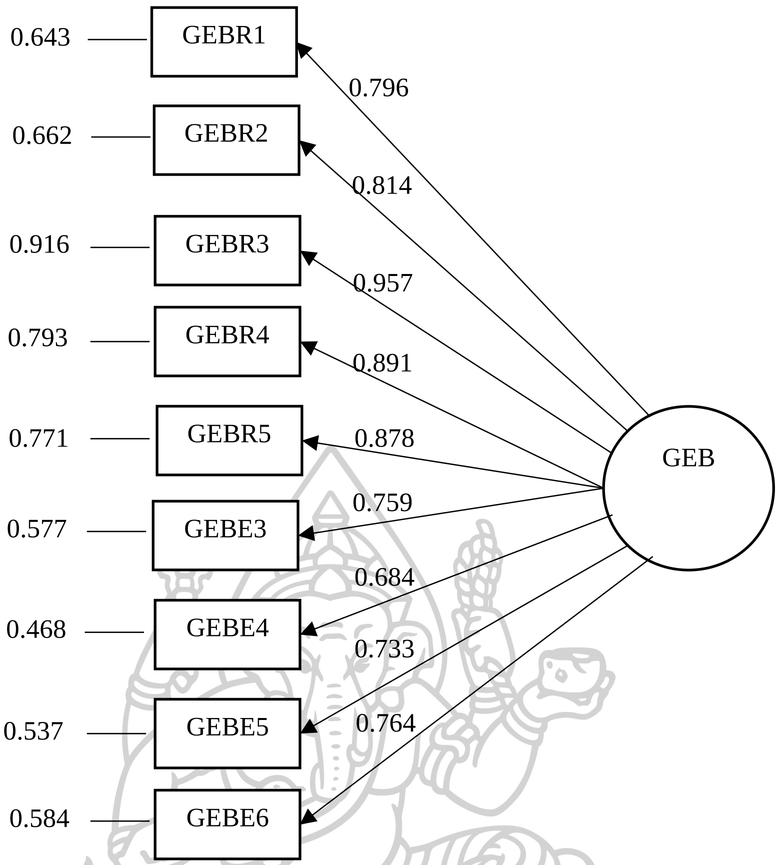

Figure 7 Adjusted model of green employee behaviour (GEB)

Table 68 Analysis result of model measurement of green employee behaviour (GEB)

Indicators	**FL**	**t**	**SMC**	**Error**
GEBR1	0.796	20.975	0.643	0.357
GEBR2	0.814	21.846	0.662	0.338
GEBR3	0.957	28.711	0.916	0.084
GEBR4	0.891	34.491	0.793	0.207
GEBR5	0.878	N/A	0.771	0.229
GEBE3	0.759	18.056	0.577	0.423
GEBE4	0.684	15.464	0.468	0.532
GEBE5	0.733	17.123	0.537	0.463
GEBE6	0.764	18.204	0.584	0.416
α = 0.951, CR = 0.946, AVE = 0.661				

Note: GEBR5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.684 to 0.957, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 15.464 to 34.491, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.537 to 0.916, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.951, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.946, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.661, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Corporate Policy (GPo)

Green corporate policy (GPo) consisting of 5 items including GPo1, 2, 3, 4, 5 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 69 Model-fit indices of initial and modified model regarding green corporate policy (GPo)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.122
CMIN/df	**31.223**	CMIN/df	2.395
GFI	**0.887**	GFI	0.998
AGFI	**0.660**	AGFI	0.964

Model-fit index			
Initial Model		**Modified Model**	
RMSEA	**0.275**	RMSEA	0.059
RMR	0.012	RMR	0.002
CFI	0.936	CFI	0.998
TLI	**0.871**	TLI	0.994
NFI	0.934	NFI	0.999

Note: Values in bold are unaccepted.

From the study it was found that the initial model contained 5 initial items (GPo1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 31.223, GFI of 0.887, AGFI of 0.660, RMSEA of 0.275, and TLI of 0.871. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.122, CMIN/df of 2.395, GFI of 0.998, AGFI of 0.964, RMSEA of 0.059, RMR of 0.002, CFI of 0.998, TLI of 0.994, and NFI of 0.999. Moreover, the adjusted model remained 5 items (GPo1, 2, 3, 4, 5). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

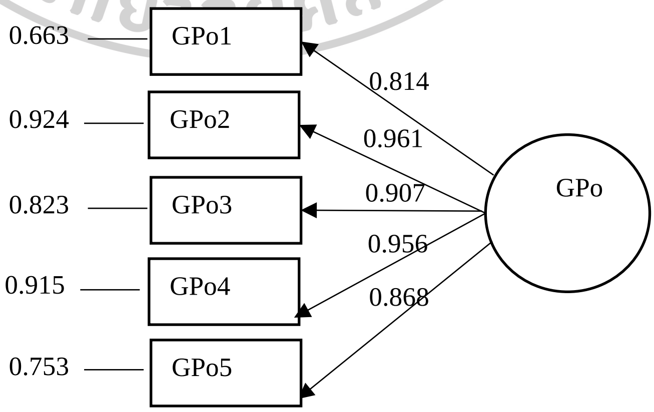

Figure 8 Adjusted model of green corporate policy (GPo)

Table 70 Analysis result of model measurement of green corporate policy (GPo)

Indicators	FL	t	SMC	Error
GPo1	0.814	20.728	0.663	0.337
GPo2	0.961	28.451	0.924	0.076
GPo3	0.907	26.237	0.823	0.177
GPo4	0.956	32.084	0.915	0.085
GPo5	0.868	N/A	0.753	0.247
α = 0.957, CR = 0.957, AVE = 0.816				

Note: GPo5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.814 to 0.961, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 20.728 to 32.084, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.663 to 0.924, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.957, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.957, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.816, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Forces and Drivers (GFD)

Green forces and drivers (GFD) consisting of 5 items including GFD1, 2, 3, 4, 5 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 71 Model-fit indices of initial and modified model regarding green forces and drivers (GFD)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.354
CMIN/df	**16.529**	CMIN/df	1.085
GFI	0.918	GFI	0.997
AGFI	**0.754**	AGFI	0.984
RMSEA	**0.197**	RMSEA	0.008
RMR	0.012	RMR	0.002
CFI	0.963	CFI	1.000
TLI	0.926	TLI	1.000
NFI	0.961	NFI	0.998

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 5 initial items (GFD1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 16.529, AGFI of 0.754, and RMSEA of 0.197. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.354, CMIN/df of 1.085, GFI of 0.997, AGFI of 0.984, RMSEA of 0.008, RMR of 0.002, CFI of 1.000, TLI of 1.000, and NFI of 0.998. Moreover, the adjusted model remained 5 items (GFD1, 2, 3, 4, 5). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

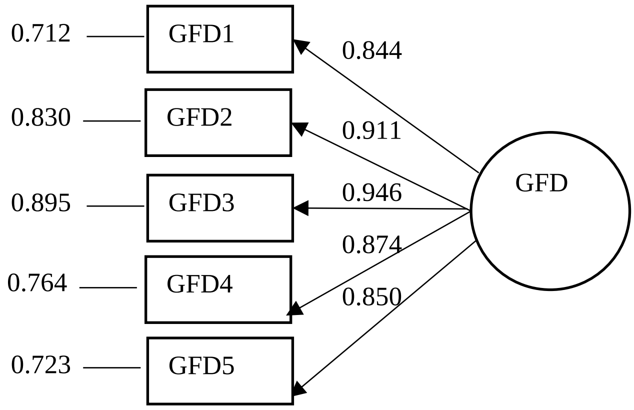

Figure 9 Adjusted model of green forces and drivers (GFD)

Table 72 Analysis result of model measurement of green forces and drivers (GFD)

Indicators	**FL**	**t**	**SMC**	**Error**
GFD1	0.844	21.431	0.712	0.288
GFD2	0.911	24.682	0.830	0.17
GFD3	0.946	26.584	0.895	0.105
GFD4	0.874	30.448	0.764	0.236
GFD5	0.850	N/A	0.723	0.277
α = 0.952, CR = 0.948, AVE = 0.785				

Note: GFD5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.844 to 0.946, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 21.431 to 30.448, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.712 to 0.895, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.952, which is higher than 0.70 (Hair et al., 2010); construct reliability (CR) was 0.948,

which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.785, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Products and Services (GPaS)

Green products and services (GPaS) consisting of 4 items including GPaS1, 2, 3, 4 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 73 Model-fit indices of initial and modified model regarding green products and services (GPaS)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.002**	p-value	0.507
CMIN/df	**6.429**	CMIN/df	0.439
GFI	0.983	GFI	0.999
AGFI	0.917	AGFI	0.995
RMSEA	**0.117**	RMSEA	0.000
RMR	0.005	RMR	0.001
CFI	0.993	CFI	1.000
TLI	0.979	TLI	1.000
NFI	0.992	NFI	1.000

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 4 initial items (GPaS1, 2, 3, 4) with some unacceptable values: p-value of 0.002, CMIN/df of 6.429, and RMSEA of 0.117. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.507, CMIN/df of 0.439, GFI of 0.999, AGFI of 0.995, RMSEA of 0.000, RMR of 0.001, CFI of 1.000, TLI of 1.000, and NFI of 1.000. Moreover, the adjusted model remained 4 items (GPaS1, 2, 3, 4). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

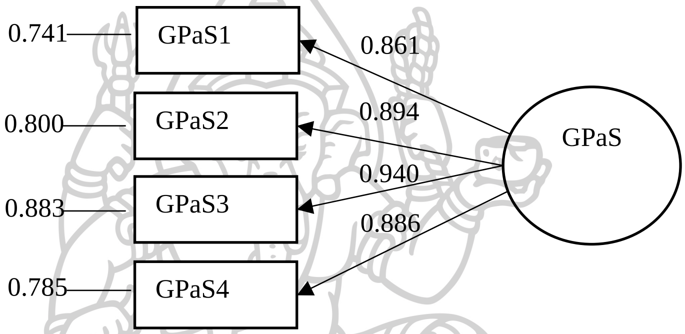

Figure 10 Adjusted model of green products and services (GPaS)

Table 74 Analysis result of model measurement of green products and services (GPaS)

Indicators	**FL**	**t**	**SMC**	**Error**
GPaS1	0.861	23.879	0.741	0.259
GPaS2	0.894	26.005	0.800	0.200
GPaS3	0.940	28.809	0.883	0.117
GPaS4	0.886	N/A	0.785	0.215
α = 0.945, CR = 0.942, AVE = 0.802				

Note: GPaS4 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach’s Alpha (α), construct reliability (CR), and average variance extracted

(AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.861 to 0.940, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 23.879 to 28.809, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.741 to 0.883, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.945, which is higher than 0.70 (Hair et al., 2010); construct reliability (CR) was 0.942, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.802, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.1.2 Higher-order CFA of Green Corporate Identity

In order to inspect whether the latent variables can be vividly separated from others, the higher-order confirmatory factor analysis (higher-order CFA) was employed. In this study, green corporate identity consisting of 7 sub-dimensions with 43 items (GCCoI1, 3, 4, 5, GCCoE1, 2, 3, 4, GCVI1, 2, 3, 4, 5, 6, GEBR1, 2, 3, 4, 5, GEBE1, 2, 3, 4, 5, 6, GCCu1, 2, 3, 4, 5, 6, GPo1, 2, 3, 4, 5, GFD1, 2, 3, 4, 5, and GPaS1, 2, 3, 4) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 75 Model-fit indices of initial and modified model regarding higher-order CFA on green corporate identity (GCI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**6.151**	CMIN/df	1.415
GFI	**0.621**	GFI	0.952

Model-fit index			
Initial Model		**Modified Model**	
AGFI	**0.573**	AGFI	0.603
RMSEA	**0.114**	RMSEA	0.032
RMR	0.025	RMR	0.013
CFI	**0.809**	CFI	0.994
TLI	**0.795**	TLI	0.988
NFI	**0.781**	NFI	0.979

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 7 sub-dimensions with 43 items (GCCoI1, 3, 4, 5, GCCoE1, 2, 3, 4, GCVI1, 2, 3, 4, 5, 6, GEBR1, 2, 3, 4, 5, GEBE1, 2, 3, 4, 5, 6, GCCu1, 2, 3, 4, 5, 6, GPo1, 2, 3, 4, 5, GFD1, 2, 3, 4, 5, and GPaS1, 2, 3, 4) with some unacceptable values: p-value of 0.000, CMIN/df of 6.151, GFI of 0.621, AGFI of 0.573, RMSEA of 0.114, CFI of 0.809, TLI of 0.795, and NFI of 0.781. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.415, GFI of 0.952, AGFI of 0.603, RMSEA of 0.032, RMR of 0.013, CFI of 0.994, TLI of 0.988, and NFI of 0.979. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). Therefore, this research also accepts the model fitness with p-value of 0.000. As a result, the adjusted model, therefore, remained 7 sub-dimensions with 29 items (GCCoI1, 4, 5, GCCoE1, 2, 3, GCVI2, 4, 5, GEBR2, 4, 5, GEBE5, 6, GCCu1, 2, 3, 4, GPo1, 2, 3, 4, GFD1, 2, 3, 4, GPaS1, 2, 3, 4). Accordingly, the detail of adjusted model is shown in the below figure and tables.

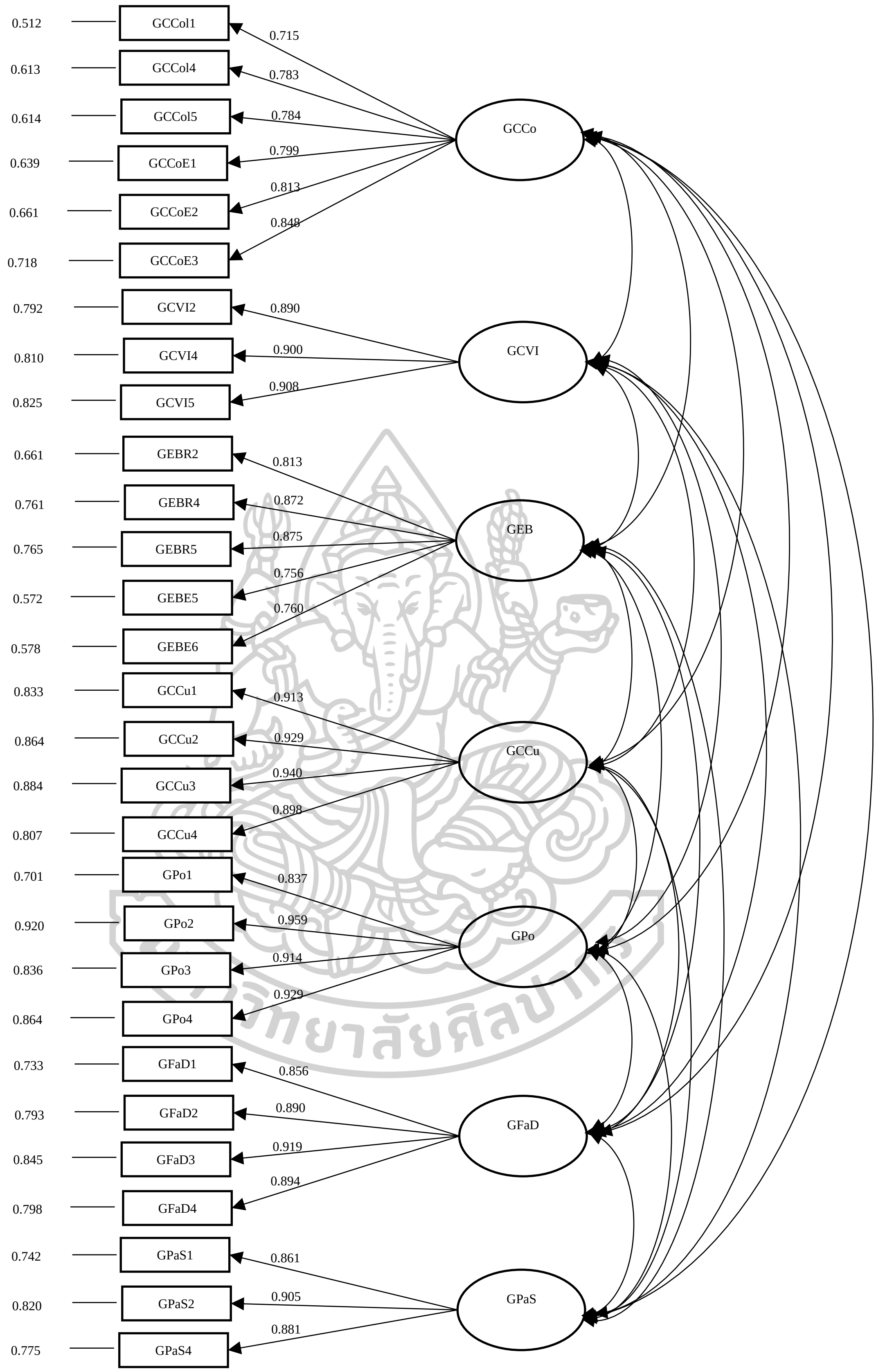

Figure 11 Adjusted model of higher-order CFA on green corporate identity (GCI)

Table 76 Analysis result of higher-order CFA on green corporate identity (GCI)

Indicators	**FL**	**t**	**SMC**	**Error**
Green Corporate Communication: GCCo (α = 0.916, CR = 0.909, AVE = 0.626)				
GCCoI1	0.715	16.388	0.512	0.488
GCCoI4	0.783	17.110	0.613	0.387
GCCoI5	0.784	17.447	0.614	0.386
GCCoE1	0.799	18.939	0.639	0.361
GCCoE2	0.813	22.927	0.661	0.339
GCCoE3	0.848	N/A	0.718	0.282
Green Corporate Visual Identity: GCVI (α = 0.932, CR = 0.927, AVE = 0.809)				
GCVI2	0.890	24.520	0.792	0.208
GCVI4	0.900	30.444	0.810	0.190
GCVI5	0.908	N/A	0.825	0.175
Green Employee Behaviour: GEB (α = 0.919, CR = 0.909, AVE = 0.667)				
GEBR2	0.813	16.882	0.661	0.339
GEBR4	0.872	18.112	0.761	0.239
GEBR5	0.875	18.344	0.765	0.235
GEBE5	0.756	24.732	0.572	0.428
GEBE6	0.760	N/A	0.578	0.422
Green Corporate Culture: GCCu (α = 0.960, CR = 0.957, AVE = 0.847)				
GCCu1	0.913	N/A	0.833	0.167
GCCu2	0.929	47.671	0.864	0.136
GCCu3	0.940	33.600	0.884	0.116
GCCu4	0.898	29.380	0.807	0.193
Green Corporate Policy: GPo (α = 0.951, CR = 0.951, AVE = 0.830)				
GPo1	0.837	N/A	0.701	0.299
GPo2	0.959	28.542	0.920	0.080
GPo3	0.914	25.949	0.836	0.164
GPo4	0.929	24.040	0.864	0.136
Green Forces and Drivers: GFD (α = 0.944, CR = 0.938, AVE = 0.792)				
GFD1	0.856	N/A	0.733	0.267

Indicators	FL	t	SMC	Error
GFD2	0.890	28.717	0.793	0.207
GFD3	0.919	25.918	0.845	0.155
GFD4	0.894	24.708	0.798	0.202
Green Products and Services: GPaS (α = 09.45, CR = 0.914, AVE = 0.779)				
GPaS1	0.861	24.320	0.742	0.258
GPaS2	0.905	26.750	0.820	0.180
GPaS4	0.881	N/A	0.775	0.225

Note: The path of GCCoE3, GCVI5, GEBE6, GCCu1, GPo1, GFD1, and GPaS4 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.715 to 0.959, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 16.388 to 47.671, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.512 to 0.920, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.916 to 0.960, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.909 to 957, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.626 to 0.847, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 77 Discriminant validity and correlation matrix among the latent variables of green corporate identity (GCI) from higher-order CFA

Indicators	Mean	S.D.	AVE	GCCo	GCVI	GEB	GCCu	GPo	GFD	GPaS
GCCo	4.328	0.570	0.626	**0.791**						
GCVI	4.077	0.713	0.809	0.759	**0.899**					
GEB	4.122	0.626	0.667	0.706	0.773	**0.817**				
GCCu	4.269	0.645	0.847	0.787	0.698	0.772	**0.920**			
GPo	4.203	0.643	0.830	0.616	0.560	0.661	0.732	**0.911**		
GFD	4.284	0.618	0.792	0.644	0.532	0.694	0.740	0.860	**0.890**	
GPaS	4.253	0.625	0.779	0.658	0.617	0.766	0.765	0.876	0.927	**0.883**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green corporate identity (GCI) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.532 to 0.927, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between GFD and GPaS. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.1.3 Second-order CFA of Green Corporate Identity

In order to inspect whether the latent variables can be vividly separated from others, the second-order confirmatory factor analysis (second-order CFA) was employed. In this study, green corporate identity consisting of 7 sub-dimensions with 43 items (GCCoI1, 3, 4, 5, GCCoE1, 2, 3, 4, GCVI1, 2, 3, 4, 5, 6, GEBR1, 2, 3, 4, 5, GEBE1, 2, 3, 4, 5, 6, GCCu1, 2, 3, 4, 5, 6, GPo1, 2, 3, 4, 5, GFD1, 2, 3, 4, 5, and GPaS1, 2, 3, 4) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 78 Model-fit indices of initial and modified model regarding second-order CFA on green corporate identity (GCI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**6.472**	CMIN/df	1.391
GFI	**0.605**	GFI	0.952
AGFI	**0.562**	AGFI	0.903
RMSEA	**0.117**	RMSEA	0.031
RMR	0.042	RMR	0.013
CFI	**0.794**	CFI	0.994
TLI	**0.782**	TLI	0.989
NFI	**0.766**	NFI	0.979

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 7 sub-dimensions with 43 items (GCCoI1, 3, 4, 5, GCCoE1, 2, 3, 4, GCVI1, 2, 3, 4, 5, 6, GEBR1, 2, 3, 4, 5, GEBE1, 2, 3, 4, 5, 6, GCCu1, 2, 3, 4, 5, 6, GPo1, 2, 3, 4, 5, GFD1, 2, 3, 4, 5, and GPaS1, 2, 3, 4) with some unacceptable values: p-value of 0.000, CMIN/df of 6.472, GFI of 0.605, AGFI of 0.562, RMSEA of 0.117, CFI of 0.794, TLI of 0.782, and NFI of 0.766. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.391, GFI of 0.952, AGFI of 0.903, RMSEA of 0.031, RMR of 0.013, CFI of 0.994, TLI of 0.989, and NFI of 0.979. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). Therefore, this research also accepts the model fitness with p-value of 0.000. As a result, the adjusted model, therefore, remained 7 sub-dimensions with 29 items (GCCoI1, 4, 5, GCCoE1, 2, 3, GCVI2, 4, 5, GEBR2, 4, 5, GEBE5, 6, GCCu1, 2, 3, 4, GPo1, 2, 3, 4, GFD1, 2, 3, 4, GPaS1, 2, 3, 4). Accordingly, the detail of adjusted model is shown in the below figure and tables.

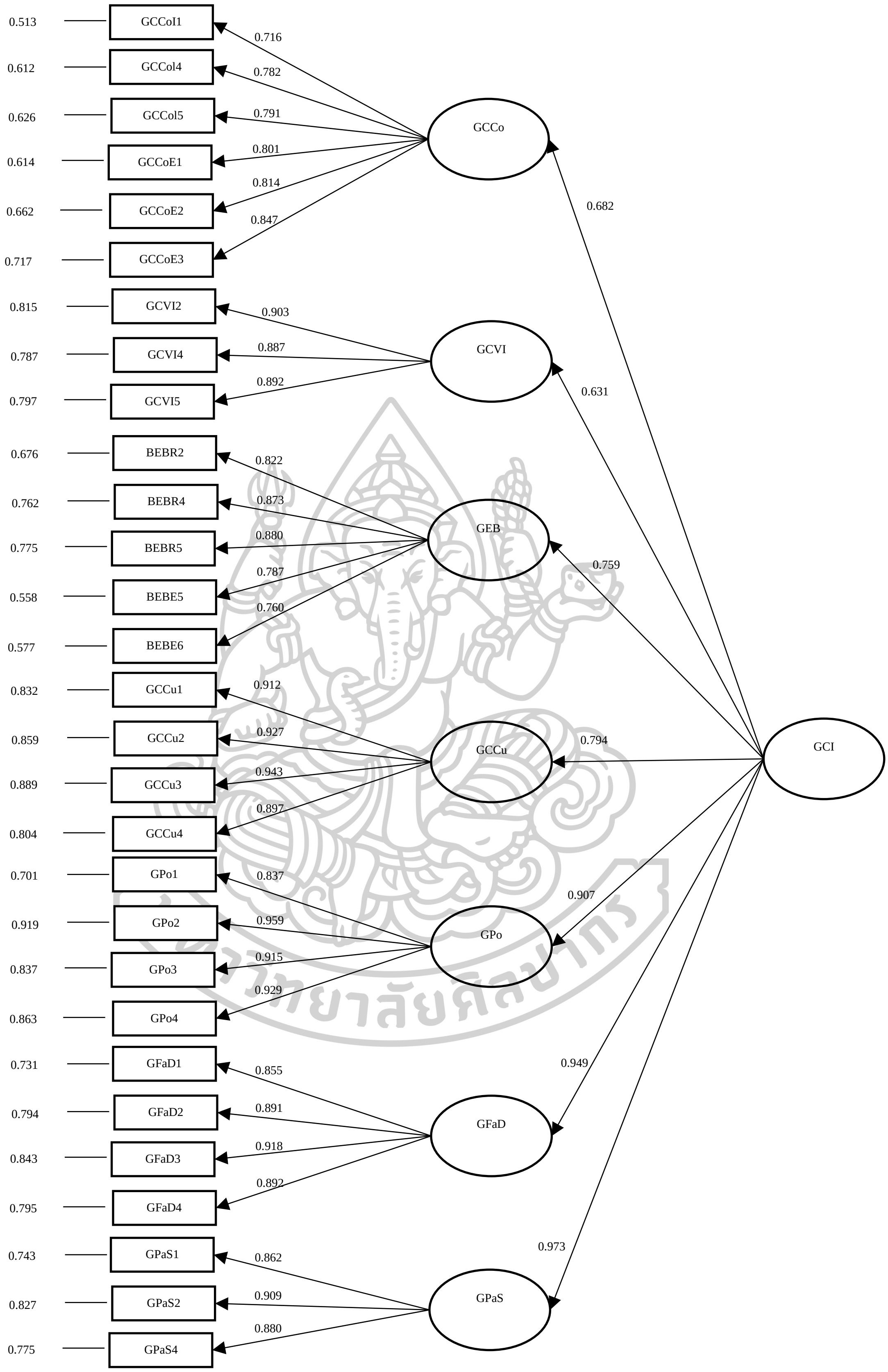

Figure 12 Adjusted model of second-order CFA on green corporate identity (GCI)

Table 79 Analysis result of second-order CFA on green corporate identity (GCI)

Indicators	**FL**	**t**	**SMC**	**Error**
Green Corporate Communication (α = 0.916, CR = 0.909, AVE = 0.624)				
GCCoI1	0.716	16.394	0.513	0.487
GCCoI4	0.782	17.221	0.612	0.388
GCCoI5	0.791	17.347	0.626	0.374
GCCoE1	0.801	18.966	0.614	0.386
GCCoE2	0.814	23.069	0.662	0.338
GCCoE3	0.847	N/A	0.717	0.283
Green Corporate Visual Identity (α = 0.932, CR = 0.923, AVE = 0.800)				
GCVI2	0.903	23.720	0.815	0.185
GCVI4	0.887	30.410	0.787	0.213
GCVI5	0.892	N/A	0.797	0.203
Green Employee Behaviour (α = 0.919, CR = 0.910, AVE = 0.670)				
GEBR2	0.822	17.182	0.676	0.324
GEBR4	0.873	18.076	0.762	0.238
GEBR5	0.880	18.405	0.775	0.225
GEBE5	0.747	24.525	0.558	0.442
GEBE6	0.760	N/A	0.577	0.423
Green Corporate Culture (α = 0.960, CR = 0.956, AVE = 0.846)				
GCCu1	0.912	N/A	0.832	0.168
GCCu2	0.927	48.007	0.859	0.141
GCCu3	0.943	33.872	0.889	0.111
GCCu4	0.897	29.420	0.804	0.196
Green Corporate Policy (α = 0.951, CR = 0.951, AVE = 0.830)				
GPo1	0.837	N/A	0.701	0.299
GPo2	0.959	28.321	0.919	0.081
GPo3	0.915	26.809	0.837	0.163
GPo4	0.929	24.024	0.863	0.137
Green Forces and Drivers (α = 0.944, CR = 0.938, AVE = 0.791)				
GFD1	0.855	N/A	0.731	0.269

Indicators	FL	t	SMC	Error
GFD2	0.891	28.581	0.794	0.206
GFD3	0.918	25.802	0.843	0.157
GFD4	0.892	24.605	0.795	0.205
Green Products and Services (α = 0.945, CR = 0.915, AVE = 0.782)				
GPaS1	0.862	24.270	0.743	0.257
GPaS2	0.909	26.885	0.827	0.173
GPaS4	0.880	N/A	0.775	0.255

Note: The path of GCCoE3, GCVI5, GEBE6, GCCu1, GPo1, GFD1, and GPaS4 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.716 to 0.959, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 16.394 to 48.007, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.513 to 0.919, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.916 to 0.960, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.909 to 0.956, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.624 to 0.846, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 80 Discriminant validity and correlation matrix among the latent variables of green corporate identity (GCI) from second-order CFA

Indicators	Mean	S.D.	AVE	GCCo	GCVI	GEB	GCCu	GPo	GFD	GPaS
GCCo	4.328	0.570	0.624	**0.790**						
GCVI	4.077	0.713	0.800	0.763	**0.894**					
GEB	4.122	0.626	0.670	0.702	0.785	**0.819**				
GCCu	4.269	0.645	0.846	0.789	0.698	0.781	**0.920**			
GPo	4.203	0.643	0.830	0.619	0.572	0.650	0.720	**0.911**		
GFD	4.284	0.618	0.791	0.647	0.556	0.720	0.753	0.861	**0.889**	
GPaS	4.253	0.625	0.782	0.664	0.614	0.738	0.772	0.882	0.923	**0.884**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green corporate identity (GCI) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.556 to 0.923, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between GFD and GPaS. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.2 Confirmatory Factor Analysis on Green Personal-Social Identification

Regarding analysis of confirmatory factor on employee's green personal-social identification, two dimensions including green personal identification (GPI) and green social identification (GSI) were performed. All detail is shown as follows.

4.6.2.1 First-order CFA of Green Personal-Social Identification

Green Personal Identification (GPI)

Green personal identification (GPI) consisting of 6 items including GPI1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 81 Model-fit indices of initial and modified model regarding green personal identification (GPI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.078
CMIN/df	**22.122**	CMIN/df	2.103
GFI	**0.873**	GFI	0.993
AGFI	**0.703**	AGFI	00964
RMSEA	**0.230**	RMSEA	0.053
RMR	0.018	RMR	0.004
CFI	0.929	CFI	0.998
TLI	**0.882**	TLI	0.994
NFI	0.926	NFI	0.997

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 6 initial items (GPI1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 22.122, GFI of 0.873, AGFI of 0.703, RMSEA of 0.230, and TLI of 0.882. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.078, CMIN/df of 2.103, GFI of 0.993, AGFI of 0.964, RMSEA of 0.053, RMR of 0.004, CFI of 0.998, TLI of 0.994, and NFI of 0.997. Moreover, the adjusted model remained 6 items (GPI1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

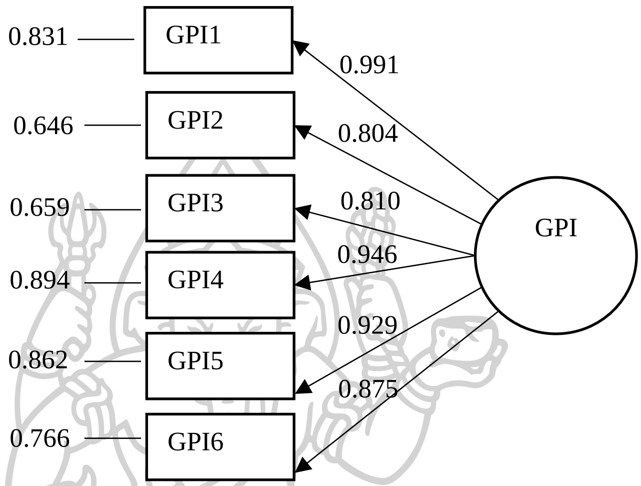

Figure 13 Adjusted model of green personal identification (GPI)

Table 82 Analysis result of model measurement of green personal identification (GPI)

Indicators	FL	t	SMC	Error
GPI1	0.991	32.269	0.831	0.169
GPI2	0.804	21.193	0.646	0.354
GPI3	0.810	23.649	0.659	0.341
GPI4	0.946	35.638	0.894	0.106
GPI5	0.929	N/A	0.862	0.138
GPI6	0.875	27.844	0.766	0.234
α = 0.957, CR = 0.955, AVE = 0.776				

Note: GPI5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.804 to 0.991, which are higher than 0.50 (Hair, 2010); t-value (t) ranged from 21.193 to 35.638, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.646 to 0.894, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.957, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.955, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.776, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Social Identification (GSI)

Green social identification (GSI) consisting of 5 items including GSI1, 2, 3, 4, 5 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 83 Model-fit indices of initial and modified model regarding green social identification (GSI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.121
CMIN/df	**21.547**	CMIN/df	2.399
GFI	0.903	GFI	0.998
AGFI	**0.708**	AGFI	0.964

Model-fit index			
Initial Model		**Modified Model**	
RMSEA	**0.227**	RMSEA	0.059
RMR	0.015	RMR	0.002
CFI	0.954	CFI	0.999
TLI	0.909	TLI	0.994
NFI	0.952	NFI	0.999

Note: Values in bold were unaccepted.

From the study it was found that the initial model contained 5 initial items (GSI1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 21.547, AGFI of 0.708, and RMSEA of 0.227. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.121, CMIN/df of 2.399, GFI of 0.998, AGFI of 0.964, RMSEA of 0.059, RMR of 0.002, CFI of 0.999, TLI of 0.994, and NFI of 0.999. Moreover, the adjusted model remained 5 items (GSI1, 2, 3, 4, 5). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

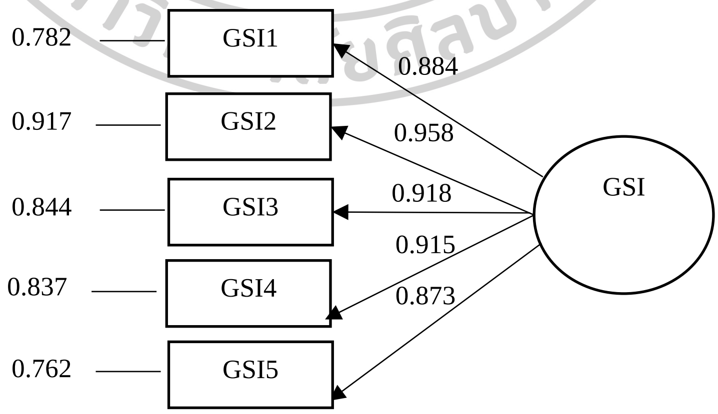

Figure 14 Adjusted model of green social identification (GSI)

Table 84 Analysis result of model measurement of green social identification (GSI)

Indicators	FL	t	SMC	Error
GSI1	0.884	26.709	0.782	0.218
GSI2	0.958	23.604	0.917	0.083
GSI3	0.918	22.351	0.844	0.156
GSI4	0.915	24.681	0.837	0.163
GSI5	0.873	N/A	0.762	0.238
α = 0.955, CR = 0.960, AVE = 0.828				

Note: GSI5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.873 to 0.958, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.351 to 26.709, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.762 to 0.917, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.955, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.960, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.828, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.2.2 Higher-order CFA of Green Personal-Social Identification (GPSI)

In order to inspect whether the latent variables can be vividly separated from others, the higher-order confirmatory factor analysis (higher-order CFA) was employed. In this study, employee's green personal-social identification (GPSI) consisting of 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 85 Model-fit indices of initial and modified model regarding higher-order CFA on green personal-social identification (GPSI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.168
CMIN/df	**12.918**	CMIN/df	1.290
GFI	**0.799**	GFI	0.988
AGFI	**0.691**	AGFI	0.961
RMSEA	**0.173**	RMSEA	0.027
RMR	0.021	RMR	0.008
CFI	0.909	CFI	0.999
TLI	**0.883**	TLI	0.997
NFI	0.902	NFI	0.995

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained of 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 12.918, GFI of 0.799, AGFI of 0.691, RMSEA of 0.173, and TLI of 0.883. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: p-value of 0.168, CMIN/df of 1.290, GFI of 0.988, AGFI of 0.961, RMSEA of 0.027, RMR of 0.008, CFI of 0.999, TLI of 0.997, and NFI of 0.995. Moreover, the adjusted model remained 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5). Accordingly, the detail of adjusted model is shown in the below figure and tables.

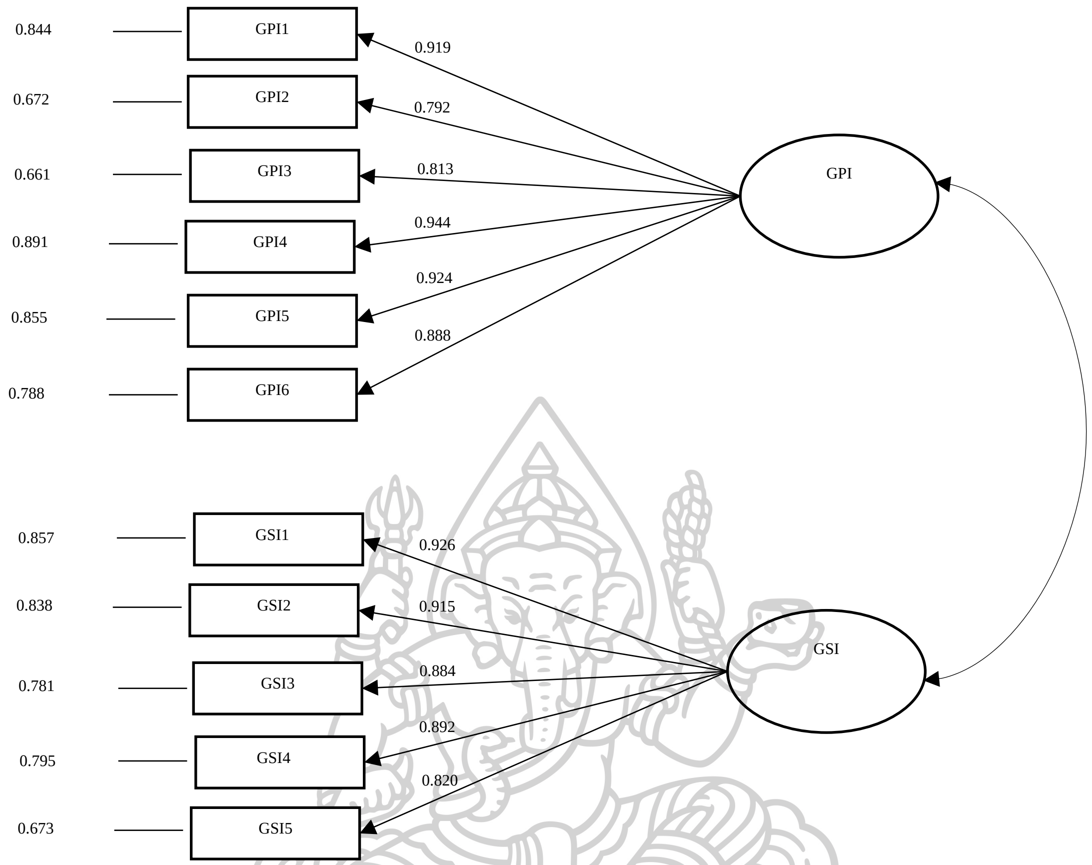

Figure 15 Adjusted model of higher-order CFA on green personal-social identification (GPSI)

Table 86 Analysis result of higher-order CFA on green personal-social identification (GPSI)

Indicators	**FL**	**t**	**SMC**	**Error**
Green Personal Identification: GPI (α = 0.957, CR = 0.956, AVE = 0.785)				
GPI1	0.919	26.021	0.844	0.156
GPI2	0.792	20.630	0.672	0.328
GPI3	0.813	21.646	0.661	0.339
GPI4	0.944	26.045	0.891	0.109
GPI5	0.924	27.765	0.855	0.145
GPI6	0.888	N/A	0.788	0.212
Green Social Identification: GSI (α = 0.955, CR = 0.949, AVE = 0.789)				

Indicators	FL	t	SMC	Error
GSI1	0.926	26.108	0.857	0.143
GSI2	0.915	21.220	0.838	0.162
GSI3	0.884	19.509	0.781	0.216
GSI4	0.892	23.593	0.795	0.205
GSI5	0.820	N/A	0.673	0.327

Note: The path of GPI6 and GSI5 were set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.792 to 0.944, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 19.509 to 27.765, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.661 to 0.891, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.957 and 0.955, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.949 to 0.956, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.785 to 0.789, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 87 Discriminant validity and correlation matrix among the latent variables of green personal-social identification (GPSI) from higher-order CFA

Indicators	Mean	S.D.	AVE	GPI	GSI
GPI	4.036	0.652	0.785	**0.886**	
GSI	3.996	0.691	0.789	0.861	**0.888**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green personal-social identification

(GPSI) were correlated in positive direction with acceptable level with correlation coefficient at 0.861, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.2.3 Second-order CFA of Green Personal-Social Identification (GPSI)

In order to inspect whether the latent variables can be vividly separated from others, the second-order confirmatory factor analysis (second-order CFA) was employed. In this study, employee's green personal-social identification (GPSI) consisting of 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there was a need to modify the model, the modification indices (MI) were required (Oort, 1998; Sanders et al., 2015).

Table 88 Model-fit indices of initial and modified model regarding second-order CFA on green personal-social identification (GPSI)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.168
CMIN/df	**12.918**	CMIN/df	1.290
GFI	**0.799**	GFI	0.988
AGFI	**0.691**	AGFI	0.961
RMSEA	**0.173**	RMSEA	0.027
RMR	0.021	RMR	0.008
CFI	0.909	CFI	0.999

Model-fit index			
Initial Model		**Modified Model**	
TLI	**0.883**	TLI	0.997
NFI	0.902	NFI	0.995

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5) with some unacceptable values: p-value of 0.000, CMIN/df of 12.918, GFI of 0.799, AGFI of 0.691, RMSEA of 0.173, and TLI of 0.883. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: p-value of 0.168, CMIN/df of 1.290, GFI of 0.988, AGFI of 0.961, RMSEA of 0.027, RMR of 0.008, CFI of 0.999, TLI of 0.997, and NFI of 0.995. Moreover, the adjusted model remained 2 sub-dimensions with 11 items (GPI1, 2, 3, 4, 5, 6, GSI1, 2, 3, 4, 5). Accordingly, the detail of adjusted model is shown in the below figure and tables.

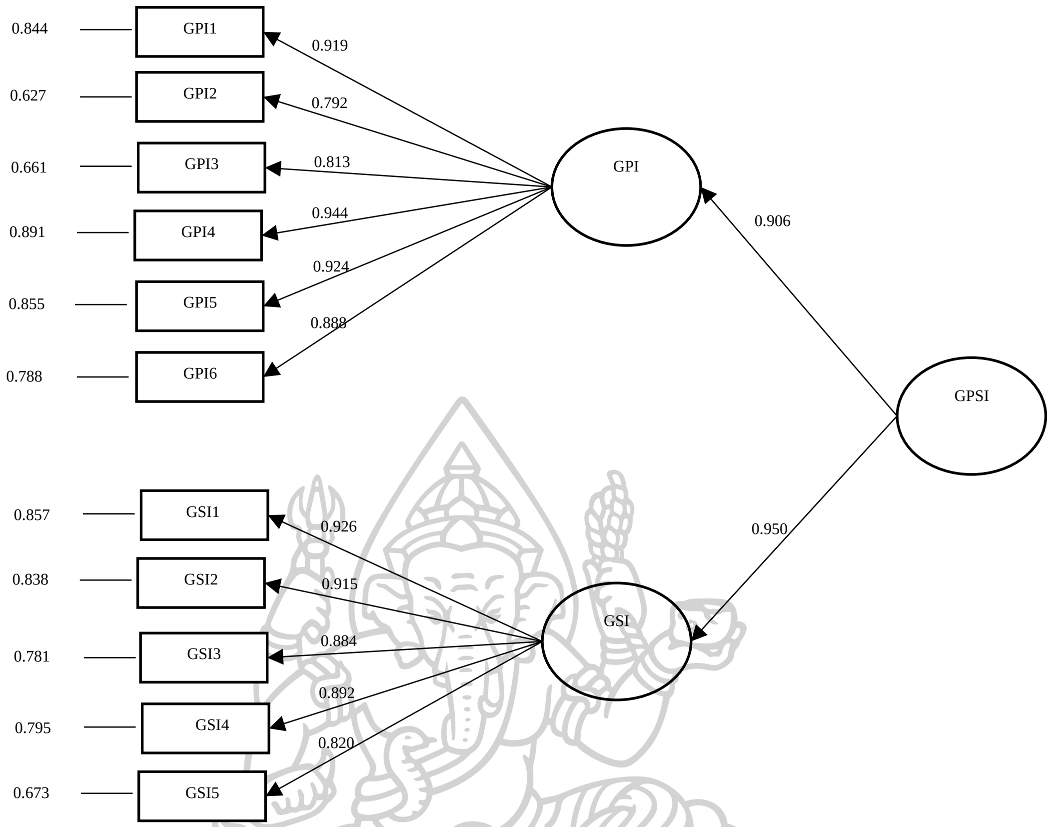

Figure 16 Adjusted model of second-order CFA on green personal-social identification (GPSI)

Table 89 Analysis result of second-order CFA on green personal-social identification (GPSI)

Indicators	**FL**	**t**	**SMC**	**Error**
Green Personal Identification: GPI (α = 0.957, CR = 0.954, AVE = 0.778)				
GPI1	0.919	26.021	0.844	0.156
GPI2	0.792	20.630	0.627	0.373
GPI3	0.813	21.646	0.661	0.339
GPI4	0.944	26.045	0.891	0.109
GPI5	0.924	27.765	0.855	0.145
GPI6	0.888	N/A	0.788	0.212
Green Social Identification: GSI (α = 0.955, CR = 0.949, AVE = 0.789)				

Indicators	FL	t	SMC	Error
GSI1	0.926	26.108	0.857	0143
GSI2	0.915	21.220	0.838	0.162
GSI3	0.884	19.509	0.781	0.219
GSI4	0.892	23.593	0.795	0.205
GSI5	0.820	N/A	0.673	0.327

Note: The path of GPI6 and GSI5 path were set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.792 to 0.944, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 19.509 to 27.765, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.627 to 0.934, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.957 and 0.955, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.949 to 0.954, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.778 to 0.789, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 90 Discriminant validity and correlation matrix among the latent variables of green personal-social identification (GPSI) from second-order CFA

Indicators	Mean	S.D.	AVE	GPI	GSI
GPI	4.036	0.652	0.778	**0.882**	
GSI	3.996	0.691	0.789	0.861	**0.888**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green personal-social identification

(GPSI) were correlated in positive direction with acceptable level with correlation coefficient at 0.861, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.3 Confirmatory Factor Analysis on Green Supply Chain Management

Regarding analysis of confirmatory factor on green supply chain management, six dimensions including green procurement (GPcu), green design (GDes), green manufacturing (GMan), green marketing (GMar), green logistics (GLog), and green recovery (GRec) were performed. All detail is shown as follows.

4.6.3.1 First-order CFA of Green Supply Chain Management

Green Procurement (GPcu)

Green procurement (GPcu) consisting of 6 items including GPcu1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 91 Model-fit indices of initial and modified model regarding green procurement (GPcu)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.104
CMIN/df	**11.449**	CMIN/df	2.054
GFI	0.922	GFI	0.995

Model-fit index			
Initial Model		**Modified Model**	
AGFI	**0.817**	AGFI	0.965
RMSEA	**0.162**	RMSEA	0.051
RMR	0.009	RMR	0.002
CFI	0.969	CFI	0.999
TLI	0.948	TLI	0.995
NFI	0.966	NFI	0.998

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 initial items (GPcu1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 11.449, AGFI of 0.817, RMSEA of 0.162. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.104, CMIN/df of 2.054, GFI of 0.995, AGFI of 0.965, RMSEA of 0.051, RMR of 0.002, CFI of 0.999, TLI of 0.995, and NFI of 0.998. Moreover, the adjusted model remained 6 items (GPcu1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

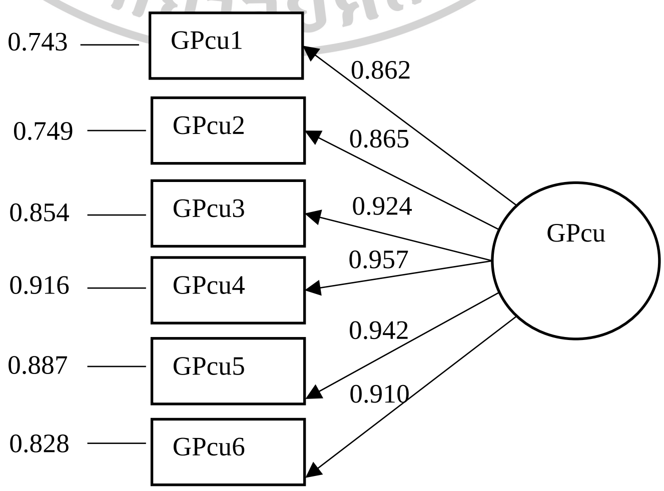

Figure 17 Adjusted model of green procurement (GPcu)

Table 92 Analysis result of model measurement of green procurement (GPcu)

Indicators	FL	t	SMC	Error
GPcu1	0.862	25.547	0.743	0.257
GPcu2	0.865	26.081	0.749	0.251
GPcu3	0.924	31.195	0.854	0.146
GPcu4	0.957	29.079	0.916	0.084
GPcu5	0.942	33.052	0.887	0.113
GPcu6	0.910	N/A	0.828	0.172
α = 0.966, CR = 0.967, AVE = 0.830				

Note: GPcu6 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.862 to 0.957, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 25.547 to 33.052, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.743 to 0.916, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.966, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.967, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.830, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Design (GDes)

Green design (GDes) consisting of 6 items including GDes1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 93 Model-fit indices of initial and modified model regarding green design (GDes)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.065
CMIN/df	**30.756**	CMIN/df	2.212
GFI	**0.824**	GFI	0.992
AGFI	**0.589**	AGFI	0.960
RMSEA	**0.273**	RMSEA	0.055
RMR	0.019	RMR	0.004
CFI	0.903	CFI	0.998
TLI	**0.839**	TLI	0.993
NFI	0.901	NFI	0.997

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 initial items (GDes1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 30.756, GFI of 0.824, AGFI of 0.589, RMSEA of 0.273, and TLI of 0.839. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.065, CMIN/df of 2.212, GFI of 0.992, AGFI of 0.960, RMSEA of 0.055, RMR of 0.004, CFI of 0.998, TLI of 0.993, and NFI of 0.997. Moreover, the adjusted model remained 6 items (GDes1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

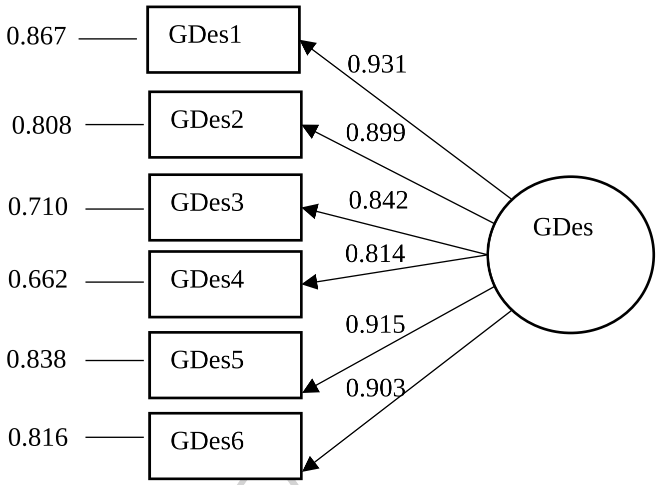

Figure 18 Adjusted model of green design (GDes)

Table 94 Analysis result of model measurement of green design (GDes)

Indicators	**FL**	**t**	**SMC**	**Error**
GDes1	0.931	32.363	0.867	0.133
GDes2	0.899	29.689	0.808	0.192
GDes3	0.842	23.687	0.710	0.290
GDes4	0.814	22.785	0.662	0.338
GDes5	0.915	N/A	0.838	0.162
GDes6	0.903	30.258	0.816	0.184
α = 0.956, CR = 0.956, AVE = 0.784				

Note: GDes5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach’s Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.814 to 0.931, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.785 to 32.363, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.662 to 0.867, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach’s Alpha (α) was 0.956, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.956,

which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.784, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Manufacturing (GMan)

Green manufacturing (GMan) consisting of 7 items including GMan1, 2, 3, 4, 5, 6, 7 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 95 Model-fit indices of initial and modified model regarding green manufacturing (GMan)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.091
CMIN/df	**13.762**	CMIN/df	1.897
GFI	**0.879**	GFI	0.964
AGFI	**0.758**	AGFI	0.994
RMSEA	**0.179**	RMSEA	0.047
RMR	0.011	RMR	0.003
CFI	0.948	CFI	0.999
TLI	0.922	TLI	0.995
NFI	0.944	NFI	0.997

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 7 initial items (GMan1, 2, 3, 4, 5, 6, 7) with some unacceptable values: p-value of 0.000, CMIN/df of 13.762, GFI of 0.879, AGFI of 0.758, and RMSEA of 0.179. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.091, CMIN/df of 1.897, GFI of 0.964, AGFI of 0.994, RMSEA of 0.047, RMR of 0.003, CFI of 0.999, TLI of

0.995, and NFI of 0.997. Moreover, the adjusted model remained 7 items (GMan1, 2, 3, 4, 5, 6, 7). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

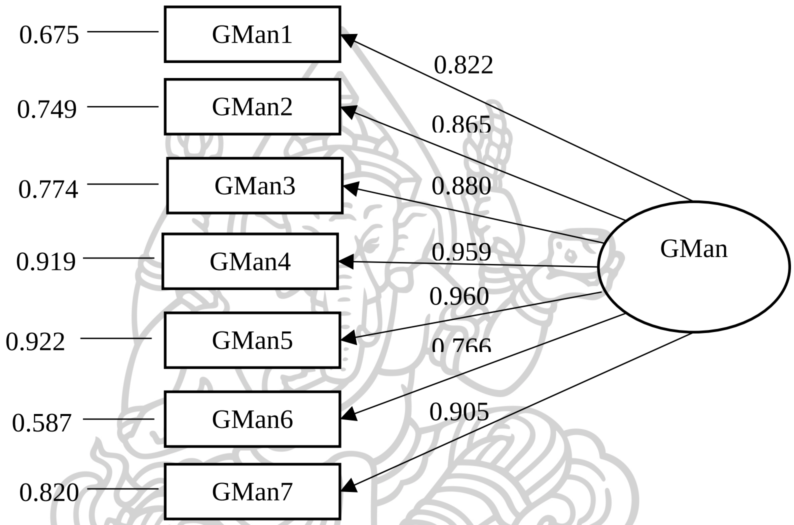

Figure 19 Adjusted model of green manufacturing (GMan)

Table 96 Analysis result of model measurement of green manufacturing (GMan)

Indicators	**FL**	**t**	**SMC**	**Error**
GMan1	0.822	25.377	0.675	0.325
GMan2	0.865	29.940	0.749	0.251
GMan3	0.880	29.290	0.774	0.226
GMan4	0.959	45.418	0.919	0.081
GMan5	0.960	N/A	0.922	0.078
GMan6	0.766	22.023	0.587	0.413
GMan7	0.905	35.220	0.820	0.180
α = 0.963, CR = 0.961, AVE = 0.778				

Note: GMan5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.766 to 0.960, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.023 to 45.418, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.587 to 0.922, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.963, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.961, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.778, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Marketing (GMar)

Green marketing (GMar) consisting of 6 items including GMar1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 97 Model-fit indices of initial and modified model regarding green marketing (GMar)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.714
CMIN/df	**13.762**	CMIN/df	0.454
GFI	**0.879**	GFI	0.999
AGFI	**0.758**	AGFI	0.992

Model-fit index			
Initial Model		**Modified Model**	
RMSEA	**0.179**	RMSEA	0.000
RMR	0.011	RMR	0.001
CFI	0.948	CFI	1.000
TLI	0.922	TLI	1.000
NFI	0.944	NFI	1.000

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 initial items (GMar1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 13.762, GFI of 0.879, AGFI of 0.758, and RMSEA of 0.179. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.714, CMIN/df of 0.454, GFI of 0.999, AGFI of 0.992, RMSEA of 0.000, RMR of 0.001, CFI of 1.000, TLI of 1.000, and NFI of 1.000. Moreover, the adjusted model remained 6 items (GMar1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

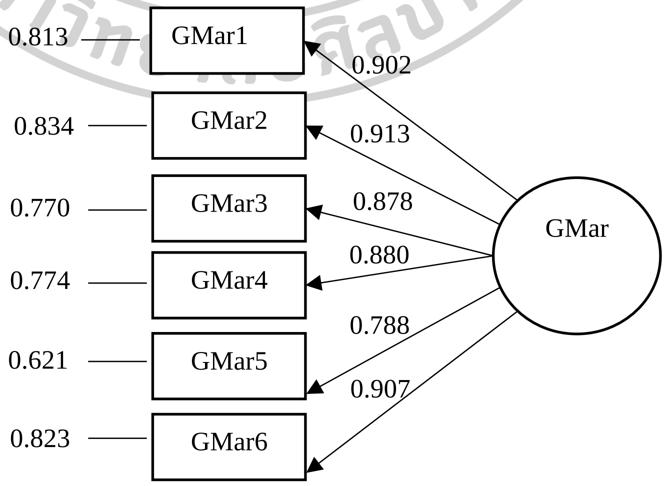

Figure 20 Adjusted model of green marketing (GMar)

Table 98 Analysis result of model measurement of green marketing (GMar)

Indicators	FL	t	SMC	Error
GMar1	0.902	19.356	0.813	0.187
GMar2	0.913	20.659	0.834	0.166
GMar3	0.878	28.401	0.770	0.230
GMar4	0.880	28.872	0.774	0.226
GMar5	0.788	N/A	0.621	0.379
GMar6	0.907	20.670	0.823	0.177
α = 0.959, CR = 0.953, AVE = 0.773				

Note: GMar5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.788 to 0.913, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 19.356 to 28.872, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.621 to 0.834, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.959, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.953, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.773, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Logistics (GLog)

Green logistics (GLog) consisting of 7 items including GLog1, 2, 3, 4, 5, 6, 7 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 99 Model-fit indices of initial and modified model regarding green logistics (GLog)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.249
CMIN/df	**38.692**	CMIN/df	1.374
GFI	**0.730**	GFI	0.997
AGFI	**0.461**	AGFI	0.976
RMSEA	**0.307**	RMSEA	0.031
RMR	0.040	RMR	0.004
CFI	**0.817**	CFI	1.000
TLI	**0.725**	TLI	0.998
NFI	**0.813**	NFI	0.998

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 7 initial items (GLog1, 2, 3, 4, 5, 6, 7) with some unacceptable values: p-value of 0.000, CMIN/df of 38.692, GFI of 0.730, AGFI of 0.461, RMSEA of 0.307, CFI of 0.817, TLI of 0.725, and NFI of 0.813. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items as well as dropping unfavorable value of factor loading (FL) or squared multiple correlation (SMC), the adjusted model gained better model-fit indices: p-value of 0.249, CMIN/df of 1.374, GFI of 0.997, AGFI of 0.976, RMSEA of 0.031, RMR of 0.004, CFI of 1.000, TLI of 0.998, and NFI of 0.998. Addition to the modification, the adjusted model remained 6 items (GLog2, 3, 4, 5, 6, 7). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

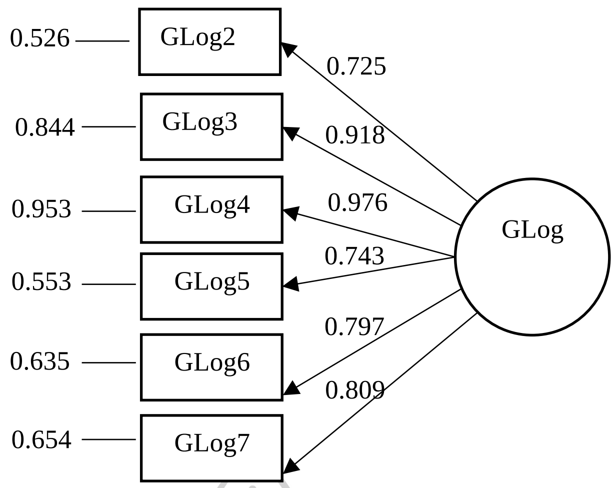

Figure 21 Adjusted model of green logistics (GLog)

Table 100 Analysis result of model measurement of green logistics (GLog)

Indicators	**FL**	**t**	**SMC**	**Error**
GLog2	0.725	17.588	0.526	0.474
GLog3	0.918	18.330	0.844	0.156
GLog4	0.976	20.731	0.953	0.047
GLog5	0.743	N/A	0.553	0.447
GLog6	0.797	17.622	0.635	0.365
GLog7	0.809	17.352	0.654	0.346
α = 0.939, CR = 0.931, AVE = 0.694				

Note: GLog5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.725 to 0.976, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 17.352 to 0.976, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.526 to 0.953, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.939, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.931, which is higher than 0.50 (Dilekli & Tezci, 2019) and average variance extracted (AVE) was 0.694, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Green Recovery (GRec)

Green recovery (GRec) consisting of 4 items including GRec 1, 2, 3, 4 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Hair Jr et al., 2016; Larson, 2006; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 101 Model-fit indices of initial and modified model regarding green recovery (GRec)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.369
CMIN/df	**16.811**	CMIN/df	0.806
GFI	0.960	GFI	0.996
AGFI	**0.789**	AGFI	1.000
RMSEA	**0.084**	RMSEA	0.000
RMR	0.014	RMR	0.009
CFI	0.975	CFI	1.000
TLI	0.924	TLI	1.000
NFI	0.973	NFI	0.999

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 4 initial items (GRec1, 2, 3, 4) with some unacceptable values: p-value of 0.000, CMIN/df of 16.811, AGFI of 0.789, and RMSEA of 0.084. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.369, CMIN/df of 0.806, GFI of 0.996, AGFI of 1.000, RMSEA of 0.000, RMR of 0.009, CFI of 1.000, TLI of 1.000, and NFI of 0.999. Moreover, the adjusted model remained 4 items (GRec1, 2, 3, 4). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

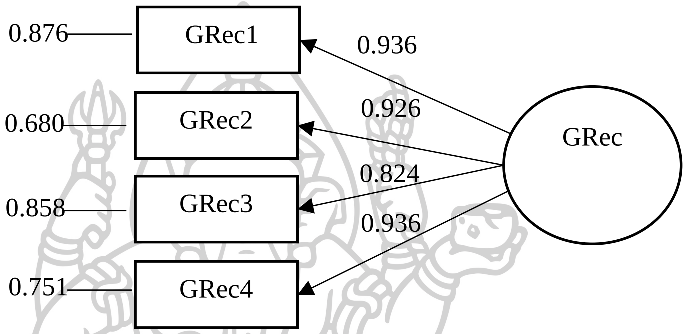

Figure 22 Adjusted model of green recovery (GRec)

Table 102 Analysis result of model measurement of green recovery (GRec)

Indicators	**FL**	**t**	**SMC**	**Error**
GRec1	0.936	27.578	0.876	0.124
GRec2	0.926	22.886	0.680	0.320
GRec3	0.824	N/A	0.858	0.142
GRec4	0.936	N/A	0.751	0.249
α = 0.922, CR = 0.940, AVE = 0.791				

Note: GRec3 and GRec4 path were set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.824 to 0.936, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.886 to 27.578, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.680 to 0.876, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.922, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.940, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.791, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.3.2 Higher-order CFA of Green Supply Chain Management

In order to inspect whether the latent variables can be vividly separated from others, the higher-order confirmatory factor analysis (higher-order CFA) was employed. In this study, green supply chain management consisting of 6 sub-dimensions with 36 items (GDes1, 2, 3, 4, 5, 6, GPcu1, 2, 3, 4, 5, 6, GMan1, 2, 3, 4, 5, 6, 7, GRec1, 2, 3, 4, GLog1, 2, 3, 4, 5, 6, 7, and GMar1, 2, 3, 4, 5, 6) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 103 Model-fit indices of initial and modified model regarding higher-order CFA on Green Supply Chain Management (GSCM)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**7.699**	CMIN/df	1.544
GFI	**0.590**	GFI	0.955
AGFI	**0.526**	AGFI	0.904
RMSEA	**0.130**	RMSEA	0.037
RMR	0.020	RMR	0.012

Model-fit index			
Initial Model		Modified Model	
CFI	**0.824**	CFI	0.994
TLI	**0.808**	TLI	0.988
NFI	**0.803**	NFI	0.983

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 sub-dimensions with 36 items (GDes1, 2, 3, 4, 5, 6, GPcu1, 2, 3, 4, 5, 6, GMan1, 2, 3, 4, 5, 6, 7, GRec1, 2, 3, 4, GLog1, 2, 3, 4, 5, 6, 7, and GMar1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 7.699, GFI of 0.590, AGFI of 0.526, RMSEA of 0.130, CFI of 0.824, TLI of 0.808, and NFI of 0.803. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.544, GFI of 0.955, AGFI of 0.904, RMSEA of 0.037, RMR of 0.012, CFI of 0.994, TLI of 0.988, and NFI of 0.983. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). Therefore, this research also accepts the model fitness with p-value of 0.000. As a result, the adjusted model, therefore, remained 6 sub-dimensions with 26 items (GDes1, 2, 3, 5, 6, GPcu1, 3, 4, 5, 6, GMan2, 3, 4, 5, 7, GRec1, 3, 4, GLog4, 5, 6, 7, and GMar2, 3, 4, 6). Accordingly, the detail of adjusted model is shown in the below figure and tables.

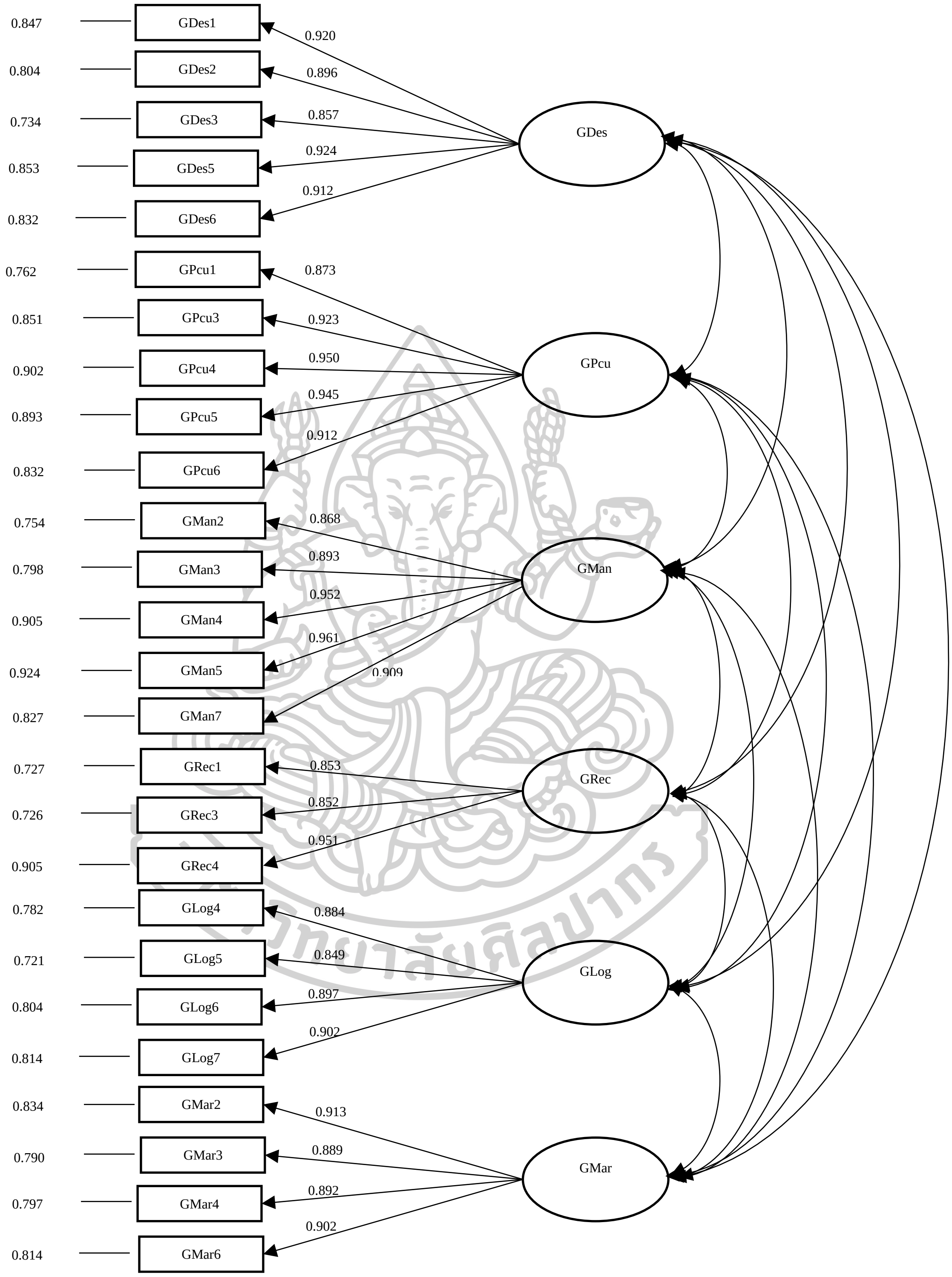

Figure 23 Adjusted model of higher-order CFA on green supply chain management (GSCM)

Table 104 Analysis result of higher-order CFA on green supply chain management (GSCM)

Indicators	FL	t	SMC	Error
Green Design: GDes (α = 0.956, CR = 0.956, AVE = 0.814)				
GDes1	0.920	31.776	0.847	0.153
GDes2	0.896	29.861	0.804	0.196
GDes3	0.857	25.059	0.734	0.266
GDes5	0.924	32.545	0.853	0.147
GDes6	0.912	N/A	0.832	0.168
Green Procurement: GPcu (α = 0.962, CR = 0.965, AVE = 0.848)				
GPcu1	0.873	28.522	0.762	0.238
GPcu3	0.923	32.345	0.851	0.149
GPcu4	0.950	29.576	0.902	0.098
GPcu5	0.945	35.191	0.893	0.107
GPcu6	0.912	N/A	0.832	0.168
Green Manufacturing: GMan (α = 0.962, CR = 0.964, AVE = 0.842)				
GMan2	0.868	28.089	0.754	0.246
GMan3	0.893	27.505	0.798	0.202
GMan4	0.952	36.827	0.905	0.095
GMan5	0.961	37.818	0.924	0.076
GMan7	0.909	N/A	0.827	0.173
Green Recovery: GRec (α = 0.912, CR = 0.917, AVE = 0.786)				
GRec1	0.853	27.245	0.727	0.273
GRec3	0.852	26.788	0.726	0.274
GRec4	0.951	N/A	0.905	0.095
Green Logistics: GLog (α = 0.924, CR = 0.934, AVE = 0.780)				
GLog4	0.884	26.611	0.782	0.218
GLog5	0.849	20.604	0.721	0.279
GLog6	0.897	31.444	0.804	0.196
GLog7	0.902	N/A	0.814	0.186
Green Marketing: Gmar (α = 0.946, CR = 0.944, AVE = 0.809)				

Indicators	FL	t	SMC	Error
GMar2	0.913	29.679	0.834	0.166
GMar3	0.889	28.078	0.790	0.210
GMar4	0.892	28.440	0.797	0.203
GMar6	0.902	N/A	0.814	0.186

Note: The path of GDes6, GPcu6, GMan7, GRec4, GLog7, and Gmar6 were set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.849 to 0.961, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 20.604 to 37.818, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.721 to 0.924, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.912 to 0.962, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.917 to 0.965, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.780 to 0.848, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 105 Discriminant validity and correlation matrix among the latent variables of green supply chain management (GSCM) from higher-order CFA

Indicators	Mean	S.D.	AVE	GDes	GPcu	GMan	GRec	GLog	GMar
GDes	4.196	0.616	0.814	**0.902**					
GPcu	4.093	0.628	0.848	0.838	**0.921**				
GMan	4.266	0.591	0.842	0.859	0.823	**0.918**			
GRec	4.009	0.719	0.786	0.661	0.634	0.649	**0.887**		
GLog	4.196	0.621	0.780	0.718	0.800	0.820	0.631	**0.883**	
GMar	4.225	0.629	0.809	0.737	0.693	0.851	0.655	0.904	**0.899**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green supply chain management (GSCM) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.631 to 0.904, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between GLog and GMar. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.3.3 Second-order CFA of Green Supply Chain Management (GSCM)

In order to inspect whether the latent variables can be vividly separated from others, the second-order confirmatory factor analysis (second-order CFA) was employed. In this study, Green Supply Chain Management (GSCM) consisting of 6 sub-dimensions with 36 items (GDes1, 2, 3, 4, 5, 6, GPcu1, 2, 3, 4, 5, 6, GMan1, 2, 3, 4, 5, 6, 7, GRec1, 2, 3, 4, GLog1, 2, 3, 4, 5, 6, 7, and GMar1, 2, 3, 4, 5, 6) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) (Hair Jr et al., 2016; Holmes-Smith, 2010; Sud-on, 2014). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 106 Model-fit indices of initial and modified model regarding second-order CFA on green supply chain management (GSCM)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**7.819**	CMIN/df	1.572
GFI	**0.584**	GFI	0.953
AGFI	**0.527**	AGFI	0.902
RMSEA	**0.131**	RMSEA	0.038
RMR	0.024	RMR	0.014
CFI	**0.818**	CFI	0.993
TLI	**0.804**	TLI	0.987
NFI	**0.797**	NFI	0.982

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 sub-dimensions with 36 items (GDes1, 2, 3, 4, 5, 6, GPcu1, 2, 3, 4, 5, 6, GMan1, 2, 3, 4, 5, 6, 7, GRec1, 2, 3, 4, GLog1, 2, 3, 4, 5, 6, 7, and GMar1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 7.819, GFI of 0.584, AGFI of 0.527, RMSEA of 0.131, CFI of 0.818, TLI of 0.804, and NFI of 0.797. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.572, GFI of 0.953, AGFI of 0.902, RMSEA of 0.038, RMR of 0.014, CFI of 0.993, TLI of 0.987, and NFI of 0.982. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). Therefore, this research also accepts the model fitness with p-value of 0.000. As a result, the adjusted model, therefore, remained 6 sub-dimensions with 26 items (GDes1, 2, 3, 5, 6, GPcu1, 3, 4, 5, 6, GMan2, 3, 4, 5, 7, GRec1, 3, 4, GLog4, 5, 6, 7, and GMar2, 3, 4, 6). Accordingly, the detail of adjusted model is shown in the below figure and tables.

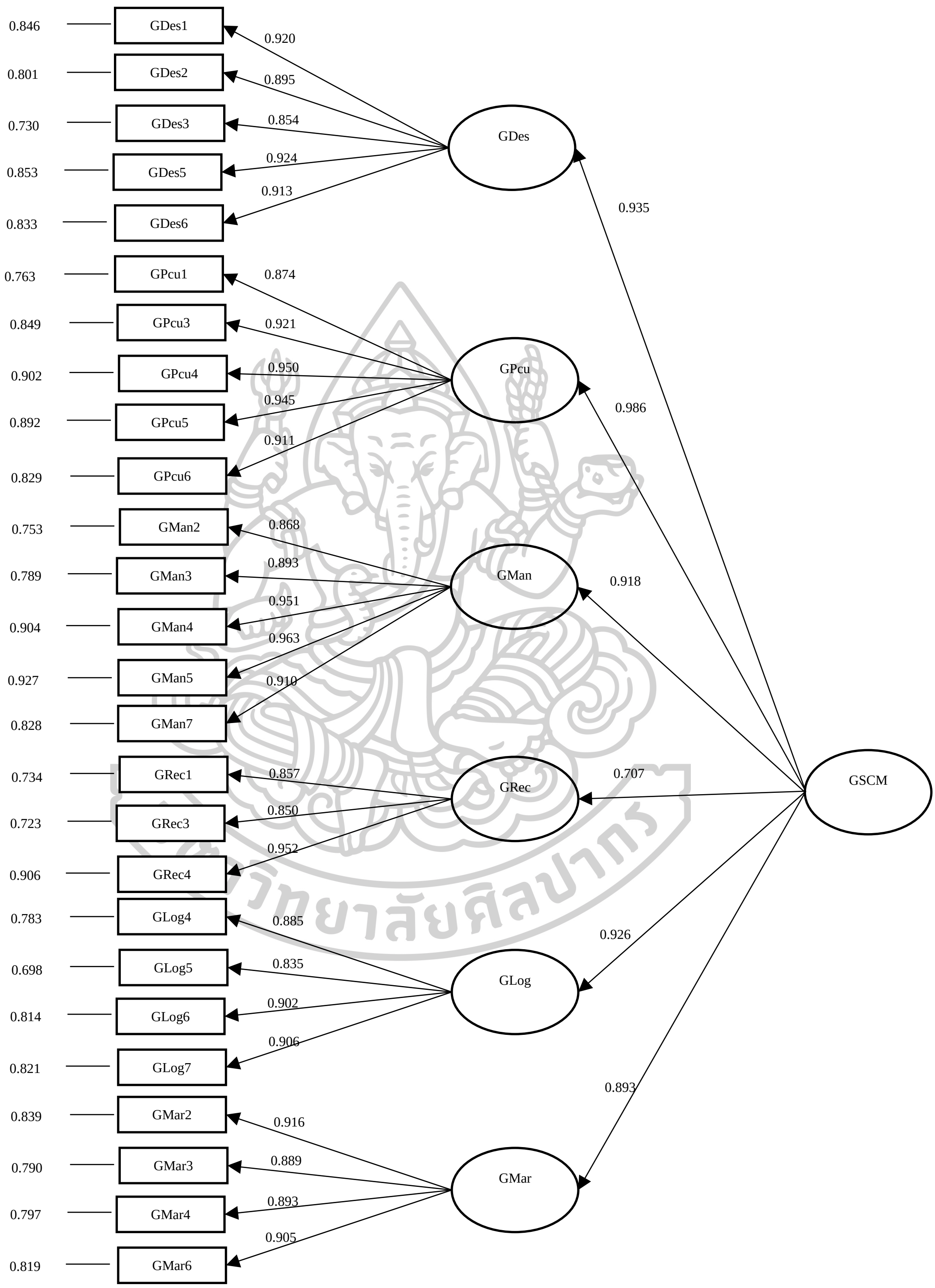

Figure 24 Adjusted model of second-order CFA on green supply chain management (GSCM)

Table 107 Analysis result of second-order CFA on green supply chain management (GSCM)

Indicators	FL	t	SMC	Error
GDes (α = 0.956, CR = 0.956, AVE = 0.813)				
GDes1	0.920	31.744	0.846	0.154
GDes2	0.895	29.833	0.801	0.199
GDes3	0.854	24.957	0.730	0.270
GDes5	0.924	32.623	0.853	0.147
GDes6	0.913	N/A	0.833	0.167
GPcu (α = 0.962, CR = 0.965, AVE = 0.847)				
GPcu1	0.874	28.623	0.763	0.237
GPcu3	0.921	32.117	0.849	0.151
GPcu4	0.950	29.445	0.902	0.098
GPcu5	0.945	35.022	0.892	0.108
GPcu6	0.911	N/A	0.829	0.171
GMan (α = 0.962, CR = 0.963, AVE = 0.840)				
GMan2	0.868	27.983	0.753	0.247
GMan3	0.893	27.510	0.789	0.211
GMan4	0.951	36.790	0.904	0.096
GMan5	0.963	38.074	0.927	0.073
GMan7	0.910	N/A	0.828	0.172
GRec (α = 0.912, CR = 0.917, AVE = 0.788)				
GRec1	0.857	27.606	0.734	0.266
GRec3	0.850	27.19	0.723	0.277
GRec4	0.952	N/A	0.906	0.094
GLog (α = 0.924, CR = 0.934, AVE = 0.779)				
GLog4	0.885	26.748	0.783	0.217
GLog5	0.835	20.439	0.698	0.302
GLog6	0.902	32.028	0.814	0.186
GLog7	0.906	N/A	0.821	0.179
GMar (α = 0.946, CR = 0.945, AVE = 0.811)				

Indicators	FL	t	SMC	Error
GMar2	0.916	30.225	0.839	0.161
GMar3	0.889	28.285	0.790	0.210
GMar4	0.893	28.673	0.797	0.203
GMar6	0.905	N/A	0.819	0.181

Note: The path of GDes6, GPcu6, GMan7, GRec4, GLog7, and Gmar6 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.835 to 0.963, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 20.439 to 38.074, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.698 to 0.927, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.912 to 0.962, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.917 to 0.965, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.779 to 0.847, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 108 Discriminant validity and correlation matrix among the latent variables of green supply chain management (GSCM) from second-order CFA

Indicators	Mean	S.D.	AVE	GDes	GPcu	GMan	GRec	GLog	GMar
GDes	4.196	0.616	0.813	**0.902**					
GPcu	4.093	0.628	0.847	0.815	**0.920**				
GMan	4.266	0.591	0.840	0.876	0.828	**0.917**			
GRec	4.009	0.719	0.788	0.654	0.641	0.627	**0.888**		
GLog	4.196	0.621	0.779	0.722	0.825	0.797	0.693	**0.883**	
GMar	4.225	0.629	0.811	0.745	0.709	0.841	0.678	0.904	**0.901**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green supply chain management (GSCM) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.641 to 0.904, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between GLog and GMar. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.4 Confirmatory Factor Analysis on Green Business Performance (GBP)

Regarding analysis of confirmatory factor on green business performance (GBP), three dimensions including economic performance (EP), environmental performance (EnP), and social performance (SP) were performed. All detail is shown as follows.

4.6.4.1 First-order CFA of Green Business Performance (GBP)

Economic Performance (EP)

Economic performance (EP) consisting of 7 items including EP1, 2, 3, 4, 5, 6, 7 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 109 Model-fit indices of initial and modified model regarding economic performance (EP)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.100
CMIN/df	**9.541**	CMIN/df	1.632
GFI	0.916	GFI	0.990
AGFI	**0.832**	AGFI	0.969
RMSEA	**0.146**	RMSEA	0.040
RMR	0.012	RMR	0.004
CFI	0.963	CFI	0.998
TLI	0.945	TLI	0.996
NFI	0.959	NFI	0.996

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 7 initial items (EP1, 2, 3, 4, 5, 6, 7) with some unacceptable values: p-value of 0.000, CMIN/df of 9.541, AGFI of 0.832, and RMSEA of 0.146. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.100, CMIN/df of 1.632, GFI of 0.990, AGFI of 0.969, RMSEA of 0.040, RMR of 0.004, CFI of 0.998, TLI of 0.996, and NFI of 0.996. Moreover, the adjusted model remained 7 items (EP1, 2, 3, 4, 5, 6, 7). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

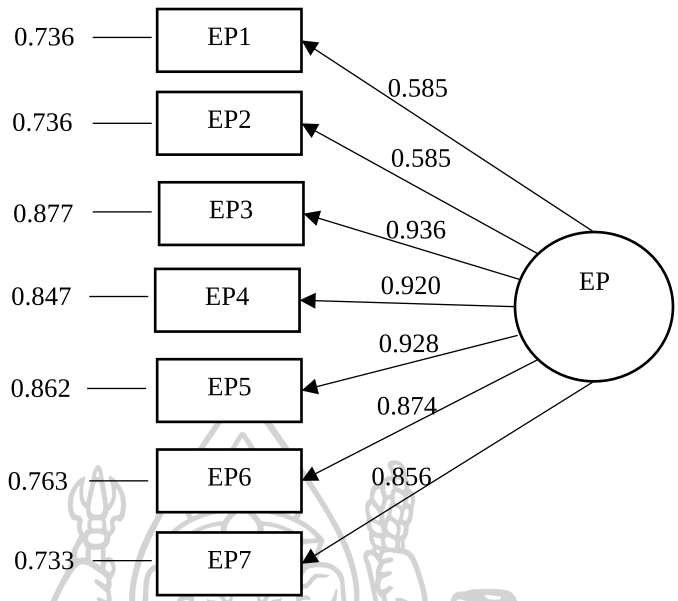

Figure 25 Adjusted model of economic performance (EP)

Table 110 Analysis result of model measurement of economic performance (EP)

Indicators	**FL**	**t**	**SMC**	**Error**
EP1	0.585	26.815	0.736	0.264
EP2	0.585	22.771	0.736	0.264
EP3	0.936	30.497	0.877	0.123
EP4	0.920	32.371	0.847	0.153
EP5	0.928	N/A	0.862	0.138
EP6	0.874	27.882	0.763	0.237
EP7	0.856	26.481	0.733	0.267
α = 0.965, CR = 0.957, AVE = 0.793				

Note: EP5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.585 to 0.936, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.771 to 32.371, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.733 to 0.877, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.965, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.957, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.793, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Environmental Performance (EnP)

Environmental performance (EnP) consisting of 6 items including EnP1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 111 Model-fit indices of initial and modified model regarding environmental performance (EnP)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.199
CMIN/df	**17.635**	CMIN/df	1.550
GFI	**0.879**	GFI	0.996
AGFI	**0.718**	AGFI	0.973

Model-fit index			
Initial Model		**Modified Model**	
RMSEA	**0.204**	RMSEA	0.037
RMR	0.015	RMR	0.003
CFI	0.940	CFI	0.999
TLI	0.900	TLI	0.997
NFI	0.937	NFI	0.998

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 initial items (EnP1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 17.635, GFI of 0.879, AGFI of 0.718, and RMSEA of 0.204. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.199, CMIN/df of 1.550, GFI of 0.996, AGFI of 0.973, RMSEA of 0.037, RMR of 0.003, CFI of 0.999, TLI of 997, and NFI of 0.998. Moreover, the adjusted model remained 6 items (EnP1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

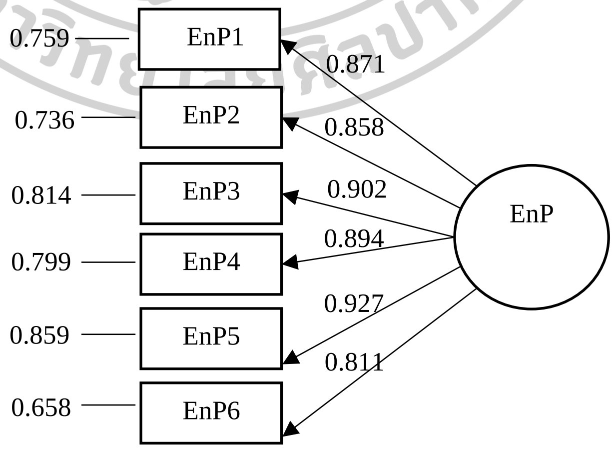

Figure 26 Adjusted model of environmental performance (EnP)

Table 112 Analysis result of model measurement of environmental performance (EnP)

Indicators	FL	t	SMC	Error
EnP1	0.871	26.726	0.759	0.241
EnP2	0.858	22.753	0.736	0.264
EnP3	0.902	29.482	0.814	0.186
EnP4	0.894	29.735	0.799	0.201
EnP5	0.927	N/A	0.859	0.141
EnP6	0.811	23.002	0.658	0.342
α = 0.953, CR = 0.953, AVE = 0.771				

Note: EnP5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach’s Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.811 to 0.927, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 22.753 to 29.735, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.658 to 0.859, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach’s Alpha (α) was 0.953, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.953, which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.771, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

Social Performance (SP)

Social performance (SP) consisting of 6 items including SP1, 2, 3, 4, 5, 6 was investigated by using confirmatory factor analysis (CFA). The initial construct was formed and tested. After that, the construct was considered whether to be modified by investigating standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach’s Alpha (α), construct reliability (CR), and average variance extracted (AVE). If there was a need to modify the construct, the modification indices (MI) were required (Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 113 Model-fit indices of initial and modified model regarding social performance (SP)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.950
CMIN/df	**19.397**	CMIN/df	0.178
GFI	**0.867**	GFI	0.999
AGFI	**0.691**	AGFI	0.997
RMSEA	**0.215**	RMSEA	0.000
RMR	0.012	RMR	0.001
CFI	0.950	CFI	1.000
TLI	0.916	TLI	1.000
NFI	0.947	NFI	1.000

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 6 initial items (SP1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 19.397, GFI of 0.867, AGFI of 0.691, and RMSEA of 0.215. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, the adjusted model gained better model-fit indices: p-value of 0.950, CMIN/df of 0.178, GFI of 0.999, AGFI of 0.997, RMSEA of 0.000, RMR of 0.001, CFI of 1.000, TLI

of 1.000, and NFI of 1.000. Moreover, the adjusted model remained 6 items (SP1, 2, 3, 4, 5, 6). Consequently, the adjusted model and analysis result of model measurement is shown in the below figure and table.

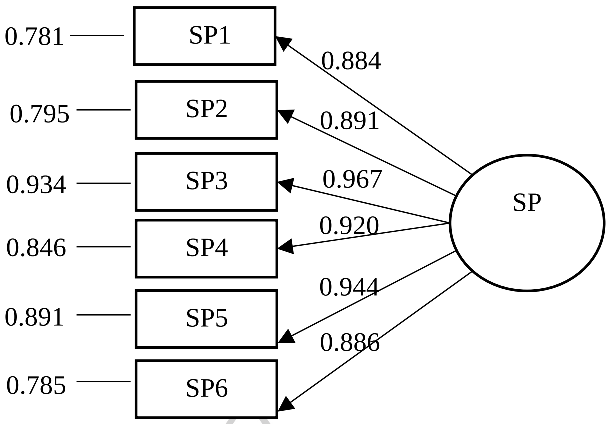

Figure 27 Adjusted model of social performance (SP)

Table 114 Analysis result of model measurement of social performance (SP)

Indicators	**FL**	**t**	**SMC**	**Error**
SP1	0.884	29.300	0.781	0.219
SP2	0.891	31.912	0.795	0.205
SP3	0.967	42.075	0.934	0.066
SP4	0.920	34.064	0.846	0.154
SP5	0.944	N/A	0.891	0.109
SP6	0.886	37.036	0.785	0.215
α = 0.971, CR = 0.969, AVE = 0.839				

Note: SP5 path was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.884 to 0.967, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 29.300 to 37.036, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.781 to 0.934, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was 0.971, which is higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was 0.969,

which is higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.839, which is higher than 0.50 (Hair Jr et al., 2016). In accordance with all acceptable values, this model measurement can be proceeded to further analysis.

4.6.4.2 Higher-order CFA of Green Business Performance (GBP)

In order to inspect whether the latent variables can be vividly separated from others, the higher-order confirmatory factor analysis (higher-order CFA) was employed. In this study, green business performance (GBP) consisting of 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Holmes-Smith, 2010; Oort, 1998; Sanders et al., 2015; Sud-on, 2014).

Table 115 Model-fit indices of initial and modified model regarding higher-order CFA on green business performance (GBP)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**7.991**	CMIN/df	1.950
GFI	**0.756**	GFI	0.956
AGFI	**0.689**	AGFI	0.911
RMSEA	**0.132**	RMSEA	0.049
RMR	0.018	RMR	0.009
CFI	0.902	CFI	0.992
TLI	**0.887**	TLI	0.985
NFI	**0.889**	NFI	0.983

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 7.991, GFI of 0.756, AGFI of 0.689, RMSEA of 0.132, TLI of 0.887, and NFI of 0.889. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.950, GFI of 0.956, AGFI of 0.911, RMSEA of 0.049, RMR of 0.009, CFI of 0.992, TLI of 0.985, and NFI of 0.983. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). As a result, the adjusted model, therefore, remained 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6). Accordingly, the detail of adjusted model is shown in the below figure and tables.

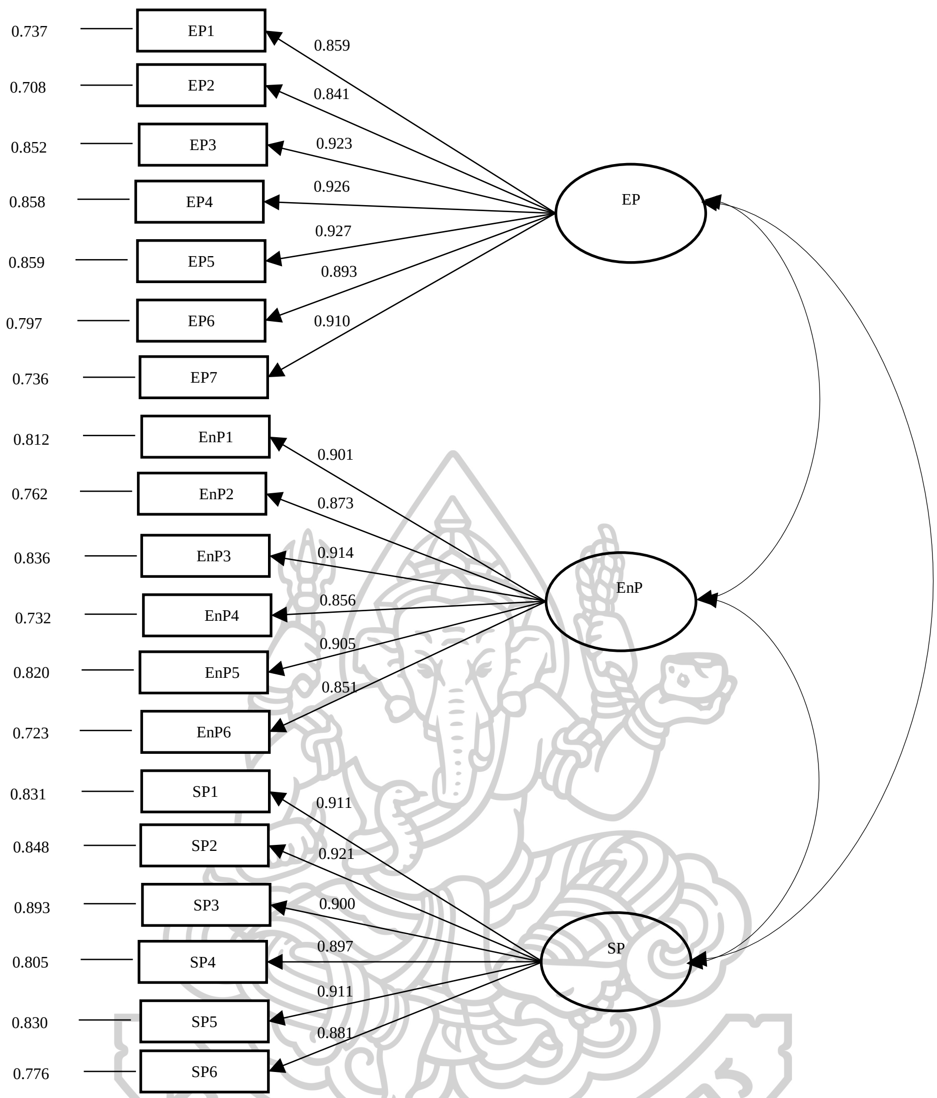

Figure 28 Adjusted model of higher-order CFA on green business performance (GBP)

Table 116 Analysis result of higher-order CFA on green business performance (GBP)

Indicators	**FL**	**t**	**SMC**	**Error**
Economic Performance (α = 0.965, CR = 0.964, AVE = 0.792)				
EP1	0.859	25.773	0.737	0.263
EP2	0.841	23.898	0.708	0.292
EP3	0.923	25.953	0.852	0.148

Indicators	FL	t	SMC	Error
EP4	0.926	26.073	0.858	0.142
EP5	0.927	26.264	0.859	0.141
EP6	0.893	28.693	0.797	0.203
EP7	0.910	N/A	0.736	0.264
Environmental Performance (α = 0.953, CR = 0.955, AVE = 0.781)				
EnP1	0.901	24.908	0.812	0.188
EnP2	0.873	29.187	0.762	0.238
EnP3	0.914	25.648	0.836	0.164
EnP4	0.856	23.109	0.732	0.268
EnP5	0.905	25.788	0.820	0.180
EnP6	0.851	N/A	0.723	0.277
Social Performance (α = 0.971, CR = 0.967, AVE = 0.831)				
SP1	0.911	28.105	0.831	0.169
SP2	0.921	27.842	0.848	0.152
SP3	0.900	29.127	0.893	0.107
SP4	0.897	35.970	0.805	0.195
SP5	0.911	35.494	0.830	0.170
SP6	0.881	N/A	0.776	0.224

Note: The path of EP7, EnP6, and SP6 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.881 to 0.927, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 23.898 to 35.970, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.723 to 0.893, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.953 to 0.971, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.955 to 0.967, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was 0.781 to 0.831, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 117 Discriminant validity and correlation matrix among the latent variables of green business performance (GBP) from higher-order CFA

Indicators	Mean	S.D.	AVE	EP	EnP	SP
EP	4.135	0.673	0.792	**0.890**		
EnP	4.296	0.611	0.781	0.833	**0.884**	
SP	4.284	0.658	0.831	0.831	0.909	**0.912**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green business performance (GBP) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.831 to 0.909, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between EnP and SP. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.4.3 Second-order CFA of Green Business Performance

In order to inspect whether the latent variables can be vividly separated from others, the second-order confirmatory factor analysis (second-order CFA) was employed. In this study, green business performance consisting of 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6) was investigated. The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 118 Model-fit indices of initial and modified model regarding second-order CFA on green business performance (GBP)

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	**0.000**
CMIN/df	**7.991**	CMIN/df	1.950
GFI	**0.756**	GFI	0.956
AGFI	**0.689**	AGFI	0.911
RMSEA	**0.132**	RMSEA	0.049
RMR	0.018	RMR	0.009
CFI	0.902	CFI	0.992
TLI	**0.887**	TLI	0.985
NFI	**0.889**	NFI	0.983

Note: Values in bold were unaccepted.

From the study, it was found that the initial model contained 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6) with some unacceptable values: p-value of 0.000, CMIN/df of 7.991, GFI of 0.756, AGFI of 0.689, RMSEA of 0.132, TLI of 0.887, and NFI of 0.889. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: CMIN/df of 1.950, GFI of 0.956, AGFI of 0.911, RMSEA of 0.049, RMR of 0.009, CFI of 0.992, TLI of 0.985, and NFI of 0.983. However, there was one model-fit index indicating unaccepted level (p-value of 0.000 less than 0.05). Even though p-value is lower than 0.05, some researchers can accept it (Anwar et al., 2018; Hu & Bentler, 1999). As a result, the adjusted model, therefore, remained 3 sub-dimensions with 19 items (EP1, 2, 3, 4, 5, 6, 7; EnP1, 2, 3, 4, 5, 6; and SP1, 2, 3, 4, 5, 6). Accordingly, the detail of adjusted model is shown in the below figure and tables.

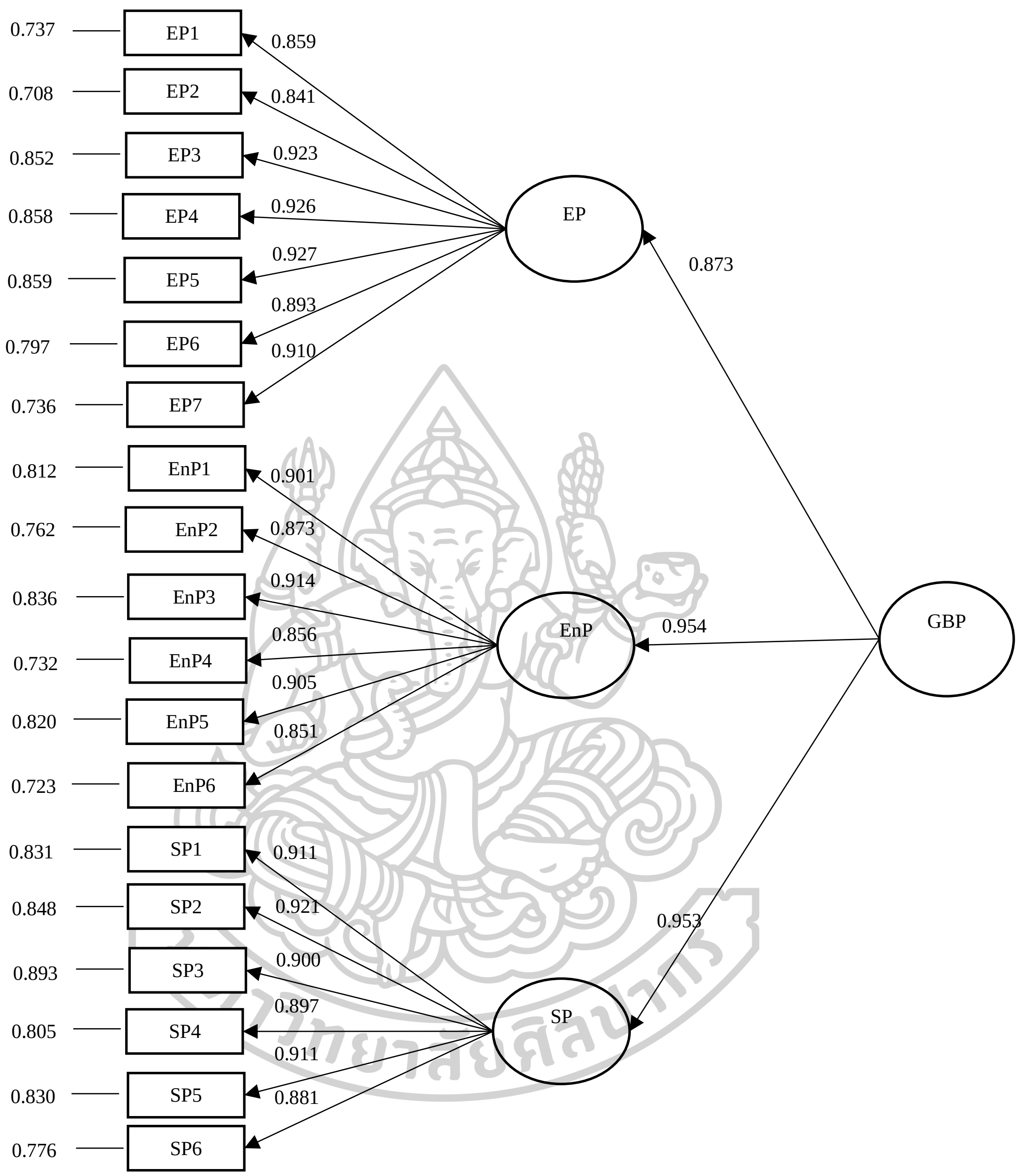

Figure 29 Adjusted model of second-order CFA on green business performance (GBP)

Table 119 Analysis result of second-order CFA on green business performance (GBP)

Indicators	FL	t	SMC	Error
Economic Performance (α = 0.965, CR = 0.964, AVE = 0.792)				
EP1	0.859	25.773	0.737	0.263
EP2	0.841	23.898	0.708	0.292
EP3	0.923	25.953	0.852	0.148
EP4	0.926	26.073	0.858	0.142
EP5	0.927	26.264	0.859	0.141
EP6	0.893	28.693	0.797	0.203
EP7	0.910	N/A	0.736	0.264
Environmental Performance (α = 0.953, CR = 0.955, AVE = 0.781)				
EnP1	0.901	24.908	0.812	0.188
EnP2	0.873	29.187	0.762	0.238
EnP3	0.914	25.648	0.836	0.164
EnP4	0.856	23.109	0.732	0.268
EnP5	0.905	25.788	0.820	0.180
EnP6	0.851	N/A	0.723	0.277
Social Performance (α = 0.971, CR = 0.967, AVE = 0.831)				
SP1	0.911	28.105	0.831	0.169
SP2	0.921	27.842	0.848	0.152
SP3	0.900	29.127	0.893	0.107
SP4	0.897	35.970	0.805	0.195
SP5	0.911	35.494	0.830	0.170
SP6	0.881	N/A	0.776	0.224

Note: The path of EP7, EnP6, and SP6 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach’s Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from

0.841 to 0.927, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 23.109 to 35.970, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.708 to 0.893, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); Cronbach's Alpha (α) was from 0.953 to 0.971, which are higher than 0.70 (Hair Jr et al., 2016); construct reliability (CR) was from 0.955 to 0.967, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.708 to 0.893, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 120 Discriminant validity and correlation matrix among the latent variables of green business performance (GBP) from second-order CFA

Indicators	Mean	S.D.	AVE	EP	EnP	SP
EP	4.135	0.673	0.792	**0.890**		
EnP	4.296	0.611	0.781	0.833	**0.884**	
SP	4.284	0.658	0.831	0.831	0.909	**0.912**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables composited in green business performance (GBP) were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.831 to 0.909, which they were not higher than 0.950 (Henseler et al., 2015). In addition, the model was almost discriminately validated according to criterial from Hair Jr et al. (2016) mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except the pair between EnP and SP. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study (Henseler et al., 2015). Therefore, in accordance with almost acceptable values, this model measurement can be proceeded to further analysis.

4.6.5 Summary of Remained Factors from First-Order, Higher-Order and Second-Order CFA

Table 121 Summary of remained factors from first-order, higher-order and second-order CFA

Variables	Remained Item		
	Amount	**Detail**	**α**
Green Corporate Identity			
- Green Corporate Communication	6	GCCoI1, 4, 5, GCCoE1, 2, 3	0.916
- Green Corporate Visual Identity	3	GCVI2, 4, 5	0.932
- Green Corporate Culture	4	GCCu1, 2, 3, 4	0.960
- Green Employee Behavior	5	GEBR2, 4, 5, GEBE5, 6	0.916
- Green Corporate Policy	4	GPo1, 2, 3, 4	0.951
- Green Forces and Drivers	4	GFD1, 2, 3, 4	0.944
- Green Products and Services	4	GPaS1, 2, 3, 4	0.945
Green Personal-Social Identification			
- Green Personal Identification	6	GPI1, 2, 3, 4, 5, 6	0.957
- Green Social Identification	5	GSI1, 2, 3, 4, 5	0.955
Green Supply Chain Management			
- Green Design	5	GDes1, 2, 3, 5, 6	0.956
- Green Procurement	5	GPcu1, 3, 4, 5, 6	0.962
- Green Manufacturing	5	GMan2, 3, 4, 5, 7	0.962
- Green Recovery	3	GRec1, 3, 4	0.912
- Green Logistics	4	GLog4, 5, 6, 7	0.924
- Green Marketing	4	GMar2, 3, 4, 6	0.946
Green Business Performance			
- Economic Performance	7	EP1, 2, 3, 4, 5, 6, 7	0.965
- Environmental Performance	6	EnP1, 2, 3, 4, 5, 6	0.953
- Social Performance	6	SP1, 2, 3, 4, 5, 6	0.971

4.7 Full Model Testing with SEM and Hypotheses Investigation

4.7.1 Preparation of Variables Used for Final Model Investigation

Assessment of normality is used repeatedly to inspect whether the data related to latent variables has normal distribution and can be employed for further study or not. The statistics hired for testing normality can include Skewness, Kurtosis, and percentage of coefficient of variation (%CV). The skewness is used to investigate whether the data is systematically distribution and the kurtosis is used to study the peakedness of the distribution, informing positive or negative data shape (Larson, 2006; Marshall & Jonker, 2010). The variables investigated by skewness should be between -3 and +3 meanwhile the variables investigated by kurtosis should be between -3 and +3 as well (Kline, 2005). In addition, the coefficient of variation (CV) has been used for measuring the dispersion of data points by considering the standard deviation to the mean, which normally will be computed in terms of percentage. For use, the CV value should not be higher than 0.30; if the CV is higher than 0.30, the data can be interpreted as high different degree (Brown, 1998). The skewness, kurtosis, and %CV were similarly used to study studied variables which detail can be mentioned as follows.

Table 122 Assessment of normality of latent variables used for final model

Variables	Mean	S.D.	%CV	Sk	Ku
GCCo	4.328	0.570	13.170	-0.820	0.783
GCVI	4.077	0.713	17.488	-0.642	0.778
GCCu	4.269	0.645	15.109	-0.656	0.626
GEB	4.122	0.626	15.187	-0.722	1.329
GPo	4.203	0.643	15.299	-0.533	0.437
GFD	4.284	0.618	14.426	-0.634	0.536
GPaS	4.253	0.625	14.696	-0.473	0.165
GPI	4.036	0.652	16.155	-0.798	2.370
GSI	3.996	0.691	17.292	-0.421	0.187
GDes	4.196	0.616	14.681	-0.364	0.224
GPcu	4.093	0.628	15.343	-0.336	0.295

Variables	Mean	S.D.	%CV	Sk	Ku
GMan	4.266	0.591	13.854	-0.559	0.750
GRec	4.009	0.719	17.935	-1.014	2.397
GLog	4.196	0.621	14.800	-0.585	0.650
GMar	4.225	0.629	14.888	-0.682	0.922
EP	4.135	0.673	16.276	-0.365	-0.211
EnP	4.296	0.611	14.223	-0.621	0.306
SP	4.284	0.658	15.359	-0.680	0.384

From the study, the result indicated that latent variables has %CV value from 13.170 to 17.935, Skewness value from -0.365 to -1.014, and Kurtosis value from -0.211 to 2.370, meaning that the data has systematical distribution and good shape since the skewness and kurtosis is in between -3 and +3 and percent of coefficient of variation (%CV) is under 30 percent as recommendation (Brown, 1998; Larson, 2006; Marshall & Jonker, 2010). Consequently, the data can be proceeded to be analyzed in further step.

4.7.2 Multi-factor Model Investigation

In order to inspect whether the latent variables can be vividly separated from others, the multi-factor model investigation was performed through confirmatory factor analysis (CFA). The initial model was formed and tested. After that, the model is considered whether to be modified by considering standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). In addition, the discriminant validity was tested (Fornell & Larcker, 1981). If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015).

Table 123 Model-fit indices of initial and modified model regarding multi-factor model investigation for final model

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.052
CMIN/df	**6.298**	CMIN/df	1.186
GFI	**0.710**	GFI	0.964
AGFI	**0.650**	AGFI	0.918
RMSEA	**0.115**	RMSEA	0.022
RMR	0.027	RMR	0.015
CFI	**0.871**	CFI	0.998
TLI	**0.855**	TLI	0.995
NFI	**0.850**	NFI	0.985

Note: Values in bold were unaccepted.

From the study, it was found that the initial model of multi-factor investigation contained some unacceptable values: p-value of 0.000, CMIN/df of 6.298, GFI of 0.710, AGFI of 0.650, RMSEA of 0.115, CFI of 0.871, TLI of 0.855, and NFI of 0.850. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: p-value of 0.052, CMIN/df of 1.186, GFI of 0.964, AGFI of 0.918, RMSEA of 0.022, RMR of 0.015, CFI of 0.998, TLI of 0.995, and NFI of 0.985. This means that this data set cab be used for further analysis. Accordingly, the detail of adjusted model is shown in the below figure and tables.

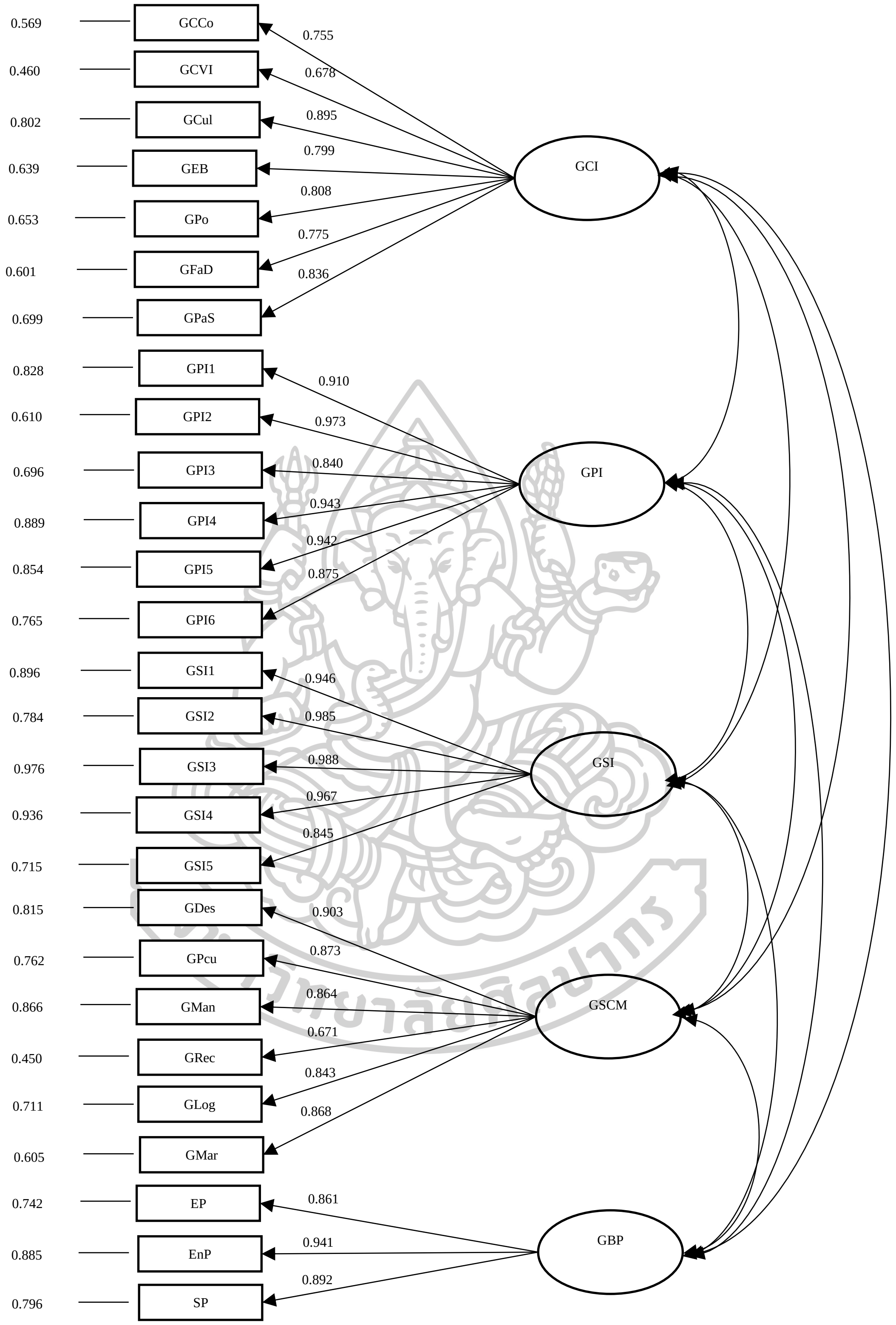

Figure 30 Adjusted model of multi-factor model investigation for final model through CFA

Table 124 Analysis result of multi-factor model investigation for final model

Indicators	FL	t	SMC	Error
Green Corporate Identity: GCI (CR = 0.923, AVE = 0.632)				
GCCom	0.755	18.308	0.569	0.431
GCVI	0.678	15.294	0.460	0.540
GCul	0.895	22.784	0.802	0.198
GEB	0.799	19.387	0.639	0.361
GPo	0.808	25.618	0.653	0.347
GFD	0.775	28.184	0.601	0.399
GPaS	0.836	N/A	0.699	0.301
Employee's Green Personal Identification: GPI (CR = 0.957, AVE = 0.774)				
GPI1	0.910	N/A	0.828	0.172
GPI2	0.973	24.182	0.610	0.390
GPI3	0.840	22.974	0.696	0.304
GPI4	0.943	34.182	0.889	0.111
GPI5	0.924	32.571	0.854	0.146
GPI6	0.875	27.562	0.765	0.235
Employee's Green Social Identification: GSI (CR = 0.970, AVE = 0.861)				
GSI1	0.946	26.270	0.896	0.104
GSI2	0.985	22.292	0.784	0.216
GSI3	0.988	18.054	0.976	0.024
GSI4	0.967	27.500	0.936	0.064
GSI5	0.845	N/A	0.715	0.285
Green Supply Chain Management: GSCM (CR = 0.934, AVE = 0.702)				
GDes	0.903	N/A	0.815	0.185
GPcu	0.873	27.467	0.762	0.238
GMan	0.864	29.048	0.866	0.134
GRec	0.671	16.791	0.450	0.550
GLog	0.843	23.543	0.711	0.285
GMar	0.868	20.594	0.605	0.395
Green Business Performance: GBP (CR = 0.926, AVE = 0.808)				

Indicators	FL	t	SMC	Error
EP	0.861	N/A	0.742	0.285
EnP	0.941	27.288	0.885	0.115
SP	0.892	24.563	0.796	0.204

Note: The path of EP7, EnP6, and SP6 was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE) were considered. As a result, standardized factor loading (FL) ranged from 0.678 to 0.988, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 15.294 from 34.182, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.450 to 0.976, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); construct reliability (CR) was from 0.923 to 0.970, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.632 to 0.861, which are higher than 0.50 (Hair Jr et al., 2016). In addition, discriminant validity and correlation matrix among the latent variables used in the research was also performed. The detail is shown in the following table.

Table 125 Discriminant validity and correlation matrix among the latent variables used for final model

Indicators	**Mean**	**S.D.**	**AVE**	GCI	GPI	GSI	GSCM	GBP
GCI	4.219	0.535	0.632	**0.795**				
GPI	4.036	0.652	0.774	0.695	**0.880**			
GSI	4.000	0.691	0.861	0.641	0.788	**0.928**		
GSCM	4.164	0.556	0.702	0.906	0.650	0.594	**0.838**	
GBP	4.237	0.604	0.808	0.729	0.558	0.549	0.724	**0.899**

Note: The bolded values in diagonal lens display the square root of AVE

From the study regarding the relationship among the latent variables, the result indicated that the latent variables used for final model were correlated in positive direction with acceptable level with correlation coefficient ranging from 0.549 to 0.906, which they were almost not higher than 0.950 (Henseler et al., 2015), except the pair between GCI and GSCM with correlation coefficient as of 0.906. In fact, this pair should be removed, but this research allows them to be highly correlated since they are significant to the study. Regarding to discriminant validity testing, the result indicated that the model was discriminately validated according to criterial from Hair Jr et al. (2016)mentioning that the correlation that has been estimated should be lower than the square root of average variance extracted (AVE), except GSCM which has not yet been discriminately validated from GCI. However, this research allows to be used in the further analysis.

4.7.3 Final Model Investigation

After the inspection of first order, higher order and second order as well as multi-factor model, the final model including green corporate identity, green personal identification, green social identification, green supply chain management and green business performance was then constructed in order to perform the hypothesis investigation. The initial model was formed and tested. The model fit indices were employed to ensure whether the model can be empirically formed. If there is a need to modify the model, the modification indices (MI) are required (Oort, 1998; Sanders et al., 2015). According to the study, the results related to model-fit indices, standardized estimates, error, t-value (t), p-value, total effect, direct effect, and indirect effect, were presented as follows.

Table 126 Model-fit indices of initial and modified model regarding final model

Model-fit index			
Initial Model		**Modified Model**	
p-value	**0.000**	p-value	0.235
CMIN/df	**7.096**	CMIN/df	1.081
GFI	**0.680**	GFI	0.969
AGFI	**0.617**	AGFI	0.933
RMSEA	**0.124**	RMSEA	0.014

Model-fit index			
Initial Model		**Modified Model**	
RMR	0.055	RMR	0.011
CFI	**0.850**	CFI	0.999
TLI	**0.834**	TLI	0.998
NFI	**0.830**	NFI	0.986

Note: Values in bold were unaccepted.

From the study, it was found that the initial final model contained some unacceptable values: p-value of 0.000, CMIN/df of 7.096, GFI of 0.680, AGFI of 0.617, RMSEA of 0.124, CFI of 0.850, TLI of 0.834, and NFI of 0.830. Due to the occurrence of some unacceptable values, the model modification was performed. After the conduction of model modification by correlating possibly correlated items, dropping standardized factor loading (FL) or dropping squared multiple correlation (SMC), the adjusted model consequently gained better model-fit indices: p-value of 0.235, CMIN/df of 1.081, GFI of 0.969, AGFI of 0.933, RMSEA of 0.014, RMR of 0.011, CFI of 0.999, TLI of 0.998, and NFI of 0.986. This means that this data set cab be used for further analysis. Accordingly, the detail of adjusted model is shown in the below figure and tables.

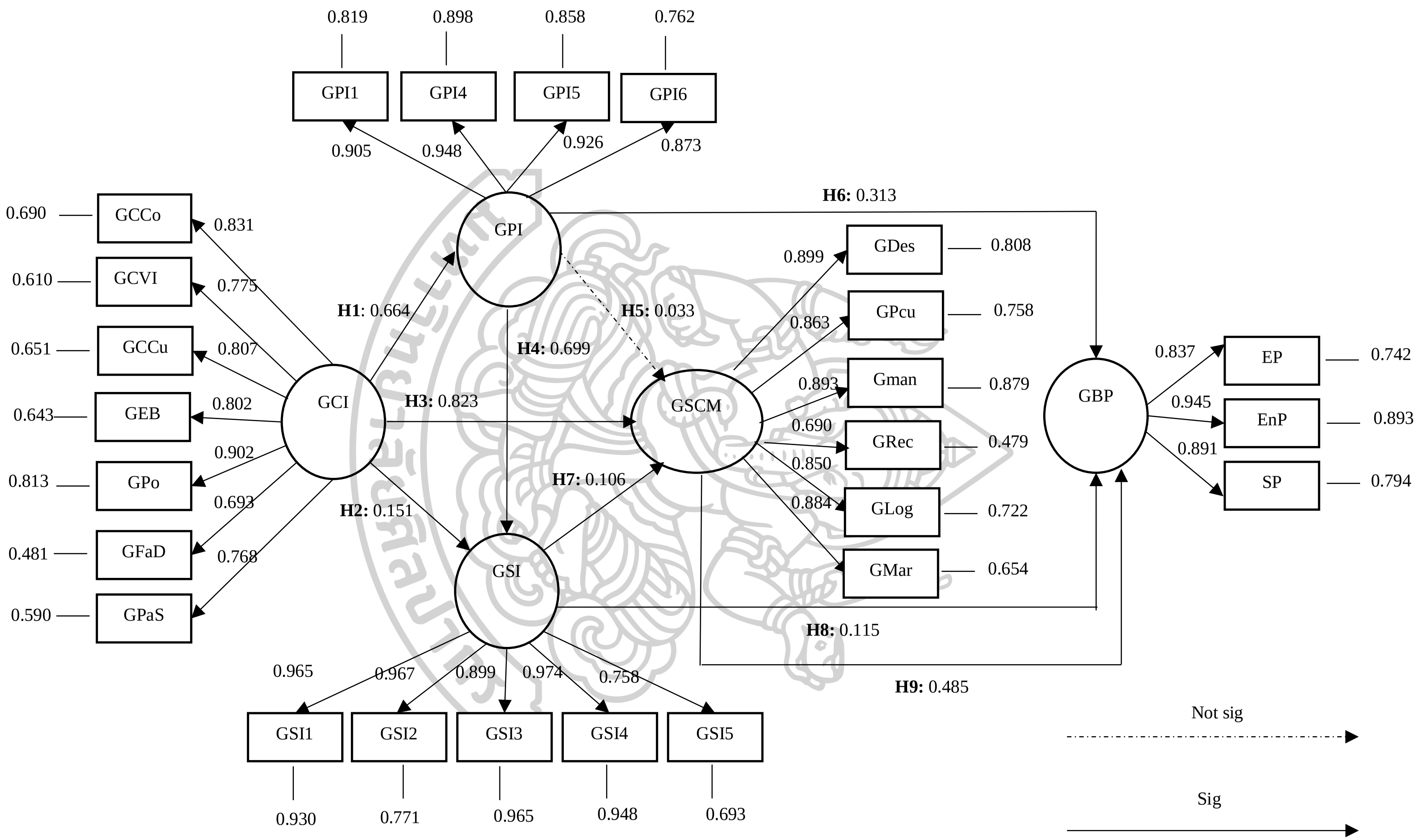

Figure 31 Adjusted final model

Table 127 Analysis result of final model

Variables			FL	SMC	t	P
Green Corporate Identity						
GCI	--- >	GPaS	0.831	0.690	N/A	N/A
GCI	--- >	GFD	0.775	0.610	28.135	0.000
GCI	--- >	GPo	0.807	0.651	25.577	0.000
GCI	--- >	GEB	0.802	0.643	19.054	0.000
GCI	--- >	GCCu	0.902	0.813	22.455	0.000
GCI	--- >	GCVI	0.693	0.481	14.879	0.000
GCI	--- >	GCCo	0.768	0.590	18.530	0.000
Employee's Green Personal Identification						
GPI	--- >	GPI1	0.905	0.819	N/A	N/A
GPI	--- >	GPI4	0.948	0.898	33.437	0.000
GPI	--- >	GPI5	0.926	0.858	32.133	0.000
GPI	--- >	GPI6	0.873	0.762	26.538	0.000
Employee's Green Social Identification						
GSI	--- >	GSI5	0.758	0.693	9.314	0.000
GSI	--- >	GSI4	0.974	0.948	10.679	0.000
GSI	--- >	GSI3	0.899	0.965	N/A	N/A
GSI	--- >	GSI2	0.967	0.771	10.974	0.000
GSI	--- >	GSI1	0.965	0.930	10.456	0.000
Green Supply Chain Management						
GSCM	--- >	GDes	0.899	0.808	N/A	N/A
GSCM	--- >	GPcu	0.863	0.758	26.501	0.000
GSCM	--- >	Gman	0.893	0.879	29.134	0.000
GSCM	--- >	GRec	0.690	0.479	16.759	0.000
GSCM	--- >	GLog	0.850	0.722	23.871	0.000
GSCM	--- >	GMar	0.884	0.654	22.199	0.000
Green Business Performance						
GBP	--- >	EP	0.837	0.742	N/A	N/A
GBP	--- >	EnP	0.945	0.893	25.633	0.000
GBP	--- >	SP	0.891	0.794	23.313	0.000

Note: The path of GPaS, GPI1, GSI3, GDes, and EP was set to 1 (not estimated)

Regarding the model adjustment, the following indicators including standardized factor loading (FL), t-value (t), squared multiple correlation (SMC), Cronbach's Alpha (α), construct reliability (CR), and average variance extracted (AVE). As a result, standardized factor loading (FL) ranged from 0.678 to 0.988, which are higher than 0.50 (Hair Jr et al., 2016); t-value (t) ranged from 15.294 from 34.182, which are higher than 1.96 (Raines-Eudy, 2000); squared multiple correlation (SMC) ranged from 0.450 to 0.976, which are higher than 0.50 (Aykan & Nalçacı, 2018; Hair Jr et al., 2016); construct reliability (CR) was from 0.923 to 0.970, which are higher than 0.50 (Dilekli & Tezci, 2019); and average variance extracted (AVE) was from 0.632 to 0.861, which are higher than 0.50 (Hair Jr et al., 2016). The data were appropriate for hypothesis investigation.

4.7.4 Important Values for Hypothesis Testing

Table 128 Important values for hypothesis testing

Variables			Standardized Estimate	Standard Error	t	P
GCI	--- >	GPI	0.664	0.060	14.020	0.000
GCI	--- >	GSI	0.151	0.057	3.481	0.000
GPI	--- >	GSI	0.699	0.076	9.386	0.000
GCI	--- >	GSCM	0.823	0.061	14.364	0.000
GPI	--- >	GSCM	0.033	0.048	0.574	0.566
GSI	--- >	GSCM	0.106	0.043	1.996	0.046
GSI	--- >	GBP	0.115	0.048	1.979	0.048
GPI	--- >	GBP	0.313	0.087	3.060	0.002
GSCM	--- >	GBP	0.485	0.071	7.016	0.000

4.7.5 Total Effect, Direct Effect, and Indirect Effect of Studied Model According to Hypothesis

Table 129 Total effect of studied model according to hypothesis

	GPI	GSI	GSCM	GBP
GCI	0.664	0.615	0.911	0.720
GPI	-	0.699	0.108	0.445
GSI	-	-	0.106	0.166
GSCM	-	-	-	0.485

From the table, the study indicated that green corporate identity had standardized total effects on employee's green personal identification with the standardized estimate as of 0.664, employee's green social identification with the standardized estimate as of 0.615, green supply chain management with the standardized estimate as of 0.911 and green business performance with the standardized estimate as of 0.720. In the meantime, employee's green personal identification had standardized total effects on employee's green social identification with the standardized estimate as of 0.699, green supply chain management with the standardized estimate as of 0.108 and green business performance with the standardized estimate as of 0.445. In addition, employee's green social identification had standardized total effects on green supply chain management with the standardized estimate as of 0.106 and green business performance with the standardized estimate as of 0.485.

Table 130 Direct effect of studied model according to hypothesis

	GPI	GSI	GSCM	GBP
GCI	0.664	0.151	0.823	-
GPI	-	0.699	-	0.313
GSI	-	-	0.106	0.115
GSCM	-	-	-	0.485

From the table, the study indicated that green corporate identity had standardized direct effects on employee's green personal identification with the standardized estimate as of 0.664, employee's green social identification with the standardized estimate as of 0.151, and green supply chain management with the standardized estimate as of 0.823. In the meantime, employee's green personal identification had standardized direct effects on employee's green social identification with the standardized estimate as of 0.699, and green business performance with the standardized estimate as of 0.313 but did not have direct effects on green supply chain management. In addition, employee's green social identification had standardized direct effects on green supply chain management with the standardized estimate as of 0.106 and green business performance with the standardized estimate as of 0.115.

Table 131 Indirect effect of studied model according to hypothesis

	GPI	**GSI**	**GSCM**	**GBP**
GCI	-	0.464	0.088	0.720
GPI	-	-	0.074	0.132
GSI	-	-	-	0.052
GSCM	-	-	-	-

From the table, the study indicated that green corporate identity had standardized indirect effects on employee's green social identification with the standardized estimate as of 0.464, green supply chain management with the standardized estimate as of 0.088, and green business performance with the standardized estimate as of 0.720. In the meantime, employee's green personal identification had standardized indirect effects on green supply chain management with the standardized estimate as of 0.074, and green business performance with the standardized estimate as of 0.132. In addition, employee's green social identification had standardized indirect effects on green business performance with the standardized estimate as of 0.052.

4.8 Hypothesis Investigation

4.8.1 Results of Hypothesis Investigation

With the empirical study on the related theories, the researcher stipulates the hypotheses to obtain the study objectives as follows:

Hypothesis 1: Green corporate identity has a positive influence on employee's green personal identification.

H_0: Green corporate identity does not have a positive influence on employee's green personal identification.

H_1: Green corporate identity has a positive influence on employee's green personal identification.

From Table 128, the study revealed that the first hypothesis attempting to investigate the positive influence of green corporate identity on employee's green personal identification significantly accepted H_1 since there is a p-value as of 0.000, which is lower than 0.05 with standardized estimate as of 0.664 and standard error as of 0.060. In addition, the study revealed t-value is as of 14.020, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 2: Green corporate identity has a positive influence on employee's green social identification.

H_0: Green corporate identity does not have a positive influence on employee's green social identification.

H_1: Green corporate identity has a positive influence on employee's green social identification.

From Table 128, the study revealed that the second hypothesis attempting to investigate the positive influence of green corporate identity on employee's green social identification significantly accepted H_1 since there is a p-value as of 0.000, which is lower than 0.05 with standardized estimate as of 0.151 and standard error as of 0.057. In addition, the study revealed t-value is as of 3.481, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 3: Green corporate identity has a positive influence on green supply chain management.

H_0: Green corporate identity does not have a positive influence on green supply chain management.

H_1: Green corporate identity has a positive influence on green supply chain management.

From Table 128, the study revealed that the third hypothesis attempting to investigate the positive influence of green corporate identity on green supply chain management significantly accepted H_1 since there is a p-value as of 0.000, which is lower than 0.05 with standardized estimate as of 0.823 and standard error as of 0.061. In addition, the study revealed t-value is as of 14.346, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 4: Green personal identification has a positive influence on employee's green social identification.

H_0: Green personal identification does not have a positive influence on employee's green social identification.

H_1: Green personal identification has a positive influence on employee's green social identification.

From Table 128, the study revealed that the fourth hypothesis attempting to investigate the positive influence of green personal identification on employee's green social identification significantly accepted H_1 since there is a p-value as of 0.000, which is lower than 0.05 with standardized estimate as of 0.699 and standard error as of 0.076. In addition, the study revealed t-value is as of 9.386, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 5: Green personal identification has a positive influence on green supply chain management.

H_0: Green personal identification does not have a positive influence on green supply chain management.

H_1: Green personal identification has a positive influence on green supply chain management.

From Table 128, the study revealed that the fifth hypothesis attempting to investigate the positive influence of green personal identification on green supply chain management significantly accepted H_0 since there is a p-value as of 0.566, which is higher than 0.05 with standardized estimate as of 0.033 and standard error as of 0.048. In addition, the study revealed t-value is as of 0.574, which is lower than 1.960. Accordingly, it can be concluded that the study rejected H_1 and accepted H_0.

Hypothesis 6: Green personal identification has a positive influence on green business performance.

H_0: Green personal identification does not have a positive influence on green business performance.

H_1: Green personal identification has a positive influence on green business performance.

From Table 128, the study revealed that the sixth hypothesis attempting to investigate the positive influence of green personal identification on green business performance significantly accepted H_1 since there is a p-value as of 0.002, which is lower than 0.05 with standardized estimate as of 0.313 and standard error as of 0.087. In addition, the study revealed t-value is as of 3.060, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 7: Green social identification has a positive influence on green supply chain management.

H_0: Green social identification does not have a positive influence on green supply chain management.

H_1: Green social identification has a positive influence on green supply chain management.

From Table 128, the study revealed that the seventh hypothesis attempting to investigate the positive influence of green social identification on green supply chain management significantly accepted H_1 since there is a p-value as of 0.046, which is lower than 0.05 with standardized estimate as of 0.106 and standard error as of 0.043. In addition, the study revealed t-value is as of 1.996, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 8: Green social identification has a positive influence on green business performance.

H_0: Green social identification does not have a positive influence on green business performance.

H_1: Green social identification has a positive influence on green business performance.

From Table 128, the study revealed that the eighth hypothesis attempting to investigate the positive influence of green social identification on green business performance significantly accepted H_1 since there is a p-value as of 0.048, which is lower than 0.05 with standardized estimate as of 0.115 and standard error as of 0.048. In addition, the study revealed t-value is as of 1.979, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

Hypothesis 9: Green supply chain management has a positive influence on green business performance.

H_0: Green supply chain management does not have a positive influence on green business performance.

H_1: Green supply chain management has a positive influence on green business performance.

From Table 128, the study revealed that the nineth hypothesis attempting to investigate the positive influence of green supply chain management on green business performance significantly accepted H_1 since there is a p-value as of 0.000, which is lower than 0.05 with standardized estimate as of 0.485 and standard error as of 0.071. In addition, the study revealed t-value is as of 7.016, which is higher than 1.960. Accordingly, it can be concluded that the study accepted H_1 and rejected H_0.

4.8.2 Result Summary of Hypothesis Investigation

Table 132 Summary of hypothesis investigation

Hypothesis			**Standardized Estimate**	**S.E.**	**t**	**P**	**Result**
H1: GCI	--- >	GPI	0.664	0.060	14.020	0.000	Accepted
H2: GCI	--- >	GSI	0.151	0.057	3.481	0.000	Accepted
H3: GCI	--- >	GSCM	0.823	0.061	14.364	0.000	Accepted
H4: GPI	--- >	GSI	0.699	0.076	9.386	0.000	Accepted
H5: GPI	--- >	GSCM	0.033	0.048	0.574	0.566	Rejected
H6: GPI	--- >	GBP	0.313	0.087	3.060	0.002	Accepted
H7: GSI	--- >	GSCM	0.106	0.043	1.996	0.046	Accepted
H8: GSI	--- >	GBP	0.115	0.048	1.979	0.048	Accepted
H9: GSCM	--- >	GBP	0.485	0.071	7.016	0.000	Accepted

4.9 Mediation Analysis

Mediation analysis is important and utilized to study the variables mediating the relationship between other independent and dependent factors (Sud-on, 2014). Its analysis can be conducted through structural equation model (Holmbeck, 1997). In this study, the mediating effect was analyzed and explained using the total effect, which is the sum of the direct and indirect effects on a specific variable (Wright, 1934). The research theorized that employee's green personal-social identification and green supply chain management act as mediating variables between green corporate identity and green business performance. From the study, the green business performance can be influenced by green corporate identity which is mediated by green personal-social identification and green supply chain management with standardized total effect as of 0.720.

CHAPTER 5
DISCUSSION AND CONTRIBUTIONS

This chapter presented the outcomes of the previous chapter's discussion about the research findings. Furthermore, the chapter linked the findings to the research area in Thailand's automobile manufacturers. The structure of this chapter was organized into sections as follows: (a) review of study results; (b) discussion of the study; (c) limitations of the study; (d) contributions of the study; and (e) recommendations for further study.

5.1 Finding Summary

The following are the objectives of the study of the impact of green corporate identity and green supply chain management on international business performance:

Objective 1: To study green corporate identity, employee's green personal-social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

Objective 2: To investigate a positive influence of the green corporate identity on employee's green personal identification, employee's green social identification, and green supply chain management in automobile manufacturing industry in Thailand.

Objective 3: To investigate a positive influence of the employee's green personal identification on employee's green social identification, green supply chain management, and green business in automobile manufacturing industry in Thailand.

Objective 4: To investigate a positive influence of employee's green social identification on green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

Objective 5: To investigate a positive influence of green supply chain management on green business performance in automobile manufacturing industry in Thailand.

Objective 6: To study a positive influence of green corporate identity on green business performance in automobile manufacturing industry in Thailand through employee's green personal-social identification and green supply chain management.

There are two main variables: the exogenous variables which include green corporate identity, employee green personal-social identification and green supply chain management. For green corporate identity, it includes green corporate identity, green corporate communication, green corporate visual identity, green corporate culture, green employee behaviour, green policy, green forces and drivers, and green products and services. For employee green personal-social identification, it includes green personal identification and green social identification. For green supply chain management, it includes green procurement, green design, green manufacturing, green marketing, green logistics, and green recovery. In the meantime, the endogenous variable includes green business performance: economic performance, environmental performance, and social performance.

To achieve the study objective, the researchers conducted the research by obtaining the data from 400 employees working in automobile manufacturing companies in Thailand and who have experience about supply chain management, encountering with cross-border procurement, manufacturing, product design, marketing and distribution, logistics, and recovery. The study was conducted in automobile manufacturing industry located in main industrial estate in Bangkok and other nearby provinces, Thailand. The automobile manufacturer was selected in this study due to its significant impacts on Thai country's economy including Thai's GDP, job creation and employment, and innovation disperses, etc. Furthermore, the automobile manufacturer has a complex supply chain that flows between domestic and international perspectives, which is interesting to learn about. The quantitative research approach was used for the study, with 5-rating-scale questionnaires developed by 7 experts from the academic fields of business management, international business, marketing, sustainability, and supply chain and logistics management to collect data from target samples. With regard to research ethics, the questionnaire used in this study was approved by the Silpakorn University Human Research Ethics Committee. The researcher used both descriptive and multivariate statistics such as frequency, percentage, mean, standard deviation, and structural equation modeling (SEM) for data analysis and hypothesis testing. As a result, the findings can be summarized as follows:

Profile of respondents

The study finds that most of the respondents are male (256 persons or 66.3%), age between 21 and 30 years old (187 persons or 46.8%), are married (212 persons or 53.0%), graduates with Bachelor's degree (251 persons or 62.7%); monthly earn between 15,001 and 25,000 baht (145 persons or 36.3%), work for between 1 and 5 years (127 persons or 31.8%), work as operational staff (204 persons or 51.0%), work in the Production Department (191 persons or 47.8%), and work in Company A1 (199 persons or 49.8%).

Respondents' opinion towards green corporate identity, green personal-social identification, green supply chain management and green business performance

From the study, the following conclusions can be drawn:

In terms of green corporate identity, the study finds that the respondents have opinion in strongly agreeable level towards green forces and drivers (GFD) with mean score of 4.288 and standard deviation of 0.613. This is followed by green corporate communication (GCCo), green corporate culture (GCCu), green products and services (GPaS), and green corporate policy (GPo) with mean scores of 4.276, 4.254, 4.253, and 4.219 and standard deviations of 0.552, 0.639, 0.625, and 0.632, respectively. In the meantime, the respondents have opinion in agreeable level towards green employee behaviour (GEB) and green corporate visual identity (GCVI), with mean scores of 4.144 and 4.085 and standard deviations of 0.588 and 0.617, respectively (Table 4.2).

In relation to employee green personal-social identification, the study finds that the respondents have opinion in agreeable level towards employee green personal identification (GPI) and employee green social identification (GSI) with mean scores of 4.036 and 3.996 and standard deviations of 0.652 and 0.691, respectively.

In relation to green supply chain management, the study finds that the respondents have opinion in strongly agreeable level towards green manufacturing (GMan) and green marketing (GMar) with the mean scores of 4.252 and 4.221 and standard deviations of 0.571 and 0.625, respectively. Meanwhile, the respondents have opinion in agreeable level towards green design (GDes), green logistics (GLog), green procurement (GPcu), and green recovery (GRec) with mean scores of 4.185, 4.153, 4.101, and 4.013 and standard deviations of 0.614, 0.596, 0.620, and 0.712, respectively.

Lastly, in relation to green business performance, the study finds that the respondents have opinion in strongly agreeable level towards environmental performance (EnP) and social performance (SP) with mean scores of 4.293 and 4.284 and standard deviations of 0.611 and 0.658, respectively. Whereas the respondents have opinion in agreeable level towards economic performance (EP) with mean score of 4.135 and standard deviation of 0.673.

Model purification through EFA and CFA

The study discovered the remaining variables using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). There are 30 remaining variables for green corporate identity. To begin, there are six observed variables in green corporate communication: GCCoI1, 4, 5, GCCoE1, 2, and 3. Second, green corporate visual identity consists of 3 observed variables: GCVI2, 4, and 5. Third, green corporate culture consists of 4 observed variables: GCCu1, 2, 3, and 4. Fourth, green employee behaviour consists of 5 observed variables: GEBR2, 4, 5, GEBE5, and 6. Fifth, green corporate policy consists of 4 observed variables: GPo1, 2, 3, and 4. Sixth, green forces and drivers consists of 4 observed variables: GFD1, 2, 3, and 4. Finally, green products and services consists of 4 observed variables: GPaS1, 2, 3, and 4.

There are 9 variables left for green personal-social identification. To begin, green personal identification is made up of four observed variables: GPI1, 4, 5, and 6. Second, there are five observed variables in green social identification: GSI1, 2, 3, 4, and 5.

For green supply chain management, there are 26 remained variables. First, green design consists of 5 observed variables: GDes1, 2, 3, 5, and 6. Second, green procurement consists of 5 observed variables: GPcu1, 3, 4, 5, and 6. Third, green manufacturing consists of 5 observed variables: GMan2, 3, 4, 5, and 7. Fourth, green recovery consists of 3 observed variables: GRec1, 3, and 4. Fifth, green logistics consists of 4 observed variables: GLog4, 5, 6, and 7. Finally, green marketing consists of 4 observed variables: GMar2, 3, 4, and 6.

For green business performance, there are 19 remained variables. First, economic performance consists of 7 observed variables: EP1, 2, 3, 4, 5, 6, and 7. Second, environmental performance consists of 6 observed variables: EnP1, 2, 3, 4, 5, and 6. Finally, social performance consists of 6 observed variables: SP1, 2, 3, 4, 5, and 6.

Hypotheses Investigation

According to the findings of the study, green corporate identity has a positive impact on employee green personal identification, employee green social identification, and green supply chain management. Meanwhile, green personal identification has a positive impact on employee green social identification, and green business performance but has no impact on green supply chain management. Green social identification also has a positive impact on green supply chain management and green business performance. Finally, green supply chain management has a positive influence on green business performance (Table 133).

Table 133 Summary of hypotheses investigation

Hypotheses	**P**	**Result**
Hypothesis 1: Green corporate identity has a positive influence on employee's green personal identification.	0.000	Accepted
Hypothesis 2: Green corporate identity has a positive influence on employee's green social identification.	0.000	Accepted
Hypothesis 3: Green corporate identity has a positive influence on green supply chain management.	0.000	Accepted
Hypothesis 4: Green personal identification has a positive influence on green social identification.	0.000	Accepted
Hypothesis 5: Green personal identification has a positive influence on green supply chain management.	0.566	Rejected
Hypothesis 6: Green personal identification has a positive influence on green business performance.	0.002	Accepted
Hypothesis 7: Green social identification has a positive influence	0.046	Accepted

Hypotheses	P	Result
on green supply chain management.		
Hypothesis 8: Green social identification has a positive influence on green business performance.	0.048	Accepted
Hypothesis 9: Green supply chain management has a positive influence on green business performance.	0.000	Accepted

5.2 Discussion

Objective 1: To study green corporate identity, employee's green personal-social identification, green supply chain management and green business performance in automobile manufacturing industry in Thailand.

To study green corporate identity in automobile manufacturing industry in Thailand

According to the study, automobile manufacturers place a high value on green forces and drivers (GFD), green corporate communication, green corporate culture, green products and services, green corporate policy, green employee behaviour, and green corporate visual identity, all of which are rated as agreeable or strongly agreeable. These components are important for creating green corporate identity. The study result is consistent with the study done by Melewar and Jenkins (2002) who mentioned that the corporate identity can consist of communication, visual identity, behaviour, corporate culture and marketing conditions. Meanwhile, Podnar (2005) studied corporate identity in Slovenia and discovered that it can include corporate behaviour, corporate communication, corporate culture, mission and values, philosophy, personality, and vision. Furthermore, this study is consistent with the reports of Maurya et al. (2015), Foroudi (2015), and Balmer (2017), who advocated that corporate identity can include symbol, corporate behaviour, communication and visual identity, mission and value, philosophy, external stakeholder behaviour, and analysis of business environment including environmental forces and drivers.

In terms of green forces and drivers, respondents from automobile manufacturers strongly agreed on this variable because the company should create a corporate identity to respond to the business environment that is constantly forcing and driving the business to change business practices, particularly in environmental matters. Examples of green forces and drivers include external forces concerning environmental issues arising from industrial involvement, internationalization, technological innovation, governmental matters, and society that require the corporate to confront and show concern for corporate management. The study is consistent with the report of Melewar (2003) and Melewar and Wooldridge (2001), who advocated that industrial forces from external parties such as customers, competitors, and suppliers can promote environmental concerns and protection, which ultimately create the way the company needs to differentiate itself from other competitors. Meanwhile, the study results are also consistent with Karimi and Rahim (2015), who stated emphatically that being on an international level can force corporations to be concerned about environmental issues.

Additionally, Malviya and Kant (2017) and Rashid et al. (2018) also found that green technology innovation force that refers to the supports of the technology and innovation in promoting and managing the environmentally friendly works, products, and services can assist the corporate to promote and produce works, products, and services. Similarly, Alhamali (2019), Malviya and Kant (2017), and Walker et al. (2008) discovered that societal and community forces concerned with and promoting environmental awareness and protection can compel corporations to be concerned with and respond to environmental issues. Finally, green governmental regulations and laws derived from governmental regulations and laws can drive and force corporations to conform to environmental standards (Chidchob & Pianthong, 2020; Huang et al., 2017; Jasmi & Fernando, 2018; Maditati et al., 2018)

Green corporate communication was strongly supported by respondents from automobile manufacturers. This is because the company must communicate directly and indirectly with its internal and external stakeholders about environmental concerns, management, and protection to improve stakeholder relationships and understanding of the corporate's distinguished identity (Balmer, 1995; Balmer & Gray, 1999; Maurya et al., 2015; Melewar, 2003; Melewar & Karaosmanoglu, 2006; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014). For internal communication, the company communicates the company's policy, mission, goal, vision, and identity toward corporate action on environmental issues and concerns to employees as internal stadtholders of the organization so that they can be aware of and engage in green activities (Tourky, 2013; Waithaka, 2014). Internal communication, in particular, focuses on both formal and informal methods of conveying messages related to environmental awareness, concerns, and protection, as well as related knowledge and information to employees, such as morning and annual meetings, etc. Furthermore, the company communicates with employees about the corporate policy, guideline, or goal related to environmental awareness, concern, and protection through various channels such as e-mail, new boards, and circulated letters, etc.

For green corporate culture, the respondents strongly agreed on green corporate culture in automobile manufacturers. Additionally, the study discovers that green corporate culture can create green corporate identity because corporate culture can guide employees to behave in accordance with the company's mission, vision, philosophy, and values to achieve the company's goal and expected practices (Balkaran, 1995; Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002; Rowlinson & Procter, 1999).

Schein (1985), corporate culture can foster mutual understanding, agreement, and execution of organizational activities in terms of the group's shared experience and integration with external and internal parties. Green corporate culture can comprise a green vision that informs the corporate's expectation to play a role in addressing and protecting environmental issues (Denison & Mishra, 1995; Küçükoğlu & Pınar, 2015b; Podnar, 2005), green values advocating the belief in the corporate embedded by corporate language, rituals, attitude, and ideologies that direct the corporate and its member to perform the works related to environmental concerns (Arendt & Brettel, 2010; Foroudi, 2015; Tourky, 2013), green principle which is a standard related to environmental concerns that governs the actions of corporate members and serves as the underlying right or wrong basis for all corporate members (Melewar, 2003; Melewar & Akel, 2005; Melewar & Jenkins, 2002), green guideline which refers to the interpretation and actualization in unfolding the principle for guiding corporate members in acting and performing work in the context of environmental concerns (Khiewnavawongsa & Schmidt, 2013; Melewar, 2003). as well as green mission informing the statement to present the reason why the corporate is still existing for environmental concerns and protection (Atakan & Eker, 2007;

Foroudi, 2015). The green culture has its significance for the automotive industry. For example, the study done by García-Machado and García-Machado and Martínez-Ávila (2019) in Automotive Industry using partial least squares structural equation modeling (PLS-SEM) revealed that green culture described as employees' involvement, value consistency, organizational adaptability to possible challenges, and clear mission establishment through green innovation can have positive relationship with environmental performance. Similarly, the study done by Hardika et al. (2019) in a Malaysian manufacturing company using PLS-SEM revealed that green organizational culture involving creative strategies, ecological policy, and sustainable practices, positively and significantly influenced green product innovation, green process innovation, competitive advantage, and environmental performance.

In terms of green products and services, the respondents strongly agreed on this variable because the products and services can immediately inform the customers and external parties about the corporate identity towards environmental objectives. Indeed, green products and services can be defined as features that demonstrate a match between the customers' expectation and perception of product and service quality, which can result from the connection between functional quality and technical quality from the process to the end products and services, and the way to maintain customers satisfaction, good experience and loyalty through environmentally conservative and protective products and services (Balmer & Stotvig, 1997; Grönroos, 1984; Melewar & Wooldridge, 2001). Importantly, the company is necessary to consider product and service, functional quality and technical quality, customer relationship building and customer's expectation and perception delivered to the customers. Segev et al. (2016) examined 433 unique ads from approximately 8 magazine titles that were presented in 2009 and 2010 and discovered that there was a high demand for green products and services, addressing the rise in environmental concern. As a result, there is a need to consider green products and services.

The respondents strongly agreed on this point in terms of green corporate policy because the policy can provide practical interpretation and knowledgeable support for the organization's employees. Every action relating to environmental issues must be taken at the policy decision level. As a result, whether or not all employees can perform tasks related to environmental issues is dependent on the supportive policy. Companies in the automobile industry that want to achieve environmental management missions and goals should develop appropriate policies. The policy can be related to assisting and providing environmental management techniques to suppliers, customers, and other stakeholders, as well as collaborating with suppliers, customers, and other stakeholders to engage in green activities. Furthermore, the company has a policy that responds to green business and activities, as well as a policy that changes and adjusts its corporate activities and business to be green. According to Küçükoğlu and Pınar (2015a), approximately 68% of respondents in an organization from various sectors in Turkey agreed that the company can go green at work because they had set an environmental policy to support their employees.

In terms of green employee behaviour, the respondents agreed on this variable because the behaviour of the employees can be the interesting indicator to identify the corporate identity. The behaviour of the employees shaped by the corporate culture, policy, mission, values and guideline can influence the better looks of the company. There are two kinds of employees' behaviour: in-role and extra-role behaviour. For green in-role behaviour, Norton et al. (2014) termed the green in-role behaviour as 'employee's task-related green behaviour', which refers to the way the employees in the organization perform the work to fulfill their responsibility. As a result, automobile manufacturers must establish clear job assignments so that employees can fulfill their job responsibilities (Yang et al., 2019). The study is consistent with the study done by Pham et al. (2020) who studied employees' in-role green performance in three- to five-star hotels and found that the organization starts to promote required works, tasks or roles regarding environmental concerns, management and protection assigned to their employees. In addition, the study finds that extra-role behaviour is also important and receives emphasis from the company. This is because the extra-role behaviour can increase employee's willingness to work, initiate, help, share, afford and inspire other organizational members about environmental concerns, management, and protection of the corporate (Boiral & Paillé, 2012; Chun, 1994). This study's findings are similar to those of Safari et al. (2018), who discovered that green employees' behaviour included idea suggestion, participation, knowledge sharing, questioning, and extra-role work as the measurement of green behaviour. Additionally, the study result also corresponds to the study done by (Iqbal et al., 2018)who found that green employee's behaviour consists of working sustainably, avoiding harm, influencing others, and taking initiative to study the employees' green behaviours as well as consistent with the study done by Yang et al. (2019) who included workplace involvement, initiative and extra-role working in defining the green extra-role behaviour.

Finally, in terms of green corporate visual identity, respondents expressed an agreeable attitude toward this dimension. The corporate visual identity has been critical for the company because it can influence the effectiveness of company communication. Many companies, including automobile manufacturers, rely on corporate visual identity such as graphic design, color, symbol, logo, slogan, and typography to communicate their environmental concerns, management, and protection issues. Automobile manufacturers which statistically emit the most environmental problems such as greenhouse gases, hazardous chemicals, and wastes, must use the corporate visual identity to demonstrate the company's environmental awareness. The study is consistent with Flores (2017)'s study, which advocated that colour is very important for having consumers interested in the corporate's brand personality, which includes excitement, sophistication, and ruggedness, leading to corporate recognition. Furthermore, Bresciani and Del Ponte (2017) stated that logos can elicit affective reactions in viewers prior to encountering promotional activity conducted by the corporate. Finally, Bresciani and Del Ponte (2017)discovered that logos with a brand icon and/or name are more appealing to viewers than logos displayed alone.

To study employee's green personal-social identification in automobile manufacturing industry in Thailand.

In relation to employee green personal-social identification, the study finds that the respondents have opinion in agreeable level towards employee green personal identification and employee green social identification. This is due to the fact that employees in automobile manufacturers are promoted and communicated their individual and social roles in the organization to complete their tasks, particularly those involving environmental work. Through direct and indirect communication from internal and external forces and drivers, the employees in automobile starts to recognize their individual tasks, values, personality as well as lifestyle that fits into the organization vision, mission, and culture, which is consistent with Graeff (1996) and Han et al. (2005) who defined personal identity as the perception that a person's belief fits with his/her identity. In terms of social identification, employees in automobile manufacturers agreeably acknowledge themselves on a social level, believing that their value, lifestyle, and personality are also compatible with the organization's social perception, allowing them to be accepted and respected by group members. This is because the automobile manufacturers attempt to promote teamwork environment as well as recreational activities to build the employees' social identification. The findings are consistent with those of Dutton et al. (1994) and Halliday and Kuenzel (2008), who defined social identification as the degree or level to which a member defines himself or herself in relation to the same attributes in society or organizations. Furthermore, the study is consistent with the findings of Carroll and Ahuvia (2006) and Sukortprommee (2013), who found that the degree of employees' social identification in the organization was high, with employees believing that their values, lifestyle, and attitudes were consistent with the organizational image.

To study green supply chain management in automobile manufacturing industry in Thailand

In relation to green supply chain management, the study finds that the respondents have opinion in strongly agreeable level towards green manufacturing and green marketing, respectively. In the meantime, the respondents have opinion in agreeable level towards green design, green logistics, green procurement, and green recovery, respectively. This is due to the importance of the study on green supply chain management to the organization. It can increase business performance such as increase in revenues and profits (Banihashemi et al., 2019; Zampese et al., 2016), increase in market share and sales growth (Leonidou et al., 2017), and increase in organizational competitiveness (Banihashemi et al., 2019). Additionally, it can increase environmental performance such as waste and pollution reduction

(Banihashemi et al., 2019; Kuei et al., 2015), environmental accidents reduction (Kuei et al., 2015), as well as organization's environmental image improvement (Leonidou et al., 2017; Rawashdeh, 2018). Accordingly, green supply chain management has been adopted in many organizations including automobile manufacturers.

To begin, the study discovers that respondents from automobile manufacturers have favorable attitudes toward green manufacturing. This is due to the fact that manufacturing is the primary process of automobile manufacturers in producing and assembling automobile products. Through efficient production, manufacturing improvements, proper technology section, strategic planning, and standard acceptance, the companies in this study emphasize on reducing hazardous-chemical inputs, wastes, air-noise-water-soil pollutions, production costs, and energy consumption. The study is consistent with the report of Tseng and Chiu (2013) and Zhu et al. (2007a) who found that re-manufacturing and lean production as well as hazardous reduction should be implemented in manufacturing process. Meanwhile, Tippayawong et al. (2015)discovered that green manufacturing can include preventive maintenance of machines, clean manufacturing technologies, and strategic planning for optimizing waste treatment and disposal systems in their study of green supply chain operations on Thai electronic firms. In addition, the study is consistent with the report of Çankaya and Sezen (2019) who studied green supply chain management practices in manufacturing firms in Turkey and found that green manufacturing can consist of reducing energy and natural resources consumption, filtering and controlling emissions and discharges as well as substituting polluting and hazardous materials and parts.

Second, green marketing is important for automobile manufacturers because it allows the company to focus on customer management as well as sales. The study indicates the consistency of the study done by Zampese et al. (2016) who studied about green marketing as a mediator between supply chain management and organizational performance in the construction business and found that green marketing can extend to corporate image by adopting green features to improve the corporate image and monitoring tool using the market monitoring tool aiming to follow green-competitive practices. Meanwhile, Çankaya and Sezen (2019) added that green marketing can also include supplying customers and institutions with regular voluntary information about environmental management, sponsoring environmental events/collaboration with ecological organizations, using natural environmental arguments in marketing, periodically updating company's website on environmental issues, labeling products with environmental purposes as well as considering eco-products that can boost the consumers' purchasing willingness.

Third, green design has been researched and found to be important in green supply chain management in automobile manufacturers, as they must design cars to meet the needs of their customers while also saving energy, environment, nature, and the world, as many car manufacturers claim about environmental awareness. This study result is in line with the report from Green et al. (2012)and Tseng and Chiu (2013)who found that the companies were necessary to design the products together minimizing the negativity on the ecological environment, such as reusing, recycling, and recovering to help save energy, promote friendly usage, and reduce pollution. In addition, the study by Yang et al. (2013) also found that the design of products for reduced consumption of materials/energy and collaboration with both domestic and international customers for eco-design, packages, and environmental management solution can be included in green design and green supply chain management.

Fourth, respondents from automobile manufacturers have a favorable attitude toward green logistics. This is due to the fact that automobile manufacturers must consider logistics and transportation as well as making it friendly to the natural environment and society. Companies must ensure that their products are delivered to the right customers at the right time and in the right place. As a result, the companies opt for environmentally friendly transportation, meticulous transportation maintenance, a full truck load system, information technology, and just-in-time logistics. The study is in line with the report of Enarsson (1998), Salimifard et al. (2012) and Murphy and Poist (2000) who revealed that green logistics can include environment-friendly distribution, usage of green fuels such as low sulfur content and alternative fuels such as liquid natural gas, as well as concerns on transportation employee health and safety. The study also corresponds with the study done by Tippayawong et al. (2015) on Thai electronic firms and found that the companies highly adopted check and maintenance plan of delivering vehicles as well as full truck load system in logistics management. In addition, Çankaya and Sezen (2019) advocated that manufacturing firms in Turkey also used cleaner transportation methods, full vehicle loading approach, as well as effective routing systems.

Fifth, green procurement in Thailand's automobile manufacturers has been critical. Companies focused on collaborating and purchasing inputs, materials, equipment, technology, and other supplies from domestic or international suppliers who provide environmentally friendly supplies in accordance with environmental standards, requirements, and objectives. The findings are consistent with those of Yang et al. (2013), who investigated the efficacy of purchasing activities and strategic involvement: an international comparison of two country groups, Asia and Western Europe/USA, and discovered that purchasing activities can include ordering, quoting, and expediting processes, as well as supplier selection. Meanwhile, Kannan et al. (2014) who studied on selecting green suppliers based on green supply chain management practices in Brazilian Electronics Company found that the selection of supplier to support green supply chain management should be based on the ability of a supplier who will enhance the green supply chain of a company. As a result, suppliers needed to be educated on how product designs were created to proactively embrace environmental management practices.

Finally, respondents from the automobile industry agreed on green recovery because it is critical for the company to adopt in managing the green supply chain. The value remained in no-longer-used manufacturing inputs and materials, old and/or used products and inventories, old and/or used materials, equipment, and machines, and reverse them into organization cash, assets, or equity. This is due to the fact that green recovery can be another way for the company to help reduce production costs while also improving its environmental image. This study's findings are consistent with those of Büyüközkan and Çifçi (2012), Tseng and Chiu (2013), and Govindan, Soleimani, et al. (2015), who discovered that green recovery includes resale, reuse, replacement, or refurbishment of used parts or components.

Furthermore, Green et al. (2012) collected data from 159 manufacturing managers to study green supply chain management practices and discovered that green supply chain management in terms of green recovery can improve environmental and economic performance, which in turn positively impacts operational performance.

To study green business performance in automobile manufacturing industry in Thailand

In relation to green business performance, the study finds that the respondents have opinion in satisfactorily agreeable level towards environmental performance, social performance and economic performance. This is because when the companies adopt the environmental focus and management by communicating, promoting, and managing all factors from internal and external perspectives from employees, suppliers, customers and other related involvers, this can lead to satisfactory level of business performance. This includes the case of automobile manufacturers in Thailand. The business performance that has been studied in this research includes economic aspect referring to financial perspectives, environmental aspect referring to environmental benefit, and social aspect referring to society benefit, and the result is consistent with the study from many researchers (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Chienwattanasook & Jermsittiparsert, 2019; Green et al., 2012; Kafa et al., 2013; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2008b).

In terms of environmental performance, the respondents advocate that the companies can gain better ecology environmental systems, organization reputation, resources utilization, waste and pollution reduction, and environmental accidents reduction. The study result is consistent with the study conducted by Çankaya and Sezen (2019)who studied about the effects of green supply chain management practices on sustainability performance and found that environmental performance can include improvement of an enterprise's environmental situation, reduction in air emission, and decrease in consumption of hazardous/harmful/toxic materials. Similarly, Banihashemi et al. (2019) who studied about relationship between reverse logistics and sustainability performance found that the environmental performance can include reduction in energy and resources, firm's environmental image, and land and biodiversity maximization. In addition, the study is also in line with the report of Fernando et al. (2019)who studied about green growth in technology firms through the connections between environmental innovation and sustainable business performance and the study done by Rawashdeh (2018) about organizational environmental performance in Jordanian health service organizations.

In terms of social performance, the respondents in automobile manufacturers in Thailand also gained better social performance from adopting green practices in the companies. They received social satisfaction, social relationship, social participation, social collaboration, social life quality, and social services from both internal and external society including employees, customers, suppliers, community, and governmental agency. The study is consistent with the report of Mutingi et al. (2014) about performance management systems for the green supply chain where it was discovered that organizational performance can include increase in green image, which there was an increase in customer goodwill due to greening activities. Moreover, the study also has similar result with the study done by Çankaya and Sezen (2019), Banihashemi et al. (2019) and Fernando et al. (2019) who revealed that received social performance can be such as improvement in relations with community stakeholders, customer health and safety, stakeholders' participation, employment stability, customer satisfaction and loyalty, and community relations.

Finally, respondents in Thailand's automobile manufacturers benefit economically from implementing green practices in their organizations. The study finds that the automobile can gain business success mainly based on reduction in purchasing and delivering cost, reduction in energy usage, reduction in waste discharge and treatment payments, reduction in payments related to environmental accidents, increase in revenues and profits, increase in market share and sales growth, and increase in organizational competitiveness. The study is consistent with the report of several researchers such as Kuei et al. (2015) who studied about performance improvement of green supply chain management in China and found that the company can gain an increase in revenue, return on asset, and return on equity. Meanwhile, Çankaya and Sezen (2019) investigated the effects of green supply chain management practices on sustainability performance and discovered that environmental performance can include a reduction in the cost of materials purchased, a reduction in the cost of energy consumption, and a reduction in the fee for waste discharge.

Furthermore, Zampese et al. (2016) investigated green marketing as a mediator between supply chain management and organizational performance in the construction industry and discovered that it improved financial results and increased revenue.

Objective 2: To investigate a positive influence of the green corporate identity on employee's green personal identification, employee's green social identification, and green supply chain management in automobile manufacturing industry in Thailand.

According to the findings of the study, green corporate identity has a significant positive influence on employee green personal identification, employee green social identification, and green supply chain management. This is due to the company's need to communicate with their employees about what they have recently done with the company. The company can communicate with employees in a variety of ways, including internal communication indicating what employees should and should not do. In particular, in terms of environmental issues, which are extra specifications required of employees in the workplace, the company should inform their employees explicitly and clearly about what the green corporate policy guiding an increase in employees' green performance entails.

Notably, Foroudi (2015) and Balmer (2017) advocated that corporate has directly and indirectly communicated with its internal stakeholders about the environmental concerns, management, and protection to better the relationship and understanding toward the distinguished identity of the corporate. Indeed, external communication towards company's stakeholders such as customers, suppliers, governors, as well as community can be directly and indirectly communicated to employees of the company because the employees need to work to respond to the needs of the customers and other stakeholders. For example, the company presented its environmental emphasis on products and services to customers, and the customers will later put forward environmental demand in the form of product and service design that is aligned with green concepts and mindset. This is in line with the study done by Balmer and Stotvig (1997) and Melewar and Wooldridge (2001) who found that product and service quality can also be embedded in presenting green corporate identity since it can display the relationship between the customers' expectation and perception towards product and service quality. In terms of creating product and service quality, Grönroos (1984) advocated the connection between functional quality and technical quality from the process to the end products and services to keep customers satisfaction, good experience and loyalty.

However, the visuality that can present the green corporate identity to all stakeholders through graphic design, color, symbol, logo, and typography through possible ways such as product, location, vehicle, printing, and other media channels must be considered to present the quality of service and products (Baker & Balmer, 1997; Dowling, 1995; Melewar, 2003; Tourky, 2013). This is very important because people who look at the visual identity can understand the company better and accurately return the message to the company. Additionally, the research conducted by Maditati et al. (2018), Alhamali (2019), and Chidchob and Pianthong (2020) demonstrated that external forces concerning environmental issues from industrial stakeholders, governmental matters, and society can positively influence and require the corporate to confront and be concerned about environmental management issues.

Another method for communicating with employees is to foster a green corporate culture by instilling in-role and extra-role behaviour, which refers to performing tasks in accordance with a clear job description and going above and beyond to assist other employees in the company. Literally, and Yang et al. (2019) proposed that employees behaving in accordance with the company's shared values, culture, structure, and strategy regarding environmental concerns, management, and protection can help reflect the company's environmental management. Importantly, the company should place emphasis on its vision, shared values, history, philosophy, principles, and guidelines concerning environmental concerns, management, and protection. When their corporate identity is well managed, their employees, both individual level and collective level will attempt to understand and interpret it into their actions by matching themselves, in terms of employee’s personal attitudes; personality; value; in-role and extra-role practices, with the organizational objectives, value, culture, policy and guideline (Lassar et al., 1995; Sukortprommee, 2013) and society’ norms, principles, and influence (Carroll & Ahuvia, 2006; Sukortprommee, 2013). Employees who identify with the corporate identity will develop a better working mindset (Chen, 2011), as well as raise employee awareness of environmental issues and protection (Sharma, 2000). As a result, it may lead to improved green supply chain management performance.

The green supply chain management consists of green design, green procurement, green manufacturing, green recovery, green logistics, and green marketing that requires employees' understanding of working goals and guidelines given by the company through various direct and indirect channels, including corporate visual identity, corporate culture through corporate vision, mission, and employee behaviours, corporate policy, products and services and green environmental forces to achieve the work performance. The study result is in line with the study conducted by Zampese et al. (2016) who found that core value related to environmental management and concern stated in mission and vision statement is very important to create the company green practices and lead employees to have better performance in managing the work related to environmental concerns.

Additionally, the study result is also in line with the report of Green et al. (2012) and Kuei et al. (2015) who indicated that better green practices depended on green environmental programs such as ISO14000 guiding the employees and company to go green as well as Çankaya and Sezen (2019) who profoundly found that internal management such as cross-functional cooperation for environmental improvements, environmental management system, and support for environmental practices from senior managers and mid-level managers can improve better management in green supply chain. As a result, Tippayawong et al. (2015) advocated for strategic planning for green supply chain adoption, as well as creating the concept of environmental responsibility and implanting it into employees' minds.

Objective 3: To investigate a positive influence of the employee's green personal identification on employee's green social identification, green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

According to the findings of the study, green personal identification has a significant positive influence on employee green social identification and green business performance but has no positive influence on green supply chain management. This is due to the fact that corporate management creates a corporate identity that emphasizes reducing harmfulness and creating a link between corporate and employees so that the corporate can create working guidelines and encourage employee behaviour to be better (Chen, 2011; Sharma, 2000). When employees in an organization understand what their organization's environmental requirements, objectives, or green directions are, they will identify themselves to respond to their green corporate identity (Karaosmanoglu et al., 2016).

In addition, the employees who can identify themselves to respond to the green concept, vision, mission, and culture that are generated by the organization, will additionally create the social identification which the employees in the organization will understand truly and work together closely to obtain their goals (Carroll & Ahuvia, 2006; Sukortprommee, 2013) that are related to green business performance including economic performance focusing on cost reduction and returns, environmental performance focusing on environmental friendliness and corporate image improvement, and social performance benefiting the employee (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2007b). However, this study discovered that while employee green personal identification has no positive influence on green supply chain management, it does have a significant indirect influence on green supply chain management. This is due to the fact that working in the theme of green supply chain management necessitates not only knowledge and skills, but also teamwork and collaboration, which is fueled by social identification. Employees who join the social group will be encouraged to work well together on green supply chain management issues such as input purchasing, product and service design, product manufacturing, product and service marketing, logistics, and investment recovery. Each activity concerns green concepts (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Soleimani, et al., 2015; Kuei et al., 2015; van Hoek, 1999; Zampese et al., 2016; Zhu et al., 2007b) and create green business performance (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu & Sarkis, 2007; Zhu et al., 2007a)

Objective 4: To investigate a positive influence of employee's green social identification on green supply chain management, and green business performance in automobile manufacturing industry in Thailand.

According to the findings of the study, green social identification has a significant positive direct and indirect influence on green supply chain management and green business performance. This is because, following the employee's self-expression, she/he feels a sense of belonging to the organization in the way that the organization's identity and management on environmental awareness and protection fit and correspond to her/his individual personality, attitudes, values, and practices (Lassar et al., 1995; Sukortprommee, 2013), and they will be able to perform environmental assignments more effectively because their commitment to environmental problems and requirements coincides with the corporate's green identity (Chen, 2011; Sharma, 2000).

Green corporate identity can be created through a variety of components such as green communication, visualization, culture, employee behaviour, policy, forces and drivers, and product and service quality (Balmer, 1995; Balmer & Gray, 1999; Maurya et al., 2015; Melewar et al., 2005; Melewar, 2003; Podnar, 2005; Tourky, 2013; Van Riel & Balmer, 1997; Waithaka, 2014). Furthermore, employees who can identify themselves to respond to the corporate's green identity will also create the social identification that the employees in the organization will truly understand and work together closely to achieve their goals (Chen, 2011; Sharma, 2000). They will realize that their methods of working on environmental assignments, which are encouraged by their corporate's green identity can also match with society (organization), influencing them to be accepted as a part of their society in accordance with organizational norms, values, and culture (Carroll & Ahuvia, 2006; Sukortprommee, 2013).

Finally, when each employee can identify herself or himself as a member of society in the organization, she or he will be willing to collaborate with other members of society to produce effective results in the supply chain from upstream to downstream, including purchasing, designing, manufacturing, marketing, logistics, and investment recovery (Azevedo et al., 2011; Çankaya & Sezen, 2019; Govindan, Soleimani, et al., 2015; Kuei et al., 2015; van Hoek, 1999; Zampese et al., 2016; Zhu

& Sarkis, 2007). Later, effective green management will result in corporate green business performance that includes economic performance focused on cost reduction and returns, environmental performance focused on environmental friendliness and corporate image improvement, and social performance benefiting employees, the community, customers, and suppliers, etc (Banihashemi et al., 2019; Çankaya & Sezen, 2019; Leonidou et al., 2017; Ngniatedema & Li, 2014; Zampese et al., 2016; Zhu et al., 2007a). In fact, an employee's green social identification can have a direct impact on green business performance, but it creates better green business performance when it is managed through a green supply chain.

Objective 5: To investigate a positive influence of green supply chain management on green business performance in automobile manufacturing industry in Thailand.

According to the findings of the study, green supply chain management has a significant positive impact on green business performance. This is due to the importance of green supply chain management to the organization. The methods in which automobile manufacturers concern themselves, such as designing, producing, and distributing products to meet the needs of customers while also aligning with environmental awareness, can lead to an increase in green business performance in terms of economic aspect (what the organization receive in terms of financial perspectives), environmental aspect (what the environment is benefited) and social aspect (what the internal and external society receives). This study's findings are consistent with those of Green et al. (2012), Tseng and Chiu (2013), and Lin (2013), who discovered that designing products for reduced material/energy consumption and collaborating with both domestic and international customers and suppliers can help create organizational performance from both financial and non-financial perspectives. Also, the study result has similar outcomes as the study done by Tippayawong et al. (2015) about the green supply chain operations on Thai electronic firms where it was discovered that green manufacturing including using clean manufacturing technologies and strategic planning for optimizing waste treatment and disposal system, as well as green logistics can have an impact on electronic firms' financial performance.

Furthermore, automobile manufacturers also place importance on green procurement while focusing on cooperating and purchasing the inputs, material, equipment, technology, and other supplies from domestic or international suppliers who are involved in providing environmental supplies under the environmental standard, requirements, and objectives since it can help the company increase business performance and business sustainability. The study is consistent with the research done by Yang et al. (2013) who studied about efficacy of purchasing activities and strategic involvement: an international comparison between two country groups, Asia and Western Europe/USA, and found that purchasing activities can have an impact on manufacturing competitiveness regardless of national differences. Meanwhile, Kannan et al. (2014) conducted a study on selecting green suppliers based on green supply chain management practices in a Brazilian electronics company and discovered that supplier selection to support green supply chain management can ultimately link to business sustainability.

Also, the automobile manufacturers increase the green business performance by employing green recovery as one of the dimension in green supply chain management because green recovery which concerns the action of the companies to consider the value remained in the no-more-use manufacturing inputs and material, old and/or used products and inventories, old and/or used materials, equipment, and machines, and reverse them into organization cash, assets, or equity, can help the company obtain the business performance and business sustainability. This study is consistent with the study done by Büyüközkan and Çifçi (2012), Tseng and Chiu (2013) and Govindan, Soleimani, et al. (2015) who revealed that the green recovery including resale, reuse, replacement or refurbishment of the used parts or components can improve the business finance and environmental performance. Additionally, Green et al. (2012) studied about green supply chain management practices by collecting data from 159 manufacturing managers and found that green supply chain management in terms of green recovery can improve environmental performance and economic performance, which, in turn, positively impacts operational performance.

As with other industries, green marketing, which refers to activities related to marketing strategies, marketing processes, market segmentation, market positioning, pricing, and advertising to market products and services to customers, can lead to increased business performance and business sustainability. The findings are consistent with those of Chan et al. (2012), who investigated the impact of green supply chain management on corporate performance in 194 foreign-invested enterprises operating in China and discovered that green marketing has an impact on corporate performance. In addition, the study is also consistent with the report of Zampese et al. (2016) who indicated that green marketing has an impact on organizational performance such as corporate image. Moreover et al. Simão and Lisboa (2017), Sertyesilisik (2017) and Gelderman et al. (2021) added that green marketing can increase revenue, decrease cost of production, improve relations with community stakeholders as well as improve environmental image.

Objective 6: To study a positive influence of green corporate identity on green business performance in automobile manufacturing industry in Thailand through employee's green personal-social identification, and green supply chain management.

According to the findings of the study, green corporate identity has significant indirect effects on green business performance through employee green personal-social identification and green supply chain management. This is because the way the automobile manufacturers have explicit management and strategic tool adopted by the corporate to positively express the distinguished and recognizable identity manifested by corporate value, corporate culture and corporate behaviour responding towards external and internal forces in the market and industry condition through corporate mission, corporate strategy, corporate communication, visuality, and corporate products and services delivered to related stakeholders including employees, customers, suppliers, governors and community, can create understanding of employees towards their works, responsibility and volition on environmental work at the individual and social level and lead to increase in green business performance. This performance can include increase in revenues and profits, increase in market share and sales growth, and increase in organizational competitiveness, increase in environmental performance, reduction in waste and pollution, reduction in environmental accidents, as well as improvement in organization's environmental image.

Moreover, green corporate identity can have an impact on social performance such as social satisfaction, social relationship, social participation, social collaboration, social life quality, and social services to both internal and external society, including employees, customers, suppliers, community and governmental agency. The study is consistent with the report of Küçükoğlu and Pınar (2015b)who found that about 68% of respondents in an organization from different sectors in Turkey agreed that the company can go green at work because they had set the environmental policy to support their employees.

In addition, Leonidou et al. (2017) studied about 153 small Cypriot manufacturers and found that external and internal drivers can enhance performance consequences of the firms. The study also corresponds with Yang et al. (2019) report, which included workplace involvement, initiative, and extra-role working in defining that green extra-role behaviour can link employees to work well on job assignments, and ultimately, link to green business performance. Similarly, the study done by Hardika et al. (2019) in Malaysian manufacturing company using PLS-SEM revealed that green organizational culture involving creative strategies, ecological policy, and sustainable practices, positively and significantly influenced competitive advantage and environmental performance.

5.3 Limitations of the Study

For starters, this study was limited to quantitative research, with data obtained solely from self-reported questionnaires. Other research methods, such as qualitative or mixed methods, are ignored. Second, the study was limited to a single topic related to the automotive industry. As a result, the generalizability of the study's findings must be carefully considered. Third, the model only focuses on green corporate identity, employee green identification, green supply chain management, and green business performance, which may be another important variable to investigate. Fourth, the study only examines the impact of green corporate identity and employee green identification, green supply chain management, and green business performance using a structural equation modeling (SEM), ignoring other aspects such as comparing the degree of variable perception using other statistical techniques. Fifth, the study of green supply chain management in this study focuses on collecting data from manufacturers' perceptions, while perceptions from other supply chain players such as Tiers 1 and 2 are not considered. Lastly, the study collected the data during the COVID 19 outbreak in Thailand, many companies had limited and regulated to contact with visitors, causing the difficulty in data collection and consuming high effort.

5.4 Research Implications

5.4.1 Practical Implications

After the study has been analyzed and discussed, its result can provide useful implications to the managers in the company as follows:

To create a positive influence of green corporate identity on employee's green personal identification, employee's green social identification and green supply chain management

Since it was discovered from the study that green corporate identity has a positive influence on employee's green personal identification, employee's green social identification and green supply chain management, the managerial implication suggests that these in-order matters, which include green corporate policy, green corporate communication, green corporate culture, green employee behaviour, green corporate visual identity, green products and services, and green forces, and drivers should be considered. To begin, the company should establish corporate policy to provide environmental management techniques to suppliers, customers, and other stakeholders, collaborate with suppliers, customers, and other stakeholders to do green activities, establish environmental agreements with suppliers, customers, and other stakeholders, and be adaptable and adjustable to environmental forces and drivers.

Second, the company should provide both internal and external green communication. For internal communication, the company should formally and informally convey messages to employees about environmental awareness, concern, and protection, such as morning and annual meetings, etc. Furthermore, the company should always keep its employees up to date on environmental awareness, concern, and protection. The corporate can clearly deliver knowledge, information, and news related to environmental awareness, concern, and protection. To send a message about environmental care and corporate action to all stakeholders, the company should use various channels such as its website, email, product packages, social media, and TV programs, among others. In addition, the company should participate in promoted environmental events such as being sponsors, CSR, etc. Finally, the company should publicize related environmental actions on a regular basis to keep all stakeholders informed.

Third, the company should cultivate green corporate culture by creating green vision to reflect environmental management and protection, creating green values embedded by corporate language, rituals, attitude, and ideologies that are consistent with the company's vision, mission and goal on environmental protection and awareness, providing green principles ruling the corporate members' actions and underlying right or wrong basis for all company members, and lastly, providing appropriate green guidelines by clearly interpreting and actualizing the principles related to environmental concerns for guiding corporate members to perform the environmental actions.

Fourth, the company should develop both in-role and extra-role behaviour for green employees. In order to encourage in-role behaviour, the company should establish clear job criteria, expectations, and descriptions related to environmental concerns. For extra-role behaviour, the company should encourage employees to inspire, encourage, and speak to their coworkers about environmental concerns, as well as share their knowledge about environmental action with their coworkers.

Fifth, the company should implement a green corporate visual identity, specifically a green color, a green slogan, and a green logo that can represent the corporate identity in relation to environmental concerns and convey messages about environmental concerns.

Sixth, the company should also provide green products and services that can match with the customers' need and accurately respond to their needs within the time and conditions, resulting in high customer satisfaction. Furthermore, the company should provide overall products and after-sale services that intertwine between the process and finish of products and services, which can contribute to corporate reputation. The company should emphasize the importance of maintaining relationships with customers in order for them to perceive, be satisfied with, and decide to continue using and visiting the corporate products and services.

Also, the company should observe and respond to green forces and drivers by overseeing and reacting to them. The company should keep eyes on external parties including customers, competitor, and suppliers towards promoting environmental concerns and protection. Their practices and behaviour can direct the company's direction and strategies. The company should consider internationalization forces because being an internal company requires compliance with international environmental standards as well as global expectations from the international business environment. The company should pay close attention to green technology and innovation because technological and innovative supports can promote and manage environmentally friendly works, products, and services.

To create a positive direct and indirect influence of green personal identification on employee's green social identification, green supply chain management and green business performance

Because green personal identification has a positive direct impact on employee green social identification and green business performance, as well as a positive indirect impact on green supply chain management, the company should consider promoting employee green personal identification. In addition, the company should understand the employee lifestyle, personality, and role by organizing work and non-work activities such as company orientation, department meetings, and supervisory programs to observe and learn more about employee behaviour so that the company can lead them to have self-expression toward green corporate identity.

To create a positive direct and indirect influence of green social identification on green supply chain management and green business performance

Because green social identification has a positive impact on green supply chain management and green business performance, the company should consider promoting employee green social identification by establishing a green corporate identity such as arranging company seminar, department and company meeting, company training and group activities, which it can create social recognition and respect, social status, social role, and image. Employees who feel accepted on a social level will perform better in terms of green supply chain management and green business performance.

To a positive influence of green supply chain management on green business performance

According to research, green supply chain management has a positive impact on green business performance. As a result, the company should prioritize green manufacturing, green design, green procurement, green logistics, green marketing, and green recovery.

To reduce waste in green manufacturing, the company should first use re-manufacturing and lean production. In addition, for green production, the company should use clean manufacturing technologies. Furthermore, the company should optimize its manufacturing process for maximum efficiency and make effective use of raw materials. Finally, the company should obtain a manufacturing process that is internationally certified and standardized. Second, for green design, the company should create products and services that help reduce unnecessary energy, hazardous substances, production waste, and raw material usage, as well as negative environmental effects. Furthermore, the company should work with both domestic and international customers to develop green design, packaging, and management solutions. Finally, the company should design green products that are simple to use.

Third, the company should choose either domestic or international suppliers based on its green criteria for green procurement. In addition, the company should work with both domestic and international suppliers to deliver green raw materials. Furthermore, prior to any purchase, the company should monitor the internal green management of both domestic and international suppliers. Finally, the company should prioritize domestic and international suppliers who have identifiable green certificates or standards.

Fourth, for effective delivery, the company should use a full truck load system for green logistics. In addition, the company should use a delivery method that uses alternative energy to save energy and money. Furthermore, the company should implement just-in-time logistics. Finally, the business should use information technology to track delivery services.

Fifth, for green marketing, the company should use marketing principles as a tool to gain a competitive advantage. Furthermore, the company should conduct market research and study customers' behaviour in relation to green specifications demanded by customers and other stakeholders. Finally, the company should position and publicize its green products and services through various channels.

Sixth, for green recovery, to extend the life of end-of-life materials, parts, and components, the company should try to repair and reuse them. In addition, the company should think about reconditioning and refurbishing used parts or components.

5.4.2 Theorical Implications

Following the analysis and discussion of the study's findings, academicians can benefit from the following contributions.

To begin, the study examines the uniqueness of green corporate identity as it relates to employee green personal identification, employee green social identification, and green supply chain management in Thai automobile manufacturers. In this study through tested and validated model from EFA and CFA with empirical supports, the green corporate identity comprises green corporate policy consisting of green knowledge provision, green collaboration, green agreement establishment, and green change and adjustment; green corporate communication consisting of internal and external communication; green corporate culture consisting of green vision, green values, green principle, and green guideline; green employee behaviour including in-role and extra-role; green corporate visual identity consisting of green color, logo and slogan; green products and services consisting of products and after-sale services, production process, customer relationship building, and customer’s expectation and perception and green forces and drivers consisting of green industrial forces (from external parties including customers, competitor, and suppliers), green internationalization forces, green technology innovation forces and green societal forces.

Second, the study provides the originality of employee's green personal and social identification linked to green supply chain management, as well as confirms the relationship between employee's green personal and social identification and green business performance in automobile manufacturers in Thailand. Through the model which was empirically tested and validated through EFA and CFA, the study finds that employee's green personal identification can directly and indirectly influence green supply chain management and green business performance through employee lifestyle, personality, and role. Meanwhile the study finds that employee's green social identification can be directly link to green supply chain management and green business performance through social recognition and respect, social status, social image, social role and society views.

Third, study extends the green supply chain model in automobile manufacturers in Thailand by including green marketing as one of its components. Through EFA and CFA being employed to test and validate the model, green supply chain model in automobile manufacturers consists of green manufacturing, green design, green procurement, green logistics, green marketing, and green recovery. For green manufacturing, it consists of re-manufacturing and lean production, clean manufacturing technologies, green capacity utilization, green production efficiency and green production standard. For green design, it consists of materials/energy reduction, environment impact reduction, customers' collaboration, friendly usage, and waste and chemical usage. For green procurement, it consists of green criteria for supplier section, specific green requirements, supplier's green cooperation, environmental audit for supplier, and supplier green recognizable standard. For green logistics, it consists of green delivering routes, green cost and alternative fuels, just-in-time adoption, and green information technology. For green marketing, it consists of marketing monitoring tool, market segmentation, market positioning, and product advertising. Lastly, for green recovery it consists of recovery of end-of-life items, component replacement, and recondition and refurbishing. Accordingly, green supply chain model can have an influence on green business performance.

Fourth, the study can also contribute to the confirmation of academicians that green business performance that is influenced by green corporate identity, employee's green personal identification, employee's green social identification and green supply chain management can consist of economic performance, environmental performance, and social performance. Economic performance includes cost reduction, increased revenues and profits, increased market share and sales, and increased competitive advantages as a result of EFA and CFA being used to test and validate the model. Meanwhile, environmental performance includes resource maximization, pollution and waste reduction, accident and risk reduction, reputation enhancement, green process improvement, and green adoption capacity.

Finally, social performance includes social satisfaction, social relationships, social participation, social collaboration, the quality of one's social life, and social services.

5.4.3 Policy Implications

According to the analysis and discussion of the study's findings, the government’s policy makers can benefit from the following contributions.

Firstly, the government should play an important role in enacting and implementing regulations and laws as well as environmental standards to ensure there is efficient operation of the automobile manufacturing industry since the government agencies are found in this study to act as the significant environmental force and driver on automobile manufacturing industry’s environmental business management.

Secondly, the government agencies should provide and share automobile manufacturing industry proper knowledge regarding conducting business in compliance with environmental laws, regulations and standards since government agencies’ knowledge sharing has been significantly presented from this study. Consequently, with clear knowledge and understanding, they are able to effectively operate their businesses related to the environment.

Thirdly, since this study presents the significance of incentives in implementing environmental business management; therefore, the government agencies should provide policy motivating automobile manufacturing industry to be active and realize the benefits of operating their business in compliance with relevant environmental laws, regulations and standards. According, it can finally create a positive impact on the organization, society and the environment.

Fourthly, due to the study result presenting the importance of the collaboration among governmental agencies, automobile manufacturing industry, and community that can finally establish a positive outcome for industry, society and natural environment; therefore, the governmental agencies should promote the collaboration and participation when there are issues about environmental management, policy, regulation and so on.

Fifthly, it is necessary that government agencies should pay attention to monitoring and evaluating the automobile manufacturing industry's environmental activities in order to solve problems, develop and improve the performance and activities.

5.5 Recommendations for Future Research

After the research limitations have been found, the future research can be included as follows:

To begin, the study limited to quantitative research to develop the model; however, the next research may employ a qualitative approach, such as an in-depth interview, to gain more insights. Furthermore, the mixed method, which collects data from both in-depth interviews and self-reported questionnaires, can be considered. This can aid future researchers in capturing more in-depth points.

Second, the study attempts to focus on the automobile manufacturing industry area, specifically on automotive manufacturing type; thus, the study's results may only be generalized within a limited frontier. As a result, future research can be expanded to other industries and the findings compared.

Third, the model only focuses on green corporate identity, employee green identification, green supply chain management, and green business performance, which may be another important variable to investigate. For example, the influence of green corporate identity on employee green social identification is quite weak, implying that other factors, such as organizational socialization, can act as mediated or moderated variables. Another finding from the study is that the influence of employee green social identification on green supply chain management and green business performance is quite low, implying that other factors acting as mediated or moderated variables, such as organizational championship or organizational leadership, should be considered.

Fourth, the study only focuses on the influence of green corporate identity and employee’s green identification, green supply chain management and green business performance through structural equation modeling (SEM), which other aspects such as comparison between the degree of variable perception by using other statistical techniques such as independent sample t-test, One-way ANOVA or chi-square should be considered. For example, the study should compare the different degrees of green corporate identity on different degrees of employee’s green identification, green supply chain management and green business performance to determine whether the company’s focus on degree of green corporate identity has an increased or decreased impact on employee’s green identification, green supply chain management, and green business performance.

Fifth, the study of green supply chain management in this study focuses on collecting data from manufacturers' perceptions, while perceptions from other supply chain players such as Tiers 1 and 2 are not considered. As a result, the next study should include automobile spare parts from Tiers 1 and 2 so that the researchers can cover the entire supply chain.

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APPENDICES

Appendix A. Questionnaire (Thai Version)

แบบสอบถาม

หัวข้อวิจัยเรื่อง “อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ”

Research Title “The influence of green corporate identity and green supply chain management on performance of the international business”

คำชี้แจง

แบบสอบถามนี้เป็นส่วนหนึ่งของการศึกษาระดับปริญญาเอก หลักสูตรการบริหารธุรกิจระหว่างประเทศ ของวิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร ในหัวข้อวิจัยเรื่อง “อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ” ซึ่งเป็นการศึกษาเกี่ยวกับผลกระทบของอัตลักษณ์องค์กรสีเขียวที่ผลมีต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศผ่านการระบุบ่งชี้ตัวตนและสังคมสีเขียวของพนักงานและการจัดการห่วงโซ่อุปทานสีเขียว โดยแบบสอบถามนี้มีจำนวน 6 ตอน ประกอบด้วย

ตอนที่ 1 เกี่ยวกับอัตลักษณ์องค์กรสีเขียว	จำนวน	47	ข้อ
ตอนที่ 2 เกี่ยวกับการระบุบ่งชี้ตัวตนสีเขียวของพนักงาน	จำนวน	11	ข้อ
ตอนที่ 3 เกี่ยวกับการจัดการห่วงโซ่อุปทานสีเขียว	จำนวน	36	ข้อ
ตอนที่ 4 เกี่ยวกับผลการดำเนินธุรกิจสีเขียว	จำนวน	19	ข้อ
ตอนที่ 5 เกี่ยวกับข้อมูลทั่วไปของผู้ตอบแบบสอบถาม	จำนวน	9	ข้อ
ตอนที่ 6 เกี่ยวกับความคิดเห็นที่มีต่อการจัดการอัตลักษณ์องค์กรสีเขียว (ปลายเปิด)			

โดยข้อมูลที่เก็บรวบรวมจากแบบสอบถามของแต่ละบุคคลจะถูกเก็บไว้เป็นความลับและไม่สามารถระบุตัวตนของผู้ตอบแบบสอบถามแต่ละคนได้ ข้อมูลที่เก็บรวบรวมได้นี้จะถูกนำไปศึกษาเกี่ยวข้องกับหัวข้องานวิจัยของผู้วิจัยเท่านั้น โดยผู้ตอบแบบสอบถามสามารถยุติการตอบแบบสอบถามได้ทุกเมื่อ หากมีความต้องการ สุดท้ายผู้วิจัยขอบคุณสำหรับความอนุเคราะห์ในการตอบแบบสอบถามของท่าน

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ตอนที่ 1 แบบสอบถามระดับความคิดเห็นเกี่ยวกับอัตลักษณ์องค์กรสีเขียว

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	อัตลักษณ์ขององค์กรสีเขียว	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 1.1 ด้านการสื่อสารองค์กรสีเขียว						
	ด้านการสื่อสารภายในองค์กรสีเขียว					
1	องค์กรได้สื่อสารกับพนักงานเกี่ยวกับการทำงานที่เป็นมิตรต่อสิ่งแวดล้อม					
2	องค์กรยินดีรับฟังข้อคิดเห็นและข้อเสนอแนะต่าง ๆ เกี่ยวกับการปรับปรุงการดำเนินงานด้านสิ่งแวดล้อมจากพนักงาน					
3	องค์กรใช้ช่องทางในการสื่อสารที่หลากหลาย ในการสื่อสารกับพนักงานเกี่ยวกับนโยบายขององค์กร แนวปฏิบัติ หรือเป้าหมายด้านสิ่งแวดล้อม					
4	องค์กรแจ้งให้พนักงานทราบเกี่ยวกับการทำงานที่ต้องเป็นมิตรต่อสิ่งแวดล้อมอยู่เสมอ					
5	องค์กรได้ถ่ายทอดและประชาสัมพันธ์ความรู้ ข้อมูล หรือข่าวสารต่าง ๆ ที่เป็นประโยชน์ในการทำงานที่เป็นมิตรต่อสิ่งแวดล้อม					
	ด้านการสื่อสารภายนอกองค์กรสีเขียว					
1	องค์กรใช้ช่องทางการสื่อสารที่หลากหลาย เช่น เว็บไซต์ อีเมล์ บรรจุภัณฑ์ สื่อสังคมออนไลน์ รายการทีวี และอื่น ๆ เพื่อสื่อสารกับผู้มีส่วนได้ส่วนเสียต่าง ๆ ให้เห็นถึงการให้ความสำคัญขององค์กรที่มีต่อการดำเนินงานที่เป็นมิตรต่อสิ่งแวดล้อม					
2	องค์กรมีส่วนร่วมในกิจกรรมที่ส่งเสริมการอนุรักษ์สิ่งแวดล้อม เช่น การเป็นผู้สนับสนุนกิจกรรมเพื่อสังคม หรือ อื่นๆ เป็นต้น					
3	องค์กรประชาสัมพันธ์กิจกรรมด้านการอนุรักษ์และให้ความสำคัญกับสิ่งแวดล้อมอยู่สม่ำเสมอเพื่อให้บุคคลภายนอกส่วนใหญ่ได้รับทราบ					
4	องค์กรมีการประชาสัมพันธ์ข่าวสารการดำเนินงานที่เป็นมิตรต่อสิ่งแวดล้อมผ่านวัสดุอุปกรณ์ หรือ พนักงานขององค์กร					
5	องค์กรใช้การสื่อสารแบบปากต่อปากเพื่อประชาสัมพันธ์และเผยแพร่ข้อมูลข่าวสารเกี่ยวกับการดำเนินงานที่เป็นมิตรต่อสิ่งแวดล้อมที่องค์กรได้จัดทำขึ้น					
ตอนที่ 1.2 ด้านรูปลักษณ์และการนำเสนอองค์กรสีเขียว						
1	องค์กรออกแบบกราฟิกต่าง ๆ เช่น โลโก้ ที่สามารถสื่อให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
2	องค์กรมีการเลือกใช้สี (เขียว) เป็นองค์ประกอบหนึ่งของข้อความ วัสดุ อุปกรณ์ อาคาร รถยนต์ หรือพนักงานขององค์กรเพื่อสะท้อนให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
3	องค์กรใช้สัญลักษณ์ต่าง ๆ ที่สามารถสื่อให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
4	โลโก้ขององค์กรสามารถสะท้อนให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
5	องค์กรมีสโลแกนที่สามารถแสดงให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
6	องค์กรมีการดัดแปลงรูปแบบและรูปลักษณ์ตัวอักษรและใช้เป็นส่วนประกอบในสื่อต่างๆ เพื่อสื่อให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					

ตอนที่ 1 แบบสอบถามระดับความคิดเห็นเกี่ยวกับอัตลักษณ์องค์กรสีเขียว (ต่อ)

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	อัตลักษณ์ขององค์กรสีเขียว	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 1.3 พฤติกรรมการทำงานด้านสีเขียวของพนักงานในองค์กร						
	พฤติกรรมตามบทบาท					
1	ข้าพเจ้าปฏิบัติงานโดยคำนึงถึงความเป็นมิตรต่อสิ่งแวดล้อมตามที่ได้รับมอบหมายไว้					
2	งานของข้าพเจ้าที่ได้ปฏิบัตินั้นเป็นไปตามเกณฑ์ด้านสิ่งแวดล้อมที่องค์กรได้กำหนดไว้					
3	ข้าพเจ้าปฏิบัติงานที่ต้องเป็นมิตรต่อสิ่งแวดล้อมตามที่องค์กรได้มอบหมายไว้อย่างประสบความสำเร็จ					
4	ข้าพเจ้าสามารถปฏิบัติงานที่เป็นมิตรต่อสิ่งแวดล้อมตามที่องค์กรได้คาดหวังไว้					
5	ข้าพเจ้าสามารถปฏิบัติงานที่เป็นมิตรต่อสิ่งแวดล้อมตามที่องค์กรได้กำหนดไว้ในรายละเอียดของงาน					
	พฤติกรรมนอกเหนือบทบาท					
1	ข้าพเจ้าได้มีส่วนร่วมในกิจกรรมด้านสิ่งแวเล้อมและร่วมแสดงความคิดเห็นเพื่อการปรับปรุงการดำเนินงานขององค์กรด้านสิ่งแวดล้อมให้ดีขึ้น					
2	ข้าพเจ้าเต็มใจที่จะช่วยเพื่อนร่วมงานในการจัดการปัญหาหรืออุปสรรคที่เกี่ยวข้องกับการดำเนินงานด้านสิ่งแวดล้อม ถึงแม้ว่าข้าพเจ้าไม่มีหน้าที่ที่ต้องรับผิดชอบในหน้าที่ดังกล่าว					
3	ข้าพเจ้ามีความสมัครใจที่จะนำเอาหลักการปฏิบัติงานที่ต้องคำนึงถึงการเป็นมิตรต่อสิ่งแวดล้อมมาใช้ในงานประจำของข้าพเจ้า					
4	ข้าพเจ้ามีความอดทนต่อความยากลำบากในการปฏิบัติงานที่ต้องคำนึงถึงการเป็นมิตรต่อสิ่งแวดล้อม					
5	ข้าพเจ้าชี้นำและกระตุ้นให้เพื่อนร่วมงานของข้าพเจ้าให้ความสำคัญกับการทำงานที่ต้องคำนึงถึงการเป็นมิตรต่อสิ่งแวดล้อม					
6	ข้าพเจ้าแบ่งปันความรู้ที่เกี่ยวข้องกับการทำงานด้านสิ่งแวดล้อมให้กับเพื่อนร่วมงาน					

ตอนที่ 1 แบบสอบถามระดับความคิดเห็นเกี่ยวกับอัตลักษณ์องค์กรสีเขียว (ต่อ)

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	อัตลักษณ์ขององค์กรสีเขียว	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 1.4 วัฒนธรรมองค์กรสีเขียว						
1	องค์กรให้ความสำคัญกับวิสัยทัศน์การดำเนินธุรกิจที่เป็นมิตรกับสิ่งแวดล้อม					
2	องค์กรสร้างวัฒนธรรมและค่านิยมในการทำงานที่เป็นมิตรกับสิ่งแวดล้อมให้กับสมาชิกในองค์กร					
3	องค์กรมีการกำหนดมาตรฐานและหลักการต่าง ๆ ในการทำงานที่เป็นมิตรต่อสิ่งแวดล้อมให้สมาชิกในองค์กร					
4	องค์กรมีแนวปฏิบัติที่ชัดเจนเกี่ยวกับการทำงานที่เป็นมิตรต่อสิ่งแวดล้อมให้สมาชิกในองค์กร					
5	พันธกิจขององค์กรสะท้อนให้เห็นถึงการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อม					
6	องค์กรมีการถ่ายทอดพันธกิจในการดำเนินธุรกิจที่เป็นมิตรต่อสิ่งแวดล้อมไปยังสมาชิกองค์กรและผู้อื่นได้อย่างชัดเจน					
ตอนที่ 1.5 นโยบายองค์กรสีเขียว						
1	องค์กรมีนโยบายในการแบ่งปันและถ่ายทอดความรู้เกี่ยวกับเทคนิคในการจัดการด้านสิ่งแวดล้อมให้กับพนักงาน ซัพพลายเออร์ ลูกค้า และผู้อื่นๆ ที่มีส่วนเกี่ยวข้อง					
2	องค์กรมีนโยบายในการสร้างความร่วมมือกับพนักงาน ซัพพลายเออร์ ลูกค้า และอื่นๆ ที่เกี่ยวข้องในการดำเนินธุรกิจและกิจกรรมต่างๆ ที่ต้องเป็นมิตรต่อสิ่งแวดล้อม					
3	องค์กรมีนโยบายในการจัดทำข้อตกลงต่างๆ กับพนักงาน ซัพพลายเออร์ ลูกค้า และอื่นๆ ในการดำเนินธุรกิจและกิจกรรมต่างๆ ที่ต้องเป็นมิตรต่อสิ่งแวดล้อม					
4	องค์กรมีนโยบายที่จะเปลี่ยนแปลงและปรับตัวในการดำเนินธุรกิจและกิจกรรมต่างๆ ที่ต้องเป็นมิตรต่อสิ่งแวดล้อม					
5	องค์กรมีนโยบายที่ตอบสนองต่อการดำเนินธุรกิจและกิจกรรมต่างๆ ที่ต้องเป็นมิตรต่อสิ่งแวดล้อม					

ตอนที่ 1 แบบสอบถามระดับความคิดเห็นเกี่ยวกับอัตลักษณ์องค์กรสีเขียว (ต่อ)

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	อัตลักษณ์ขององค์กรสีเขียว	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 1.6 แรงกดดันและแรงขับเคลื่อนสีเขียว						
1	ผู้มีส่วนเกี่ยวข้องภายนอก เช่น ลูกค้า คู่แข่งขันรายอื่นๆ และซัพพลายเออร์มีส่วนทำให้องค์กรต้องให้ความสำคัญกับการเป็นมิตรต่อสิ่งแวดล้อม					
2	การเป็นบริษัทที่ดำเนินธุรกิจระหว่างประเทศนั้นมีส่วนทำให้องค์กรต้องให้ความสำคัญกับการเป็นมิตรต่อสิ่งแวดล้อม					
3	ความก้าวหน้าของเทคโนโลยีและนวัตกรรมต่างๆ มีส่วนช่วยให้องค์กรผลิตสินค้าและการบริการที่เป็นมิตรต่อสิ่งแวดล้อม					
4	สังคมและชุมชนมีส่วนทำให้องค์กรต้องให้ความสำคัญกับการเป็นมิตรต่อสิ่งแวดล้อม					
5	กฎระเบียบและกฎหมายของรัฐบาลมีส่วนทำให้องค์กรต้องให้ความสำคัญกับการเป็นมิตรต่อสิ่งแวดล้อม					
ตอนที่ 1.7 ผลิตภัณฑ์สีเขียว						
1	ผลิตภัณฑ์และการบริการขององค์กรสะท้อนให้เห็นถึงการเป็นมิตรต่อสิ่งแวดล้อม					
2	องค์กรสามารถผลิตสินค้าและการบริการที่เป็นมิตรต่อสิ่งแวดล้อม					
3	องค์กรมีการสร้างความสัมพันธ์กับลูกค้าเพื่อให้ลูกค้ายังคงยินดีที่จะใช้ผลิตภัณฑ์และการบริการขององค์กรต่อไป					
4	องค์กรสามารถตอบสนองต่อความต้องการของลูกค้าด้านผลิตภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อมได้					

ตอนที่ 2 แบบสอบถามระดับความคิดเห็นเกี่ยวกับการระบุบ่งชี้ตัวตนสีเขียวของพนักงาน

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	การระบุบ่งชี้ตัวตนสีเขียวของพนักงาน	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 2.1 การระบุบ่งชี้ตัวตนสีเขียวของพนักงานในระดับบุคคล						
1	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมสอดคล้องกับตัวข้าพเจ้า					
2	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมมีแนวทางการปฏิบัติงานที่สอดคล้องกับตัวข้าพเจ้า					
3	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมสอดคล้องกับค่านิยมในการทำงานของข้าพเจ้า					
4	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมบ่งบอกถึงลักษณะความเป็นจริงที่ข้าพเจ้าเป็น					
5	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมสะท้อนให้เห็นถึงบุคลิกภาพของข้าพเจ้า					
6	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมช่วยให้ข้าพเจ้าให้ความสำคัญกับการเป็นมิตรต่อสิ่งแวดล้อมมากขึ้น					
ตอนที่ 2.2 การระบุบ่งชี้ตัวตนสีเขียวของพนักงานในระดับสังคม						
1	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมทำให้ข้าพเจ้าได้รับการยอมรับและการเคารพจากสังคม					
2	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมส่งผลต่อสถานะทางสังคมของข้าพเจ้าในทางที่ดีขึ้น					
3	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมส่งเสริมภาพลักษณ์ที่ดีของข้าพเจ้า					
4	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมนี้ได้เพิ่ม "บทบาท" ทางสังคมให้กับข้าพเจ้า					
5	อัตลักษณ์องค์กรที่เป็นมิตรต่อสิ่งแวดล้อมนี้ช่วยให้สังคมมองข้าพเจ้าในทางที่ดีขึ้น					

ตอนที่ 3 แบบสอบถามระดับความคิดเห็นเกี่ยวกับการจัดการห่วงโซ่อุปทานสีเขียว

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	ข้อคำถาม	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 3.1 การออกแบบสีเขียว						
1	องค์กรมีการออกแบบผลิตภันฑ์และการบริการที่สามารถลดการใช้พลังงานและปัจจัยการผลิตที่ไม่จำเป็นลงได้					
2	องค์กรตั้งใจที่จะลดส่วนประกอบของผลิตภัณฑ์ที่ไม่เป็นมิตรต่อสิ่งแวดล้อม					
3	องค์กรมีการร่วมมือกับลูกค้าทั้งในและต่างประเทศในการออกแบบผลิตภัณฑ์ การบรรจุภัณฑ์ ตลอดจนการหาแนวทางการแก้ไขปัญหาที่เกี่ยวข้องกับสิ่งแวดล้อม					
4	องค์กรออกแบบผลิตภัณฑ์ที่มีส่วนประกอบที่สามารถนำกลับมาใช้หรือผลิตใหม่ได้					
5	องค์กรมีการออกแบบผลิตภัณฑ์ที่ใช้งานง่าย					
6	องค์กรมีการออกแบบผลิตภันฑ์ที่ลดการใช้สารเคมีและลดการเกิดของเสียจากการผลิต					
ตอนที่ 3.2 การจัดซื้อสีเขียว						
1	องค์กรมีการเลือกซัพพลายเออร์จากในหรือต่างประเทศที่เป็นไปตามเงื่อนไขด้านสิ่งแวดล้อมตามที่องค์กรกำหนดไว้					
2	องค์กรมีการจัดซื้อปัจจัยการผลิตที่เป็นมิตรต่อสิ่งแวดล้อม					
3	องค์กรได้กำหนดข้อมูลเฉพาะเกี่ยวกับปัจจัยการผลิตซึ่งต้องเป็นมิตรต่อสิ่งแวดล้อมให้กับซัพพลายเออร์ทั้งในและต่างประเทศ					
4	องค์กรมีการประสานงานกับซัพพลายเออร์ทั้งในและต่างประเทศในการจัดส่งปัจจัยการผลิตที่เป็นมิตรต่อสิ่งแวดล้อม					
5	องค์กรมีการสำรวจและตรวจสอบการดำเนินงานด้านสิ่งแวดล้อมของซัพพลายเออร์ทั้งภายในและต่างประเทศ ก่อนการตัดสินใจซื้อปัจจัยการผลิต					
6	ซัพพลายเออร์จากในหรือต่างประเทศต้องมีมาตรฐานด้านสิ่งแวดล้อมที่เป็นที่ยอมรับ					
ตอนที่ 3.3 การผลิตสีเขียว						
1	องค์กรมีการผลิตสินค้าที่ลดการใช้สารเคมี และลดการเกิดมลพิษ					
2	องค์กรมีการใช้หลักการผลิตซ้ำและการผลิตแบบลีน (ลดของเสีย)					
3	องค์กรมีการใช้เทคโนโลยีสะอาดเพื่อการผลิตที่เป็นมิตรต่อสิ่งแวดล้อม					
4	องค์กรมีการพัฒนากระบวนการผลิตเพื่อให้เกิดประสิทธิภาพในการผลิตสูงสุด					
5	องค์กรมีการใช้ปัจจัยการผลิตอย่างมีประสิทธิภาพ					
6	องค์กรมีการวางแผนในการซ่อมบำรุงเครื่องจักรและอุปกรณ์ต่าง ๆ เพื่อยืดอายุการใช้งานได้อย่างเหมาะสม					
7	องค์กรมีมาตรฐานการผลิตที่เป็นที่ยอมรับและเป็นสากล					

ตอนที่ 3 แบบสอบถามระดับความคิดเห็นเกี่ยวกับการจัดการห่วงโซ่อุปทานสีเขียว (ต่อ)

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	ข้อคำถาม	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 3.4 การฟื้นคืนสภาพสีเขียว						
1	องค์กรมีการฟื้นคืนสภาพวัสดุ อุปกรณ์ ตลอดจนชิ้นส่วนอะไหล่ต่างๆ ที่หมดอายุแล้วเพื่อให้สามารถนำกลับมาใช้งานได้					
2	องค์กรมีการนำเอาวัสดุ อุปกรณ์ ตลอดจนชิ้นส่วนอะไหล่ต่างๆ ที่หมดอายุหรือเก่าแล้วกลับมาขายเพื่อเปลี่ยนเป็นเงินหรือทรัพย์สินขององค์กร					
3	องค์กรมีการยืดอายุการใช้งานวัสดุ อุปกรณ์ ตลอดจนชิ้นส่วนอะไหล่ต่างๆ ที่เก่าหรือชำรุดด้วยการซ่อมบำรุง					
4	องค์กรมีการปรับสภาพและปรับปรุงชิ้นส่วนอะไหล่ต่าง ๆ ที่ใช้งานแล้วให้สามารถนำกลับมาผลิตหรือใช้งานใหม่ได้อีก					
ตอนที่ 3.5 การขนส่งสีเขียว						
1	องค์กรมีการขนส่งสินค้าโดยเป็นมิตรต่อสิ่งแวดล้อม					
2	องค์กรมีการเลือกใช้เส้นทางในการขนส่งที่สามารถลดการเกิดมลพิษ					
3	องค์กรมีการตรวจสอบและวางแผนเส้นทางเป็นอย่างดีก่อนการปฏิบัติงาน					
4	องค์กรมีการใช้พื้นที่ในการบรรทุกสินค้าหรือปัจจัยการผลิตได้อย่างมีประสิทธิภาพ					
5	องค์กรมีการเลือกการขนส่งที่ประหยัดพลังงาน ประหยัดค่าใช้จ่าย และหันมาใช้พลังงานทางเลือกมากขึ้น					
6	องค์กรมีการใช้ระบบแบบทันเวลาพอดี (just-in-time) ในการขนส่ง					
7	องค์กรมีการนำเอาเทคโนโลยีสารสนเทศมาใช้ในการติดตามการขนส่ง					
ตอนที่ 3.6 การตลาดสีเขียว						
1	องค์กรใช้แนวคิดการเป็นมิตรต่อสิ่งแวดล้อมในการสร้างภาพลักษณ์องค์กร					
2	องค์กรใช้หลักการตลาดเป็นเครื่องมือในการสร้างความได้เปรียบในการแข่งขัน					
3	องค์กรมีการวิจัยเพื่อศึกษาพฤติกรรมต่อความต้องการสินค้าที่เป็นมิตรต่อสิ่งแวดล้อม					
4	องค์กรมีการกำหนดตำแหน่งผลิตภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อม					
5	องค์กรมีการกำหนดราคาของผลิตภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อมได้เหมาะสม เข้าถึงได้					
6	องค์กรได้มีการประชาสัมพันธ์ผลิตภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อมในหลายช่องทาง					

ตอนที่ 4 แบบสอบถามระดับความคิดเห็นเกี่ยวกับผลการดำเนินธุรกิจสีเขียว

คะแนน :1 = ไม่เห็นด้วยอย่างยิ่ง 2 = ไม่เห็นด้วย 3 = ไม่แน่ใจ 4 = เห็นด้วย 5 = เห็นด้วยอย่างยิ่ง

ลำดับ	ผลการดำเนินธุรกิจสีเขียว	ระดับความคิดเห็น				
		1	2	3	4	5
ตอนที่ 4.1 ด้านเศรษฐกิจ						
1	ต้นทุนในการจัดซื้อวัสดุขององค์กรลดลง					
2	ค่าใช้จ่ายในการใช้พลังงานขององค์กรลดลง					
3	ค่าใช้จ่ายในการบำบัดและปล่อยของเสียขององค์กรลดลง					
4	ค่าปรับหรือค่าสินไหมที่เกิดจากการเกิดอุบัติเหตุด้านสิ่งแวดล้อมลดลง					
5	รายได้ขององค์กรเพิ่มขึ้น					
6	ส่วนแบ่งทางการตลาดขององค์กรเพิ่มขึ้น					
7	องค์กรมีความสามารถในการแข่งขันทั้งในและต่างประเทศมากขึ้น					
ตอนที่ 4.2 ด้านสิ่งแวดล้อม						
1	เทคโนโลยีและทรัพยากรขององค์กรมีการใช้งานได้อย่างมีประสิทธิภาพ					
2	ปริมาณของมลพิษ ของเสีย และอันตรายจากสารเคมีต่างๆ ลดน้อยลง					
3	อุบัติเหตุและความเสี่ยงที่เกี่ยวข้องกับสิ่งแวดล้อมเกิดน้อยลง					
4	ภาพลักษณ์องค์กรด้านสิ่งแวดล้อมดีขึ้น					
5	คุณภาพสินค้าและการบริการมีความเป็นมิตรกับสิ่งแวดล้อมมากขึ้น					
6	องค์กรมีความสามารถและประสบการณ์ในการนำผลิตภัณฑ์ ชิ้นส่วน หรือ ปัจจัยการผลิตกลับมาใช้ซ้ำมากขึ้น					
ตอนที่ 4.3 ด้านสังคม						
1	พนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐมีความพึงพอใจในการดำเนินงานขององค์กรมากขึ้น					
2	องค์กรมีความสัมพันธ์ที่ดีกับพนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐมากขึ้น					
3	พนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐมีส่วนร่วมในการแสดงความคิดเห็นหรือตัดสินใจในกิจกรรมต่าง ๆ ที่เป็นประโยชน์ต่อสังคมมากขึ้น					
4	องค์กรได้รับความร่วมมือจากพนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐในการบรรลุเป้าหมายที่เป็นประโยชน์ต่อสังคมมากขึ้น					
5	พนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐได้รับประโยชน์ต่าง ๆ เช่น ความรู้ ข้อมูลข่าวสาร การบริจาค หรือกิจกรรมเพื่อสังคมจากองค์กรเป็นประจำ					
6	พนักงาน ลูกค้า ชุมชน ซัพพลายเออร์ ตลอดจนหน่วยงานภาครัฐมีคุณภาพชีวิตที่ดีขึ้น					

ตอนที่ 5 ข้อมูลส่วนบุคคล

หมายเหตุ: กรุณาใส่เครื่องหมาย √ ลงใน ☐ หน้าคำตอบที่ตรงกับตัวท่านมากที่สุด

1. เพศ

☐ ชาย ☐ หญิง

2. อายุ

☐ ต่ำกว่า 20 ปี ☐ 21 – 30 ปี ☐ 31 - 40 ปี

☐ 41 - 50 ปี ☐ 51 ปีขึ้นไป

3. สถานภาพ

☐ โสด ☐ สมรส ☐ หย่าร้าง/แยกกันอยู่

4. ระดับการศึกษา

☐ ต่ำกว่าปริญญาตรี ☐ ปริญญาตรี ☐ ปริญญาโท

☐ สูงกว่าปริญญาโท

5. รายได้ต่อเดือน

☐ ต่ำกว่าหรือเท่ากับ 15,000 บาท ☐ 15,001 บาท – 25,000 บาท

☐ 25,001 บาท – 35,000 บาท ☐ 35,001 บาท – 45,000 บาท

☐ 45,001 บาทขึ้นไป

6. ประสบการณ์ในการทำงาน

☐ ต่ำกว่า 1 ปี ☐ 1 - 5 ปี ☐ 6 - 10 ปี

☐ 11 - 15 ปี ☐ มากกว่า 15 ปี

7. ตำแหน่ง

☐ ผู้บริหาร/คณะกรรมการบริหาร ☐ ผู้จัดการ/หัวหน้าฝ่าย/แผนก

☐ พนักงานระดับปฏิบัติการ

8. แผนก

☐ ฝ่ายการผลิต ☐ ฝ่ายจัดซื้อ ☐ ฝ่ายการตลาด/ประชาสัมพันธ์

☐ ฝ่ายการเงิน ☐ ฝ่ายทรัพยากรบุคคล ☐ อื่น ๆ โปรดระบุ ....

ตอนที่ 6 ความคิดเห็น อื่นๆ

ความคิดเห็นอื่นๆ เกี่ยวกับการจัดการอัตลักษณ์องค์กรสีเขียว ในการส่งเสริมการปฏิบัติงานโซ่อุปทานเพื่อสิ่งแวดล้อม (ถ้ามี)

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ขอขอบพระคุณทุกท่านที่เสียสละเวลาในการตอบแบบสอบถาม

Appendix B. Questionnaire (English Version)

Questionnaire

Research Title "The influence of green corporate identity and green supply chain management on performance of the international business"

Notification

This questionnaire entitled "The influence of green corporate identity and green supply chain management on performance of the international business" is a part of a study on Doctor of Philosophy in International Business at the Silpakorn University International College. This research concentrates on the influence of green corporate identity on international business performance towards employee green personal and social identification and green supply chain management. This questionnaire consists of six parts as follows:

Part 1: 47 items on green corporate identity
Part 2: 11 items on green employee identification
Part 3: 36 items on green supply chain management,
Part 4: 19 items on green business performance
Part 5: 9 items on general information of respondents
Part 6: Comments from respondents

Data confidentiality is maintained in this research. Thus, the data subject cannot be identified. The collected data will be used and studied within the scope of this research only. The respondents can stop filling the questionnaire at any time. Your answers and help are greatly appreciated.

Contact: Suraporn Onputta
Tel: 095-639-2926
E-mail: onputtha_s@su.ac.th
Silpakorn University International College

Part 1: Green Corporate Identity

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Corporate Identity	Agreement Level				
		1	2	3	4	5
Part 1.1 Green Corporate Communication						
	Green Corporate Internal Communication					
1	The company conveys the messages related to environmental awareness at work to employees.					
2	The company welcomes any comments and suggestions towards improving environmental actions from the employees.					
3	The company uses various channels to communicate with employees about the corporate policy, guideline or goal related to environmental awareness.					
4	The company keeps employees informed about environmental awareness at work.					
5	The company delivers knowledge, information, and news related to environmental awareness that is beneficial for work to employees.					
	Green Corporate External Communication					
1	The company use various channels, such as website, email, product packages, social media, TV program, and others to send message about environmental care and action of the corporate to all stakeholders.					
2	The company participates and promotes environmental events, such as offering a sponsorship, CSR, etc.					
3	The company regularly publicizes its environmental activities in order to keep all stakeholders informed.					
4	The company publicizes its green activities news through its facilities, equipment's, and staff.					
5	The company implement word-of-mouth to publicize news related to the corporate's environmental care and activities.					
Part 1.2 Green Corporate Visual Identity						
1	The company's graphics, such as logos are designed to consistently convey and represent its green business activities.					
2	The company uses the (green) color to be a part of the message, parts, materials, buildings, cars, employees to reflect its green business activities.					
3	The company uses the environmental caring symbol that represents its green business activities.					
4	The company's logo reflects the corporate's green business activities.					
5	The company's slogan reflects the corporate's green business activities.					
6	The company's typography and font used in various media reflect the corporate's green business activities.					

Part 1: Green Corporate Identity (Continued)

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Corporate Identity	Agreement Level				
		1	2	3	4	5
Part 1.3 Green employee behavior						
	Green In-Role Behavior					
1	I perform the works with environment awareness as assigned.					
2	My work performance meets the environmental criteria as required by the company.					
3	I can successfully perform my work related to the environmental protection as assigned by the company.					
4	I can perform the tasks related to the environmental protection as expected by the company.					
5	I can perform the tasks related to the environmental protection as specified in the job description.					
	Green Extra-Role Behavior					
1	I participate in company environmental activities and voice opinion for company's environmentally operational improvement.					
2	I am willing to help my colleagues to manage problems or obstacles related to environmental issue that they encounter even though it is not my responsibility.					
3	I voluntarily apply the principles of eco-friendly work into my regular work.					
4	I am patient with difficulties at work when performing tasks with environmental awareness.					
5	I inspire and encourage my colleagues to take environmental concern into account.					
6	I share my knowledge related to environmental work with my colleagues.					
Part 1.4 Green Corporate Culture						
1	The company concentrates on the vision of green business operation.					
2	The company creates culture and value on green business operation among employees.					
3	The company sets the corporate standards and principles for corporate members to work with environmental awareness.					
4	The company has a clear guideline for corporate members to work with environmental awareness.					
5	The company's mission reflects its green business operation.					
6	The company's mission is clearly communicated to corporate members and related to stakeholders.					

Part 1: Green Corporate Identity (Continued)

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	**Green Corporate Identity**	**Agreement Level**				
		1	**2**	**3**	**4**	**5**
Part 1.5 Green Corporate Policy						
1	The company has a policy to share and provide environmental management techniques to suppliers, customers and other stakeholders.					
2	The company has a policy to collaborate with suppliers, customers and other stakeholders to do green activities.					
3	The company establishes the environmental agreements with suppliers, customers and other stakeholders.					
4	The company has a policy to change and adjust its corporate activities and business to be green.					
5	The company has a policy that responds to green business and activities.					
Part 1.6 Green Forces and Drivers						
1	External stakeholders, such as customers, competitor, and suppliers force the company to concern environmental matters.					
2	Being an internationalized company forces the company to concern environmental matters.					
3	Technology and innovation can assist the company to promote and produce products and services.					
4	Society and community force the company to concern environmental matters.					
5	Governmental regulations and laws force the company to concern environmental matters.					
Part 1.7 Green Product and Service Quality						
1	The products and services represent the corporate's concerns on environmental matters.					
2	The company can produce green products and provide green services.					
3	The company builds relationship with customers to satisfy them and prolong their decision to continue using the products and services provided by the company.					
4	The company accurately respond the customer's needs in terms of green products.					

Part 2: Employee Green Personal-Social Identification

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Employee Green Personal-Social Identification	Agreement Level				
		1	2	3	4	5
Part 2.1 Employee Green personal identification						
1	The green corporate identity is consistent my lifestyle.					
2	The green corporate identity is consistent with my role.					
3	The green corporate identity is consistent with my value.					
4	The green corporate identity symbolizes my identity.					
5	The green corporate identity reflects my personality.					
6	The green corporate identity extends my green role.					
Part 2.2 Employee Green Social Identification						
1	The green corporate identity provides me social recognition and respect.					
2	The green corporate identity enhances my social status.					
3	The green corporate identity enhances my image.					
4	The green corporate identity increases my “social role.					
5	The green corporate identity influences the society to view me in a better way.					

Part 3: Green Supply Chain Management

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Supply Chain Management	Agreement Level				
		1	2	3	4	5
Part 3.1 Green Design						
1	The company designs products and services that help reduce unnecessary energy and raw materials usage.					
2	The company intends to reduce product components that give negative effects on the environment.					
3	The company collaborates with both domestic and international customers for green design, packages, and management solution.					
4	The company designs the products with reusable, recyclable materials.					
5	The company designs the green products to be easily used.					
6	The company designs products that can reduce the use of hazardous substances and reduce production waste.					

Part 3: Green Supply Chain Management (Continued)

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Supply Chain Management	Agreement Level				
		1	2	3	4	5
Part 3.2 Green Procurement						
1	The company chooses either domestic or international suppliers based on its green criteria.					
2	The company purchases green raw materials.					
3	The company has a green design specification as a requirement for domestic and international suppliers.					
4	The company has a cooperation with both domestic and international suppliers for delivering green raw materials.					
5	The company monitors both domestic and international suppliers' internal green management prior to any purchase.					
6	The domestic and international supplier of the company is required to have recognizable green certificates or standard.					
Part 3.3 Green Manufacturing						
1	The company minimizes using chemical substances and pollution.					
2	The company applies re-manufacturing and lean production to reduce waste.					
3	The company applies clean manufacturing technologies for green production.					
4	The company optimizes its manufacturing process for highest efficiency.					
5	The company utilizes raw materials effectively.					
6	The company strategically plans to repair machines and supplies.					
7	The company's manufacturing process is certified and standardized at international level.					
Part 3.4 Green Recovery						
1	The company repairs and reuses end-of-life materials, parts and components.					
2	The company resells end-of-life materials, parts and components for money or assets of the company.					
3	The company prolongs the use of materials, parts and components by maintenance.					
4	The company reconditions and refurbishes used parts or components.					

Part 3: Green Supply Chain Management (Continued)

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Supply Chain Management	Agreement Level				
		1	2	3	4	5
Part 3.5 Green Logistics						
1	The company provides green transportation.					
2	The company uses the delivery route that can reduce the pollution.					
3	The company determines delivery routes prior to any delivery.					
4	The company applies full truck load system for effective delivery.					
5	The company uses delivery method with alternative energy to save energy and expenses.					
6	The company adopts just-in-time logistics.					
7	The company applies information technology to track delivery services.					
Part 3.6 Green Marketing						
1	The company adopts green features to improve its image.					
2	The company uses marketing principles as a tool to create competitive advantages.					
3	The company conducts a market research and studies customers' behavior towards green specifications					
4	The company positions its green products.					
5	The company set reasonable prices for green products.					
6	The company publicizes its green products in various channels.					

Part 4: Green Business Performance

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree

4 = Agree 5 = Strongly agree

Lists	Green Business Performance	Agreement Level				
		1	2	3	4	5
Part 4.1 Economic Performance						
1	The company's raw material cost decreases.					
2	The company's energy usage decreases.					
3	The company's expenses on waste discharge decrease.					
4	The company's fines and compensation caused by environmental accidents decrease.					
5	The company's revenues increase.					
6	The company's market share increases.					
7	The company's domestic and international competitive advantages increase.					

Part 4: Green Business Performance (Continued)

Score :

1 = Strongly disagree 2 = Disagree 3 = Neither agree nor disagree
4 = Agree 5 = Strongly agree

Lists	Green Business Performance	Agreement Level				
		1	2	3	4	5
Part 4.2 Environmental Performance						
1	Technology and resources are effectively utilized.					
2	The level of pollution, toxic and harms due to chemical substances are decreased.					
3	Environmental accidents and risks are reduced.					
4	Reputation, image, and quality of the company is improved.					
5	The quality of green product and services are improved.					
6	The company has the ability to recycle and reuse parts, component or raw materials more.					
Part 4.3 Social Performance						
1	Employees, customers, community, suppliers and governmental agencies are satisfied with the process of the company.					
2	The company has better relationship with employees, customers, community, suppliers, and governmental agencies.					
3	Employees, customers, community, suppliers, and governmental agencies participate in expressing ideas and making a decision on activities that benefit the society.					
4	The company has a collaboration with employees, customers, community, suppliers and governmental agencies in achieving corporate goals that also benefit the society.					
5	Employees, customers, community, suppliers and governmental agencies regularly obtain beneficial knowledge, news, donation, as well as CSR from the company.					
6	Employees, customers, community, suppliers and governmental agencies have better quality of life.					

Part 5: Personal Information

Remarks: Please put √ in the ☐ in front of the answers that best describes you.

1. Gender

☐ Male ☐ Female

2. Age

☐ Under 20 years old ☐ 21 – 30 years old ☐ 31 - 40 years old

☐ 41 - 50 years old ☐ Above 51 years old

3. Marital Status

☐ Single ☐ Married ☐ Divorced/Separated

4. Education

☐ Lower than bachelor's degree ☐ Bachelor's degree ☐ Master's degree

☐ Above Master's degree

5. Monthly income

☐ Less than 15,000 Baht ☐ 15,001– 25,000 Baht

☐ 25,001 – 35,000 Baht ☐ 35,001 – 45,000 Baht

☐ More than 45,001 Baht

6. Work experience

☐ Less than 1 year ☐ 1 - 5 years ☐ 6 - 10 years

☐ 11 - 15 years ☐ More than 15 years

7. Position

☐ Executive / Executive Committee ☐ Manager / Head of Department / Division

☐ Operational staff

8. Department

☐ Production department ☐ Purchase Department

☐ Marketing / Public Relations Department ☐ Finance department

☐ Human Resources Department ☐ Others, please specify ....

Part 6: Comments

Other Comments in regards to green corporate identity management to promote green supply chain operations (if any)

Thank you for kindly participating in this questionnaire.

Appendix C. Content Validity Index Analysis

CONTENT VALIDITY INDEX ANALYSIS

The Influence of Green Corporate Identity and Green Supply Chain Management on Performance of the International Business

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
Green Corporate Identity							
Green Corporate Communication							
Green Corporate Internal Communication							
1	The company conveys the messages related to environmental awareness at work to employees.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company welcomes any comments and suggestions towards improving environmental actions from the employees.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company uses various channels to communicate with employees about the corporate policy, guideline or goal related to environmental awareness.	1.00	0.86	1.00	1.00	0.96	1.00
4	The company keeps employees informed about environmental awareness at work.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company delivers knowledge, information, and news related to environmental awareness that is beneficial for work to employees.	1.00	1.00	1.00	1.00	1.00	1.00
Green Corporate External Communication							
1	The company uses various channels, such as website, email, product	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	packages, social media, TV program, and others to send message about environmental care and action of the corporate to all stakeholders.						
2	The company participates and promotes environmental events, such as offering a sponsorship, CSR, etc.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company regularly publicizes its environmental activities in order to keep all stakeholders informed.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company publicizes its green activities news through its facilities, equipment’s, and staff.	1.00	1.00	0.86	1.00	0.96	1.00
5	The company implement word-of-mouth to publicize news related to the corporate’s environmental care and activities.	1.00	1.00	1.00	1.00	1.00	1.00
Green Corporate Visual Identity							
1	The company’s graphics, such as logos are designed to consistently convey and represent its green business activities.	1.00	0.86	0.86	1.00	0.93	1.00
2	The company uses the (green) colour to be a part of the message, parts, materials, buildings, cars, employees to reflect its green business activities.	0.86	0.71	0.71	0.86	0.79	0.86
3	The company uses the environmental caring symbol that represents its green	0.86	0.86	0.86	0.86	0.86	0.86

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	business activities.						
4	The company’s logo reflects the corporate’s green business activities.	0.86	0.86	0.86	0.86	0.86	0.86
5	The company’s slogan reflects the corporate’s green business activities.	1.00	1.00	1.00	1.00	1.00	1.00
6	The company’s typography and font used in various media reflect the corporate’s green business activities.	0.86	0.86	0.86	0.86	0.86	0.86
Green Employee Behaviour							
Green Intra-Role Behaviour							
1	I perform the works with environment awareness as assigned.	1.00	1.00	1.00	1.00	1.00	1.00
2	My work performance meets the environmental criteria as required by the company.	1.00	1.00	1.00	1.00	1.00	1.00
3	I can successfully perform my work related to the environmental protection as assigned by the company.	1.00	1.00	1.00	1.00	1.00	1.00
4	I can perform the tasks related to the environmental protection as expected by the company.	1.00	0.86	0.86	0.86	0.89	1.00
5	I can perform the tasks related to the environmental protection as specified in the job description.	1.00	0.86	0.86	0.71	0.86	1.00
Green Extra-Role Behaviour							
1	I participate in company environmental activities and voice opinion for company’s environmentally	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	operational improvement.						
2	I am willing to help my colleagues to manage problems or obstacles related to environmental issue that they encounter even though it is not my responsibility.	1.00	1.00	1.00	1.00	1.00	1.00
3	I voluntarily apply the principles of eco-friendly work into my regular work.	1.00	1.00	1.00	1.00	1.00	1.00
4	I am patient with difficulties at work when performing tasks with environmental awareness.	1.00	1.00	1.00	1.00	1.00	1.00
5	I inspire and encourage my colleagues to take environmental concern into account.	1.00	1.00	1.00	1.00	1.00	1.00
6	I share my knowledge related to environmental work with my colleagues.	1.00	1.00	1.00	1.00	1.00	1.00
Green Corporate Culture							
1	The company concentrates on the vision of green business operation.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company creates culture and value on green business operation among employees.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company sets the corporate standards and principles for corporate members to work with environmental awareness.	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
4	The company has a clear guideline for corporate members to work with environmental awareness.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company's mission reflects its green business operation.	1.00	1.00	1.00	1.00	1.00	1.00
6	The company's mission is clearly communicated to corporate members and related to stakeholders.	1.00	1.00	1.00	1.00	1.00	1.00
Green Corporate Policy							
1	The company has a policy to share and provide environmental management techniques to suppliers, customers and other stakeholders.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company has a policy to collaborate with suppliers, customers and other stakeholders to do green activities.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company establishes the environmental agreements with suppliers, customers and other stakeholders.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company has a policy to change and adjust its corporate activities and business to be green.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company has a policy that responds to green business and activities.	1.00	1.00	1.00	1.00	1.00	1.00
Green Forces and Drivers							

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
1	External stakeholders, such as customers, competitor, and suppliers force the company to concern environmental matters.	1.00	1.00	1.00	1.00	1.00	1.00
2	Being an internationalized company forces the company to concern environmental matters.	1.00	1.00	1.00	1.00	1.00	1.00
3	Technology and innovation can assist the company to promote and produce products and services.	1.00	1.00	1.00	1.00	1.00	1.00
4	Society and community force the company to concern environmental matters.	1.00	1.00	1.00	1.00	1.00	1.00
5	Governmental regulations and laws force the company to concern environmental matters.	1.00	1.00	1.00	1.00	1.00	1.00
Green Products and Services		0.00	0.00	0.00	0.00	0.00	
1	The products and services represent the corporate’s concerns on environmental matters.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company can produce green products and provide green services.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company builds relationship with customers to satisfy them and prolong their decision to continue using the products and services provided by the company.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company accurately respond the	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	customer’s needs in terms of green products.						
Employee's Green Personal-Socail Identification							
Green Personal Identification							
1	The green corporate identity is consistent my lifestyle.	0.86	0.86	0.86	0.86	0.86	0.86
2	The green corporate identity is consistent with my role.	0.71	0.71	0.71	0.71	0.71	0.71
3	The green corporate identity is consistent with my value.	0.86	0.86	0.86	0.86	0.86	0.86
4	The green corporate identity symbolizes my identity.	0.71	0.71	0.71	0.71	0.71	0.71
5	The green corporate identity reflects my personality.	0.86	0.86	0.86	0.86	0.86	0.86
6	The green corporate identity extends my green role.	0.86	0.86	0.86	0.86	0.86	0.86
Employee's Green Social Identification							
1	The green corporate identity provides me social recognition and respect.	1.00	1.00	1.00	1.00	1.00	1.00
2	The green corporate identity enhances my social status.	1.00	1.00	1.00	1.00	1.00	1.00
3	The green corporate identity enhances my image.	1.00	1.00	1.00	1.00	1.00	1.00
4	The green corporate identity increases my “social role”.	1.00	1.00	1.00	1.00	1.00	1.00
5	The green corporate identity influences the society to view me in a better way.	0.86	0.86	0.86	0.86	0.86	0.86

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
Green Supply Chain Management							
Green Design							
1	The company designs products and services that help reduce unnecessary energy and raw materials usage.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company intends to reduce product components that give negative effects on the environment.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company collaborates with both domestic and international customers for green design, packages, and management solution.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company designs the products with reusable, recyclable materials.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company designs the green products to be easily used.	0.86	1.00	1.00	0.86	0.93	0.86
6	The company designs products that can reduce the use of hazardous substances and reduce production waste.	1.00	1.00	1.00	1.00	1.00	1.00
Green Procurement							
1	The company chooses either domestic or international suppliers based on its green criteria.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company purchases green raw materials.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company has a green design specification as a requirement for domestic and international suppliers.	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
4	The company has a cooperation with both domestic and international suppliers for delivering green raw materials.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company monitors both domestic and international suppliers' internal green management prior to any purchase.	1.00	1.00	1.00	1.00	1.00	1.00
6	The domestic and international supplier of the company is required to have recognizable green certificates or standard.	1.00	1.00	1.00	1.00	1.00	1.00
Green Manufacturing							
1	The company minimizes using chemical substances and pollution.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company applies re-manufacturing and lean production to reduce waste.	1.00	1.00	1.00	0.86	0.96	1.00
3	The company applies clean manufacturing technologies for green production.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company optimizes its manufacturing process for highest efficiency.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company utilizes raw materials effectively.	1.00	1.00	1.00	1.00	1.00	1.00
6	The company strategically plans to repair machines and supplies.	1.00	1.00	1.00	1.00	1.00	1.00
7	The company's manufacturing process	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	is certified and standardized at international level.						
Green Recovery							
1	The company repairs and reuses end-of-life materials, parts and components.	0.86	0.86	0.86	0.86	0.86	0.86
2	The company resells end-of-life materials, parts and components for money or assets of the company.	0.86	0.86	0.86	0.86	0.86	0.86
3	The company prolongs the use of materials, parts and components by maintenance.	0.86	0.86	0.86	0.86	0.86	0.86
4	The company reconditions and refurbishes used parts or components.	0.86	0.86	0.86	0.86	0.86	0.86
Green Logistics							
1	The company provides green transportation.	0.71	0.71	0.71	0.71	0.71	0.71
2	The company uses the delivery route that can reduce the pollution.	0.86	1.00	1.00	1.00	0.96	0.86
3	The company determines delivery routes prior to any delivery.	1.00	1.00	1.00	0.86	0.96	1.00
4	The company applies full truck load system for effective delivery.	1.00	1.00	1.00	0.86	0.96	1.00
5	The company uses delivery method with alternative energy to save energy and expenses.	1.00	1.00	1.00	0.86	0.96	1.00
6	The company adopts just-in-time logistics.	1.00	1.00	1.00	0.86	0.96	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
7	The company applies information technology to track delivery services.	1.00	1.00	1.00	0.86	0.96	1.00
Green Marketing							
1	The company adopts green features to improve its image.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company uses marketing principles as a tool to create competitive advantages.	0.71	0.71	0.71	0.71	0.71	0.71
3	The company conducts a market research and studies customers' behaviour towards green specifications	0.86	0.86	0.86	0.86	0.86	0.86
4	The company positions its green products.	1.00	1.00	1.00	1.00	1.00	1.00
5	The company set reasonable prices for green products.	0.86	0.71	0.71	0.86	0.79	0.86
6	The company publicizes its green products in various channels.	0.86	0.86	0.86	0.86	0.86	0.86
Green Business Performance							
Economic Performance							
1	The company's raw material cost decreases.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company's energy usage decreases.	1.00	1.00	1.00	1.00	1.00	1.00
3	The company's expenses on waste discharge decrease.	1.00	1.00	1.00	1.00	1.00	1.00
4	The company's fines and compensation caused by environmental accidents decrease.	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
5	The company's revenues increase.	0.86	0.86	0.86	0.86	0.86	0.86
6	The company's market share increases.	1.00	1.00	1.00	1.00	1.00	1.00
7	The company's domestic and international competitive advantages increase.	0.71	0.71	0.71	0.71	0.71	0.71
Environmental Performance							
1	Technology and resources are effectively utilized.	1.00	1.00	1.00	1.00	1.00	1.00
2	The level of pollution, toxic and harms due to chemical substances are decreased.	1.00	1.00	1.00	1.00	1.00	1.00
3	Environmental accidents and risks are reduced.	1.00	1.00	1.00	1.00	1.00	1.00
4	Reputation, image, and quality of the company is improved.	1.00	1.00	1.00	1.00	1.00	1.00
5	The quality of green product and services are improved.	0.86	0.86	0.86	0.86	0.86	0.86
6	The company has the ability to recycle and reuse parts, component or raw materials more.	0.86	0.86	0.86	0.86	0.86	0.86
Social Performance							
1	Employees, customers, community, suppliers and governmental agencies are satisfied with the process of the company.	1.00	1.00	1.00	1.00	1.00	1.00
2	The company has better relationship with employees, customers, community, suppliers and	1.00	1.00	1.00	1.00	1.00	1.00

List	Variables	Relevance	Clarity	Simplicity	Ambiguity	Total CVI	I-CVI
	governmental agencies.						
3	Employees, customers, community, suppliers, and governmental agencies participate in expressing ideas and making a decision on activities that benefit the society.	1.00	1.00	0.86	0.86	0.93	1.00
4	The company has a collaboration with employees, customers, community, suppliers and governmental agencies in achieving corporate goals that also benefit the society.	1.00	1.00	1.00	1.00	1.00	1.00
5	Employees, customers, community, suppliers and governmental agencies regularly obtain beneficial knowledge, news, donation, as well as CSR from the company.	1.00	1.00	1.00	1.00	1.00	1.00
6	Employees, customers, community, suppliers and governmental agencies have better quality of life.	1.00	1.00	1.00	1.00	1.00	1.00

Variables	S-CVI/UA	S-CVI/Ave
Green Corporate Identity	0.80 (80%)	0.98
Employee Green Personal-Social Identification	0.36 (36%)	0.88
Green Supply Chain Management	0.52 (52%)	0.95
Green Business Performance	0.73 (73%)	0.96
Overall	0.66 (66%)	0.96

Appendix D. Example of Request-to-Check-Questionnaire Letter

ที่ อว 8620/ว 3010

วิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร
72 อาคาร กสท.โทรคมนาคม ชั้น 8-9
ถนนเจริญกรุง แขวงบางรัก
กรุงเทพมหานคร 10500

21 กันยายน 2563

เรื่อง ขอเรียนเชิญเป็นผู้ทรงคุณวุฒิตรวจเครื่องมือการวิจัย

เรียน

สิ่งที่ส่งมาด้วย 1. โครงร่างวิทยานิพนธ์
2. แบบสอบถาม
3. แบบประเมินคุณภาพเครื่องมือการวิจัย

ด้วย นายสุรพร อ่อนพุทธา นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาธุรกิจระหว่างประเทศ วิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร ได้รับอนุมัติโครงร่างวิทยานิพนธ์ เรื่อง “อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ” ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาธุรกิจระหว่างประเทศ ภายใต้การควบคุมของ ผู้ช่วยศาสตราจารย์ ดร. เฉลิมพร สิริวิชัย อาจารย์ที่ปรึกษาวิทยานิพนธ์

เพื่อให้วิทยานิพนธ์มีความถูกต้องและสมบูรณ์ตามวัตถุประสงค์ที่ตั้งไว้ ในการนี้ หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาธุรกิจระหว่างประเทศ ใคร่ขอความอนุเคราะห์เรียนเชิญท่านเป็นผู้ทรงคุณวุฒิพิจารณาเครื่องมือการวิจัยดังกล่าว

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์เป็นผู้ทรงคุณวุฒิตรวจเครื่องมือการวิจัย วิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร หวังเป็นอย่างยิ่งว่าจะได้รับการสนับสนุนจากท่าน และขอขอบคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร. สมพิศ ขัตติยพิกุล)
คณบดีวิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร

วิทยาลัยนานาชาติ มศก. ผู้ประสานงาน: ผู้ช่วยศาสตราจารย์ ดร. เฉลิมพร สิริวิชัย e-mail: siriwichai_c@silpakorn.edu

Appendix E. Certificates of Human Research Ethic Approval

บันทึกข้อความ

ส่วนงาน สำนักงานบริหารการวิจัย นวัตกรรมและการสร้างสรรค์ มหาวิทยาลัยศิลปากร ภายใน 216004

ที่ อว 8603.16/147 **วันที่** 13 มกราคม 2564

เรื่อง ผลการพิจารณาการขอรับการรับรองจริยธรรมการวิจัยในมนุษย์

เรียน นายสุรพร อ่อนพุทธา (นักศึกษาวิทยาลัยนานาชาติ)

ตามที่ท่านได้ส่งโครงการวิจัย เรื่อง อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ (เลขที่โครงการ REC 63.1228-157-7171) ไปยังสำนักงานบริหารการวิจัย นวัตกรรมและการสร้างสรรค์ เพื่อขอรับการพิจารณารับรองจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยศิลปากร แล้วนั้น

บัดนี้ สำนักงานบริหารการวิจัยฯ ขอแจ้งผลการพิจารณาให้ทราบว่า โครงการวิจัยดังกล่าวเข้าข่ายโครงการวิจัยที่ได้รับการยกเว้นการพิจารณา (Exemption review) จึงออกหนังสือรับรองให้กับโครงการวิจัยดังกล่าวตามเอกสารแนบ

จึงเรียนมาเพื่อโปรดทราบ หากผู้วิจัยมีข้อสงสัยสามารถสอบถามเพิ่มเติมได้ที่ นางสาวปิยาภรณ์กัดสูงเนิน โทร (เบอร์สำนักงาน) 098-5479738 ภายใน 216004

(ศาสตราจารย์ ดร.พรศักดิ์ ศรีอมรศักดิ์)
ประธานกรรมการจริยธรรมการวิจัยในมนุษย์

ยุทธศาสตร์วิจัย : Creativity in Reality for Life and Sustainability
การสร้างสรรค์บนพื้นฐานความเป็นจริงเพื่อชีวิตและการพัฒนาที่ยั่งยืน

มหาวิทยาลัยศิลปากร

หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า

รหัสโครงการ: REC 63.1228-157-7171

ชื่อโครงการ (ภาษาไทย): อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ

ชื่อโครงการ (ภาษาอังกฤษ): The influence of green corporate identity and green supply chain management on performance of the international business

ผู้วิจัยหลัก: นายสุรพร อ่อนพุทธา **สังกัด:** วิทยาลัยนานาชาติ

เอกสารที่รับรอง:

1. แบบเสนอเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในมนุษย์ เวอร์ชั่น 01 ฉบับลงวันที่ 28 ธันวาคม 2563
2. แบบเสนอโครงการวิจัยเพื่อการพิจารณาจริยธรรมการวิจัยในมนุษย์ (ฉบับภาษาไทย) เวอร์ชั่น 01 ฉบับลงวันที่ 28 ธันวาคม 2563

ได้ผ่านการรับรองจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยศิลปากร โดยยึดหลักเกณฑ์ตามคำประกาศ เฮลซิงกิ (Declaration of Helsinki) และมีความสอดคล้องกับหลักจริยธรรมสากล ตลอดจนกฎหมาย ข้อบังคับ และข้อกำหนดภายในประเทศ

(ศาสตราจารย์ ดร.พรศักดิ์ ศรีอมรศักดิ์)
ประธานกรรมการจริยธรรมการวิจัยในมนุษย์
มหาวิทยาลัยศิลปากร

หมายเลขใบรับรอง COE 64.0111-001
วันที่รับรอง: 11 มกราคม พ.ศ.2564

สำนักงานบริหารการวิจัย นวัตกรรมและการสร้างสรรค์
6 ถนนราชมรรคาใน ตำบลพระปฐมเจดีย์ อำเภอเมืองนครปฐม จังหวัดนครปฐม 73000
โทร 0-3425-5808 โทรสาร (Fax) : 0-3425-5808
email : su.ethicshuman@gmail.com

Appendix F. Example of Request-to-Collect-Data Letter

ที่ อว 8620/ 3290

วิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร
72 อาคาร กสท. โทรคมนาคม ถนนเจริญกรุง
แขวงบางรัก เขตบางรัก กรุงเทพมหานคร 10500

19 ตุลาคม 2563

เรื่อง ขอความอนุเคราะห์เก็บข้อมูลแบบสอบถาม

เรียน

สิ่งที่ส่งมาด้วย 1. แบบสอบถาม

ด้วย นายสุรพร อ่อนพุทธา นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาธุรกิจระหว่างประเทศ วิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร ได้รับอนุมัติโครงร่างวิทยานิพนธ์ เรื่อง “อิทธิพลของอัตลักษณ์องค์กรสีเขียวและการจัดการห่วงโซ่อุปทานสีเขียวที่มีผลต่อประสิทธิภาพในการดำเนินธุรกิจระหว่างประเทศ” ซึ่งเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปรัชญาดุษฎีบัณฑิตสาขาวิชาธุรกิจระหว่างประเทศ ภายใต้การควบคุมของ ผู้ช่วยศาสตราจารย์ ดร. เฉลิมพร สิริวิชัย อาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก และ อาจารย์ ดร. เกียรติกำจร มีขนอน อาจารย์ที่ปรึกษาวิทยานิพนธ์ร่วม

เพื่อให้วิทยานิพนธ์มีความถูกต้องและสมบูรณ์ตามวัตถุประสงค์ที่ตั้งไว้ ในการนี้ หลักสูตรปรัชญาดุษฎีบัณฑิตสาขาวิชาธุรกิจระหว่างประเทศ ใคร่ขอความอนุเคราะห์จากหน่วยงานของท่านให้ นายสุรพร อ่อนพุทธา หมายเลขโทรศัพท์ติดต่อ 095-639-2926 อีเมล์ onputtha_s@su.ac.th หรือ suraporn.top@gmail.com ได้ประสานงานและเข้าไปเก็บข้อมูลแบบสอบถาม ซึ่งทางหลักสูตร ฯ หวังเป็นอย่างยิ่งว่าจะได้รับการสนับสนุนจากท่าน

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ และขอขอบคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(ผู้ช่วยศาสตราจารย์ ดร. สมพิศ ขัตติยพิกุล)
คณบดีวิทยาลัยนานาชาติ มหาวิทยาลัยศิลปากร

วิทยาลัยนานาชาติ มศก. ผู้ประสานงาน: ผู้ช่วยศาสตราจารย์ ดร. เฉลิมพร สิริวิชัย e-mail: siriwichai_c@silpakorn.edu

Appendix G. Respondents' Bias Analysis

Respondents' Bias Analysis

	GENDER	AGE	STATU	EDUCA	INCOM	WOREX	POSIT	DEPAR	COMPA
GCCo	-.039	-.069	.042	-.042	-.012	.022	.041	.029	.012
GCVI	.011	-.014	.068	-.050	-.010	.009	.027	-.033	.108*
GEB	-.011	-.022	.060	-.014	.007	.030	.043	-.048	.074
GCCu	-.066	-.048	.005	-.028	-.004	.061	.023	-.041	.064
GPo	-.089	-.037	.008	-.011	.020	.041	.047	-.028	.053
GFD	-.078	-.053	.007	-.027	.000	.065	.047	.018	-.015
GPaS	-.075	-.031	.017	-.010	.015	.068	.044	-.027	.021
GPI	.007	.014	.019	.034	.025	.023	-.039	-.105*	.112*
GSI	-.005	-.041	-.062	-.015	-.057	-.068	.010	-.105*	.115*
GDes	-.065	-.062	-.009	-.027	.027	.066	.041	-.012	-.018
GPcu	-.092	-.073	-.035	-.036	-.017	.036	.037	-.073	.040
GMan	-.088	-.134**	-.044	-.100*	-.070	.011	.098	.014	-.024
Grec	-.084	-.066	-.063	-.033	-.033	-.078	.053	-.112*	.083
Glog	-.034	-.072	-.016	-.065	-.037	.021	.052	-.002	-.003
Gmar	-.048	-.093	-.057	-.076	-.023	.016	.055	.024	-.035
EP	-.125*	.081	.020	.103*	.123*	.105*	-.086	-.080	.152**
EnP	-.103*	-.009	-.025	.023	.037	.021	-.026	-.033	.120*
SP	-.120*	-.008	-.027	.024	.040	.035	-.022	-.051	.131**

Gender

Group Statistics

GENDER		N	Mean	Std. Deviation	Std. Error Mean
GCI	1	265	4.2346	.49330	.03030
	2	135	4.1779	.57208	.04924
GPSI	1	265	4.0156	.59946	.03682
	2	135	4.0165	.71070	.06117
GSCM	1	265	4.1848	.50735	.03117
	2	135	4.0942	.63041	.05426
GBP	1	265	4.2911	.55101	.03385
	2	135	4.1316	.68535	.05899

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
GCI	Equal variances assumed	1.129	.289	1.030	398	.304	.05674	.05511	-.05160	.16508
	Equal variances not assumed			.981	237.450	.327	.05674	.05781	-.05716	.17063
GPSI	Equal variances assumed	4.878	.028	-.014	398	.989	-.00095	.06758	-.13380	.13191
	Equal variances not assumed			-.013	233.191	.989	-.00095	.07140	-.14161	.13972
GSCM	Equal variances assumed	2.972	.086	1.553	398	.121	.09063	.05835	-.02409	.20535
	Equal variances not assumed			1.448	224.607	.149	.09063	.06257	-.03267	.21393
GBP	Equal variances assumed	4.149	.042	2.516	398	.012	.15951	.06340	.03486	.28415
	Equal variances not assumed			2.345	224.429	.020	.15951	.06801	.02549	.29352

Age

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	.818	3	.273	1.004	.391
	Within Groups	107.567	396	.272		
	Total	108.386	399			
GPSI	Between Groups	1.610	3	.537	1.320	.267
	Within Groups	160.943	396	.406		
	Total	162.553	399			
GSCM	Between Groups	1.204	3	.401	1.316	.269
	Within Groups	120.740	396	.305		
	Total	121.944	399			
GBP	Between Groups	.386	3	.129	.352	.788
	Within Groups	144.982	396	.366		
	Total	145.369	399			

Status

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	.576	2	.288	1.060	.347
	Within Groups	107.810	397	.272		
	Total	108.386	399			
GPSI	Between Groups	.456	2	.228	.558	.573
	Within Groups	162.097	397	.408		
	Total	162.553	399			
GSCM	Between Groups	.230	2	.115	.376	.687
	Within Groups	121.713	397	.307		
	Total	121.944	399			
GBP	Between Groups	.020	2	.010	.028	.973
	Within Groups	145.348	397	.366		
	Total	145.369	399			

Education

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	.207	3	.069	.252	.860
	Within Groups	108.179	396	.273		
	Total	108.386	399			
GPSI	Between Groups	1.571	3	.524	1.288	.278
	Within Groups	160.981	396	.407		
	Total	162.553	399			
GSCM	Between Groups	1.088	3	.363	1.189	.314
	Within Groups	120.856	396	.305		
	Total	121.944	399			
GBP	Between Groups	1.713	3	.571	1.574	.195
	Within Groups	143.655	396	.363		
	Total	145.369	399			

Income

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	1.522	4	.380	1.406	.231
	Within Groups	106.864	395	.271		
	Total	108.386	399			
GPSI	Between Groups	2.948	4	.737	1.824	.123
	Within Groups	159.604	395	.404		
	Total	162.553	399			
GSCM	Between Groups	3.376	4	.844	2.812	.025
	Within Groups	118.568	395	.300		
	Total	121.944	399			
GBP	Between Groups	3.690	4	.923	2.572	.037
	Within Groups	141.678	395	.359		
	Total	145.369	399			

Work Experience

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	.980	4	.245	.901	.463
	Within Groups	107.406	395	.272		
	Total	108.386	399			
GPSI	Between Groups	.305	4	.076	.186	.946
	Within Groups	162.248	395	.411		
	Total	162.553	399			
GSCM	Between Groups	.762	4	.190	.621	.648
	Within Groups	121.182	395	.307		
	Total	121.944	399			
GBP	Between Groups	.738	4	.184	.504	.733
	Within Groups	144.631	395	.366		
	Total	145.369	399			

Position

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	.232	2	.116	.427	.653
	Within Groups	108.153	397	.272		
	Total	108.386	399			
GPSI	Between Groups	.947	2	.474	1.164	.313
	Within Groups	161.605	397	.407		
	Total	162.553	399			
GSCM	Between Groups	1.282	2	.641	2.108	.123
	Within Groups	120.662	397	.304		
	Total	121.944	399			
GBP	Between Groups	.448	2	.224	.613	.542
	Within Groups	144.921	397	.365		
	Total	145.369	399			

Department

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	2.075	5	.415	1.538	.177
	Within Groups	106.311	394	.270		
	Total	108.386	399			
GPSI	Between Groups	4.380	5	.876	2.182	.055
	Within Groups	158.173	394	.401		
	Total	162.553	399			
GSCM	Between Groups	3.308	5	.662	2.197	.054
	Within Groups	118.636	394	.301		
	Total	121.944	399			
GBP	Between Groups	3.588	5	.718	1.994	.079
	Within Groups	141.780	394	.360		
	Total	145.369	399			

Company

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
GCI	Between Groups	5.967	5	1.193	4.591	.000
	Within Groups	102.418	394	.260		
	Total	108.386	399			
GPSI	Between Groups	8.197	5	1.639	4.185	.001
	Within Groups	154.356	394	.392		
	Total	162.553	399			
GSCM	Between Groups	10.966	5	2.193	7.786	.000
	Within Groups	110.978	394	.282		
	Total	121.944	399			
GBP	Between Groups	10.938	5	2.188	6.411	.000
	Within Groups	134.431	394	.341		
	Total	145.369	399			

VITA

NAME	Suraporn Onputtha
DATE OF BIRTH	28 February 1987
PLACE OF BIRTH	Roi-Ed
INSTITUTIONS ATTENDED	School of Business, Lucerne University of Applied Sciences and Arts School of Environment, Resources, and Development, Asian Institute of Technology Faculty of Business Administration, Rajamangala University of Technology Thanyaburi
HOME ADDRESS	No. 18, Moo 10, Klong Hok Sub-district, Klong Luang District, Pathum Thani Province, 12120
PUBLICATION	Onputtha, S., & Siriwichai, C. (2021). The Impact of Green Corporate Identity and Green Personal-Social Identification on Green Business Performance: A Case Study in Thailand. The Journal of Asian Finance, Economics and Business, 8(5), 157-166. Onputtha, S., & Siriwichai, C. (2021). Measurement Development of Green Business Performance: An Evidence from Automobile Manufacturers in Thailand. Journal of Marketing and Management, 8(1) Onputtha, S., Thongsook Ularn, S., & Banjongprasert, J. (2020). Green Corporate Identity: Definitions, Importance, Components and Methods. Test Engineering and Management. 83. 1998-2007.
AWARD RECEIVED	-