

SUPPLIER SELECTION, SUPPLIER DEVELOPMENT, INTELLECTUAL
CAPITAL, AND MANUFACTURING FIRMS' SUSTAINABILITY
PERFORMANCE

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UNIVERSITI TEKNOLOGI MALAYSIA

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SUSTAINABILITY PERFORMANCE

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A dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
Doctor of Business Administration

Azman Hashim International Business School
Universiti Teknologi Malaysia

AUGUST 2022

DEDICATION

This thesis is dedicated to my wife and my three angels
who are the pillars of my strength,
throughout DBA journey.

ACKNOWLEDGEMENT

First and foremost, I would like to thank God for His grace and blessings along this journey, which have provided me with the strength, opportunity, and permission to complete this thesis.

Furthermore, I want to express my heartfelt gratitude to my distinguished supervisor, Assoc Prof Dr. Grace Thoo Ai Chin, for her unwavering dedication, advice, motivation, and patience. I am extremely appreciative of her critical remarks, astute research abilities, and knowledge that she has shared with me during this journey, which has been of tremendous assistance. In addition, I'd like to thank Dr. Kesavan from UPSI, who has been extremely helpful in reviewing the statistics.

Additionally, I would like to express my heartfelt appreciation to Universiti Teknologi Malaysia (UTM) for providing me with a place to complete my studies.

This DBA journey has been made possible by a group of wonderful friends — Tamilarasan, Panir Selvam, Ravi Manikam, and Sheena – who were gracious enough to listen to my ramblings and make me smile whenever I am depressed.

I'd like to express my gratitude to my parents for their unending love and prayers. Additionally, I am grateful to my family members for their unwavering support and encouragement throughout this research. Finally, I would want to dedicate this thesis to four of the most essential people in my life: Logaiswari, Meenakshi, Visalakshi, and Prithihashni. It has been a long and difficult journey, but your unwavering support and encouragement have enabled me to gather the fortitude necessary to complete this thesis. Many thanks.

ABSTRACT

Increasing attention to environmental issues has put tremendous pressure on manufacturing organisations to select and develop suppliers based on social and environmental elements, aside from merely based on standard operational practices. Manufacturing organisations invest resources in their suppliers to increase their abilities in order to remain competitive in today's markets. However, the intellectual capital of manufacturing organisations' ability to drive supplier capabilities tends to be challenged when it depends on the suppliers' willingness and ability to adapt to rapid and unpredictable changes in the business environment. Therefore, this study investigates the relationships between supplier selection criteria, supplier development and sustainability performance. Intellectual capital as a moderator is examined on the relationship between supplier development and sustainability performance. In addition, the mediating effect of supplier development was investigated on the relationship between supplier selection and sustainability performance. The conceptual framework was developed in this study based on the Resource-based View (RBV) and Natural Resource-based View (NRBV) theories. Questionnaires were distributed as the main research instrument, and data were collected from 234 manufacturing organisations in Malaysia. The manufacturers were selected randomly from more than 2800 manufacturers in the Federation of Malaysian Manufacturers directory (51st Edition). Research hypotheses were formulated and tested using Partial Least Squares Structural Equation Modelling (PLS-SEM). According to the findings, supplier selection criteria and supplier development directly influence the sustainability performance of manufacturing organisations. Additionally, supplier selection criteria have a direct influence on supplier development. Furthermore, the findings demonstrated that supplier development partially mediates the relationship between supplier selection criteria and sustainability performance. Also, findings indicate that intellectual capital moderates the relationship between supplier development and the sustainability performance of manufacturing organisations. Overall, the findings of this study are expected to assist manufacturing organisations in identifying collaborative suppliers for sustainability performance. Further, the manufacturing organisation can use the conceptual framework offered in this study to develop new supplier selection criteria to facilitate its supplier development program. Through a formal procurement and supplier quality procedure, firms could communicate their expectations to motivate suppliers to improve performance. Lastly, intellectual capital supports manufacturing organisations in identifying, selecting, and retaining practical supplier networks in the best manner so that the firms can maintain their competitive advantages.

ABSTRAK

Perhatian yang semakin meningkat terhadap isu alam sekitar telah memberikan tekanan yang hebat kepada organisasi pembuatan untuk memilih dan membangunkan pembekal berdasarkan elemen sosial dan alam sekitar, selain daripada hanya berdasarkan amalan operasi standard. Organisasi pembuatan melaburkan sumber kepada pembekal mereka untuk meningkatkan kebolehan mereka agar kekal berdaya saing dalam pasaran hari ini. Walau bagaimanapun, keupayaan modal intelek organisasi pembuatan untuk memacu keupayaan pembekal cenderung dicabar apabila ia bergantung pada kesediaan dan keupayaan pembekal untuk menyesuaikan diri dengan perubahan pesat dan perubahan yang tidak dapat diramalkan dalam persekitaran perniagaan. Oleh itu, kajian ini bertujuan untuk menyelidik hubungan antara kriteria pemilihan pembekal, pembangunan pembekal dan prestasi kelestarian. Modal intelek pula dikaji sebagai penyederhana di antara hubungan pembangunan pembekal dan prestasi kelestarian. Di samping itu, kesan pengantaraan pembangunan pembekal telah dikaji ke atas hubungan antara pemilihan pembekal dan prestasi kelestarian. Berdasarkan teori Pandangan Berasaskan Sumber (RBV) dan Pandangan Berasaskan Sumber Asli (NRBV), kerangka konsep telah dibangunkan dalam kajian ini. Soal selidik sebagai instrumen utama kajian telah diedarkan dan data dikumpul daripada 234 organisasi pembuatan di Malaysia. Organisasi pembuatan telah dipilih secara rawak daripada lebih 2800 pengeluar dalam direktori Persekutuan Pengilang Malaysia (Edisi ke-51). Hipotesis penyelidikan telah dibentuk dan diuji menggunakan Pemodelan Persamaan Struktur - Kuasa Dua Separa Terkecil (PLS-SEM). Berdasarkan kepada penemuan kajian ini, kriteria pemilihan pembekal dan pembangunan pembekal secara langsung mempengaruhi prestasi kelestarian organisasi pembuatan. Selain itu, kriteria pemilihan pembekal mempunyai pengaruh langsung terhadap pembangunan pembekal. Tambahan pula, dapatan kajian menunjukkan bahawa pembangunan pembekal menjadi pengantara separa hubungan antara kriteria pemilihan pembekal dan prestasi kelestarian. Selain itu, penemuan menunjukkan bahawa modal intelek menyederhanakan hubungan antara pembangunan pembekal dan prestasi kelestarian organisasi pembuatan. Secara keseluruhannya, dapatan kajian ini diharapkan dapat membantu organisasi pembuatan untuk mengenal pasti pembekal kolaboratif untuk prestasi kelestarian. Seterusnya, kerangka konsep yang dibangunkan dalam kajian ini boleh digunakan oleh organisasi pembuatan untuk membangunkan kriteria pemilihan pembekal baharu bagi memudahkan program pembangunan pembekalnya. Melalui perolehan rasmi dan prosedur kualiti pembekal, firma boleh menyampaikan jangkaan mereka untuk memotivasikan pembekal bagi meningkatkan prestasi. Akhirnya, modal intelek menyokong organisasi pembuatan untuk mengenal pasti, memilih dan mengekalkan rangkaian pembekal praktikal dengan cara yang terbaik supaya firma dapat mengekalkan daya saing mereka.

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LIST OF ABBREVIATIONS

UTM	-	Universiti Teknologi Malaysia
SDG	-	Sustainable Development Goals
FMM	-	Federation of Malaysian Manufacturers
SCOR	-	Supply Chain Operations Reference
RBV	-	Resource Based View
NRBV	-	Natural Resource Based View
SSC	-	Supplier Selection Criteria
SD	-	Supplier Development
IC	-	Intellectual Capital
SP	-	Sustainability Performance
TBL	-	Triple Bottom Line
GDP	-	Gross Domestic Product
CSR	-	Corporate Social Responsibility
AVL	-	Approved Vendor List
VRIN	-	Valuable, Rare, Inimitable, and Non-substitutable
ESG	-	Environmental, Social and Government Governance
CI	-	Confidence Interval
LL	-	Lower Limit
UL	-	Upper Limit

LIST OF SYMBOLS

β	-	Beta
$<$	-	Less than
z	-	Standardized score

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Since the adoption of the United Nation's Sustainable Development Goals (SDG) and the Paris Agreement in 2015, the world has been working towards goals related to social well-being, economic prosperity, and environmental preservation. The 17 global goals, coupled with 169 targets set to cover various aspects related to the economy, environment, and society, serve as a blueprint to create a better future for mankind (Pradhan *et al.*, 2017). The transformations that countries around the world need to go through include improving access to basic amenities; investing in the health system; improving education to build human capital (the foundation for a knowledge-based economy); implementing environmental protection systems in industries (the foundation for a green economy); promoting no waste or circular economy; and adapting to the 4th Industrial Revolution (IR4.0) (Sachs *et al.*, 2019). Today, achieving sustainability performance enables manufacturing organisations to gain a competitive edge in a market that is transitioning to a greener economy, while also generating significant financial gains and attracting customers to ensure long-term profitability (Çankaya and Sezen, 2019).

In the year 2020's SDG annual report, Malaysia improved its ranking from 66th to 60th. Malaysia is on track to eliminate poverty, provide affordable and clean energy, promote decent work and economic growth, and invest in industry-based innovation and infrastructure. Malaysia has made modest progress in areas such as health and well-being, gender equality, access to safe drinking water and proper sanitation, and urban sustainability. However, the drive to eradicate hunger, provide high-quality education, combat climate change, and conserve life in the water and on land has slowed (Sachs *et al.*, 2020). In the 1970s, the New Economic Policy included some elements of sustainability, such as poverty eradication and social

imbalance correction. Meanwhile, the 11th Malaysia Development Plan, continuing into the 12th Malaysia Plan, included sustainable development as a means of achieving economic prosperity on a sustainable basis, a social balance that is equitable, the availability of basic necessities, and access to education and healthcare. In a recent survey conducted by the Pew Research Center, seven out of ten Malaysians prioritise environmental protection over economic growth and job creation, which matches the results of surveys conducted in 20 different countries (Lim, 2020).

Malaysia's target under SDG goal 12 on responsible consumption and production is to encourage businesses to adopt sustainability practises that improve their sustainability performance and to integrate sustainability information into their reporting (Deloitte, 2019a). Manufacturing organisations account for a portion of Malaysia's total business sector. Bursa Malaysia requires all listed companies, including manufacturing organisations, to incorporate sustainability reporting, and according to the latest statistics, 97 of the top 100 highest earning companies on the Bursa are already complying with this requirement (Visuvaseven, 2020). Therefore, the importance of sustainable development and the role that manufacturing organisations can play in supporting Malaysia's sustainable development efforts have become crucial. For manufacturing organisations, sustainable development activities will result in an increase in their own sustainability performance.

Manufacturing organisations are the backbone of both the global and Malaysian economies, contributing significantly to countries' Gross Domestic Product (GDP), employment rates, and export percentages (OECD, 2019). Manufacturing contributes 16% of the global GDP and 22.7% of the Malaysian GDP in 2020, according to the United Nations Industrial Development Organisation (UNIDO) statistical portal. Manufacturing also contributes 26.8% of total employment in Malaysia for 2020, based on development indicators collected and analysed by the World Bank and accounts for 84.8% of total exports in Malaysia for February 2020, as reported by the Ministry of International Trade and Industry (MITI). According to the Malaysian annual economic statistics report for 2018 on the performance of the manufacturing sector, the value of gross output increased by

5.7% per year in 2017 and the value-added of the manufacturing sector rose by 6.9% per year in 2017. Other than output and value-added, manpower employed by the sector grew by 2.2% per annum in the same year as well (Department of Statistics Malaysia, 2020). Therefore, all the statistics demonstrate the critical role of manufacturing organisations and the manufacturing sector in the development of Malaysia's economy.

However, manufacturing, as a sector that consumes natural resources and has an impact on the environment, has to adopt these sustainable development activities in Malaysia, and the manufacturing organisations have to set the appropriate sustainability performance objectives. For all manufacturing organisations, supply chain management are important activities as per the Supply Chain Operations Reference (SCOR) framework (Dissanayake and Cross, 2018). Supplier chain management is a strategy that coordinates the business functions and the tactics across these business functions in an organisation as well as across business functions of different organisations, such as suppliers in a supply chain, with the aim of long term improvement for the organisation and the supply chain in its entirety (Carter and Rogers, 2008; Younus, 2021). Management of the supply chain enables manufacturing organisations to grow, select and establish long-term relationships with suppliers, outsource non-core processes and activities, and expand brand names (Rungsithong *et al.*, 2017; Çankaya and Sezen, 2019; Kumar and Routroy, 2018; Pahunkar *et al.*, 2020).

Typically, the cost of purchased parts and components constitutes up to an average of 70% of the total cost of production, and it has a direct impact on the cost and quality of the products manufactured (Salam, 2019; Hosseini and Al Khaled, 2019). Thus, purchasing plays a crucial role in an organisation, particularly in selecting a supplier based on the supplier's performance, capability, and ability to achieve its business objectives, and remain competitive. In addition to striving for economic growth, organisations also include sustainability aspects in their supply chain management efforts due to the increasing stakeholder pressure caused by environmental related regulations and social responsibilities (Kannan, 2018). The three aspects are described as social, ecological and economic elements, where each

dimension represents the society, environment and economy, encompassing sustainability performance (Joyce and Paquin, 2016). Thus, manufacturing organisations place a premium on their supply chain management procedures, which span several phases, from raw material procurement through final product delivery in terms of financial as well as sustainability performance.

In Malaysia, green purchasing or public procurement for sustainable products by the government is very low. Based on the national sustainable consumption and production blueprint, under the government's green procurement strategy, the goal is to increase green purchasing to 50% by 2025 and 100% by 2030. The green purchasing activities by the government will create a demand for sustainable products being produced and consumed domestically, and this will pave the pathway for industries such as manufacturing to shift their target and achieve better sustainability performance. Another objective of this green purchasing venture by the government is to lead by example. When government procurement practises become more environmentally friendly, the private sector and consumers will follow suit (SCP Malaysia, 2016). A study by Tiwari *et al.* (2019), shows that green purchasing is still in its infancy in Malaysia's manufacturing sector.

Furthermore, in addition to focusing on short-term gains, supplier selection must also take into account long-term development plans and strategic objectives that represent the competitive performance of the suppliers relative to their competitors (Khalil, 2019). Suppliers are part of an organization's supply chain, and the supplier selection strategy used to establish the relationship between supplier selection and manufacturing organisation is prudent in order to achieve a competitive advantage for a manufacturing organisation (Chen, 2011). Therefore, manufacturing organisations focus on evaluating different alternative suppliers based on a wide and diverse set of supplier selection criteria in order to identify the most suitable supplier to support their supply chain management strategy (Taherdoost and Brard, 2019). The right supplier selection criteria will assist the manufacturing organisation in overcoming upstream uncertainties, meeting their requirements, and establishing a long-term relationship. A supplier with poor performance will cause many problems in the future, which may affect the credibility and profitability of the manufacturing

organisation. On the other hand, eliminating a supplier from the approved supplier list and qualifying a new supplier increases the manufacturing organisation's expenses (El Mokadem, 2017; Vijayakumar *et al.*, 2019).

Suppliers selected by the manufacturing organisation may be underperforming in which case the manufacturing organisations resort to searching for a more capable supplier and switching to this new supplier. Alternatively, the manufacturing organisation can opt to invest in supplier development activities to bolster and enhance the capabilities of its suppliers (Patrucco *et al.*, 2020; Friedl and Wagner, 2012; Wagner, 2009). Supplier development activities are those carried out by the manufacturing organisation to improve the supplier's performance, capabilities, or both, and include activities such as supplier assessment, supplier audits, supplier visits, supplier training, supplier incentives, as well as working directly with the suppliers. Furthermore, these activities help manufacturing organisations improve their continuous improvement efforts and strategic competitiveness in the market (Akhavan *et al.*, 2018; Bag *et al.*, 2018; Ağan *et al.*, 2016). In Malaysia, as per the national sustainable consumption and production blueprint, under the green purchasing strategy by the government to lead by example one of the key activities includes accelerating supplier development (SCP Malaysia, 2016). Supplier development is an investment by manufacturing organisations in terms of money, manpower, and time that will result in a loss if suppliers are unable to improve following supplier development efforts or if suppliers' sustainability performance cannot be sustained.

Furthermore, the lack of an adequate supply of skilled labour, particularly in the field of sustainability, has been identified as another significant impediment confronting manufacturing organisations (Massaro *et al.*, 2018). In Malaysia, manufacturing contributes the most to employment rates, and the latest statistics indicate that the share of skilled workers remains low at 27.2%, while the contribution of labour quality is also low at about 8% of GDP (OECD, 2019). A study of manufacturing organisations and suppliers reveals a dearth of sustainability knowledge among procurement teams at manufacturing organisations and suppliers. The teams require additional training and even incentives to provide the necessary

motivation to achieve the organisations' triple bottom line targets (Ron, 2018). Internally, manufacturing organisations in this knowledge-based economy era require intellectual capital in addition to physical and financial capital. Intellectual capital is defined as the sum of an organisation's knowledge (Subramaniam and Youndt, 2005). Intellectual capital (IC) is material that contains intellectual elements that has been formalised, captured, and leveraged in order to generate prosperity through the creation of more valuable assets (Stewart, 1997). As a result, researcher identified human capital, structural capital, and relational capital as three major components of IC (Andreeva and Garanina, 2016; Bontis, 1998; Bozbura, 2004; Molodchik *et al.*, 2014; Roos *et al.*, 1998). Moreover, from the perspective of organisational performance, researchers have also suggested that IC drives sustainability performance (Yusoff *et al.*, 2019; Yusliza *et al.*, 2020).

Thus, as a result of the critical role of supply chain management activities such as supplier selection and development, as well as manufacturing organisations' intellectual capital, in achieving sustainability performance in this era of knowledge and green economy, this study aims to investigate the relationship between supplier chain management activities (selection and development) and intellectual capital with the sustainability performance of manufacturing organisations. The findings may prove to be crucial for manufacturing organisations studied by providing viable information regarding selecting the right suppliers, supporting supplier development, increasing knowledge capacity, and accumulating intangible resources with the goal of enhancing the organisations' sustainability performance. This may eventually allow manufacturing organisations to advance towards a higher level of model generation in knowledge and green economy.

In summary, every organisation including manufacturing organisations and their suppliers are dependent on the internal resources, skills and capabilities to achieve the organisational and sustainability performance according to Resource Based View (RBV) theory and the type of environmental related activities according to the extended RBV which is the Natural Resource Based View (NRBV).

1.2 Problem Statement

Sustainability is concerned with the protection of the environment and the advancement of societal development without affecting life on Earth (Woodward *et al.*, 2012). It entails balancing the interests of society, the environment, and profit in a profit-oriented organisation such as manufacturing organisations (Leitão *et al.*, 2013). However, Malaysia's weak laws and enforcement paved the path for all of the major significant sustainability-related crises in recent history (Kanniah, 2017; Ahmed *et al.*, 2020). Climate change, air pollution, water pollution, deforestation, and floods are the major environmental concerns in Malaysia. The primary cause of climate change is the generation of greenhouse gases, and industrialisation plays a significant role in Malaysia, since manufacturing accounts for 22.7% of total National GDP according to UNIDO statistical portal in 2020. Meanwhile, air pollution, commonly measured by the amount of Nitrogen Dioxide (NO₂) in the air, is mainly caused by transportation in Malaysia, however a clear runner up causing air pollution is the coal and gas consuming power plants which produces 80% Malaysia's energy need for the growing population and manufacturing industries (Raj, 2020).

Water pollution has recently gained prominence in Malaysia as a result of water disruption issues in Selangor caused by odour contamination of Sungai Semenyih as a result of illegal waste dumping into the river and the Sungai Kim Kim incident in the southern part of Malaysia, where hazardous industrial wastes were illegally dumped into the river, resulting in hospitalisation of children inhaling toxic fumes (Noh, 2021; Aziz 2021). Other environmental challenges such as deforestation and floods are also indirectly tied to manufacturing operations, since manufacturing generates demand for wood and logging, as well as flooding as a result of climate change induced by greenhouse gas emissions from manufacturing (Rahman, 2021; Raihan *et al.*, 2018). As a result, several disruptive environmental problems exist in Malaysia, attracting the attention of customers, government, and non-governmental organisations (NGOs) in Malaysia, who have begun increasing pressure on manufacturing organisations to act responsibly toward the environment and future

generations, and to consider the environmental impacts of their activities (Ali *et al.*, 2019).

Social sustainability is the next growing concern in Malaysia when it comes to sustainability. Global CEOs, according to KPMG's Global Manufacturing Prospects 2022 study, are focusing more on social issues than on environmental and other governance concerns (KPMG, 2022a). Local manufacturing businesses in Malaysia are significantly impacted by issues of forced labour, particularly in the electronics, rubber glove manufacturing, and palm oil plantation sectors (KPMG, 2022b). For the electronics sector, a watershed moment occurred when Dyson, the world's largest home appliance manufacturer, severed connections with one of its Malaysian suppliers, ATA IMS, following an independent assessment of ATA IMS's labour practices (Azhar, 2021b). Meanwhile, the US Customs and Border Protection (US CBP) placed two major Malaysian manufacturers of rubber gloves (Top Glove Corp Bhd and Supermax Corp Bhd) on its import ban list prior to and during the pandemic, and the same bans were placed on FGV Holdings Bhd and Sime Darby Plantations Ltd in the palm oil plantation industry (Bernama, 2022). In addition to weak government regulations and enforcement, all of the above incidents illustrate the lackadaisical attitude of manufacturing organisations that prioritise short-term profits over the long-term benefits to the environment, society, and future generations.

It's an undeniable fact, the most hazardous industry in Malaysia is actually the manufacturing industry (Zhou *et al.*, 2018). However, Malaysian manufacturing organisations continue to lag far behind in terms of adopting sustainable manufacturing practises (Ministry of Energy, Green Technology, and Water, 2017). In Malaysia, 70% of the companies listed on Bursa Malaysia include a section on sustainability in their annual reports. Of these companies, 80% do not incorporate sustainability into their business strategy (Vinod, 2020). This shows that most companies are not seriously adapting sustainability into their businesses. This again demonstrates the ineffective enforcement of regulations by the Malaysian government (Kanniah, 2017; Ahmed *et al.*, 2020). In 2019, Malaysia exported RM473 billion worth of goods to developed countries such as the United States (US)

and the United Kingdom (UK). According to GlobalWebIndex study in 2019, 68% of consumers online in the US and UK will avoid purchasing a product if the social performance is unclear, while 50% will spend more if the social performance is better (GlobalWebIndex, 2019). Malaysia, as a country that exports manufactured goods to developed countries, is susceptible to and vulnerable to emerging consumer trends globally. All of this stakeholder pressure from customers, consumers, and other parties such as Bursa Malaysia are driving manufacturing organisations to set objectives and improve their sustainability performance.

Environmental, social, and governance (ESG) factors are used to assess how far firms and countries have progressed in terms of sustainability implementation, and Bursa Malaysia launched an internationally benchmarked ESG index in December 2014 called the FTSE4Good Bursa Malaysia ESG Index, the first of its kind in Asean (Subramaniam, 2022; Bursa Malaysia, 2015). According to a survey conducted by KPMG management and risk consulting firm in Malaysia in 2020 (Table 1.1), among the top key risks for ESG are associated with sustainability performance, beginning with social sustainability, which encompasses labour rights, human rights, local community, occupational safety, and health (OSH). Following that is environmental management, climate change and greenhouse gas emissions, and waste management (Subramaniam, 2022).

Table 1.1 Ten most common ESG risks discussed by public listed companies in Malaysia in 2020

No	Risks	Percentage
1	Corporate governance, regulations & compliance	11.13%
2	Talent development, attraction & retention	9.54%
3	Labour rights & human rights	8.92%
4	Environmental management	8.76%
5	Local community	5.12%
6	Customer satisfaction	4.42%
7	Occupational, safety & health	4.09%
8	Climate change & greenhouse gas emissions	4.09%
9	Supply chain management	3.85%
10	Waste management	3.72%

Additionally, according to KPMG survey (Table 1.1), supply chain management is one of the top ESG risks identified among public listed firms, which includes manufacturing organisations (Table 1.1). Furthermore, according to Komathi Mariyappan, head of advice and consultancy (climate action group) at Malaysian Green Technology and Climate Change Corporation (MGTC), greenhouse gas emissions in manufacturing are caused by supplier related activities such as raw material extraction, transportation, and processing (Banoo, 2022). Meanwhile, according to an August 2021 EY consultant research, supply chains are a critical emphasis area since they account for the majority of emissions and operational expenses and are particularly vulnerable to climate changes such as natural disasters and global warming (Subramaniam, 2022).

Supplier chain management is a strategy that coordinates the business functions and the tactics across these business functions in an organisation as well as across business functions of different organisations, such as suppliers in a supply chain, with the aim of long term improvement for the organisation and the supply chain in its entirety (Carter and Rogers, 2008). Management of the supply chain enables manufacturing organisations to grow, establish long-term relationships with suppliers, outsource non-core processes and activities, and expand brand names (Rungsithong *et al.*, 2017; Çankaya and Sezen, 2019; Kumar and Routroy, 2018). Research shows that 79% of the organisations with high-performing supply chains outperformed their industry average in terms of growth, demonstrating the critical nature of the supply chain and suppliers to a manufacturing organisation (Deloitte, 2014).

Rashidi *et al.* (2020) conducted a meta-literature review in the area of sustainable supplier selection criteria and discovered that the key factors evaluated are economic, environmental, and social. Another critical finding from the research is that innovation and invention in the upstream supply chain is crucial for downstream manufacturers to remain competitive (Teece, 2007). Numerous businesses have started to seize this opportunity by including suppliers into new product development activities (Schiele, 2010; Thomas, 2013), as well as environmental and sustainability development initiatives (Hall, 2006; Lee and Kim,

2011). Rashidi *et al.* (2020) indicate, however, that this criterion, which is connected with new product creation and competitiveness, is often disregarded. Apart from new product development and competitiveness, two additional often coupled indicators are new market and new technology, termed strategic selection criteria jointly (Gelderman *et al.*, 2016; Nair *et al.*, 2015; Wetzstein *et al.*, 2016). Due to the competitive advantage of the supplier's innovations for manufacturing organisations, incorporating this factor related to new product development, new market, and new technology, as well as the competitiveness of the suppliers in the market, can lead to a better selection of suppliers using strategic selection criteria.

Additionally, the meta-literature study by Rashidi *et al.* (2020) revealed that no study from Scopus and Web of Science indexed journals integrates all four categories of selection criteria as the combined selection criterion for research in the period of the study ranging from 1990 to 2018. Based on the studies, it is evident the most commonly used selection criteria are operational, environmental, and social criteria, whereas strategic selection criteria are often not included. To the best of the researcher's knowledge, there are no other studies on selection criteria as a combination of operation, environment, social, and strategic criteria. Therefore, in this study a new combination of selection criteria extracted from studying past research works have been used to identify the right selection criteria that will help the manufacturing organisations to identify compatible suppliers. The selection criteria used in this study are an unexplored set of criteria for selecting new suppliers in a manufacturing environment. They combine operational, strategic, environmental and social factors.

Several studies have shown that supplier selection and supplier development practices have a positive impact on organisational performance, particularly when both are implemented concurrently (Gualandris and Kalchschmidt, 2016; Park *et al.*, 2010; Yadlapalli *et al.*, 2018). Following the supplier selection decision, manufacturing organisations and suppliers often monitor, manage, and collaborate for suppliers' short- and long-term performance and capabilities to mitigate any potential risks to manufacturing organisations (Cole and Aitken, 2019). In addition, past studies found that supplier selection and supplier development could enhance

organisational performance (Yadlapalli *et al.*, 2018; Akamp and Müller, 2013; Gualandris *et al.*, 2015; Yang and Zhang, 2017). Moreover, research has shown that supplier selection has a substantial effect on the development of supplier skills (Yang and Zhang, 2017; Pradhan and Routroy, 2016; Kannan and Tan 2006). Research by Aharonovitz *et al.* (2018) and Nair *et al.* (2015) suggests that supplier selection may improve strategic supplier development efforts. This shows that supplier development is a proven mediator for the relationship between supplier selection criteria and organisational performance. Thus, the purpose of this study is to confirm this relationship, however with a unique difference: supplier development is established as a unique combination of short-term and long-term activities known as supplier assessment and supplier collaboration.

According to Krause and Ellram (1997), supplier development is a long-term strategy led by the manufacturing organisation to improve suppliers' performance and capabilities so that they can meet the manufacturing organisation's needs more effectively and efficiently, thereby providing the manufacturing organisation with an additional competitive advantage. According to Yadlapalli *et al.* (2018) and Luzzini *et al.* (2015), supplier development has a significant impact on each of the sustainability performance dimensions. Other studies including Large and Thomsen (2011) and Gimenez and Sierra (2013), corroborate the findings. In addition, Kumar and Rahman (2016) and Subramaniam *et al.* (2019) found a significant impact between supplier development and environmental and social performance.

On the other hand, some of the studies show a negative relationship between supplier development and sustainability performance. According to Kumar and Rahman (2016) and Shou *et al.* (2019), supplier development has a negative correlation with economic success, particularly in the short run. Gimenez *et al.* (2012) and Sancha *et al.* (2015) found that supplier collaboration, one of the components of supplier development, has a positive impact on financial performance, whereas supplier assessment has a negative impact. Based on the literature reviewed, it is evident that supplier development efforts, which consist of short term development efforts related to supplier assessment and long term development efforts related to supplier collaboration, have different (inconsistent)

effects on an organization's sustainability performance. Thus, a moderator can be introduced to further support and strengthen the relationship between supplier development and sustainability performance.

According to Yusoff *et al.* (2019) and Yusliza *et al.* (2020), intellectual capital has a positive relationship with sustainability performance. Thus, in this study, supplier development refers to efforts made by the manufacturing organisation, whereas intellectual capital refers to the manufacturing organisation's existing knowledge base developed over time, which can serve as a foundation for supporting supplier development efforts, sustaining them, and enabling the manufacturing organisation to develop new activities with suppliers. According to a review of prior research on intellectual capital and business performance, the majority of studies focus on the direct relationship between intellectual capital and firm performance or on intellectual capital as a mediator. While research indicates that intellectual capital is critical for a firm's success, the most critical aspect is not in owning information but in understanding how to use it (Inkinen, 2015). According to the best researcher knowledge and studies, only one analogous study has been undertaken on the role of intellectual capital as a moderator in the relationship between lean practises and operational performance of the company. The findings indicate that intellectual capital, as represented by VRIN characteristics, does indeed complement this relationship (Onofrei *et al.*, 2019). Thus, as per the extent of the researcher's knowledge this study is the first to introduce intellectual capital as a moderator in the relationship between supplier development and sustainability performance.

Additionally, this study is also the first investigation, to the best of the researcher's knowledge focusing upon the relationships of supplier selection criteria, supplier development, and the manufacturing organisation's intellectual capital on the performance of manufacturing organisations specifically from the sustainability perspective based on a model developed from RBV and NRBV theories. The studies conducted on supplier selection criteria and the effect of supplier development is always focused on the sustainability performance components individually (Luzzini *et al.*, 2015; Kumar and Rahman, 2016; Yadlapalli *et al.*, 2018; Shou *et al.*, 2019),

reveals empirical results that indicated their role as crucial factors for manufacturer growth. Then, Yusoff *et al.* (2019), has suggested further a conceptual framework to investigate intellectual capital components (i.e. human capital, structural capital, relational capital) towards sustainability performance of manufacturing organisations.

1.3 Research Questions of the Study

The research questions in this study are:

- i. What is the relationship between supplier selection criteria and sustainability performance of manufacturing organisations?
- ii. What is the relationship between supplier selection criteria and supplier development of manufacturing organisations?
- iii. What is the relationship between supplier development and sustainability performance of manufacturing organisations?
- iv. Does supplier development mediate the relationship between supplier selection criteria and sustainability performance of manufacturing organisations?
- v. Does intellectual capital moderate the relationship between supplier development and sustainability performance of manufacturing organisations?

1.4 Research Objectives of the Study

This research has been designed to achieve the following research objectives:

- i. To evaluate the relationship between supplier selection criteria and sustainability performance of manufacturing organisations,
- ii. To evaluate the relationship between supplier selection criteria and supplier development of manufacturing organisations,
- iii. To evaluate the relationship between supplier development and sustainability performance of manufacturing organisations,

- iv. To evaluate the mediating effect of supplier development between supplier selection criteria and sustainability performance of manufacturing organisations, and
- v. To analyze the moderating effect of intellectual capital between supplier development and sustainability performance of manufacturing organisations

1.5 Significance of the Study

Based on the gaps identified in the problem statement, the study is bridging both theoretical and practical contributions. It develops a theoretical framework for investigating the relationship between supply chain management practises (supplier selection and supplier development) and the influence of intellectual capital on manufacturing organisations' sustainability performance. The scope is applicable to manufacturing organisations in Malaysia.

1.5.1 Academia and Theoretical Contribution

The first theoretical contribution is related to the supplier selection criteria used in this study. The supplier selection criteria are commonly based on a combination of operational based supplier selection criteria. They are very limited studies on strategic based supplier selection criteria and even more less when it comes to a combination of supplier selection criteria that includes operational, strategic, environment and social. However, this is the first investigation using combination of supplier selection criteria that includes operational, strategic, environment and social and sustainability performance in the field of supply chain management and sustainability, to the knowledge of the researcher.

The second theoretical contribution is related to the mediating effect of supplier development in the context of sustainability performance and manufacturing organizations. Past research has demonstrated that supplier selection and supplier development practises have a positive impact on an organization's performance,

particularly when both are implemented concurrently. However, the research does not combine supplier assessment and supplier collaboration as a combination of supplier development on a combined sustainability performance that includes environmental, social, and economic dimensions (Gualandris and Kalchschmidt, 2016; Park *et al.*, 2010; Yadlapalli *et al.*, 2018). This study aims to verify the effect of supplier development as a mediator between supplier selection criteria and the sustainability performance of manufacturing organisations, but with the unique distinction of establishing supplier development as a unique combination of short-term and long-term development activities known as supplier assessment and supplier collaboration on a combined sustainability performance construct.

The third theoretical contribution from this study is related to the main construct of the study. Supplier development studies too have found many unconvincing relationships between supplier development and organisational performance. In this study, the effect of supplier development is studied on sustainability performance. In this case, intellectual capital has been included in the study to moderate and strengthen the relationship between supplier development and sustainability performance (Gimenez *et al.*, 2012, Luzzini *et al.*, 2015 and Shou *et al.*, 2019). Therefore, this study is contributing new knowledge by overcoming literary gap, specifically by being one of the earliest studies that has included intellectual capital of manufacturing organisations as a moderator, which is extremely important in the fields of supply chain management and sustainability. Therefore, it can be concluded that the findings from this study are extending the following theoretical gaps:

- The combination of selection criteria among operational, strategic, environment and social based criteria, and the sustainability performance of manufacturing organisations,
- The mediating effect of supplier development (combination of supplier assessment and supplier collaboration) between supplier selection criteria of suppliers and the sustainability performance (combination of environmental performance, social performance and economic performance) of manufacturing organisations,

- The moderating effect of intellectual capital between supplier development of suppliers and the sustainability performance of manufacturing organisations,

1.5.2 Practical Contribution

The main findings of this research can support manufacturing organisation to identify the most suitable suppliers to collaborate to achieve sustainability performance not only for the manufacturing organisation but as well as for the suppliers supplying the manufacturing organisations. The conceptual framework developed in this study can be used to develop a best set of supplier selection criteria which will help the organisations to identify the suppliers that can support their objectives related to sustainability performance. Moreover, the conceptual framework will also be able to provide the optimal supplier development program that can be implemented on improving poor performing suppliers and this can be transferred into the supplier development procedures of the organisations. The supplier selection criteria and supplier development methods will be form part of the supplier selection, monitoring and development procedure that is managed by the Procurement and Supplier Quality team of the manufacturing organisations. Lastly, the intellectual capital that is needed at each manufacturing organisations can be identified and used to select and retain the suppliers for long term partnership that forms the necessary resources needed to attain the competitive advantage according to RBV and NRBV theories.

Moreover, this study is also contributing to the practical gap by providing empirical results substantiating the importance of selection criteria, supplier development, and the intellectual capital to manufacturing organisations on the sustainability performance. These results will serve as a guide for Malaysian manufacturing companies interested in applying for and investing in future projects. Manufacturers would be able to use the necessary selection criteria and engage in the necessary supplier development strategies. Both steps will constitute the manufacturing business's internal strategy for new supplier selection and supplier management. Sustainability-minded organisations would examine the selection

criteria components as well as the development strategy, in their supply chain management operations. Malaysian manufacturing organisations will develop a supplier selection and management system that incorporates the optimal combination of supplier selection criteria for identifying suppliers, developing identified suppliers to improve their performance, and retaining subject matter experts on a continuous basis. Thus, the findings from the present study are calling for the manufacturing organisations to take the necessary precautionary steps in enhancing the sustainability performance of suppliers supplying to them. Hence, this study is the first attempt towards contributing the importance of right selection criteria together with the right supplier development practices and right type of intellectual capital in existence at the manufacturing organisations towards the sustainability performance of manufacturing organisations.

Additionally, in summary, Malaysia is currently in the 60th position behind 60 other countries in the world on the SDG goals, according to the 2020 SDG annual report, and numerous indicators are underperforming or showing no improvement. Malaysian businesses (particularly manufacturing organizations) are unconcerned about sustainability, since the majority of them do not include it into their business strategies. Meanwhile, stakeholders such as customers, particularly millennial, anticipate the availability of sustainable products. Clearly, Malaysian industrial organisations are to blame, particularly in light of recent forced labour scandals. If not addressed immediately and aggressively, this will push away investors and consumers. As such, the purpose of this study is to investigate and provide a solution to the sustainability issues confronting manufacturing organisations in Malaysia.

1.6 Scope of the Study

The scope of the present research has been derived from three fields of literature: supply chain management (supplier selection, supplier development), intellectual capital and sustainability respectively. To achieve the objectives outlined in this study, the relationship between supply chain management practices (supplier selection and supplier development) with intellectual capital and the sustainability

performance of manufacturing organisations have been investigated by crosscutting all the fields of research. The new combination of four components of selection criteria, namely operational selection criteria, strategic selection criteria, environment selection criteria and social selection criteria have been utilised to measure selection criteria. This study has employed two specific dimensions of supplier development, namely supplier assessment and supplier collaboration. Furthermore, the intellectual capital moderator is measured using three different dimensions of human capital, structural capital and relational capital. The sustainability performance has been measured according to the manufacturers' perception of their both financial and non-financial performance which is economic performance, social performance and environment performance. Next, these relationships have been empirically tested by carrying out this study in manufacturing organisations in Malaysia, as listed in FMM directory (51st Edition). The questionnaire survey has been distributed to quality managers, supply chain managers, procurement managers, and top management of manufacturing organisations who are involved in the supply chain management processes.

1.7 Terms and Operational Definitions

The following terms are operationally defined for the purpose of this study:

1.7.1 Manufacturing organisations

Manufacturing organisations play a crucial role in the growth of a country's economy and driving down unemployment rates by being global and competitive financially and sustainably. Therefore, manufacturing organisations have to drive value into their product and services to be market leaders and maintain the dominance; this is now not sufficient purely from cost basis but needs to be competitive in terms of sustainability values as well (Leitão *et al.*, 2013). Supply chain forms part of the critical network that supports a manufacturing organisation and the management of this supply chain provides opportunities for the performance

growth of the manufacturing organisation (Rungsithong *et al.*, 2017; Çankaya and Sezen, 2019; Kumar and Routroy, 2018). The manufacturing organisations in the study are based in Malaysia.

1.7.2 Sustainability Performance

Performance measurement starts with the evaluating process and ends by comparing resulting achievements against specific set goals (Yang *et al.*, 2011). In this study, sustainability performance of suppliers is referring to performance from the triple bottom line perspective. Therefore, this study has employed sustainability performance that comprised of economic performance, social performance and environmental performance measurement, as adapted from Chow and Chen (2012) and Yusoff *et al.* (2019).

1.7.3 Supplier selection criteria

Supplier selection criteria are used by manufacturing organisations in the process of supplier selection and there are many different sets of criteria involved, this purchasing process decision making is based on this selected set of selection criteria (Aharonovitz *et al.*, 2018). This study has classified supplier selection criteria of supplier into four components, namely operational selection criteria, strategic selection criteria, environment selection criteria and social selection criteria.

1.7.4 Supplier Development

According to Krause *et al.* (2000), supplier development is grouped into two main categories; supplier assessment and supplier collaboration. In this study, supplier development has two approaches. The initial approach and short-term approach is supplier improvement in term of operational performances such as

quality, cost, delivery, flexibility. Meanwhile the second approach is to improve the supplier's capability, via improvement programs. Thus, supplier development is studied through the perspective of both short-term supplier assessment and long-term supplier collaboration.

1.7.5 Intellectual Capital

IC is recognized as a cluster of knowledge in an organisation in striving to achieve competitive advantage (Subramaniam and Youndt, 2005). Thus, the operational definition of IC in this study is: a set of valuable knowledge and non-tangible assets of an organisation that support the organisation's drive to achieve competitive advantage and strive for an extremely enhanced performance. This study has classified IC of suppliers into three components, namely human capital, structural capital, and relational capital.

1.8 Organisation of the Thesis

The first chapter includes an introduction to the study, providing an explanation concerning the problem background, and explanation of the theoretical gaps found in current literature. Research questions and objectives have also been elaborated on too. Next, Chapter 2 is on literature review that includes the problem statements and a theoretical background for each construct. The conceptual framework is presented at the end of the second chapter. Then, Chapter 3 is focused on discussing the research design, research instruments, sampling procedures, and data collection procedures employed in this study. Following that, Chapter 4 presents the results of the hypothesis testing and a detailed explanation of the findings. Finally, Chapter 5 functions as the concluding chapter by establishing a rational connection between the findings and relevant literature, followed by a review of the hypotheses tested. The chapter concludes with a discussion of the study's limitations and then makes recommendations for future research.

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Appendix A Research Questionnaires



Dear respondents,

This survey is being conducted by the undersigned, Murugappan Velayutham, a research scholar from Universiti Teknologi Malaysia, Skudai, Johor. This questionnaire is a part of a Doctor of Business Administration (DBA) research work. The study is examining the role of supplier selection criteria, supplier development and intellectual capital of manufacturing organisations which will provide benefits to the sustainability performance of the manufacturing organisations in Malaysia.

SUSTAINABILITY PERFORMANCE is the harmonization of economical, environmental and social objectives of a manufacturing organisation in performing their business activities.

SUPPLIER SELECTION CRITERIA is described as a set of multiple criteria used to identify the right supplier that suits the manufacturing organisation and to make on-going purchasing decisions.

SUPPLIER DEVELOPMENT is the activities led by the manufacturing organisation as part of their long term strategy to improve their suppliers' performance in order to meet their needs.

INTELLECTUAL CAPITAL is the composition of knowledge, skills, experience and information that influences the manufacturing organisation's value creation and success in business.

I hereby ensure that all responses will be kept highly confidential and will serve only for academic research purpose. Further, the data collected will be analysed, in general, result summarised and presented in aggregate. Thus no single either individual's or organisation's result will be highlighted.

Thank you for your kind cooperation and participation.

Yours sincerely,

MURUGAPPAN VELAYUTHAM

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(012-7830057)

PART A: Firmographic and Demographic (Please tick (/) one choice only)

1. Company location (state in Malaysia):

2. Approximately how many employees work in your company?

- | | |
|------------------------------------|-------------------------------------|
| <input type="checkbox"/> < 50 | <input type="checkbox"/> 251 - 500 |
| <input type="checkbox"/> 51 - 100 | <input type="checkbox"/> 501 - 1000 |
| <input type="checkbox"/> 101 - 250 | <input type="checkbox"/> > 1000 |

3. Which sector represents your company?

- | | |
|--|---|
| <input type="checkbox"/> Food, Beverage & Tobacco | <input type="checkbox"/> Medical, Precision and Optical Instruments, Watches & Clocks |
| <input type="checkbox"/> Chemicals (including Petroleum) | <input type="checkbox"/> Textile, Wearing Apparel and Leather |
| <input type="checkbox"/> Fabricated Metals | <input type="checkbox"/> Wood and Wood Products, excluding Furniture |
| <input type="checkbox"/> Plastic | <input type="checkbox"/> Recycling |
| <input type="checkbox"/> Electrical & Electronics | <input type="checkbox"/> Office, Accounting & Computing Machinery |
| <input type="checkbox"/> Machinery and Equipment | <input type="checkbox"/> Furniture |
| <input type="checkbox"/> Non-Metallic Mineral | <input type="checkbox"/> Others |
| <input type="checkbox"/> Transport, Vehicle & Equipment | |
| <input type="checkbox"/> Basic Metals | |
| <input type="checkbox"/> Rubber | |
| <input type="checkbox"/> Paper, Printing & Publishing | |

4. How many years has your company been established?

- | | |
|---------------------------------|-----------------------------------|
| <input type="checkbox"/> 1 - 5 | <input type="checkbox"/> 11 - 15 |
| <input type="checkbox"/> 6 - 10 | <input type="checkbox"/> Above 15 |

5. What is your company ownership structure?

- | | |
|---|---|
| <input type="checkbox"/> Malaysian full-owned | <input type="checkbox"/> Japanese-based |
| <input type="checkbox"/> Joint venture | <input type="checkbox"/> European-based |
| <input type="checkbox"/> American-based | |
| <input type="checkbox"/> Others, please specify | |
-

6. What certification does your company have?

- ISO 14001
- ISO 45001/OHSAS 18001
- ISO 14001 and ISO 45001/OHSAS 18001
- None of the above

7. What is your job position?

- General Manager/Director/CEO
 - Supply Chain Manager
 - Procurement / Purchasing Manager
 - Supplier Quality Manager
 - Quality Manager
 - Others, please specify
-

PART B: Questionnaires Items

Please indicate (/) on your response to each statement based on the following scale: (1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree). Do not forget to respond as a representative of your company/organisation.

Please specify to what extent you agree with the following statements on the selection criteria used by your organisation.

SUPPLIER SELECTION CRITERIA					
OPERATIONAL SELECTION CRITERIA	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Our organisation selects suppliers who offer high product durability <i>(Durability: the ability to offer products that withstand hard use over an extended period of time)</i>	①	②	③	④	⑤
2. Our organisation selects suppliers who offer products conforming to design specs <i>(Conformance: product and manufacturing processes that correspond to the specifications, which helps to ensure defect free products)</i>	①	②	③	④	⑤
3. Our organisation selects suppliers who offer products with high product performance <i>(Performance: to provide products and processes at the desired high level of performance)</i>	①	②	③	④	⑤
4. Our organisation selects suppliers who provide high delivery dependability <i>(Dependability: reliable delivery by meeting schedules or on time delivery)</i>	①	②	③	④	⑤
5. Our organisation selects suppliers who provide high delivery speed <i>(Speed: fast delivery and respond quickly to customer orders)</i>	①	②	③	④	⑤
6. Our organisation selects suppliers who provide high production mix flexibility. <i>(Production mix flexibility: volume change the range of products in the production and respond rapidly to changes)</i>	①	②	③	④	⑤
7. Our organisation selects suppliers who provide high volume flexibility. <i>(Volume flexibility: change production volume and respond rapidly to volume changes)</i>	①	②	③	④	⑤
8. Our organisation selects suppliers who provide customization flexibility according to customer requirements and needs.	①	②	③	④	⑤
9. Our organisation selects suppliers who provide a broad product portfolio with wide-ranging product features.	①	②	③	④	⑤

OPERATIONAL SELECTION CRITERIA	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10. Our organisation selects suppliers based on the suppliers' ability to reduce production costs.	①	②	③	④	⑤
11. Our organisation selects suppliers based on the suppliers' ability to optimize capacity utilization rate.	①	②	③	④	⑤
12. Our organisation selects suppliers based on the suppliers' ability to optimize productivity.	①	②	③	④	⑤
13. Our organisation selects suppliers based on the suppliers' ability to reduce inventory cost.	①	②	③	④	⑤
STRATEGIC SELECTION CRITERIA	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. Our organisation selects suppliers based on the suppliers' willingness to make investments/collaborate on investments.	①	②	③	④	⑤
15. Our organisation selects suppliers based on the suppliers' global presence	①	②	③	④	⑤
16. Our organisation selects suppliers based on the suppliers' new market expansion plans	①	②	③	④	⑤
17. Our organisation selects suppliers based on the suppliers' ability to introduce new generation of products	①	②	③	④	⑤
18. Our organisation selects suppliers based on the suppliers' capability to keep up with new technological developments.	①	②	③	④	⑤
ENVIRONMENT SELECTION CRITERIA	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
19. Our organisation selects suppliers based on the suppliers' waste management capabilities.	①	②	③	④	⑤
20. Our organisation selects suppliers based on the suppliers' ability to efficiently consume raw materials	①	②	③	④	⑤
21. Our organisation selects suppliers based on the suppliers' ability to meet environmental compliance standards	①	②	③	④	⑤
22. Our organisation selects suppliers based on the suppliers' ability to restrict the chemical usage in the production processes.	①	②	③	④	⑤
23. Our organisation selects suppliers who possess environmental certifications such as ISO14001.	①	②	③	④	⑤

SOCIAL SELECTION CRITERIA	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
24. Our organisation selects suppliers based on the suppliers' procedures to prevent discrimination against gender, race, and ethnicity.	①	②	③	④	⑤
25. Our organisation selects suppliers based on the suppliers' fair workplace practices regarding working hours and compensation.	①	②	③	④	⑤
26. Our organisation selects suppliers based on the suppliers' practices to eliminate child labour.	①	②	③	④	⑤
27. Our organisation selects suppliers based on the suppliers' strategies to eliminate all forms of forced or compulsory labour.	①	②	③	④	⑤
28. Our organisation selects suppliers based on the suppliers' accountability for their own actions.	①	②	③	④	⑤

Please specify to what extent you agree with the following statements on the supplier development methods used by your organisation.

SUPPLIER DEVELOPMENT					
(A) SUPPLIER ASSESSMENT	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Our organisation assesses the suppliers through formal evaluation, using established guidelines and procedures	①	②	③	④	⑤
2. Our organisation provides the suppliers with feedback about the results of our evaluation.	①	②	③	④	⑤
3. Our organisation performs audits of the suppliers' internal management systems.	①	②	③	④	⑤
4. Our organisation uses a certification program to certify the suppliers, thus making incoming inspection unnecessary.	①	②	③	④	⑤
5. Our organisation confers awards and recognition to the suppliers, based on supplier performance.	①	②	③	④	⑤
(B) SUPPLIER COLLABORATION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6. Our organisation visits the suppliers to help them to improve performance.	①	②	③	④	⑤
7. Our organisation invites suppliers to our site to increase awareness of how products are used.	①	②	③	④	⑤
8. Our organisation provides training/education to the suppliers' personnel.	①	②	③	④	⑤
9. Our organisation makes joint efforts with the suppliers to reduce waste.	①	②	③	④	⑤
10. Our organisation makes joint efforts with the suppliers to solve problems and develop new products.	①	②	③	④	⑤

Please specify to what extent you agree with the following statements on the intellectual capital of your organisation.

INTELLECTUAL CAPITAL						
(A) HUMAN CAPITAL		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Our employees are creative and bright	①	②	③	④	⑤
2.	Our employees develop new ideas and knowledge	①	②	③	④	⑤
3.	Our employees are highly skilled	①	②	③	④	⑤
4.	Our employees are experts in their particular jobs and functions	①	②	③	④	⑤
5.	Our employees are widely considered the best in our industry	①	②	③	④	⑤
(B) STRUCTURAL CAPITAL		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6.	Our organisation uses patents and licenses as a way to store knowledge	①	②	③	④	⑤
7.	Much of our organisation's knowledge is contained in manuals, databases and etc.	①	②	③	④	⑤
8.	Our organisation's culture (stories, rituals) contains valuable ideas, ways of doing business, etc	①	②	③	④	⑤
9.	Our organisation embeds much of its knowledge and information in structures, systems, and processes	①	②	③	④	⑤
(C) RELATIONAL CAPITAL		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10.	Our employees partner with customers, suppliers, alliance partners, etc., to develop solutions	①	②	③	④	⑤
11.	Our employees are skilled at collaborating with each other to diagnose and solve problems	①	②	③	④	⑤
12.	Our employees share information and learn from one another	①	②	③	④	⑤
13.	Our employees interact and exchange ideas with people from different functions of the company	①	②	③	④	⑤
14.	Our employees apply knowledge from one function of the company to problems and opportunities that arise in another	①	②	③	④	⑤

PART C: Questionnaires Items

The following statements are about your company's/organisation's performance related to key competitors in the industry over the years and will be used for administrative and comparative purposes only. If you are not absolutely sure about a statement, please just approximate.

The following questions refer to sustainability performance measures. Please indicate your response to each of the following statements.

SUSTAINABILITY PERFORMANCE					
(A) Economic Performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Our organisation is able to reduce the cost of materials purchased	①	②	③	④	⑤
2. Our organisation is able to reduce the cost of energy consumption	①	②	③	④	⑤
3. Our organisation is able to reduce the fee for waste discharge	①	②	③	④	⑤
4. Our organisation is able to reduce the fee for waste treatment	①	②	③	④	⑤
5. Our organisation is able to reduce the fine for environmental accidents	①	②	③	④	⑤
6. Our organisation is able to improve return on investment (ROI)	①	②	③	④	⑤
7. Our organisation is able to improve earnings per share	①	②	③	④	⑤
(B) Social Performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
8. Our organisation prioritizes employee health and safety	①	②	③	④	⑤
9. Our organisation prioritizes community health and safety	①	②	③	④	⑤
10. Our organisation protects claims and rights of aboriginal people or local community	①	②	③	④	⑤
11. Our organisation considers the interests of stakeholders in investment decisions by creating a formal dialogue	①	②	③	④	⑤
12. Our organisation recognizes and acts on the need to fund local community initiatives	①	②	③	④	⑤
13. Our organisation communicates the firm's environmental impacts and risks to the public	①	②	③	④	⑤
14. Our organisation shows concern for the visual aspects of the firm's facilities and operations	①	②	③	④	⑤

(C) Environment Performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
15. Our organisation reduces the use of traditional fuels by substituting them with less polluting energy sources	①	②	③	④	⑤
16. Our organisation reduces the impact on animal species and natural habitats	①	②	③	④	⑤
17. Our organisation reduces purchases of non-renewable materials, chemicals, and components	①	②	③	④	⑤
18. Our organisation reduces energy consumption	①	②	③	④	⑤
19. Our organisation reduces wastes and emissions from operations	①	②	③	④	⑤
20. Our organisation reduces the risk of environmental accidents, spills, and releases	①	②	③	④	⑤

~ Thank You for Your Time and Cooperation ~

Appendix B Previous studies on the constructs

Previous study on relationship between SS - supplier selection, SD - supplier development (SA - supplier assessment and SC - supplier collaboration), SP - sustainability performance (EcoP - economic performance, EnvP - environmental performance and SocP - social performance)

Author (Year)	Country	Industry	Independent Variable	Dependent Variable	Findings
Wu (2017)	Taiwan	SME (manufacturing)	SD	SP	SD does not show a significant positive effect on SP
Subramaniam <i>et al.</i> (2019)	Malaysia	MNC (manufacturing)	SD	SocP	SD has a positive influence on SocP
Kumar and Rahman (2016)	India	Automobile (manufacturing)	SS, SD	SocP, EnvP and EcoP	SS positively influences SocP, EnvP and EcoP SD positively influences SocP and EnvP SD not positively related to EcoP
Foo <i>et al.</i> (2018)	Malaysia	ISO14001 (manufacturing)	SS, SA	SP	SS influence on SP is not supported SA influence on SP is not supported
Yang and Zhang (2017)	China	Manufacturing	SS, SD	Supplier Performance	SS influence on supplier performance is not significant SD influence on supplier performance is significant
Gimenez and Sierra (2013)	Spain and Germany	Manufacturing	SA, SC	EnvP	SA shows a positive effect on EnvP SC shows a positive effect on EnvP
Krause <i>et al.</i> (2000)	NA	Manufacturing	SD	Performance	SD influence on performance is significant
Large and Thomsen (2011)	Germany	Manufacturing	SA, SC	EnvP	SA shows a positive effect on EnvP SC shows a positive effect on EnvP
Sancha <i>et al.</i> (2019)	China	Manufacturing	SA, SC	Supplier Performance	SA shows a negative effect on supplier performance SC shows a positive effect on supplier performance

Author (Year)	Country	Industry	Independent Variable	Dependent Variable	Findings
Yadlapalli <i>et al.</i> (2018)	Bangladesh	Apparel (Manufacturing)	SS, SD	SocP, EnvP and EcoP	SS shows a positive effect on SocP and EnvP SS shows a negative effect on EcoP SD shows a positive effect on SocP, EnvP and EcoP
			SS	SD	SS shows a positive effect on SD
Wang and Dai (2017)	China	Manufacturing and Retailer	SA, SC	SocP, EnvP and EcoP	SA shows a negative effect on SocP, EnvP and EcoP SC shows a negative effect on SocP and EcoP SC shows a positive effect on EnvP
Luzzini <i>et al.</i> (2015)	EU and NA	Manufacturing	SS, SD	SocP, EnvP and EcoP	SS shows a negative effect on SocP, EnvP and EcoP SD shows a positive effect on SocP, EnvP and EcoP
Sancha <i>et al.</i> (2016)	Spain	Manufacturing	SA, SC	SocP	SA shows a negative effect on SocP SC shows a positive effect on SocP
Gimenez <i>et al.</i> (2012)	20 countries	Multiple industries	SA, SC	SocP, EnvP and EcoP	SA shows a negative effect on SocP, EnvP and EcoP SC shows a positive effect on SocP, EnvP and EcoP
Shou <i>et al.</i> (2019)	Multiple countries	Manufacturing	SD	SocP, EnvP and EcoP	SD shows a positive effect on SocP and EnvP SD shows a negative effect EcoP
Nair <i>et al.</i> (2015)	US	Manufacturing	SS	SD	SS shows a positive effect on SD
Pradhan and Routroy (2016)	India	Manufacturing	SS	SD	SS shows a positive effect on SD
Aharonovitz <i>et al.</i> (2018)	Brazil	Retail	SS	SD	SS shows a positive effect on SD

Appendix C An Example Letter Sent To Experts

05 May 2021

Name

Address

QUESTIONNAIRE EXPERT VALIDATION

Dear Prof/Dr,

I am currently undertaking doctoral research (DBA) at AHIBS UTM on the subject mentioned below, under the supervision of Dr Grace Thoo.

RESEARCH TITLE

TITLE: SUPPLIER SELECTION AND INTELLECTUAL CAPITAL FOR SUPPLIER DEVELOPMENT AND SUSTAINABILITY PERFORMANCE

The phenomenon of interest for this research is examining **supply management focusing on supplier selection and supplier development**. To collect the data by survey method, I have adapted the research instruments from previous studies to measure the constructs for this phenomenon of interest. The current stage is to ascertain the content validity of the items to establish whether they are reflecting the respective variables as described in the operational definitions.

With this background, I kindly request you to run through the items and assess their content validity. I am grateful to you for spending your valuable time facilitating this process.

Please respond to the exercise by indicating with a tick (✓) mark whether each item is a "Perfect Match", "Fair Match" or "Poor Match". Kindly provide your comments (if any) in the "Comments" column.

Thank you in advance for your time and expert advice.

Murugappan Velayutham
(DBA Candidate)
Azman Hashim International Business School (AHIBS),
Universiti Teknologi Malaysia,
Kuala Lumpur, Malaysia.
E-mail: murugappan.velayutham@gmail.com

Appendix D Synopses of expert and practitioner comments and suggestions

Expert	<p>Santhira Segaran Senior Supplier Quality Manager <i>Micron Semiconductor Malaysia Sdn Bhd</i></p>	<p>Ravi Manikam Senior Sustainability Manager <i>Dyson Manufacturing Sdn Bhd</i></p>	<p>Dr. Shalini Devi Head of Department, Logistics Management <i>USCI University</i></p>	<p>Dr. Noor Aslinda Binti Abu Seman Technology and Business Administration Department <i>UTHM</i></p>
General Information	<p>Please add more employee ranges up to > 1000</p> <p>Please add the origins of the organization</p> <p>Add explanations in brackets to clarify the meaning better</p>	<p>Add other certification standard options related to sustainability such as ISO 45001.</p>	<p>Specific comment: On ISO14001 question If respondents tick No, do they stop answering or any other sections to proceed??? May try to think about it... or if this study only applicable for certified company, my suggestion is may exclude this question.</p>	<p>Acceptable</p>
Supplier selection criteria	<p>Clear questions</p>	<p>Consider adding more selection criteria especially related to social</p>	<p>Specific comment: On general question for part B, How do you feel about the statement on the selection criteria used by your organization? the word "feel" may not appropriate here.</p>	<p>Question 11: Change “utilization” to “utilization rate”</p> <p>Question 13: Change “inventory” to “inventory cost”</p>

Expert	Santhira Segaran Senior Supplier Quality Manager <i>Micron Semiconductor Malaysia Sdn Bhd</i>	Ravi Manikam Senior Sustainability Manager <i>Dyson Manufacturing Sdn Bhd</i>	Dr. Shalini Devi Head of Department, Logistics Management <i>USCI University</i>	Dr. Noor Aslinda Binti Abu Seman Technology and Business Administration Department <i>UTHM</i>
Supplier development	Clear questions	Clear questions	All variables: Add 1 to 2 statements/questions for each variable especially if the total questions ≤ 3 questions	Acceptable
Intellectual Capital	Clear questions	Clear questions	Acceptable	Acceptable
Sustainability Performance	Clear questions	Clear questions	Acceptable	Acceptable

Appendix E Analysis of Questionnaire Before and After Expert Validation

No	Before	After	Remarks
Overall: Redesigned and improved the questionnaire's structure including cover page, cover letter and the questions			
SECTION A			
Q1	Company location (state in Malaysia):	-	Original
Q2	Approximately how many employees work in your company?	Add more options up to 1000 employees or more	Modify
Q3	Which sector represents your company?	Add more options to match the categories in FMM	Modify
Q4	How many years has your company been established?	-	Original
Q5	What is your company ownership structure?	-	Original
Q6	Is your company ISO14001 certified?	Add more options for other related certifications	Modify
Q7	What is your job position?	-	Original
SECTION B, C			
Overall:			
<ol style="list-style-type: none"> 1. Added another group of selection criteria - social selection criteria. 2. More questions about the supplier development variable have been added. 3. The general question for each variable was using the word "feel", this word has been changed to "what extent do you agree" 			
SUPPLIER SELECTION CRITERIA			
Q1	Our organization selects suppliers based on the ability to offer with high product durability <i>(Durability: the ability to offer products that withstand hard use over an extended period of time)</i>	Simplify questions, rephrased “based on the ability to” to “who”	Modify
Q2	Our organization selects suppliers based on the ability to offer products conforming to design specs <i>(Conformance: product and manufacturing processes that correspond to the specifications, which helps to ensure defect free products)</i>	Same as above	Modify

No	Before	After	Remarks
Q3	Our organization selects suppliers based on the ability to offer products with high product performance <i>(Performance: to provide products and processes at the desired high level of performance)</i>	Same as above	Modify
Q4	Our organization selects suppliers based on the ability to provide delivery dependability <i>(Dependability: reliable delivery by meeting schedules or on time delivery)</i>	Same as above	Modify
Q5	Our organization selects suppliers based on the ability to provide delivery speed <i>(Speed: fast delivery and respond quickly to customer orders)</i>	Same as above	Modify
Q6	Our organization selects suppliers based on the ability to provide production mix flexibility <i>(Production mix flexibility: volume change the range of products in the production and respond rapidly to changes)</i>	Same as above	Modify
Q7	Our organization selects suppliers based on the ability to provide volume flexibility <i>(Volume flexibility: change production volume and respond rapidly to volume changes)</i>	Same as above	Modify
Q8	Our organization selects suppliers based on the ability to provide customization flexibility <i>(Customization flexibility: adjust the product according to customer requirements and needs)</i>	Same as above	Modify
Q9	Our organization selects suppliers based on the ability to provide broad production line <i>(Broad production line: offer a wide range of products, with a large number of features)</i>	Same as above	Modify

No	Before	After	Remarks
Q10	Our organization selects suppliers based on the ability to reduce production costs	Same as above	Modify
Q11	Our organization selects suppliers based on the ability to optimize capacity utilization	Same as above	Modify
Q12	Our organization selects suppliers based on the ability to optimize productivity	Same as above	Modify
Q13	Our organization selects suppliers based on the ability to reduce inventory	Same as above	Modify
Q14	Our organization selects suppliers based on the willingness to make needed investments	Same as above	Modify
Q15	Our organization selects suppliers based on the suppliers' global presence	Same as above	Modify
Q16	Our organization selects suppliers based on the ability to open up new markets <i>(New markets: create, expand and develop products and services, as to reach additional groups of customers)</i>	Same as above	Modify
Q17	Our organization selects suppliers based on the ability to introduce new generation of products <i>(New products: develop and introduce updated or novel products to the market)</i>	Same as above	Modify
Q18	Our organization selects suppliers based on the ability to enter new technology fields <i>(New technology: develop and implement updated and novel technologies)</i>	Same as above	Modify
Q19	Our organization selects suppliers based on the ability to treat wastes	Change “ability” to “suppliers’ ability”	Modify
Q20	Our organization selects suppliers based on the ability to efficiently consume raw materials	Same as above	Modify

No	Before	After	Remarks
Q21	Our organization selects suppliers based on the ability to comply with local environmental protection policies/plans	Same as above	Modify
Q22	Our organization selects suppliers based on environment related certification such as ISO14001	Same as above	Modify
SUPPLIER DEVELOPMENT			
Q1	Our organization assesses our suppliers through formal evaluation, established guidelines and procedures	-	Original
Q2	Our organization provides our suppliers with feedback about results of their evaluation.	-	Original
Q3	Our organization performs audits of our suppliers' internal management systems.	-	Original
Q4	Our organization visits our suppliers to help them to improve performance	-	Original
Q5	Our organization provides training/education to our suppliers' personnel	-	Original
Q6	Our organization makes joint efforts with our suppliers to solve problems and develop new products	-	Original
INTELLECTUAL CAPITAL			
Q1	Our employees are creative and bright	-	Original
Q2	Our employees develop new ideas and knowledge	-	Original
Q3	Our employees are highly skilled	-	Original
Q4	Our employees are experts in their particular jobs and functions	-	Original
Q5	Our employees are widely considered the best in our industry	-	Original
Q6	Our organization uses patents and licenses as a way to store knowledge	-	Original
Q7	Much of our organization's knowledge is contained in manuals, databases and etc.	-	Original

No	Before	After	Remarks
Q8	Our organization's culture (stories, rituals) contains valuable ideas, ways of doing business, etc	-	Original
Q9	Our organization embeds much of its knowledge and information in structures, systems, and processes	-	Original
Q10	Our employees partner with customers, suppliers, alliance partners, etc., to develop solutions	-	Original
Q11	Our employees are skilled at collaborating with each other to diagnose and solve problems	-	Original
Q12	Our employees share information and learn from one another	-	Original
Q13	Our employees interact and exchange ideas with people from different areas of the company	Change "area" to "function"	Modify
Q14	Our employees apply knowledge from one area of the company to problems and opportunities that arise in another	Same as above	Modify
SUSTAINABILITY PERFORMANCE			
Q1	Our organization is able to reduce the cost of materials purchased	-	Original
Q2	Our organization is able to reduce the cost of energy consumption	-	Original
Q3	Our organization is able to reduce the fee for waste discharge	-	Original
Q4	Our organization is able to reduce the fee for waste treatment	-	Original
Q5	Our organization is able to reduce the fine for environmental accidents	-	Original
Q6	Our organization is able to improve return on investment (ROI)	-	Original
Q7	Our organization is able to improve earnings per share	-	Original
Q8	Our organization prioritizes employee or community health and safety	Split into 2 questions – one for employees and another for community	Modify
Q9	Our organization protects claims and rights of original people or local community	-	Original
Q10	Our organization considers the interests of stakeholders in investment decisions by creating a formal dialogue	-	Original

No	Before	After	Remarks
Q11	Our organization recognizes and acts on the need to fund local community initiatives	-	Original
Q12	Our organization communicates the firm's environmental impacts and risks to the public	-	Original
Q13	Our organization shows concern for the visual aspects of the firm's facilities and operations	-	Original
Q14	Our organization reduces the use of traditional fuels by substituting them with less polluting energy sources.	-	Original
Q15	Our organization reduces the impact on animal species and natural habitats	-	Original
Q16	Our organization reduces purchases of non-renewable materials, chemicals, and components	-	Original
Q17	Our organization reduces energy consumption	-	Original
Q18	Our organization reduces wastes and emissions from operations	-	Original
Q19	Our organization reduces the risk of environmental accidents, spills, and releases	-	Original

Appendix F Result of Uni-variate Outlier Based on Standardized Values

Construct	Item	Standardized value (Z-Score)	
		Lower Bound	Upper Bound
Operational Selection Criteria (SSCA)	SSCA01	-2.93058	0.91478
	SSCA02	-3.20004	0.82582
	SSCA03	-3.14604	0.82612
	SSCA04	-3.12264	0.81997
	SSCA05	-2.68341	0.89107
	SSCA06	-2.84209	0.98737
	SSCA07	-2.54836	0.95252
	SSCA08	-1.89999	0.92285
	SSCA09	-2.53551	1.03864
	SSCA10	-2.61516	0.90178
	SSCA11	-2.76528	0.98951
	SSCA12	-2.86218	0.99435
	SSCA13	-2.90394	1.01638
Strategic Selection Criteria (SSCB)	SSCB01	-2.70845	1.34125
	SSCB02	-1.68688	1.32633
	SSCB03	-2.67460	1.31175
	SSCB04	-3.08317	1.23050
	SSCB05	-2.79003	1.24001
Environment Selection Criteria (SSCC)	SSCC01	-2.90371	1.27121
	SSCC02	-2.71209	1.15760
	SSCC03	-2.92531	1.10129
	SSCC04	-2.75465	1.13427
	SSCC05	-2.51296	1.12248
Social Selection Criteria (SSCD)	SSCD01	-3.12049	0.86964
	SSCD02	-2.84222	0.90999
	SSCD03	-3.14436	0.77458
	SSCD04	-3.16952	0.81259
	SSCD05	-3.35909	0.79978
Supplier Assessment (SDA)	SDA01	-2.71197	0.94919
	SDA02	-3.15332	1.00373
	SDA03	-2.81392	1.09964
	SDA04	-2.42065	1.03848
	SDA05	-2.54159	1.05739
Supplier Collaboration (SDB)	SDB01	-2.50531	1.22278
	SDB02	-2.47376	1.02918
	SDB03	-2.25819	1.25873
	SDB04	-2.46849	1.11925
	SDB05	-2.54823	1.07661

Construct	Item	Standardized value (Z-Score)	
		Lower Bound	Upper Bound
Human Capital (ICA)	ICA01	-2.88257	1.27259
	ICA02	-2.74985	1.14994
	ICA03	-2.62279	1.18134
	ICA04	-2.88099	1.21305
	ICA05	-2.74744	1.30446
Structural Capital (ICB)	ICB01	-2.54275	1.17602
	ICB02	-2.94653	1.14539
	ICB03	-3.11924	1.14919
	ICB04	-3.23668	1.15395
Relational Capital (ICC)	ICC01	-3.89537	1.03841
	ICC02	-3.11818	1.09947
	ICC03	-3.21894	1.07706
	ICC04	-2.99809	1.08863
	ICC05	-2.88289	1.00901
Economic Performance (SPA)	SPA01	-2.88848	1.06418
	SPA02	-3.35771	1.11924
	SPA03	-2.84907	1.06683
	SPA04	-2.82054	1.15540
	SPA05	-2.77712	1.00106
	SPA06	-3.04542	1.04427
	SPA07	-2.89787	1.06185
Social Performance (SPB)	SPB01	-2.90038	0.85620
	SPB02	-2.89546	0.87562
	SPB03	-2.51921	1.01776
	SPB04	-3.57205	0.91579
	SPB05	-2.29666	1.02758
	SPB06	-3.34926	1.04137
	SPB07	-2.42278	0.91866
Environment Performance (SPC)	SPC01	-3.05962	1.10289
	SPC02	-3.35486	1.01861
	SPC03	-2.24933	1.11747
	SPC04	-2.32489	1.07526
	SPC05	-3.42690	1.00346
	SPC06	-2.54950	0.93250

Appendix G Non-response bias analysis results

Group Statistics					Group Statistics					Group Statistics							
Group	N	Mean	Std. Deviation	Std. Error Mean	Group	N	Mean	Std. Deviation	Std. Error Mean	Group	N	Mean	Std. Deviation	Std. Error Mean			
SSCA01	Early	182	4.313	.7622	.0565	SDA01	Early	182	4.324	.7648	.0567	SPA01	Early	182	3.973	.9829	.0729
	Late	52	4.192	.8411	.1166		Late	52	3.865	.9081	.1259		Late	52	3.750	1.1004	.1526
SSCA02	Early	182	4.429	.7454	.0553	SDA02	Early	182	4.121	.9144	.0678	SPA02	Early	182	4.071	.8412	.0624
	Late	52	4.231	.7307	.1013		Late	52	3.731	1.0685	.1482		Late	52	3.750	1.0266	.1424
SSCA03	Early	182	4.434	.7606	.0564	SDA03	Early	182	3.945	1.0231	.0758	SPA03	Early	182	3.945	1.0067	.0746
	Late	52	4.173	.7063	.0979		Late	52	3.635	.9907	.1374		Late	52	3.788	1.0726	.1487
SSCA04	Early	182	4.423	.7299	.0541	SDA04	Early	182	3.769	1.1946	.0886	SPA04	Early	182	3.852	1.0000	.0841
	Late	52	4.212	.8480	.1176		Late	52	3.904	1.0148	.1407		Late	52	3.788	1.0354	.1436
SSCA05	Early	182	4.264	.8322	.0617	SDA05	Early	182	3.791	1.1274	.0836	SPA05	Early	182	3.956	1.1066	.0820
	Late	52	4.212	.8708	.1208		Late	52	3.942	1.0556	.1464		Late	52	3.885	.8779	.1217
SSCA06	Early	182	4.242	.7773	.0576	SDB01	Early	182	3.742	1.0742	.0796	SPA06	Early	182	4.011	.9518	.0706
	Late	52	4.173	.8098	.1123		Late	52	3.500	1.0572	.1466		Late	52	3.865	1.0670	.1480
SSCA07	Early	182	4.170	.8595	.0637	SDB02	Early	182	3.890	1.1120	.0824	SPA07	Early	182	3.956	1.0397	.0771
	Late	52	4.231	.8544	.1185		Late	52	3.596	1.2249	.1699		Late	52	3.827	.9014	.1250
SSCA08	Early	182	4.352	.7187	.0533	SDB03	Early	182	3.577	1.1525	.0854	SPB01	Early	182	4.357	.7859	.0583
	Late	52	4.327	.6780	.0940		Late	52	3.538	1.0930	.1516		Late	52	4.173	.8336	.1156
SSCA09	Early	182	4.088	.8623	.0639	SDB04	Early	182	3.797	1.1211	.0831	SPB02	Early	182	4.357	.7645	.0567
	Late	52	4.269	.7440	.1032		Late	52	3.596	1.0893	.1511		Late	52	4.115	.8779	.1217
SSCA10	Early	182	4.176	.8744	.0648	SDB05	Early	182	3.868	1.1195	.0830	SPB03	Early	182	4.148	.8442	.0626
	Late	52	4.423	.7501	.1040		Late	52	3.615	1.0319	.1431		Late	52	4.096	.8691	.1205
SSCA11	Early	182	4.209	.7869	.0583	ICA01	Early	182	4.099	.7291	.0540	SPB04	Early	182	4.220	.8895	.0659
	Late	52	4.212	.8480	.1176		Late	52	4.019	.6999	.0971		Late	52	4.058	.8947	.1241
SSCA12	Early	182	4.192	.7805	.0579	ICA02	Early	182	4.154	.7642	.0566	SPB05	Early	182	4.038	.9186	.0681
	Late	52	4.346	.7640	.1059		Late	52	3.981	.7794	.1081		Late	52	4.192	.8411	.1166
SSCA13	Early	182	4.225	.7858	.0582	ICA03	Early	182	4.093	.8054	.0597	SPB06	Early	182	4.082	.8912	.0661
	Late	52	4.212	.6955	.0965		Late	52	3.981	.7273	.1009		Late	52	3.942	.9785	.1357
SSCB01	Early	182	3.709	.9792	.0726	ICA04	Early	182	4.181	.7091	.0526	SPB07	Early	182	4.203	.8841	.0655
	Late	52	3.558	1.0178	.1411		Late	52	3.865	.7677	.1065		Late	52	4.077	.9465	.1313
SSCB02	Early	182	3.703	1.0082	.0747	ICA05	Early	182	4.049	.7454	.0552	SPC01	Early	182	3.923	.9998	.0741
	Late	52	3.596	.9551	.1324		Late	52	3.981	.7273	.1009		Late	52	4.000	.8165	.1132
SSCB03	Early	182	3.698	1.0148	.0752	ICB01	Early	182	3.747	1.0832	.0803	SPC02	Early	182	4.077	.9071	.0672
	Late	52	3.635	.9707	.1346		Late	52	3.692	1.0579	.1467		Late	52	4.038	.9489	.1316
SSCB04	Early	182	3.874	.9405	.0697	ICB02	Early	182	3.918	.9570	.0709	SPC03	Early	182	4.022	.8917	.0661
	Late	52	3.808	.8865	.1229		Late	52	3.750	1.0455	.1450		Late	52	3.942	.8947	.1241
SSCB05	Early	182	3.802	1.0215	.0757	ICB03	Early	182	3.967	.9218	.0683	SPC04	Early	182	4.088	.8750	.0649
	Late	52	3.654	.8831	.1225		Late	52	3.769	.9625	.1362		Late	52	3.923	.9042	.1254
SSCC01	Early	182	3.758	.9610	.0713	ICB04	Early	182	4.011	.9042	.0676	SPC05	Early	182	4.137	.8968	.0665
	Late	52	3.885	.9503	.1318		Late	52	3.731	.9100	.1262		Late	52	3.942	.9164	.1271
SSCC02	Early	182	3.857	.9813	.0727	ICC01	Early	182	4.187	.8398	.0622	SPC06	Early	182	4.231	.8614	.0639
	Late	52	3.615	1.1907	.1651		Late	52	4.058	.6977	.0968		Late	52	4.077	.8597	.1192
SSCC03	Early	182	3.962	.9769	.0724	ICC02	Early	182	4.242	.7105	.0527						
	Late	52	3.712	1.0354	.1436		Late	52	4.135	.7148	.0991						
SSCC04	Early	182	3.852	1.0379	.0769	ICC03	Early	182	4.264	.6947	.0515						
	Late	52	3.769	1.0023	.1390		Late	52	4.192	.7151	.0992						
SSCC05	Early	182	3.753	1.1022	.0817	ICC04	Early	182	4.253	.7144	.0530						
	Late	52	3.808	1.1033	.1530		Late	52	4.019	.7794	.1081						
SSCD01	Early	182	4.148	.9605	.0712	ICC05	Early	182	4.253	.7447	.0552						
	Late	52	4.058	1.1447	.1587		Late	52	4.115	.8553	.1186						
SSCD02	Early	182	4.033	1.0766	.0798												
	Late	52	4.019	1.0383	.1440												
SSCD03	Early	182	4.236	1.0051	.0745												
	Late	52	4.115	1.0784	.1495												
SSCD04	Early	182	4.176	1.0093	.0748												
	Late	52	4.212	.9968	.1382												
SSCD05	Early	182	4.291	.9211	.0683												
	Late	52	4.019	1.0754	.1491												

Independent Samples Test										
		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Difference	
									Lower	Upper
SSCA01	Equal variances assumed	.868	.352	.985	232	.326	.1209	.1227	-.1208	.3626
	Equal variances not assumed			.933	76.553	.354	.1209	.1296	-.1372	.3790
SSCA02	Equal variances assumed	.639	.425	1.695	232	.091	.1978	.1167	-.0321	.4277
	Equal variances not assumed			1.714	83.750	.090	.1978	.1154	-.0317	.4273
SSCA03	Equal variances assumed	1.713	.192	2.216	232	.028	.2610	.1178	.0289	.4930
	Equal variances not assumed			2.309	87.681	.023	.2610	.1130	.0364	.4856
SSCA04	Equal variances assumed	.615	.434	1.776	232	.077	.2115	.1191	-.0231	.4462
	Equal variances not assumed			1.634	73.942	.106	.2115	.1294	-.0464	.4695
SSCA05	Equal variances assumed	.342	.559	.395	232	.693	.0522	.1322	-.2083	.3127
	Equal variances not assumed			.385	79.560	.701	.0522	.1356	-.2177	.3221
SSCA06	Equal variances assumed	.040	.842	.557	232	.578	.0687	.1234	-.1744	.3117
	Equal variances not assumed			.544	79.829	.588	.0687	.1262	-.1825	.3199
SSCA07	Equal variances assumed	.048	.827	-.448	232	.655	-.0604	.1350	-.3264	.2055
	Equal variances not assumed			-.449	82.806	.654	-.0604	.1345	-.3280	.2071
SSCA08	Equal variances assumed	.832	.363	.221	232	.825	.0247	.1116	-.1952	.2447
	Equal variances not assumed			.229	86.495	.820	.0247	.1081	-.1901	.2395
SSCA09	Equal variances assumed	1.219	.271	-1.376	232	.170	-.1813	.1317	-.4409	.0782
	Equal variances not assumed			-1.494	93.770	.139	-.1813	.1214	-.4223	.0597
SSCA10	Equal variances assumed	1.601	.207	-1.853	232	.065	-.2473	.1334	-.5102	.0156
	Equal variances not assumed			-2.017	94.285	.046	-.2473	.1226	-.4906	-.0039
SSCA11	Equal variances assumed	.105	.746	-.022	232	.983	-.0027	.1259	-.2508	.2453
	Equal variances not assumed			-.021	77.852	.983	-.0027	.1313	-.2641	.2586
SSCA12	Equal variances assumed	.047	.828	-1.259	232	.209	-.1538	.1222	-.3945	.0869
	Equal variances not assumed			-1.274	83.851	.206	-.1538	.1207	-.3939	.0862
SSCA13	Equal variances assumed	1.096	.296	.114	232	.909	.0137	.1206	-.2238	.2513
	Equal variances not assumed			.122	91.548	.903	.0137	.1127	-.2101	.2375
SSCB01	Equal variances assumed	.054	.817	.973	232	.332	.1511	.1553	-.1549	.4571
	Equal variances not assumed			.952	79.971	.344	.1511	.1587	-.1647	.4669
SSCB02	Equal variances assumed	.180	.672	.684	232	.495	.1071	.1567	-.2017	.4159
	Equal variances not assumed			.705	86.184	.483	.1071	.1521	-.1952	.4094
SSCB03	Equal variances assumed	.279	.598	.400	232	.690	.0632	.1581	-.2482	.3746
	Equal variances not assumed			.410	85.470	.683	.0632	.1542	-.2434	.3698
SSCB04	Equal variances assumed	.120	.729	.451	232	.652	.0659	.1461	-.2218	.3537
	Equal variances not assumed			.467	86.554	.642	.0659	.1413	-.2150	.3468
SSCB05	Equal variances assumed	1.661	.199	.950	232	.343	.1484	.1561	-.1592	.4559
	Equal variances not assumed			1.030	93.600	.305	.1484	.1440	-.1375	.4342
SSCC01	Equal variances assumed	.083	.773	-.710	232	.478	-.1071	.1508	-.4043	.1900
	Equal variances not assumed			-.715	83.197	.477	-.1071	.1498	-.4051	.1908
SSCC02	Equal variances assumed	5.177	.024	1.491	232	.137	.2418	.1621	-.0776	.5612
	Equal variances not assumed			1.340	71.949	.185	.2418	.1804	-.1179	.6014
SSCC03	Equal variances assumed	1.178	.279	1.606	232	.110	.2500	.1557	-.0567	.5567
	Equal variances not assumed			1.555	78.806	.124	.2500	.1608	-.0701	.5701
SSCC04	Equal variances assumed	.020	.886	.509	232	.611	.0824	.1620	-.2367	.4016
	Equal variances not assumed			.519	84.800	.605	.0824	.1589	-.2335	.3983
SSCC05	Equal variances assumed	.385	.535	-.317	232	.752	-.0549	.1733	-.3965	.2866
	Equal variances not assumed			-.317	82.345	.752	-.0549	.1734	-.4000	.2901
SSCD01	Equal variances assumed	.959	.328	.574	232	.566	.0907	.1579	-.2204	.4017
	Equal variances not assumed			.521	72.754	.604	.0907	.1740	-.2561	.4374
SSCD02	Equal variances assumed	.020	.889	.082	232	.935	.0137	.1680	-.3172	.3447
	Equal variances not assumed			.083	84.890	.934	.0137	.1646	-.3136	.3411
SSCD03	Equal variances assumed	.016	.900	.752	232	.453	.1209	.1606	-.1956	.4374
	Equal variances not assumed			.724	78.101	.472	.1209	.1671	-.2117	.4535
SSCD04	Equal variances assumed	.082	.776	-.226	232	.822	-.0357	.1583	-.3475	.2761
	Equal variances not assumed			-.227	83.241	.821	-.0357	.1572	-.3483	.2769
SSCD05	Equal variances assumed	.588	.444	1.807	232	.072	.2720	.1505	-.0246	.5685
	Equal variances not assumed			1.658	73.708	.102	.2720	.1640	-.0549	.5988

Independent Samples Test										
		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the	
								Lower	Upper	
SDA01	Equal variances assumed	2.804	.095	3.654	232	.000	.4588	.1256	.2114	.7062
	Equal variances not assumed			3.322	72.922	.001	.4588	.1381	.1835	.7340
SDA02	Equal variances assumed	2.000	.159	2.610	232	.010	.3901	.1494	.0957	.6846
	Equal variances not assumed			2.394	73.666	.019	.3901	.1629	.0654	.7148
SDA03	Equal variances assumed	.047	.828	1.943	232	.053	.3104	.1598	-.0043	.6252
	Equal variances not assumed			1.978	84.599	.051	.3104	.1569	-.0016	.6225
SDA04	Equal variances assumed	2.897	.090	-1.740	232	.460	-.1346	.1820	-.4932	.2240
	Equal variances not assumed			-.810	95.178	.420	-.1346	.1663	-.4647	.1955
SDA05	Equal variances assumed	1.596	.208	-.864	232	.388	-.1511	.1749	-.4956	.1934
	Equal variances not assumed			-.896	87.057	.373	-.1511	.1686	-.4861	.1839
SDB01	Equal variances assumed	.040	.842	1.436	232	.152	.2418	.1683	-.0899	.5734
	Equal variances not assumed			1.449	83.480	.151	.2418	.1668	-.0900	.5736
SDB02	Equal variances assumed	2.078	.151	1.643	232	.102	.2940	.1789	-.0585	.6464
	Equal variances not assumed			1.557	76.647	.124	.2940	.1888	-.0820	.6699
SDB03	Equal variances assumed	.390	.533	.215	232	.830	.0385	.1792	-.3146	.3915
	Equal variances not assumed			.221	86.104	.826	.0385	.1740	-.3074	.3843
SDB04	Equal variances assumed	.099	.753	1.145	232	.254	.2005	.1752	-.1446	.5457
	Equal variances not assumed			1.163	84.359	.248	.2005	.1724	-.1423	.5434
SDB05	Equal variances assumed	.166	.684	1.460	232	.146	.2527	.1731	-.0883	.5938
	Equal variances not assumed			1.528	88.253	.130	.2527	.1654	-.0760	.5815
ICA01	Equal variances assumed	.504	.478	.701	232	.484	.0797	.1137	-.1443	.3036
	Equal variances not assumed			.717	85.224	.475	.0797	.1111	-.1412	.3005
ICA02	Equal variances assumed	.944	.332	1.434	232	.153	.1731	.1207	-.0647	.4109
	Equal variances not assumed			1.418	81.136	.160	.1731	.1220	-.0697	.4159
ICA03	Equal variances assumed	2.408	.122	.908	232	.365	.1126	.1241	-.1318	.3570
	Equal variances not assumed			.961	89.885	.339	.1126	.1172	-.1202	.3455
ICA04	Equal variances assumed	.018	.893	2.781	232	.006	.3159	.1136	.0921	.5397
	Equal variances not assumed			2.661	77.596	.009	.3159	.1187	.0795	.5523
ICA05	Equal variances assumed	.415	.520	.589	232	.556	.0687	.1166	-.1610	.2984
	Equal variances not assumed			.597	84.062	.552	.0687	.1150	-.1600	.2974
ICB01	Equal variances assumed	.035	.851	.324	232	.746	.0549	.1695	-.2789	.3888
	Equal variances not assumed			.329	84.006	.743	.0549	.1672	-.2776	.3875
ICB02	Equal variances assumed	1.166	.281	1.091	232	.277	.1676	.1536	-.1351	.4703
	Equal variances not assumed			1.038	77.093	.302	.1676	.1614	-.1538	.4890
ICB03	Equal variances assumed	1.191	.276	1.345	232	.180	.1978	.1471	-.0920	.4876
	Equal variances not assumed			1.298	78.481	.198	.1978	.1524	-.1056	.5012
ICB04	Equal variances assumed	.160	.690	1.968	232	.050	.2802	.1424	-.0003	.5607
	Equal variances not assumed			1.961	81.993	.053	.2802	.1429	-.0040	.5645
ICC01	Equal variances assumed	6.282	.013	1.013	232	.312	.1291	.1275	-.1220	.3803
	Equal variances not assumed			1.122	97.262	.264	.1291	.1151	-.0992	.3575
ICC02	Equal variances assumed	.019	.890	.958	232	.339	.1071	.1119	-.1133	.3275
	Equal variances not assumed			.955	82.013	.343	.1071	.1122	-.1161	.3304
ICC03	Equal variances assumed	.059	.808	.650	232	.517	.0714	.1099	-.1452	.2880
	Equal variances not assumed			.639	80.561	.524	.0714	.1117	-.1509	.2938
ICC04	Equal variances assumed	.602	.439	2.037	232	.043	.2335	.1147	.0076	.4594
	Equal variances not assumed			1.940	77.170	.056	.2335	.1204	-.0061	.4732
ICC05	Equal variances assumed	.002	.962	1.134	232	.258	.1374	.1211	-.1013	.3760
	Equal variances not assumed			1.050	74.500	.297	.1374	.1308	-.1233	.3980

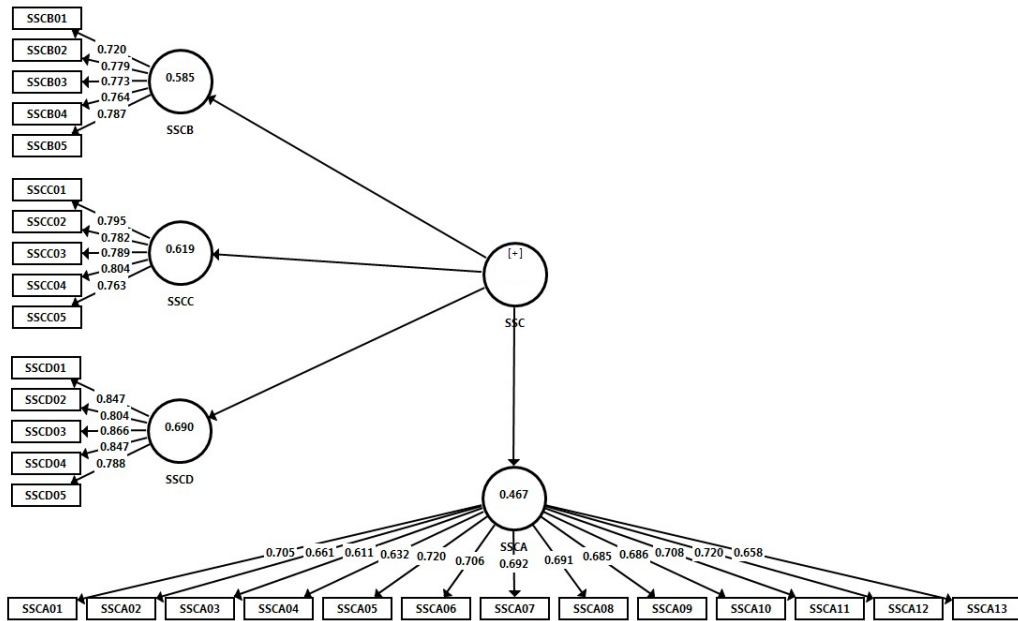
Independent Samples Test										
		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the	
								Lower	Upper	
SPA01	Equal variances assumed	1.455	.229	1.401	232	.162	.2225	.1588	-.0903	.5354
	Equal variances not assumed			1.316	75.794	.192	.2225	.1691	-.1143	.5593
SPA02	Equal variances assumed	5.590	.019	2.309	232	.022	.3214	.1392	.0472	.5957
	Equal variances not assumed			2.068	71.699	.042	.3214	.1554	.0116	.6313
SPA03	Equal variances assumed	.182	.670	.975	232	.331	.1566	.1606	-.1599	.4731
	Equal variances not assumed			.941	78.504	.350	.1566	.1664	-.1747	.4879
SPA04	Equal variances assumed	.000	.982	.399	232	.690	.0632	.1585	-.2491	.3754
	Equal variances not assumed			.391	80.201	.697	.0632	.1616	-.2584	.3847
SPA05	Equal variances assumed	1.881	.172	.428	232	.669	.0714	.1668	-.2571	.4000
	Equal variances not assumed			.487	101.896	.628	.0714	.1468	-.2198	.3626
SPA06	Equal variances assumed	1.163	.282	.947	232	.345	.1456	.1538	-.1575	.4487
	Equal variances not assumed			.888	75.726	.377	.1456	.1639	-.1809	.4721
SPA07	Equal variances assumed	.612	.435	.812	232	.417	.1291	.1590	-.1841	.4423
	Equal variances not assumed			.879	93.335	.382	.1291	.1469	-.1625	.4207
SPB01	Equal variances assumed	.193	.661	1.469	232	.143	.1841	.1253	-.0627	.4309
	Equal variances not assumed			1.422	78.757	.159	.1841	.1295	-.0736	.4417
SPB02	Equal variances assumed	.021	.885	1.944	232	.053	.2418	.1244	-.0032	.4868
	Equal variances not assumed			1.800	74.508	.076	.2418	.1343	-.0258	.5093
SPB03	Equal variances assumed	.018	.892	.391	232	.696	.0522	.1336	-.2111	.3154
	Equal variances not assumed			.384	80.556	.702	.0522	.1358	-.2180	.3224
SPB04	Equal variances assumed	1.354	.246	1.157	232	.248	.1621	.1400	-.1138	.4380
	Equal variances not assumed			1.154	82.027	.252	.1621	.1405	-.1174	.4416
SPB05	Equal variances assumed	.040	.842	-1.085	232	.279	-.1538	.1419	-.4333	.1256
	Equal variances not assumed			-1.139	88.782	.258	-.1538	.1351	-.4222	.1145
SPB06	Equal variances assumed	.115	.734	.978	232	.329	.1401	.1433	-.1422	.4224
	Equal variances not assumed			.928	76.827	.356	.1401	.1509	-.1604	.4406
SPB07	Equal variances assumed	.142	.707	.895	232	.372	.1264	.1412	-.1519	.4046
	Equal variances not assumed			.861	78.225	.392	.1264	.1467	-.1657	.4184
SPC01	Equal variances assumed	8.765	.003	-.508	232	.612	-.0769	.1513	-.3751	.2213
	Equal variances not assumed			-.568	98.939	.571	-.0769	.1353	-.3454	.1916
SPC02	Equal variances assumed	.303	.583	.267	232	.790	.0385	.1441	-.2455	.3224
	Equal variances not assumed			.260	79.577	.795	.0385	.1478	-.2556	.3326
SPC03	Equal variances assumed	.001	.970	.568	232	.571	.0797	.1403	-.1968	.3561
	Equal variances not assumed			.567	82.187	.572	.0797	.1406	-.2000	.3593
SPC04	Equal variances assumed	.008	.928	1.189	232	.236	.1648	.1386	-.1083	.4379
	Equal variances not assumed			1.168	80.328	.246	.1648	.1412	-.1161	.4457
SPC05	Equal variances assumed	.072	.789	1.377	232	.170	.1951	.1417	-.0841	.4742
	Equal variances not assumed			1.360	81.020	.178	.1951	.1434	-.0903	.4804
SPC06	Equal variances assumed	.494	.483	1.136	232	.257	.1538	.1354	-.1129	.4206
	Equal variances not assumed			1.138	82.543	.259	.1538	.1352	-.1152	.4229

Appendix H Assessment of Normality for All Items

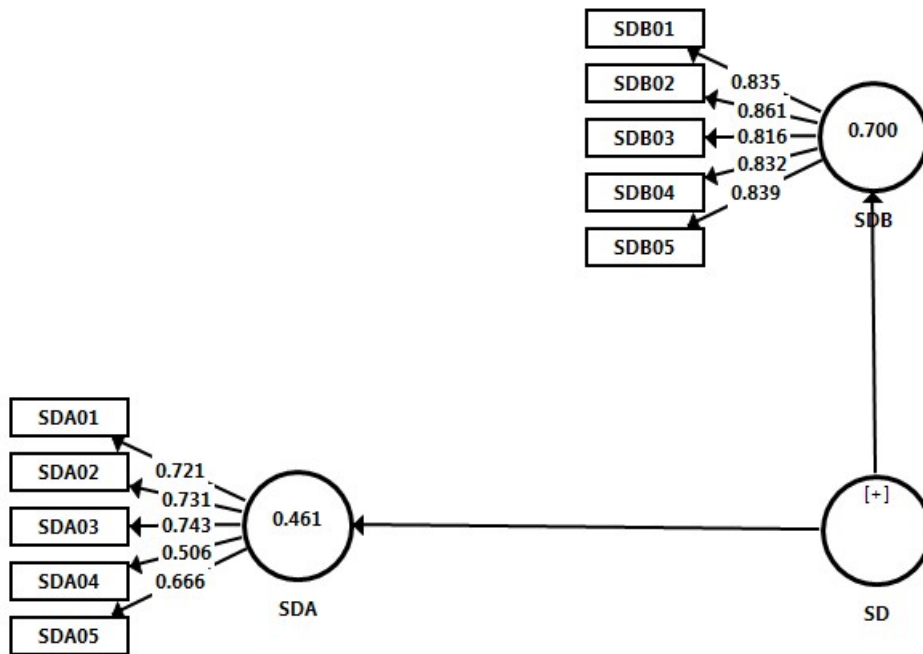
Construct	Item	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Operational Selection Criteria (SSCA)	SSCA01	-0.769	0.159	-0.255	0.317
	SSCA02	-1.073	0.159	0.701	0.317
	SSCA03	-0.989	0.159	0.271	0.317
	SSCA04	-0.871	0.159	-0.330	0.317
	SSCA05	-0.724	0.159	-0.597	0.317
	SSCA06	-0.746	0.159	-0.029	0.317
	SSCA07	-0.817	0.159	-0.071	0.317
	SSCA08	-0.611	0.159	-0.819	0.317
	SSCA09	-0.554	0.159	-0.603	0.317
	SSCA10	-0.797	0.159	-0.306	0.317
	SSCA11	-0.803	0.159	0.145	0.317
	SSCA12	-0.695	0.159	-0.184	0.317
	SSCA13	-0.691	0.159	-0.078	0.317
Strategic Selection Criteria (SSCB)	SSCB01	-0.335	0.159	-0.556	0.317
	SSCB02	-0.190	0.159	-1.019	0.317
	SSCB03	-0.206	0.159	-0.927	0.317
	SSCB04	-0.465	0.159	-0.462	0.317
	SSCB05	-0.346	0.159	-0.807	0.317
Environment Selection Criteria (SSCC)	SSCC01	-0.466	0.159	-0.421	0.317
	SSCC02	-0.774	0.159	0.281	0.317
	SSCC03	-0.737	0.159	0.113	0.317
	SSCC04	-0.735	0.159	0.095	0.317
	SSCC05	-0.712	0.159	-0.134	0.317
Social Selection Criteria (SSCD)	SSCD01	-1.085	0.159	0.660	0.317
	SSCD02	-0.746	0.159	-0.418	0.317
	SSCD03	-1.187	0.159	0.714	0.317
	SSCD04	-1.171	0.159	0.701	0.317
	SSCD05	-1.178	0.159	0.779	0.317
Supplier Assessment (SDA)	SDA01	-0.573	0.159	-0.872	0.317
	SDA02	-0.885	0.159	0.410	0.317
	SDA03	-0.576	0.159	-0.287	0.317
	SDA04	-0.609	0.159	-0.560	0.317
	SDA05	-0.689	0.159	-0.324	0.317
Supplier Collaboration (SDB)	SDB01	-0.466	0.159	-0.479	0.317
	SDB02	-0.715	0.159	-0.370	0.317
	SDB03	-0.400	0.159	-0.625	0.317
	SDB04	-0.622	0.159	-0.306	0.317
	SDB05	-0.742	0.159	-0.086	0.317

Construct	Item	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Human Capital (ICA)	ICA01	-0.330	0.159	-0.389	0.317
	ICA02	-0.543	0.159	-0.168	0.317
	ICA03	-0.492	0.159	-0.293	0.317
	ICA04	-0.440	0.159	-0.221	0.317
	ICA05	-0.310	0.159	-0.415	0.317
Structural Capital (ICB)	ICB01	-0.540	0.159	-0.569	0.317
	ICB02	-0.675	0.159	-0.121	0.317
	ICB03	-0.793	0.159	0.435	0.317
	ICB04	-0.757	0.159	0.233	0.317
Relational Capital (ICC)	ICC01	-0.833	0.159	0.597	0.317
	ICC02	-0.632	0.159	0.206	0.317
	ICC03	-0.687	0.159	0.421	0.317
	ICC04	-0.728	0.159	0.444	0.317
	ICC05	-0.859	0.159	0.518	0.317
Economic Performance (SPA)	SPA01	-0.847	0.159	0.392	0.317
	SPA02	-0.655	0.159	0.071	0.317
	SPA03	-0.818	0.159	0.282	0.317
	SPA04	-0.587	0.159	-0.173	0.317
	SPA05	-0.843	0.159	0.190	0.317
	SPA06	-0.929	0.159	0.663	0.317
	SPA07	-0.811	0.159	0.341	0.317
Social Performance (SPB)	SPB01	-0.938	0.159	0.124	0.317
	SPB02	-0.858	0.159	-0.107	0.317
	SPB03	-0.435	0.159	-1.042	0.317
	SPB04	-0.920	0.159	0.407	0.317
	SPB05	-0.427	0.159	-1.034	0.317
	SPB06	-0.720	0.159	0.034	0.317
	SPB07	-0.712	0.159	-0.575	0.317
Environment Performance (SPC)	SPC01	-0.494	0.159	-0.523	0.317
	SPC02	-0.611	0.159	-0.446	0.317
	SPC03	-0.449	0.159	-0.732	0.317
	SPC04	-0.479	0.159	-0.752	0.317
	SPC05	-0.787	0.159	0.170	0.317
	SPC06	-0.757	0.159	-0.342	0.317

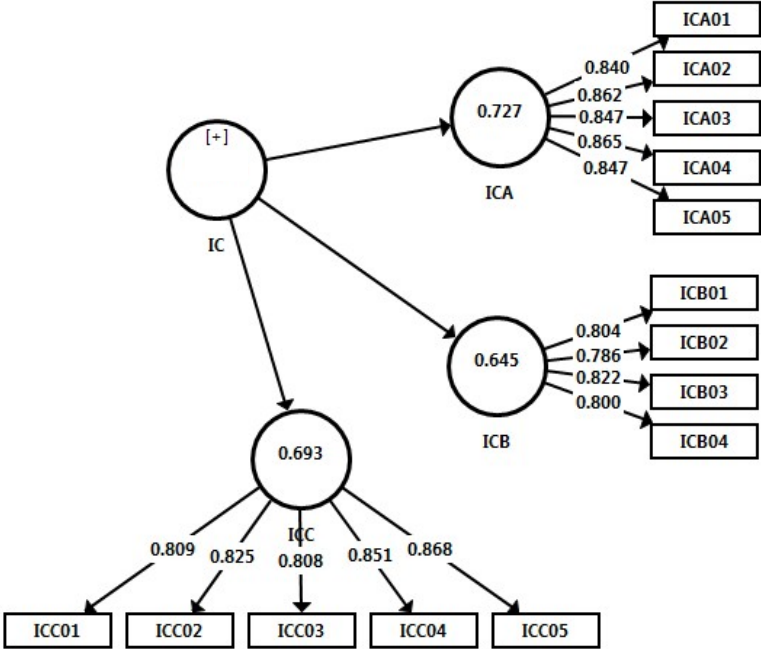
Appendix I Initial CFA model for Supplier Selection Criteria (SSC) with all 28 items and AVE results



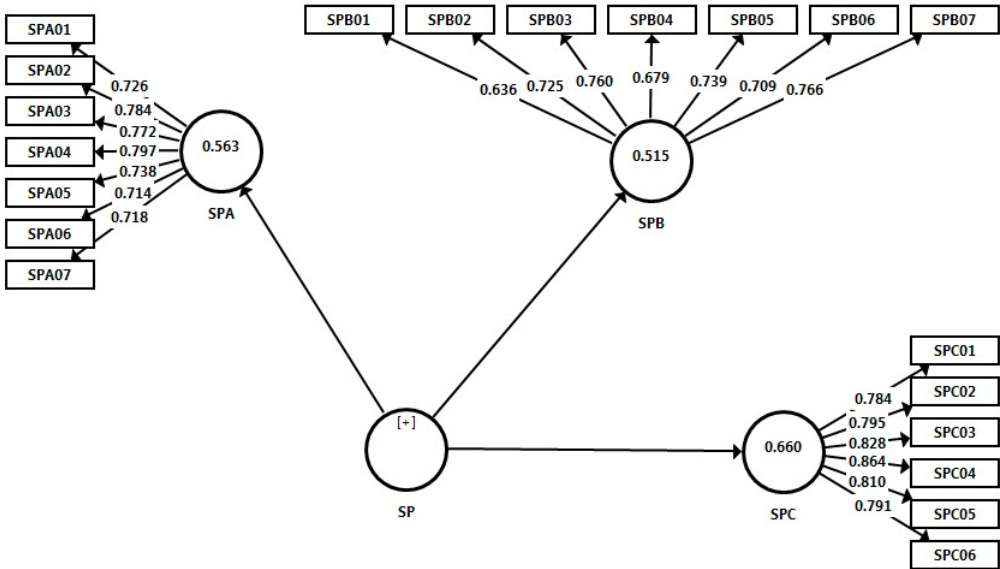
Appendix J Initial CFA model for Supplier Development (SD) with all 10 items and AVE results



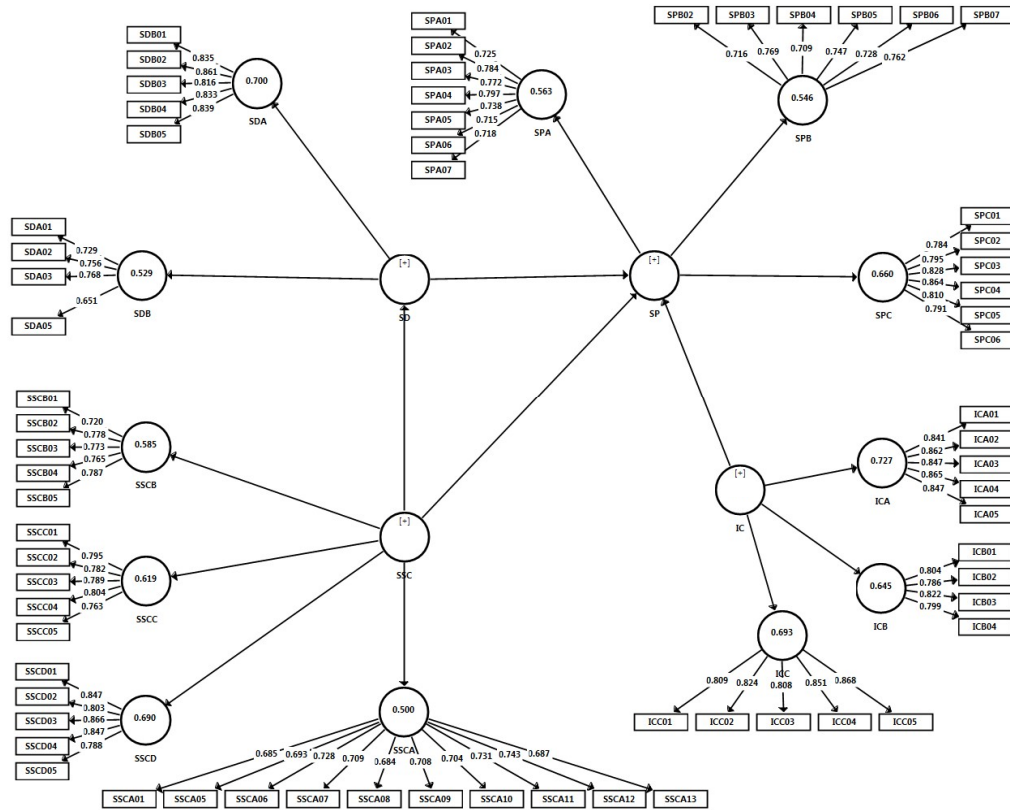
Appendix K Initial CFA model for Intellectual Capital (IC) with all 14 items and AVE results



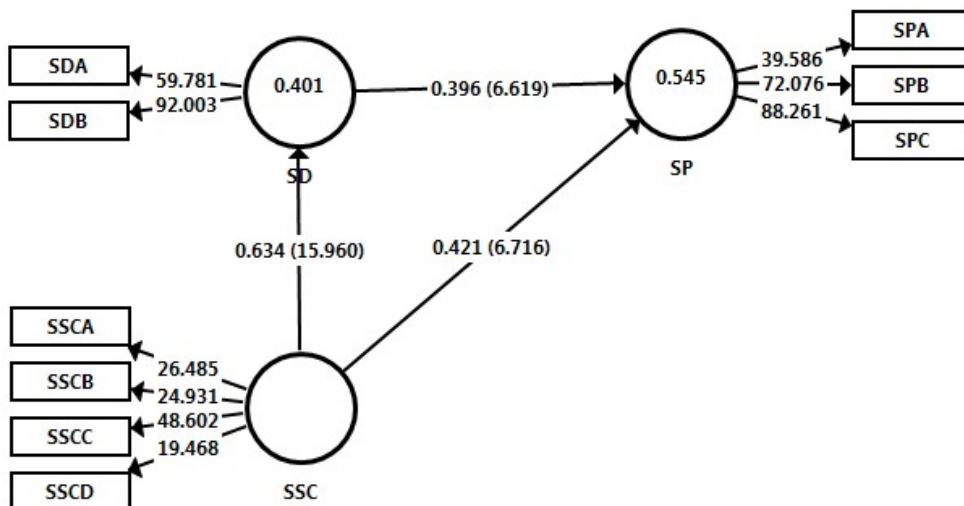
Appendix L Initial CFA model for Sustainability Performance (SP) with all 20 items and AVE results



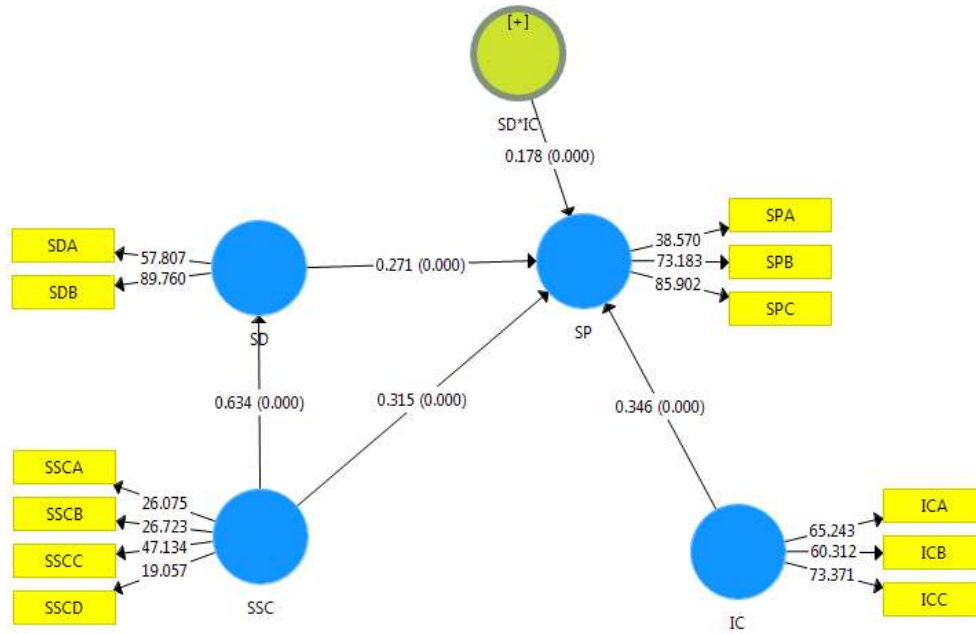
Appendix M Modified CFA model for Research Model (after items removed) and AVE results



Appendix N Structural Model for Mediation



Appendix O Structural Model for Moderation



LIST OF PUBLICATIONS

Velayutham, M., Chin, T. A., & Indiran, L. (2021). Supplier Development and Sustainability Performance: A Meta-analytic Study. *International Journal of Academic Research in Business and Social Sciences*, 11(7), 408–428