GREEN PURCHASING CAPABILITIES AND PRACTICES TOWARDS TRIPLE BOTTOM LINE PERFORMANCE: MODERATING EFFECTS OF INSTITUTIONAL PRESSURE

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ABSTRACT

Sustainability and environmental concerns have become mainstream issues. With increasing awareness and pressure from the general public and stakeholders, firms need to be more transparent in addressing and managing green issues of their supply base implementation. Many firms have concentrated sustainability efforts only in their internal operations, but neglect the part in examining the green sustainability practices through their supply base by utilizing the internal green purchasing capabilities to assess the actual environmental, economic, and intangible outcomes of the adoption of green purchasing practices. This study focuses on the sustainability practices of the green purchasing practices (green supplier selection, development, collaboration and evaluation) of firms, coupled with their internal green purchasing capabilities (manufacturing, integration, intraorganisational, financial and innovation capabilities) for the triple bottom line performance (environmental, economic, and intangible) of the firms based on the Resource Based theory. The study also includes institutional pressure (regulation, competitor and customer) as the moderator. The focus of this study is in the context of Malaysian ISO 14001 accredited manufacturing firms. A total of 163 usable response samples were drawn from all the 673 ISO 14001 certified companies in Malaysia. These companies have been certified by the SIRIM and included also in the list of the FMM directories. PLS analysis was used to test the hypotheses of this study in the first stage. The adequacy of the measurement model was assessed, followed by the examination of the structural relationship in the second stage. The results revealed that manufacturing, financial, intraorganisational, and integration capabilities have positive effects on green purchasing practices; the results found that green purchasing

practices have positive effect on triple bottom line performance. On the other hand, the survey results indicate that manufacturing, intraorganisational and integration capabilities have positive effects on the triple bottom line performance of the firms, and that green purchasing practices mediate these three capabilities and the triple bottom line. Both financial and innovation capabilities have no significant effect on the triple bottom line performance of the firms or any mediating effect on green purchasing practices. This study found positive moderating effects of regulation, customer and competitor pressure on manufacturing capabilities, and green purchase practices. On the one hand, this study found only moderating effect of consumer pressure on intraorganisational capabilities, but no moderating effect on all the other green capabilities. Using the resource based theory for theory building and institutional pressure as the moderator, this study explores how the purchasing functions should use their supply base, together with their green purchasing capabilities toward the triple bottom line performance of ISO 14001 manufacturing firms in Malaysia context. The research findings provide useful insights for firms seeking to adopt green purchasing programme and provide insights for professional organizations, regulators, and legislators to further promote green purchasing inactivate

Keywords: Green Purchasing Capabilities, Green Purchasing Practices, Triple Bottom Line Performance, Resource Based View and Institutional pressure.

KEUPAYAAN DAN AMALAN PEMEROLEHAN HIJAU KE ARAH PRESTASI KEUNTUNGAN BERTIGA: KESAN PENYEDERHANAAN TEKANAN INSTITUSI

ABSTRAK

Kemampanan dan alam sekitar telah menjadi isu utama. Dengan peningkatan kesedaran dan tekanan daripada pihak awam dan pemegang kepentingan, firma perlu lebih telus dalam menangani dan mengurus isu-isu Hijau dalam pelaksanaan pangkalan bekalan merekaan . Banyak syarikat telah menumpukan usaha kemapanan hanya dalam operasi dalaman mereka, tetapi mengabaikan pemeriksaan amalan kemampanan hijau menerusi asas pembekalan mereka dengan menggunakan keupayaan pembelian hijau dalaman untuk menilai alam sekitar, ekonomi, dan hasil sebenar yang tidak ketara daripada penggunaan amalan pembelian hijau. Kajian ini menumpu kepada amalan kemampanan lanjutan atas amalan pembelian hijau firma (pemilihan pembekal hijau, pembangunan, kerjasama dan penilaian), berserta keupayaan dalaman firma atas pembelian hijau (keupayaan perkilangan, integrasi, *intraorganisational*, kewangan dan inovasi) untuk prestasi *triple bottom line* (alam sekitar, ekonomi dan ciri-ciri tidak ketara) berdasarkan teori *Resource Based*, di mana tekanan institusi (peraturan, pesaing dan pelanggan) adalah selaku penyederhana. Fokus kajian ini adalah firma perkilangan ISO 14001 yang diiktiraf di Malaysia. Sebanyak 163 sampel yang boleh gunapakai telah diambil dari kesemua 673 firma yang diperakui oleh ISO 14001 di Malaysia. Firma-firma ini telah disahkan oleh SIRIM dan disenarai dalam direktori FMM, tahun pada 2014. Pada peringkat pertama, analisis PLS telah digunakan untuk menguji hipotesis kajian. Kesesuaian model pengukuran dinilai, diikuti dengan pemeriksaan hubungan struktur dalam peringkat kedua. Hasil kajian menunjukkan keupayaan perkilangan, *intraorganisational*, integrasi dan kewangan mempunyai kesan positif kepada amalan pembelian hijau. Sebaliknya, keputusan kajian menunjukkan bahawa keupayaan

perkilangan, *intraorganisational* dan integrasi mempunyai kesan positif signifikan keatas prestasi keuntungan bertiga firma dan amalan pembelian hijau menjadi penyederhana kepada tiga keupayaan dan prestasi keuntungan bertiga firma Walau bagaimanapun, keupayaan kewangan dan inovasi tidak mempunyai kesan keatas prestasi Keuntungan bertiga atau kesan penyederhana kepada amalan pembelian hijau. Kajian ini mendapati tekanan peraturan, pelanggan dan pesaing mempunyai kesan penyederhana positif yang sederhana kepada keupayaan perkilangan dan amalan pembelian hijau. Walau bagaimanapun, kajian ini mendapati hanya tekanan pelanggan mempunyai kesan penyerdehana kepada keupayaan *intraorganisational*, tetapi tiada kesan penyederhana terhadap semua keupayaan hijau yang lain. Dengan menggunakan Teori pandangan berasaskan sumber sebagai asas teori, kajian ini menerangkan bagaimana fungsi pembelian harus menggunakan pangkalan bekalan mereka, bersama-sama dengan keupayaan membeli hijau mereka untuk prestasi keuntungan bertiga. Kajian ini membayangkan bagaimana tekanan institusi dapat digunakan untuk menjelaskan mekanisme keupayaan dan amalan membeli hijau dalam konteks Malaysia. Berkenaan dengan implikasi praktikal, penemuan penyelikan ini memberikan pandangan berguna bagi firma yang ingin menggunakan program pembelian hijau dan juga kepada organisasi prefesional, penggubal undang undang untuk mempromosikan pembelian hijau di mana pelaksanaan pembelian hijau dapat mempengaruhi responsiveness, amalan, dan membuat keputusan ke arah prestasi keuntungan bertiga.

Kata kunci: Keupayaan Pembelian Hijau, Amalan Pembelian Hijau, Prestasi keuntungan Bertiga.

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LIST OF SYMBOLS AND ABBREVIATIONS

AVE:	Average variance extracted
RBV:	Resource Based View
CMV:	Common method variance
CFA:	Confirmatory factor analysis
CP:	Customer pressures,
COP:	Competitor pressures,
CO2-eq:	Carbon Dioxide equivalent
DC:	Innovative capabilities,
DDI:	Domestic direct investment.
DOA:	Department of Agriculture
DV:	Dependent variable
EN:	Environmental performance,
EO:	Economic performance,
ETP:	Economic transformation programmed
EMS:	Environmental Management System
FDI:	Foreign direct investment
FMM:	Federation of Malaysian Manufacturers
FC:	Financial capabilities,
GSS:	Green supplier selection,
GSD:	Supplier development,
GSC:	Green supplier collaboration,
GSE:	Green supplier evaluation,
GDP:	Gross Domestic Product
GTP:	Government transformation programmed
ISO:	International Organization for Standardization
IEC:	International Electrotechnical Commission.

IV:	Independent variable
IC:	Integration capabilities,
IRP:	International resource panel
IP:	Intangible performance.
INT:	Institutional Pressure
KeTTHA:	Ministry of Energy, Green Technology and Water (Kementerian Tenaga, Teknologi Hijau dan Air).
NEM:	New economic model
MTCC:	Malaysian Timber Certification Council
MAMPU:	Malaysian Administrative Modernization and Management Planning Unit
MOF:	Ministry of Finance
MTHPI:	National Green Technology and Climate Change Council. (Majlis Teknologi Hijau Negara & Perubahan Iklim).
MTCS:	Malaysia Timber certification scheme
MyHIJAU:	Malaysia's Green Recognition Scheme
MGTC:	Malaysian Green Technology Corporation
MC:	Manufacturing capabilities,
10 MP:	10^{th} Malaysia Plan
PLS:	Partial least square
PPPI:	Public procurement p promoting innovation
QAS:	Quality assurance system
RP:	Regulations pressures,
SC:	Intraorganisational capabilities.
SEM:	Structural equation modelling
SPAN:	National Water Services Commission. (Suruhanjaya Perkhidmatan Air Negara)
SRPP:	Socially Responsible Public Procurement
SALM:	Malaysian farm certification scheme for good agriculture
SOM:	Malaysia organic scheme

SIRIM:	Scientific and Industrial Research Institute of Malaysia
SD:	Standard deviation
SCM:	Supply Chain Management
SPSS:	Statistical package for social sciences
UNEP:	United Nations Environment Programme
VIF:	Variance inflation factor
VAF:	Variance account for
WEPLS:	Water Efficient Product Labelling Scheme

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Sustainability has become a fundamental issue at present due to financial crises and growth of environmental issues such as greenhouse emission, global warming, air pollution, solid wastes, and ozone depletion (Gimenez, Sierra, & Rodon, 2012; Rashid, Jabar, Yahya, & Samer, 2015). Wu, Liao, Tseng and Chiu (2015) highlighted sustainability awareness and related green environmental issues have gradually gained attention among various stakeholders and have also become a priority concern among individuals. At present, organizations are facing tremendous pressure from various stakeholders, along with having to meet the need to comply with regulations. Chen and Chang (2012), Sarkis (2012) and Carter and Rogers (2008) stressed that oganizations need to provide better services in meeting the requirements of customers in terms of cost and other demands. Similarly, organisations have to be responsible for and response to both social and environmental concerns (Agi & Nishant, 2017). Thus, the practice of sustainbility is no longer an option for many organisations. It now has become obligatory in current business practices.

According to the global Non-renewable Natural Resources Scarcity Analysis Reports (Latiff, 2010), non-renewable natural resources are becoming progressively scarce due to increase in global demand and ineffective resource management. In fact, it is estimated that by the year 2030, a permanent shortfall of numerous essential natural resources will be experienced. Table 1.1 shows the permanent global shortfall probabilities by the year of 2030. Hence, all stakeholders, individuals and organizations must heed the warnings and fully implement sustainability practices that are mandatory for continued existence.

Table 1.1: Permanent Global Shortfall Probabilities by the year 2030

NNR	Global NNR Extraction Data and Estimates			Projected Peak Global (Annual) NNR Extraction Level[1]	Probability of a Permanent Global Supply Shortfall by the Year 2030
	Current Annual Extraction Level	2000-2008 Annual Extraction Growth Rate	Projected 2030 Annual Extraction Level		
Bauxite	205M MT	5.3%	639M MT	1,400M MT	Low
Cadmium	20.8K MT	Global Extraction Has Likely Peaked		21.9K MT	Nearly Certain
Chromium	6.6M MT	4.0%	19.5M MT	8.5M MT	High
Coal	6,900M ST	6.0%	26,300M ST	11,000M ST	High
Cobalt	71.8K MT	9.0%	478M MT	70K MT	Very High
Copper	15.7M MT	2.2%	25.3 M MT	20M MT	High
Gold	2.3K MT	Global Extraction Has Likely Peaked		2.6K MT	Nearly Certain
Indium	568 MT	6.8%	2,415 MT	830 MT	High
Iron Ore	2.2B MT	9.4%	15.9B MT	3.9B MT	High
Lead	3.8M MT	2.2%	6.1M MT	3.4M MT	Very High
Lithium	27.4K MT	9.6%	206M MT	57K MT	High
Manganese	14M MT	9.1%	95M MT	73M MT	High
Mercury	1K MT	Global Extraction Has Likely Peaked		10.4 K MT	Nearly Certain
Molybdenum	212K MT	5.8%	733M MT	180K MT	Very High
Natural Gas	110T CF	2.8%	207T CF	140T CF	High
Nickel	1.6M MT	2.8%	2.9M MT	1.85M MT	High
Oil	31.5B bbls	1.4%	43.3B bbls	35B bbls	High
PGM	504 MT	4.8%	1,481 MT	440 MT	Very High
Phosphate Rock	167M MT	3.0%	320M MT	150M MT	Very High
REM	124K MT	4.0%	294K MT	3,050K MT	Low
Silver	20.9K MT	1.8%	31K MT	16K MT	Very High
Tellurium	<95 MT	Global Extraction Has Likely Peaked		212 MT	Nearly Certain
Tin	333K MT	2.3%	549K MT	730K MT	Low
Titanium	9.6M MT	6.2%	39M MT	9M MT	Very High
Tungsten	54.6K MT	Global Extraction Has Likely Peaked		66.5K MT	Nearly Certain
Zinc	11.3M MT	3.2%	23M MT	10.3M MT	Very High

(1) In cases where the annual "global extraction level has likely peaked", the figure is the USGS global "peak-to-date"

Source: Non-renewable Natural Resources Scarcity Analysis Reports 2010

Organizations are beginning to recognize the role of the suppliers for firm sustainability initiatives. A company could maintain its sustainability depending on the suppliers from which it sources (Krause, Vachon, & Klassen, 2009). The research by Paulraja, Chen and Flynn (2006) and Ramsay and Croom (2008) claimed that the purchasing function have evolved into the strategic roles and business partnership for firm sustainability. Tate, Ellram and Dooley (2012) found that many organizations have started to recognize the important roles played by suppliers through collaboration with the purchasing departments for implementing sustainability initiatives in support of this this view.

In the study of Carter and Rogers (2008), both authors suggested that it would be fruitful to initiate sustainability practices through green sourcing or procurement, utilize reuse, remanufacture and recycle materials in order to conserve resources. Green

sourcing strategies are rapidly becoming primary activities for organizations, not only to enhance the image of the organization as being environmentally responsible, but also to improve profitability, because procurement is a key supply chain function, where manufacturing firms spend approximately 50 percent of their total revenue on their procurement-related activities (Dobrzykowski, Hong, & Park, 2012). In a study done by Zailani, Jeyaraman, Vengadasan and Premkumar (2012b), they found that firms might be investing 75 percent of their costs in the purchase of materials.

De Giovanni (2012) and Krause et al. (2009) pointed out that firms need to use their internal environmental strategies and proactive environmental management to promote their performance. On the other hand, Montabon, Sroufe and Narasimhan (2007) found that manufacturing firms could be more proactive through efficient utilization of resources to improve their corporate image. It is a limited empirical research on the implementation of sustainability of green purchasing activities in Malaysia. Based on prior empirical research on environmental and green purchasing issues, firms are focused mainly on their own internal activities. Eltayeb, Zailani and Ramayah (2011) found that many firms have concentrated sustainability efforts only on their internal operations, such as manufacturing and handling of issues. These firms have not extended sustainability practices to their external operations, such as using their supply base in supplier selection, development, collaboration, and evaluation, coupled with their internal green purchasing capabilities for firm sustainability. The perspective of focusing on external operations has created a gap between the conceptual models and the practical implementations of green purchasing capabilities, green purchasing practices, and firm triple bottom line performance.

This study starts with the introduction of the overall background of the environmental issue in the global perspective as well as in the Malaysian context. These include the importance and evolution of purchasing, followed by the statement of the problem, research questions, and objectives of the study. The significance of the study is defined and the expected contributions are identified in the succeeding chapters, followed by the key definitions for this study.

1.2 Background of the Study

1.2.1 Environmental Sustainability Issues in the Global Context

The multitude of environmental challenges, such as the exploitation of natural resources, loss of biodiversity, climate change and issues in recycling of wastes, have attracted the attention of various stakeholders, especially those who are focused on sustainability practices. Tate et al. (2012) recognized that environmental issues have dramatically increased the awareness of the consumers about environmental problems. According to the United Nations Environment Programme (UNEP 2011), a green economy is characterized as low carbon, resource efficient, and socially inclusive. The report published by the Division of Technology, Industry and Economics, and UNEP (2011) highlighted the growing concern about environmentally sustainable access to natural resources and encouraged countries to adopt the practice of sustainable consumption and production.

In addition, the World Rio Conference 2012, in Johannesburg on the subject of sustainable development, emphasized the need for a paradigm shift to a more proactive environmental initiative and sustainable life style. A statement given in the World Rio Conference 2012 states that "protecting and managing the natural resource base for economic and social development" recognizes the need to use natural resources

efficiently to maintain economic and social development goals, especially poverty eradication. The participants at the Rio Conference stressed the importance of the integration of environmental consideration into public purchasing in the state and community levels to promote a sustainable procurement and society in the long run (Ministry of Energy, Green Technology, & Water 2013).

At present the model of both the industrialized and developing countries focuses mainly on the monetary growth. The public, and more importantly, the stakeholders view the environmental impacts as externalized and taken for granted because resources is perceived to be always ample and without any cost for disposal and contamination (UNEP, 2015). In the past half century, growing population and increasing world economic demand have led to the increase in the pressure and harm on all the natural resources, such as water, soil, energy, minerals, and metal (UNEP, 2016).

The report on global material flows and resource productivity report (UNEP, 2016) highlighted that the global economy has expanded more than threefold (averaging about 3% per year over the same period). The world has doubled in population (increasing at about 1.1% per year from 1970 to 2010), and as such, have caused the consumption of primary resources of the earth such as metals, fuels, timber, cereals, and so forth. This consumption has tripled in the last 40 years. The United Nations International Resource Panel (IRP), in its 'Global Material Flows and Resource Productivity' report revealed that human consumption trends are unsustainable and resource depletion diminishes human health, quality of life, and future development.

The global material extraction tripled between 1970 and 2010. This growth was tremendously driven by increasing domestic extraction, especially of fossil fuels and

metal ores in order to meet the high demands for all the said items in the Asia-Pacific region. As a consequence, emission and waste have grown along with the growing extraction of natural resources.

From 1970 to 2010, the share of global material extraction grew from 24.3% to 52.9% in Asia-Pacific region and from 9.4% to 10.7% in Latin America and the Caribbean. However it decreased in Africa, from 7.9% to 7 %, in Europe from 20.9% to 10.5 %, in North America from 19.6% to 9.7%, and in Eastern Europe from 14.7% to 5.8%. However, in the Asia-Pacific region, the increase was more than fivefold in just 40 years, at a compounding annual rate of nearly 4.8%. The average rate of growth actually increased in the latter half of the period (from 1990 to 2010), revealing the acceleration of material extraction and demand in Asia-Pacific (UNEP, 2016). Figure 1.1 shows the Asia-Pacific the share of the region in global domestic extraction.

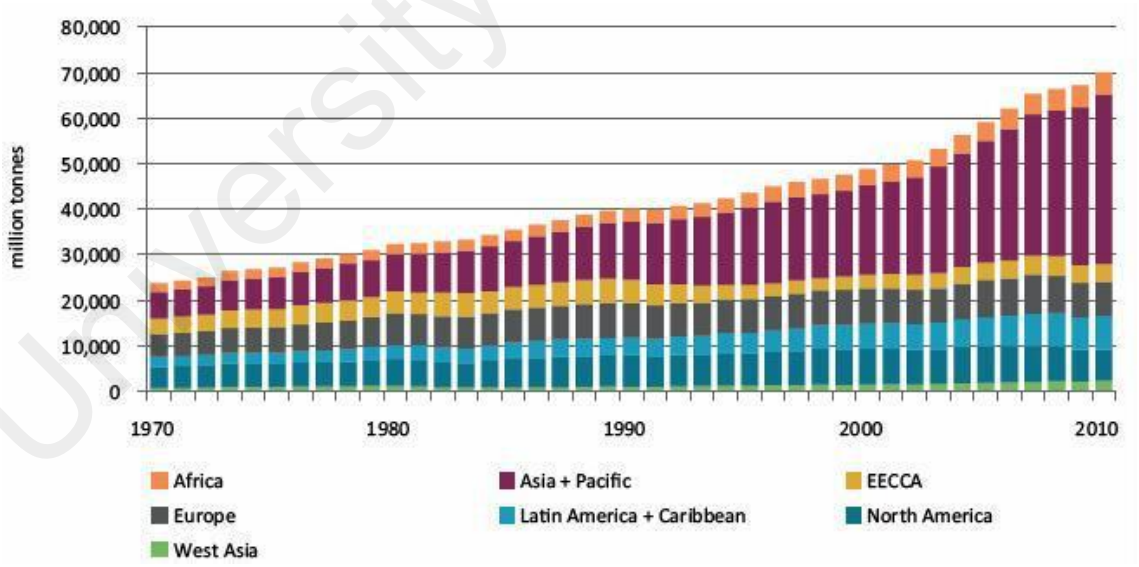


Figure 1.1 Domestic extraction (DE) by seven subregions, 1970–2010, million tonnes
Source: Global material flows and resource productivity 2016

The forum of "Survival 2100" recognizes that sustainability is a global problem and must be addressed by everyone throughout the whole world. The main objective is to

achieve greater social equity and economic security (Rees, 2012). On the one hand, the International Green Purchasing Network has been promoting green purchasing around the world through collection and education of the best practices, guidelines, product information, research, and trends in green purchasing. The group has also promoted green purchasing among individual consumers as well as institutional purchasers and SMEs to promote green purchasing globally. Meanwhile, Greenpeace, an independent global campaigning organisation, acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace (Greenpeace International, 2014).

Even though global material usage slowed down in 2008 and 2009 due to the global financial crisis, most of the demand diminished globally in 2009. However, the demand rose again; as such, natural resources became difficult to sustain (UNEP, 2015). With the increasing pressure of the stakeholders, organizations are expected to supply eco-products and services to their customers throughout the green supply chain in order to be more competitive in the global market (Hartmann & Germain, 2015). Businesses must ensure environmentally sound management and promote green purchasing for development of eco-products in order to reduce carbon emission and pollution, enhance efficiency in the consumption of energy and resources, and prevent the loss of biodiversity and ecosystem services in global context. Therefore, the interrelationship and trade-of between social well-being, economy, and the environment are the key factors for firm sustainability in the global context.

1.2.2 Sustainability in the Malaysian Context

The implementation of the New Economic Model (NEM), the Economic Transformation Programmed (ETP) and the Government Transformation Programmed (GTP) that are outlined in the 10th Malaysian Plan (10MP), show that currently

Malaysia is undergoing a fundamental reform. All these policies reflect the efforts to promote sustainable development in the Malaysian context (Adham & Siwar, 2012). Musa, Buniamin, Johari, Ahmad, Abd Rauf and Abdul Rashid (2013) highlighted that green issues are worldwide issues, regardless of whether it is in a developed or developing country. The public spending of the government is about 12-15 per cent of the total purchase, which represents the biggest single contributor and acts as a catalyst for socioeconomic development.

McCrudden (2004) pointed out that in developing countries, public expenditure is one of the key economic activities that can promote the consumption of environmentally friendly products and services that is consistent with the comment made by The Ministry of Energy, Green Technology and Water (2012) which projected that by 2020, public purchasing power would lead to approximately 40 per cent reduction in per capita greenhouse gas (GHG) emissions among the public sector and would influence the overall domestic market.

Green government procurement (GGP) is implemented throughout all levels of government procurement. The main activities under the GGP are to promote environment friendly products and services, to minimize degradation of the environment, to reduce the greenhouse gas (GHG) emission, to preserve the use of natural resources, energy and use of recycle resources, and to promote environmental activities and healthful lifestyle for all forms of life (Ministry of Energy, Green Technology, & Water, 2012).

Therefore, the success factor for the GGP transformation in Malaysia requires a comprehensive transformation, involving commitments by all parties and across sectors,

stated by Musa et al. (2013) and to address the long-term economic and social capability and environmental impact issues. Below are the commitment statements cited in the introduction to GGP (Ministry of Energy, Green Technology, & Water, 2012).

Government green procurement (GGP) will be made mandatory for all government ministries and agencies. GGP will create the demand for green products and services, encouraging industries to raise the standard and quality of their products to meet green requirements.

By 2020, it is targeted that at least 20% of government procurement will be green.

Economic Transformation Program "boost demand for green products and services (proposes up to 50% of certain products and services purchased by the public sector should be eco labelled by 2020)"

Acquisition of products and services and works in the public sector that takes into account environmental criteria and standards to conserve the natural environment and resources, which minimizes and reduces the negative impacts of human activities."

However, in the research of Adham and Siwar (2012), the authors commented that there is no clear policy, regulation, and legal framework for this relatively new concept in Malaysia at present. This research found that government procurement still emphasizes on the cost and quality, but there is no specific environmental criterion stated in the procurement. This finding is consistent with those of Eltayeb, Zailani and Jayaraman (2010) who found that there are indirect regulations on the prohibition in use of hazardous elements in products, promotion of the use of recycled materials, and reduction of pollutants in order to promote supply of green inputs. Without any specific regulation in Malaysia, firms could be motivated by short-term gain and regulations imposed by local authorities, rather than focusing on long-term strategy and sense of social responsibilities.

The main challenges are the perception that eco-products or goods are more expensive, the lack of resources to apply GGP, the readiness of suppliers, the influx of foreign products, the understanding and commitment in implementation, the difficulties in monitoring and enforcement, the limited supply, and the risk of insufficient competition (Ministry of Energy, Green Technology, & Water, 2015). This is consistent with the findings of Goh and Zailani (2010) regarding the SMEs in Malaysia, in terms of attitude and perception, lack of relevant technical barriers and information, lack of resources and strategic planning, and the implementation for green initiatives, which are very much on an ad hoc basis for their operations. Another perspective for low adoption shared by Min and Galle (2001), Yang and Zhang (2012) and He, Liu, Lu and Cao (2015) is that the main reasons are also partly due to cost factors and capabilities, and trade-off between green options and business benefits for the firms. Shaharudin, Zailani and Tan (2015) states that the reasons of low adoption of green initiative practices in Malaysia are due to high cost, lack of stringent regulation, lack of capabilities, and low pressure and sense of social responsibilities of customers.

Sambasivan, Bah and Jo-Ann (2013) highlighted that there is lack of empirical studies in the early stage of green supply chain initiative and performance in Malaysia, mainly the large firms would control the performance of their suppliers by setting strict green standard in their purchase specification, and make it mandatory for their suppliers to meet these standards. This "green multiplier effect" acts as an important mechanism for spreading green initiatives among firms (Preuss, 2002), and could force Malaysian organizations to consider the green environmental elements when designing strategies and execution of operations due to the tremendous pressure from the internal and external stakeholders. Muslan, Hamid, Tan and Idris (2013) further support this when they found that firms are forced to incorporate and extend their green strategy across the

supply chain network due to these pressures for green implementation. The Malaysian Government has shown strong commitments towards the GGP implementation to cope with the rapidly changing global economy. In addition, transformation of government procurement needs to be cascaded to the private sectors that could lead to a sustainable developmental policy goal enabling Malaysia to achieve an inclusive and sustainable, high-income nation by 2020. The statements below reflect the commitments for the implementation of GGP in Malaysia. (Ministry of Energy, Green Technology, & Water , 2012).

"Gradually, all levels of government, national, state and local will apply GGP".

"GGP will be the norm in government procurement, further evolving into socially responsible public procurement (SRPP) and public procurement promoting innovation (PPPI), which constitutes the most advanced wave of government procurement."

"It will be imperative for all procurement officers in Malaysia to undergo systematic GGP training. Train-the-trainers modules will increase the institutional capacity to provide such training".

1.2.2.1 Initiative to Support the GGP Implementation

Several GGP initiative and activities have been put in place and have started more than ten years ago. The initiatives implemented are expected to promote sustainable management of resources, to promote and increase local demand for green products, to explore new market, to increase competitiveness and innovation, to encourage eco-friendly practices in local industries, and to get better value for money. KeTTHA and the Malaysian Green Technology Corporation (MGTC) would coordinate the implementation of MyHIJAU programme. Table 1.2 shows the short term Government Green Procurement (GGP) Initiative Plan from 2002 to 2012.

Table 1.2 Government Green Procurement (GGP), Short Term Initiative Plan 2002 - 2012

No	Year	Launched by	Award certificate
1	2002	Department of Agriculture (DOA)	Malaysian Farm Certification Scheme for Good Agriculture (SALM)
2	2002	Department of Agriculture (DOA)	Malaysia Organic Scheme (SOM)
3	2004	SIRIM QAS International Sdn. Bhd.	SIRIM Eco Labeling Scheme
4	2005	Malaysian Timber Certification Council (MTCC)	The Malaysian Timber Certification Scheme (MTCS)
5	2006	Energy Commission.	Energy Rating Label Scheme
6	2008	IBS	Government buildings, reduces noise, traffic and waste.
7	2010	Malaysian Administrative Modernization and Management Planning Unit (MAMPU)	Green ICT guidelines for public sector
8	2011	Ministry of Finance (MOF)	The Green Lane Policy (Funding, tax incentives, innovative and government procurement.
9	2011	Ministry of Energy, Green Technology and Water (KeTTHA)	SIRIM Eco labeling scheme as the National Eco labeling scheme.
10	2012	Standards Malaysia	Eco Label Accreditation Scheme for Certification Bodies, MS ISO/IEC 17011:2011 (making creditable claims on the environmental attributes of their products).
11		National Green Technology and Climate Change Council (MTHPI):	MyHIJAU. a) MyHIJAU Labeling b) MyHIJAU Procurement c).MyHIJAU Directory d). MyHIJAU Industry and SME
12			

Sources: Sustainable consumption and production - Malaysia

Various Ministries and Government agencies have followed the footstep for GGP implementation of the above-mentioned initiatives, such as buying recycled paper, monitoring energy efficiency in building construction, and promoting waste reduction. All these systematic and structured approach of the implementation of green initiative demonstrates the capabilities of GGP.

1.2.2.2 Master Development Plans (2012-2030)

The rollout of a broad-scale GGP will take place after the successful completion of the short-term pilot phase. To ensure a smooth transition for GGP, a pilot phase (2013-2015) and a long-term action plan will be conceptualized together with the pilot activities. (Ministry of Energy, Green Technology, & Water, 2015). A successful implementation of the long-term plan would depend on careful evaluation of the pilot phase, record of experiences gathered during the pilot phase, and record of the experiences across the supporting initiatives (training, communication, etc.). The long-term action plan will be taken systematically, extending to other government ministries and agencies, involving other levels of government by introducing more products and service categories towards the vision of GGP in Malaysia. Figure 1.2 shows that the first step of institutional setting was done in 2012.

The pilot phase for product selection of the group, guidelines compilation, conducting of the first tenders, and capacity building was implemented from 2013 to 2015. It is expected that from 2016 to 2020, enhancement the scope of products and increase of its capacity would be materialized. Up to 20 per cent of selected procured products are green. By 2025, it is expected that with the adoption of GGP at all state and local levels, up to 50 per cent of selected procured products are green. The ultimate milestones

towards green sustainability for GGP throughout Malaysia would be between 2026 and 2030 when up to 100 per cent of selected procured products are green.

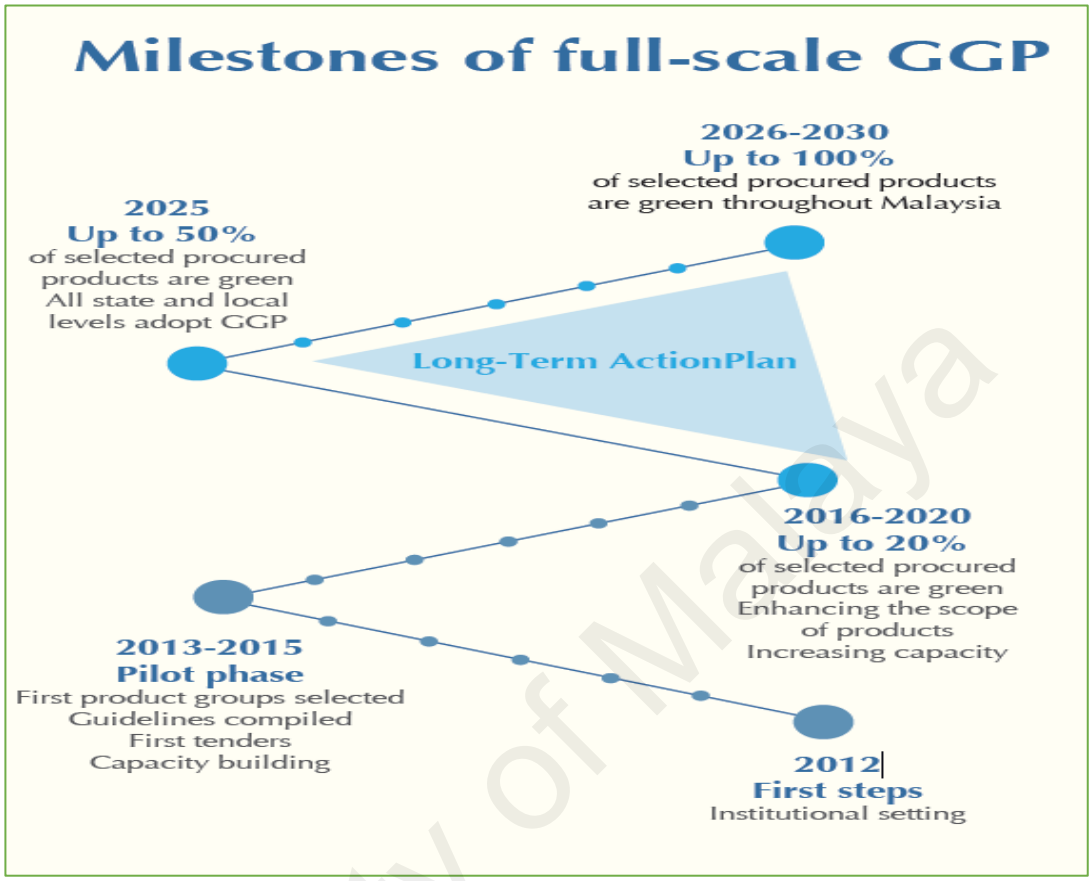


Figure 1.2 Ways Forward – Milestones of Full-Scale GGP
Source: Green Technology Sector, Ministry of Energy, Green Technology and Water Malaysia (KeTTHA)

1.2.2.3 The Triple Bottom Line Performance for GGP Malaysia (2013-2020)

GGP needs to be introduced systematically and efficiently in order to achieve the 2030 goals (Ministry of Energy, Green technology, & Water, 2015). Based on the source for the triple bottom line performance in the National Green Technology Master Plan for 2020, the impact of GGP on the economic performance shown in Figure 1.3 and contribution to GDP is RM22.4 billion (an estimate of 1.2 per cent of national GDP; the total investments would be RM28.0 billion, and green job creation opportunity would be 144,590, which makes up 0.7 per cent of the workforce. However, if without the implementation of GGP, throughout this period, the estimated GDP would be RM12.7

billion; total investment would be RM10.7 billion, and green job creation would be 76,470. Base on the National Green Technology Master Plan, by 2030, it is expected that the GDP would increase to RM60 billion; total investment would reach RM86.3 billion, and green job creation would increase to 211,500. Whereas, if it were business as usual, from now until 2030, the GDP would be RM27.90 billion; total investment would be RM37.1 billion, and green job creation would be 104,060. Besides all these, the main objective for Malaysia in relation to economic performance would be the target contribution to the national GDP, FDI and DDI, certified green industries and revenue, increase in the number of jobs, and spin-offs and supporting industries by the year 2030.

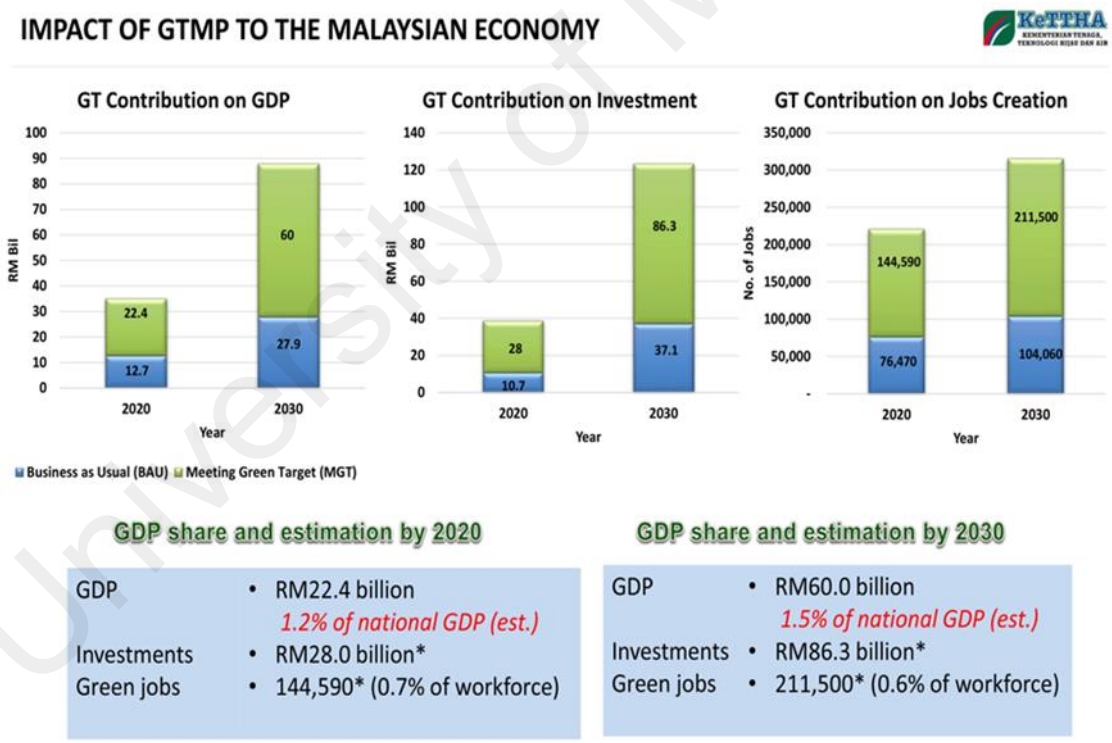


Figure 1.3: Economic performance for Malaysia's Green technology Master Plan
Source: National Green Technology Master Plan 2015

All these environmental performance could directly improve the quality of life in cleaner and green cities, supply better air quality and sustainable water supply, could bring active and healthful lifestyle, and give new mind-set for future green innovation.

These environmental performances could also create more green jobs, provide better air quality, healthier society, and promote comfortable homes that could bring intangible performance, aside from improving the economic performance by reducing the cost of living for future green generation by 2030. For Intangible, performance that is shown in Figures 1.4, the objective is to create green cities and townships, green lifestyle and culture, and improve the quality of life (Ministry of Energy, Green Technology, & Water, 2015).

Figure 1.4: Intangible Performance for Malaysia's Green Technology Master Plan
Source: National Green Technology Master Plan 2015

Based on the environmental performance shown in Figure 1.5, the government looked at the reduction in GHG emission in 2013 at 11.6 million tons of CO_2 eq/year, 119.2 million tons of CO_2 eq/year in 2020 and achieves 192.3 million tons of CO_2 eq/year in 2030. However, the CO_2 reduction in the years 2020 and 2030 would be subjected to the mitigations put in place for the energy, transportation, building, waste, and water

sectors. Besides the reduction in CO_2 for environmental performance, the efforts and commitments by the government could lead to reduction in air and noise pollution, the ability to generate own power, clean sustainable water supply, and reduce land usage by building multi-functional infrastructure.

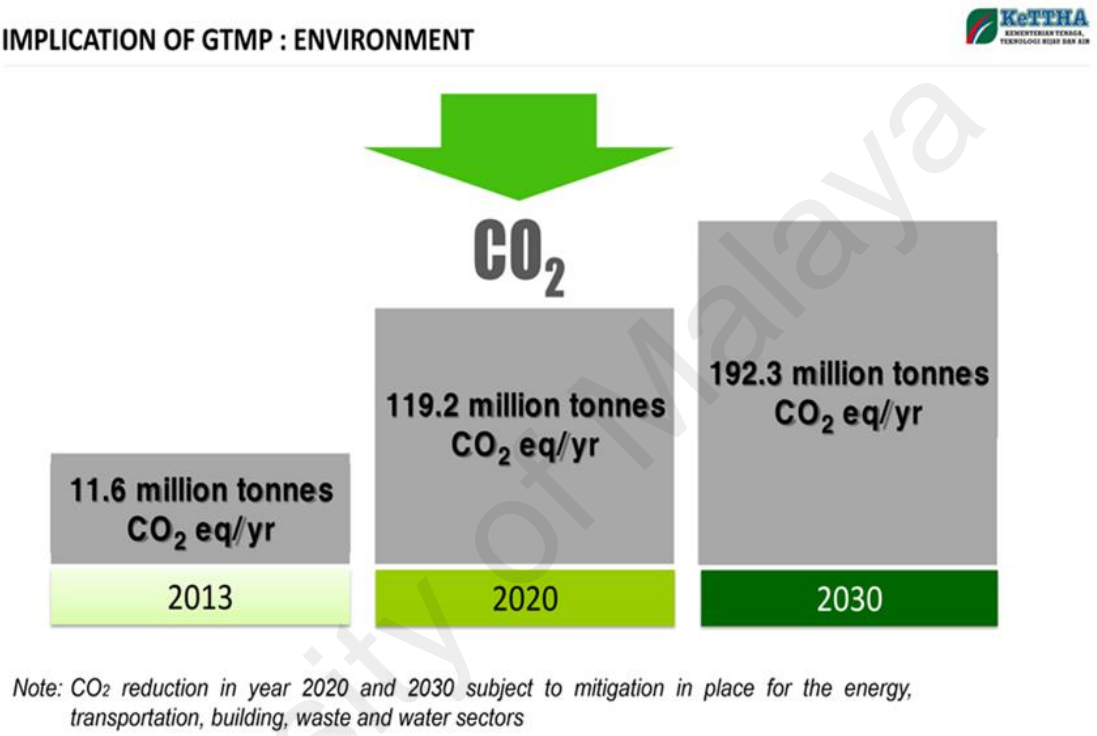


Figure 1.5 Environmental Performance for Malay's Green Technology Master Plan
Source: National Green Technology Master Plan 2015

The commitments of the Malaysian Government towards GGP have been proven by the short-term strategies that have been outlined in the national policies and GGP-related initiatives in order to pave the way towards GGP long-term implementation in Malaysia. The green technology master plan is a national strategic plan and implementation framework to catalyze green growth towards sustainable development and high-income nation by 2020, and to position Malaysia as the forerunner in the implementation of GGP in Southeast Asia.

1.2.3 The Importance of Green Purchasing

Carter, Ellram and Ready (1998), Min and Galle (2001), and Zsidisin and Siferd (2001), Tate et al. (2012) and Giunipero, Hooker and Denslow (2012) defined green purchasing as an environmental conscious purchases that meet the environmental objectives of a firm, such as reducing or eliminating hazardous items, minimizing waste, promoting the recycling, reuse, and reclamation of purchased materials. Theyel (2001), Benito, Rocha and Queiruga (2010) and Knoppen and Sáenz (2015) revealed that traditionally, the "purchasing" function is solely the support role, with a limited part to play in achieving the corporate goals of an organization.

However, purchasing activities within organizations were found to have increased during a recent survey, suggesting that this traditional role is subject to further re-evaluations. In their research, Walker, Miemczyk, Johnsen and Spencer (2012) found that the concept of sustainable procurement has been emerging and gaining attention in both practical and academic literature. Sustainable procurement became a growing interest from 2010 onwards. This continuous trend can be proven with the significant increase in research paper submissions related to the multiple aspects of sustainability in procurement, as pointed by Walker et al. (2012) and Luzzini, Brandon-Jones, Brandon-Jones and Spina (2015).

Min and Galle (1997), Corbett (2006) and ElTayeb et al. (2010) shared that during these past decades, due to pressure of consumers pertaining to the continuous environmental deterioration, various business organizations have been forced to hold accountable by consumers to develop 'proactive' environment programmes. Sarkis, Torre and Diaz. (2010) also shared similar views and pointed out that organizations have constantly been monitored and pressured by consumers, investors, shareholders, and regulatory

agencies to ensure compliance. By encouraging the implementation of green procurement at various levels within an organization, it would certainly help in enhancing the commitments of an organization to minimize the environmental impact, which makes both environmental and economic sense. In addition, Walton, Handfield and Melnyk (1998), Rao and Holt (2005) and Koe and Nga (2009) highlighted that green elements need to be included during the new product development stage; organizations need to address environmental concerns to ensure compliance with environmental regulation and legislation on product end of life and production processes. Cai and Zhou (2014) further pointed out that at each level of product development and service stage, the buying organizations must include their suppliers in their environmental programme, meeting the environmental expectations of the buying customers of an organization.

Rao and Holt (2005) and Amores-Salvadó, Castro and Navas-López (2014) further emphasized that successful green supply and procurement management could lead to synergy among business partners, minimizing waste management and cost down program for their environmental performance. The principle for implementing green procurement is to procure a product and service, and the options available for its disposal must be evaluated before conducting the purchase (Björklund, Martinsen, & Abrahamsson, 2012). All these research has shown interest in the role played by the purchasing and supply management in corporate environmental management through the recent years.

Green purchasing objectives are frequently linked to supplier selection due to the condition that most buying organizations have resorted to encourage their suppliers to commit to environmental partnerships. Personal purchasing is encouraged to make

wiser decision and selection before intending to do any purchase (Zsidisin & Siferd, 2001; Chen, Paulraj, & Lado, 2004; Lee, Kang, Hsu, & Hung, 2009; Sarkis & Dhavale, 2015). Organizations should realize that integrating the selection of a supplier in their environmental goals would influence the success of green initiatives. Organizations would not have much choice but to comply with the requirements by developing the necessary procurement capabilities and capitalizing on human resources to gain competitive advantage in green procurement practices.

The emergence of quality assurance, such as ISO 14001 certification, has provided a strong motivation for manufacturers to endorse environmentally conscious products and services. According to Chen (2005) and He et al. (2015) by incorporating green purchasing into the framework of ISO 14001, organizations have started to enforce and pressure their suppliers to become part of their green partners program by applying ISO 14001 certification as a minimum requirement during the supplier selection process. According to Green, Morton and New (1998), Johnstone, Labonne and Thevenot (2008) and Castka & Prajogo (2013), even though an organization might be the best in green performance and productivity in the industry, poor environmental performance of suppliers would definitely hamper the effort of an organization as a whole in achieving its eco-friendly goals.

Zailani et al. (2012b) advocated that the purchasing organization could use its strategic function as a powerful agent of change to improve the impact on the natural environmental. Similarly, Yen and Yen (2012) concluded that procurement as an agent of change and gatekeeper of a firm could control the flow of raw materials; thus, quality and cost down activities will eventually lead to the overall firm supply chain competencies.

The procurement role has become more significant in fulfilling the current green demand in establishing value added contents of products and a vital determinant in promoting profitability and future survival of the organization as stated by Lee and Shin (2010). Purchasers will have to deal with a more complicated process when working with environmental issues because they should consider the environmental efficiency of a supplier. A proactive or strategic approach should not be ignored if the organization is aiming for a fruitful management of a supplier (Lawson, Tyler, & Cousins, 2008). Carter, Kale and Grimm (2000), King and Lenox (2001) and Knight, Tu and Preston (2014) concluded that green procurement could enhance competitiveness, whereas Grekova, Calantone, Bremmers, Trienekens and Omta (2015) found that the focus on the environmental purchasing activities by the supply managers positively affect firm performance.

1.2.4 Evolution of Purchasing

Purchasing activities can range from the clerical up to the strategic levels (Úbeda, Alsua, & Carrasco, 2015). Pearson and Ellram (1996) indicated that the low clerical level of purchasing involved in basic purchasing activities are following up on deliveries, order processing, and expediting orders, where the selection criteria is solely based on price. This is consistent the findings of Keough (1994) who found that the role of purchasers is to support daily operation activities without the need for relevant professional qualifications, whereas Reck and Long (1988) and Adams, Kauffman, Khoja and Coy (2016) found the roles of purchasers to have low visibility with little inter-functional communication. Freeman and Cavinato (1990) classify the purchasing performance as solely to evaluate based on the actual performance versus the budget goals.

Spekman and Hill (1980) stated that purchasing emerge as a strategic planning process that started from the 1980s. Pearson and Gritzmacher (1990) and Freeman and Cavinato (1990) pointed out that purchasing started to be involved in strategic planning whereas Watts, Kim and Hahn (1992) revealed that both academics and practitioners have focused on strategic purchasing from the 1990s onwards. Due to the rapidly changing competitive business environment, Spekman, Kamauff and Salmond (1994), Pressey, Winklhofer and Tzokas (2009), Lintukangas et al. (2010) and Knoppen and Sáenz (2015) verified that purchasing professionals were granted the new opportunity to become a strategic profession.

Purchasing has transformed from the passive role as buying function to the current strategic function in business organizations (Ellam & Carr, 1994; Carr & Smeltzer, 1999). Purchasing activities are integrative at the strategic level (Pearson & Ellram, 1996), whereas strategic purchasing activities could lead towards a long-term goal. Gwenaelle and Jean (2012) and Reck and Long (1988) highlighted that purchasing is considered as part of the strategic planning process. Knoppen and Sáenz (2015) further defined purchasing as a strategy which involves in operating decision-making, planning, evaluating, implementing and controlling, and contributions to the success of a firm.

Although strategic purchasing is an integral part of supply chain management, both have not been empirically tested and investigated in their relationship (Cooper & Ellram, 1993; Novack & Simco, 1991). The research by Bowen, Cousins, Lamming and Faruk (2001a) stated that the strategic level of purchasing has been neglected despite of the important role-plays by purchasing in the study of green supply management. According to Bowen, Cousins, Lamming and Faruk (2001b), there is no direct impact of strategic purchasing on supply management practice, but more of an indirect effect

through supply management capabilities. Carr and Pearson (2002), Lamming and Hampson (1996), support this view. A higher level of the supply management capabilities would lead to higher strategic level of purchasing. On the other hand, Carr and Person (1999) and Knight, Tu and Preston (2014) also stressed that firms could utilize their capabilities through strategic purchasing to achieve their long-term goals and that strategic purchasing could contribute towards positive financial performance. Carr and Pearson (2002) and Woo, Kim, Chung and Rho (2016) found that firms could also increase their strength in managing suppliers in terms of buyer-supplier relationship and supplier evaluation and collaboration.

Walker et al. (2012) stated that there is a growing interest in the sustainable purchasing, specifically, in supply chain management and procurement within the academic community. Green purchasing is an environmental conscious purchasing practice (Yen & Yen, 2012; Joshi & Rahman, 2015), where the purpose is to reduce sources of waste and promote the recycling and reclamation of purchase materials. While sharing similar views, according to Yang and Zhang (2012), green purchasing should focus more on the recycling of materials in order to reduce the usage of the resources. This view is further explained by Lee et al. (2009) who found that green purchasing behavior is sensitive and responsive to ecological sustainable procurement.

Environmental efforts would be successful if firms integrate and align their environmental goals and policy with their purchasing activities (Walton et al., 1998; Yen & Yen, 2012; Amores-Salvadó et al., 2014). These authors agree that green purchasing could contribute towards environmental design, influence environmental performance and firm economic position (Ellram & Pearson, 1993; Handfield, 1993; Min & Galle, 1997; Carter et al., 2000; Woo et al., 2016). In addition, supplier

management, especially in the selection process that selects the "right" type of the suppliers and strategically manages the supplier relationships, is important (Gelderman & Semeijn, 2006; Keough, 1994). Firms would gain their competitive advantage through the adoption of environmentally purchasing policies and practices (Yen & Yen, 2012). Therefore, the supply manager and purchasing personal should focus on the green purchasing environmental issue that could positively affect the performance of a firm.

1.3 Problem Statement

The purpose of this quantitative research is to discover how the buyer firms are using their internal capabilities, with the focus exclusively on external supplier involvement in the green practices toward the triple bottom line performance that could be significant gap and areas of interest of this study. Using the resource based theory for theory building and institutional pressure as the moderator where both are to discover how the ISO 14001 manufacturing firms can use their green purchasing capabilities to implement green purchasing practices that could lead to TBL performance in Malaysia context.

Green environmental issues, scarcity of resources and ecosystem quality have gained attention, awareness, and interest among the general public and stakeholders. (De Sousa Jabbour, De Oliveira Frascareli, & Jabbour (2015). Firms need to be more transparent in addressing and managing the environmental and social issues. Those forward thinking organisation has pro-actively build sustainability principles into their supply chain management where supplier is one of the most critical factors for the success of sustainable supply chains.

Purchasing position plays a key liaison role between internal and external stakeholders especially with their supply base, many organisations have started to recognize the roles played by suppliers and integrated the green sustainability practices into the purchasing function for company's economic, environmental, and social performance.

Nevertheless, the main concern for most firms is whether the purchasing personnel are equipped with the green purchasing capabilities to perform their tasks (Knight, Tu, & Preston, 2014). Ordanini and Rubera (2008) found that even though procurement is believed to be the critical function, but it is still unknown and there is no clear direction as to which mechanisms that actually drive the procurement capabilities of a firm, on which resources and capabilities should be developed by the purchasing function in order to accomplish the specific purchasing purpose. This is further supported by Hult, Tomas, Ketchen and Slater (2004) and Dobrzykowski et al. (2012) who found that less attention is actually focused on how purchasing function can develop capabilities to positively influence the performance of a firm. Therefore, this research would like to identify the green purchasing capabilities for green practices implementation toward triple bottom line performance in the Malaysian context.

Firms are beginning to recognize the important role played by the suppliers in the sustainable initiative, where sustainable firms require sustainable supply networks. In the research by Johnston and Kristal (2008) found that close cooperation between suppliers and buyers could enhance green purchasing activities successful implementation The environmentally conscious companies should proactively involve their suppliers when designing their green purchasing practices to enhance environmental purchasing activities. Whether firm sustainability can be achieved through the supplier management, as it is still at an early stage for drawing any

conclusion. Therefore, this research would like to examine further a boundary-spanning situation of green purchasing practices in the Malaysian context.

Although most of the studies in the field of sustainability research in purchasing and supply chain management have emphasized the environmental, economic, and social dimensions, most of the studies on sustainability, on the one hand, are often focused only on the environmental dimension in relation to the discussion on TBL (Zhu & Sarkis, 2004; Seuring & Mueller, 2008). The research by Green, Zelbst, Meacham and Bhadauria (2012) indicates that the intangible outcomes, such as organizational image and customer loyalty normally received little attention. This study would like to examine further whether the implementation of TBL in Malaysia context cut across and focus concurrently on all these three dimensions, namely the environmental, economic, and social dimensions that measure the overall for triple bottom line performance in Malaysia context.

Firms need to be more transparent in addressing and managing the environmental and social issues due to institutional pressures. In addition to examining the green capabilities and green practices, the purpose of this study is to investigate the moderating effect of institutional pressure in term of regulation, customer, and competitors on green capabilities and practices. Carter and Jennings (2004) and Zhu, Sarkis and Lai (2013) found that firms that adopted sustainable practices in setting their business strategies would be affected by the pressure of institutional. As mentioned by Huang, Hu, Liu, Yu and Yu (2015), it requires a systematic analysis to further understand and promote green environmental purchasing in the perspectives of institutional pressure, as this is an area of research that so far has been limitedly explored in Malaysia context.

In order to promote the global competitiveness of Malaysia, the Malaysian Government is committed to developing a long-term Green Government Purchasing strategy and action plan to build a green-economy society. In conclusion, the strategic purchasing roles and practices in the private sector require a paradigm shift to a more holistic in their environmental and intangible dimensions from the conventional association which only focuses on the financial parameters in order to gain a sustainable strategic advantage to the firm sustainability.

1.4 Research Objectives

Based on the stated given questions, the objectives for this research are as follows:

1. To investigate the relationship between green purchasing capabilities and green purchasing practices.
2. To examine the relationship between green purchasing practices and firm triple bottom line performance.
3. To investigate the relationship between green purchasing capabilities and firm triple bottom line performance.
4. To assess the mediation effects of green purchasing practices on the relationship between the green purchasing capabilities and triple bottom line performance.
5. To evaluate the moderating effect of the institutional pressure on green purchasing capabilities and green purchasing practices.

1.5 Research Questions

Based on the given problem statements, the research questions for this study are listed as follows:

1. What is the relationship between green purchasing capabilities and green purchasing practices?

2. What is the relationship between green purchasing practices and triple bottom line performance?
3. What is the relationship between green purchasing capabilities and triple bottom line performance?
4. Do green purchasing practices mediate the relationship between green purchasing capabilities and triple bottom line performance?
5. Does institutional pressure moderate the relationship between green purchasing capabilities and green purchasing practices?

1.6 Scope of the Study

Green purchasing is a new area of the study in Malaysia. This is a bourgeoning issue that needs further exploration in the context of Malaysia. The purposes using the exploratory investigations are vital, especially when the variables are still unknown with a phenomenon that is yet to be explored and expanded (Meredith, 1998). This study focuses on manufacturing firms in Malaysia, certified with ISO 14001 environmental management system that listed in Standard and Industrial Research Institute [SIRIM] and the Federation of Malaysian Manufacturers' [FMM] directory. These manufacturing firms are more likely to adopt and implement green practices requirements in relation to their suppliers on the green initiatives (Darnall et al., 2008; Zhu et al., 2010).

This research emphases on green purchasing capabilities, green purchasing practices towards the triple bottom line using resource base theory and institutional pressure to support the theoretical framework. Green purchasing practices is the mediator for green capability and triple bottom performance. Institutional pressure is used as the moderator for green purchasing capabilities and the green purchasing practice.

The variables in the study are selected based on literature review. In order to reconfirm whether the variables are suitable to apply in the scenarios in Malaysia, six ISO 14001 manufacturing firms were chosen for interview using convenient sampling method in order to understand the current practice of green purchasing in the context of Malaysia. The study made use of the triangulation technique (Jick, 1979) by means of qualitative and quantitative approaches, such as interview and survey. Such technique allows the identification of the irregular or off-quadrant dimension of the phenomenon. This also helps in development of the hypotheses using the relevant constructs for empirical testing (Jick, 1979; Snow & Thomas, 1994; Wacker, 1998). Moreover, the technique allowed the researcher to understand the relationship among all variables and the underlying conceptual framework in this study. The structural equation method is applied to measure the multiple relationships all together in order to examine the direct and indirect relationships among the variables vis-à-vis the dependent variables (Kelloway, 1998; Schumacker & Lomax, 1996). The qualitative interview is utilized first to gather data and will be used later on as support and analysis for the quantitative data. Nonetheless, the key findings and conclusions shall be based on the quantitative part of the study.

This study emphasis on ISO 14001 certified manufacturing firms in Malaysia. This sector was chosen due to its leading status in the environmental management system and green initiatives that certified by the local established bodies such as SIRIM and MIDA for ISO 14001 certifications. Furthermore, the ISO 14001 certified manufacturing firms in Malaysia are the main contributing sectors in the economy, along with their contributions to the environmental issues in Malaysia (Ratnasingam, Wagner, & Albakshi, 2009). The ISO 14001 certified firms are moving toward firm sustainability effort in view of their commitment in adoption of the ISO 14001 certified

company and high level of the adoption of green initiatives compare to the other sectors (Low, Tan, Choi, & Rabeatul Husna, 2015). The study is focused on green process-based and centers on the green purchasing capabilities and green purchasing practices on the TBL performance. The study does not include the outcomes of the green finished goods handling. The focus on the study is limited to green capabilities that need to perform the job through green practices such as supplier selection, development, collaboration, and evaluation to achieve the TBL performance.

The focuses on green purchasing capabilities are consistent with the general objective of the research, i.e., to see how the green capabilities are generally dispersed among the manufacturing firms, and not how they are successfully implemented within the firms. Capability is the strategic relevant (Kaya & Erden, 2008), the bundles or collections of complex individual skills by means of utilizing resources in order to achieve the goals and business excellence of a firm for sustainability competitive advantage (Hall,1993; Luzzini et al., 2015).

Sustainable development can be integrated into the supply-chain management of firms (Mutingi, 2013). The study focuses the strategic position of purchasing department located as the gatekeeper for controlling the flow of incoming materials within an organization (Ellram & Carr, 1994). Purchasing department works closely between internal and external stakeholders, especially with their supply base to control the environment and performance of a supplier (Preuss, 2001; Knoppen & Sáenz, 2015). This study will investigate green purchasing practices such as selection, developmental collaboration, and evaluation adopted by firms to handle the environmental issue. This means that instead of focusing internally, this study will switch its priority and focus to

the external party, using its supply base to address the environmental issue for firm sustainability.

Institutional pressure will be used as the moderator for the study. Zhu and Geng (2013) concluded that institutional pressure would affect the decision of a firm in relation to environmental activities and internal capabilities as response to external environmental pressure of an organization. Lee and Klassen (2008) pointed out that institutional pressure from government agencies, customers, and competitors directly influence an organization to implement green initiatives. One example is to obtain the ISO 14001 certifications for cleaner production. The institutional pressure would continue to push businesses to be more and more sustainable.

This study uses resource-based view theory (RBV) as the base for the development of a theoretical framework. Two elements in RBV are resources and capabilities. Wernerfelt (1984), Barney (1991), and Grant (1991) stated that resource is the core elements in RBV to operate the activities and capabilities of a firm; this arises as a result of a firm to create value by utilizing existing resources through processes to increase its capabilities. Amit and Schoemaker (1993) found that resources and capabilities are actually interdependent in nature. The capabilities of a firm are dependent on the source of the resources of a firm.

Finally, the study aims to measure the triple bottom line performance among manufacturing firms in Malaysia. Hendricks and Singhal (2003) found that the TBL concept has been merged with supply-chain management (SCM). Carter and Rogers (2008) further proved that applying these three dimensions of environment, economic, and social aspect, are beyond the boundary of an organization. TBL is beyond the

boundary of firms; firms should not focus on earning profits only. De Giovanni (2010) highlighted that firms need to compromise short-term profits by emphasizing environmental and social dimensions for long-term sustainability. The integration of these dimensions will positively affect its environment and social performance that eventually will lead to long-term economic performance and competitive advantage due to the green image of a corporation. To conclude, incorporating supply-chain activities and green initiatives into the TBL dimensions for an organization could minimize imitation of products or processes by competitors. This will lead to long-term competitiveness advantage, and long- term objectives of an organization for firm sustainability.

1.7 Significance of the Study

Zutshi and Sohal (2004) and Hofer, Cantor and Dai (2012) found that with the increasing pressure of the green environmental issue, organizations have started initiating open communications with their suppliers because many organizations would benefit from building a good partnership or relationship with suppliers. Organizations could put pressure by requesting their suppliers to comply with the Environmental Management Systems (EMS). One of the basic strategies to pressure the suppliers is the requirement for the implementation of ISO 14001 certification in order to conform to environmental policy and EMS requirements. Suppliers play an important role in supplying the raw inputs, and they are either made liable to ensure that the raw materials supplied comply with regulations or that the inputs are able to influence the operations and processes in relation to green environment impact (Gavronski, Ferrer, & Paiva, 2008). Tracey and Neuhaus (2013) found that using lesser raw materals or having lesser environmental impact inputs could lead to environmental, economic, and intangible performance for an organization. Green purchasing is getting the attention and interest

of academic and commercial research due to the growing awareness and concern of various stakeholders on the environment, and also partly due to the unbending adherence to environmental regulations (Yu-Shan & Chang, 2012).

This research offers significant contributions to both the practical and theoretical aspects of green purchasing practices by organizations.

1.7.1 Practical Contributions of the Research

1. The purchasing function can promote internal and external relationships. It has to expand its sensitivity and be proactive towards the requirements from the multidimensional stakeholders in order to implement effectively and efficiently to achieve sustainable green purchasing. Due to the implementation of sustainable sourcing for supply base collaboration, purchasing function needs to adjust and build its internal capabilities, to cope with the external pressures, where purchasing managers must equip themselves with green capabilities to communicate, network, and coordinate with all the internal and external stakeholders, especially with the suppliers.

2. This research could contribute towards raising awareness of green environmental issues among supply chain managers and of their ability to implement green purchasing. Along with those who are already engaged in some form of environmental management system, this research could contribute towards further enhancing their awareness and understanding of green purchasing potentials. Such awareness could contribute towards the successful implementation of green purchasing collaboration with suppliers.

3. An organization can estimate the potential business benefits and costs at the corporate level and understands the areas of values and principles to be addressed in order to identify its current weaknesses and strengths, threats, and opportunities, so that it can strategically manage its environmental, economic, and intangible performance.

1.7.2 Theoretical Contributions of the Study

Aside from the practical contributions, this research attempts to enrich the present theories as stated in the following:

1. This research can be viewed from different perspectives and enrich the Resource Based View theory (RBV) and Institutional pressure (INT) as explained in Chapter Two. The review of literature reveals that existing studies in green purchasing and triple bottom line are mainly dominated by the theory of industrial ecology. By applying the RBV and INT theories, this study expects to make overall contributions by using the suggested constructs and underlying logical arguments of the relationships between the constructs towards building a theory in green purchasing capabilities, green practices, and the triple bottom line.

2. Tate et al. (2012) perceive that at the current early stage of the young field of green purchasing developments, it is already able to provide great opportunities for academic researchers to expound to practitioners the influence of green purchasing environmental theory and practice. This research reflects the holistic view of firm sustainability and performance achieved through green purchasing capabilities and practices with

institutional pressure being the moderator. It contributes to those who wish to develop theories and future research in green purchasing practices.

3. The study would deepen the knowledge about how the RVB theory could be used as the theoretical base to identify the effect of the overall green capabilities, reveal the impact and relationship of each capability towards the green purchasing practices, and the extent of the contributions towards the triple bottom line in the Malaysian context.

4. This study reveals the role played by the moderating effect using the institutional pressure as the moderator. This could contribute to the knowledge of the potential role of a moderator and examine the extent of the moderating effect on green purchasing capabilities and green purchasing practices that might lead to firm sustainability performance among the Malaysian manufacturers. In this respect, using institutional pressure such as the regulation, competitor and consumer pressure, the theory should be able to provide a logical understanding about how all these pressures from outside of the firms could influence the internal practices of the firms for green sustainability performance.

1.8 Definition of key Terms.

Green Capability

In the RVB theory, resources and capabilities are considered the core elements for a firm. However capabilities arise as a result of the ability of a firm to create value by

utilizing and combining the resources through the processes and activities of a firm (Barney, 2001).

- Manufacturing capabilities: The ability of a firm to introduce new manufacturing technology and the capability of improving working conditions, reducing cost and usage of raw materials, and energy consumption. (Talbot, Lefebvre, & Lefebvre, 2007; Größler & Grübner, 2006).
- Integration capabilities: In general, there are two types of integration of capabilities. From the perspective of the supply chain management, integration of capabilities can specifically be named as internal and external integration capabilities (Huo, 2012; Flynn, Huo, & Zhao, 2010; Butler, 2011).
- Intraorganisational capabilities: These can further facilitate the strategic management of a firm to achieve long term objective, such as the firm ability to identify and develop trustworthy suppliers and supply base for long term sustainability goals (Zsidisin & Siferd, 2001; Flynn et al., 2010).

- Financial capabilities: These refer to the abilities through the involvement in the green activities, which allows a firm to invest in green environment investment such as green technology and to implement green environmental measures (Klassen & Vachon, 2003).
- Innovative capabilities: These refer to the ability to design products using less and to avoid using hazardous ingredients in the manufacturing processes, (Rio, Reyes, & Roucoules, 2013). These refer also the capability to increase the competitiveness of a firm, its speedy introduction of products to capture market share in order to maximize financial performance by introducing the new products development into the market (Richey, Genchev, & Daugherty, 2005).

Green Procurement Practices

Green procurement can be defined as purchase products or materials that meet the environmental conscious objectives of the buying firms. The purchasing firms (Carter et al., 1998; Min & Galle, 2001; Zsidisin & Siferd, 2001) would set the green criteria, such as promoting recycling, reusing, reducing resources and waste, and substituting materials. On the other hand, green purchasing focuses on developing green products that are environmentally sustainable, by joining effort and cooperating with the suppliers of the firms (Zhu, Sarkis, Cordeiro, & Lai, 2008; Carter & Carter, 1998).

- Supplier selection: This can be defined as the limitless conditions and factors used to evaluate the capabilities of suppliers and selecting the conditions for long-term competitive advantage for the buying firm (Choi & Hartley, 1996; Vonderembse & Tracey, 1999). This can also be defined as using the capabilities if suppliers in order to serve as key resources in the development of the capability and performance of a buyer (Liao, Hong, & Roa, 2010).
- Supplier development: It is the efforts and activities undertaken by the buying firm to improve the performance and capabilities of the suppliers in order to meet the short term or long-term supply needs and objectives of a buying firm. (Sánchez-Rodríguez, Hemsworth, & Martínez-Lorente, 2005).
- Supplier collaboration: The buying firm improves the environmental and manufacturing performance of suppliers by extending green purchasing management through collaboration activities with its suppliers for further improvement (Vachon & Klassen, 2008).
- Supplier evaluation: The buying firm carries out the supplier assessment, provides incentives, training, and working directly with the suppliers to improve

the performance of the latter while initiating competition among all the suppliers for firm performance (Cormican & Cunningham, 2007).

Institutional Pressure

The institutional pressure is in the form of normative, coercive, and mimetic dimensions. All these pressures such as regulations demand of customers and competitors can influence the responsiveness of an organization by using their capacity and ability to trigger the internal adoption of the work-life initiative, and activities of a firm (DiMaggio & Powell, 1983).

- Regulations pressure: This includes the regulatory authorities, government agencies, and environmental regulatory bodies. These powerful groups can use the coercive pressure to influence the actions within an organization to adopt specific green practices. To illustrate this, they can influence the punishment, fines, and trade barriers on an organization (Butler, 2011; Huang et al., 2015).
- Competitive pressures: Organizations are facing competitive pressure to adopt green initiatives in order to compete with different competitors to gain the competitive advantages (Carter & Ellram, 1998). Some organizations mimic the practices and actions of their main competitors within the industry. Firms would follow or "mimic" their competitors based on the success initiatives of their competitors (Zhu et al., 2010).
- Consumer pressures: Community groups such as NGOs, environmental societies, media, and professional associations might apply pressure on the manufacturing firms to force them to adopt more environmental responsive initiatives (Zhu, Sarkis, & Lai, 2011).

Triple Bottom Line

Triple bottom line (TBL) focuses not only on the economic value of corporations, but also on the environmental and social benefit. All these three dimensions must be discussed together (Elkington, 1998). Sustainability in TBL can be defined as the pursuit of the tripartite of economic, environmental, and social performance for an organization (Foerstl, Reuter, Hartmann, & Blome, 2010).

- Environmental performance: This refers to the ability of a firm to reduce greenhouse air emission, promote waste management, reduce material usage, and decrease the consumption of hazardous and toxic materials through the effect of implementing the internal and external green initiatives on the natural environment of a firm. (Bowen et al., 2001a; Rao, 2002; Vachon & Klassen, 2008; Zhu & Sarkis, 2004; Zhu, Sarkis, & Lai, 2013; Zhu et al., 2008; Gimenez et al., 2012).
- Intangible performance: This performance will not be able to be quantified and justified easily; it can be referred to as the organizational image in the eyes of the public and customer satisfaction (Gimenez et al., 2012).
- Economic performance: This refers to the ability of the manufacturing firms to reduce the costs related to the purchase of materials, energy consumption, waste treatment and discharge, increase profitability and sales, market share, and productivities (Carter et al., 2000; Rao & Holt, 2005; Zhu & Sarkis, 2004; Zhu et al., 2008; Gimenez et al., 2012).

1.9 The Outline of this Thesis

Chapter One contains the introduction, background of green purchasing, and sustainability in the global and Malaysian context, the importance and evolution of

green purchasing, the problem statements, research questions and objectives, the significance of the study, potential contributions of the research, and the key definitions are presented.

Chapter Two presents the literature review on the green environmental purchasing, green purchasing capabilities, green purchasing practices, and triple bottom line using the resource base theory and institutional pressure. The discussion is then followed by the deliberation on the underlying theories to develop the initial framework. The chapter ends with a summary.

Chapter Three discusses the conduct of interviews with representatives of six local manufacturing firms to reconfirm and review the constructs used in this study. The framework was finalized based on the outcomes and findings arising from the interviews. The initial framework developed in Chapter Two was revised using the constructs deduced from the interviews. The chapter ends with the finalization of the framework, development of the hypotheses, control variables and the summary.

Chapter Four addresses the research methodology of this study. It included the design of the research, research population and sample, the scales and measures of the variables of the study are presented in this chapter. The chapter further discusses the instruments development and statistical techniques that were used for data analysis.

Chapter Five deals with the data collected from the quantitative survey to generate report and to discuss the research findings. The research findings continue with the descriptive analysis, path analysis results, and the supportive and non-supportive hypotheses.

Chapter Six presents the results of the study. The findings presented in Chapter Five are further explained in this chapter. This chapter presents the theoretical and practical implications, the limitations, and future research directions. Finally, the overall conclusion of the study is presented at the end of the chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 Chapter Overview

This chapter focuses on the earlier reviews and studies in order to identify the theoretical gaps of this research. Based on prior literature review, some potential and relevant latent constructs have been identified to establish the first underlying theoretical research framework. The identified variables will be discussed systematically under the respective sub-sections of this study. These sub-sections are green purchasing capabilities, green purchasing practices, triple bottom line, resource-based view theory, and institutional pressure. Finally, a proposed framework is presented. This chapter ends with a summary on the overall discussion.

2.2 Green Supply Chain Management

Due to globalization and industrialization, environmental management has become a focus of many organizations. Chen (2011) examined industrial manufacturing activities and public awareness concerning environment deterioration issues, such as pollution, scarcity of natural resources, and global warming. The concept of environmental concern has quickly become a mainstream issue for companies that prefer to utilize green opportunities in their supply chain strategy (Chen & Chang, 2012; Molina-Azorín et al., 2009; Haden, Oyler, & Humphreys, 2009). Green issue also attracted the attention of various stateholders, either the general public, regional or global corporations (Yen & Yen, 2012), thus stimulating unnecessary conflicts. Therefore, diverse governmental, non-governmental authorities, and agencies started to design and search for sustainable development programs and initiatives in order to improve environmental performance. Srivastava (2007) commented that green supply chain management became an emerging field due to environmental consciousness and awareness from different parties, followed by revolution on quality in the 1980s and on supply chain in the 1990s. The research by

Abdallah, Farhat, Diabat and Kennedy (2012) revealed that in the early 1990s, many manufacturers faced pressure to integrate and incorporate the concept of environmental management into their supply chain. In a research by Walker et al. (2012), they found that supply chain management started to gain the attention of academic and non-academic researchers. Since 2010, the concept of sustainable procurement has emerged as the focus of supply chain management and growing interest among researchers.

Sustainable development can be integrated into the supply chain management of firms (Mutingi, 2013), where the supply chain department plays an important role in determining and selecting appropriate green sustainable development strategies in order to achieve environmental objectives. Zailani et al. (2012a) commented that sustainable development consists of three dimensions: environmental, economic, and social elements that are related to human development. These dimensions in sustainable concept would affect corporate strategies and actions.

The term "green'' sometimes is used as an alternative for "sustainability," which refers to a more holistic view of environmental, social, and economic concept (Saha & Darnton, 2005; Rahimyar & Clegg, 2007). Ho and Choi (2012) described the combination flows of materials and information to promote green products, services, and processes for the satisfaction of a customer as an environmental supply chain management. The success of supply chain management could eventually lead to success at organizational level in the later stage (Chopra & Meindl, 2004; Sarkis, 2012).

Increasing pressure from customers and government authorities (Zhu et al., 2010) has demanded for products, services, and processes that meet the environmental requirements. This forced business organizations to rethink on their environmental

sustaibanility practices by upgrading current traditional role to a strategic supply chain role in order to address the present environmental legislations. This includes technological innovation and improved eco-efficiency for long-term competitive advantage (Elkington, 2001; Baines, Brown, Benedettini, & Ball, 2012).

Zhu and Sarkis (2004) and Sarkis, Zhu and Lai (2011) showed that many forward-thinking organizations in green concept gradually integrate environmental concerns in their supply chain management. This not only encourages environmental friendliness, but it also promotes good business sense and increase profitability for a firm (Zhu & Geng, 2013). Mutingi (2013) stressed that firms must realize that green strategy is a winning criteria and the best practice for collaborative integration with the environment and operation to capture market share; thus, this practice needs to be stretched to the entire supply chain function.

Nowadays, many organizations have adopted international environment standards (such as ISO 14001 for environmental compliance) associated with environmental status to cope with pressure imposed by institutions and stakeholders (Tang & Tang, 2012). There are growing number of firms that adopt ISO 14001 status voluntarily. This has led to the adoption of environmentally friendly management and operation processes, which comply with the relevant environmental regulations. Handfield, Walton, Sroufe and Melnyk (2002) and Castka and Prajogo (2013) pointed out that firms have stated to include ISO 14001 certifications as one of the basic minimum requirement in supplier selection process. This point was further supported by Castka and Prajogo (2013), who agreed that incorporating elements of green purchasing in the framework of ISO 14001 would lead buying firms to attain both environmental and financial performance.

Researchers have highlighted that there is a growing linkage between environmental practices and business performance (Klassen & Whybark, 1999; Zhu & Sarkis, 2004; Reuter et al., 2010; Hollos, Blome, & Foerstl, 2012; Tate et al., 2012). Focusing on environmental practice in supply chain is not only the right thing to do, but it also minimizes operating costs or increase revenues within the own control of a firm. Therefore, promoting sustainable practices in business operations would lead to a more sustainable supply chain. Lambert (2008) and Jangga, Ali, Ismail and Sahari (2015) pointed out that through supply chain management, firms that manage their internal business practices across organizational boundaries would increase the economic value of firms.

The stringent requirement relating to environmental issue would gradually yield a new impact on future success and survival of firms. Yen and Yen (2012) found that firms could use environmental management system as a framework to implement environment strategies and as a tool to assess the impact at firm level. In this case, organizations need to shift towards a sustainable oriented practice with a different mindset in evaluating sustainability performance. The ability of purchasing to influence strategic planning has increased due to the rapidly changing competitive environment (Carter & Narasimhan, 1996; Pohl & Förstl, 2011; Úbeda et al., 2015).

While supply chain management was gaining attention both in practice and academic literature, the concept of strategic purchasing has also been emerging (Pressey et al., 2009; Song, Xu, & Liu, 2017). Refer to Figure 2.1, a typical supply chain is simply a network of materials, information, and services processing links with the characteristics of supply, transformation, and demand. Based on Figure 2.1, purchasing function is part of the supply chain where it identifies and describes the relationship a company

develops with its suppliers to address the purchasing and supply perspective (Farmer, 1997); this also includes managing cost, quality, time, and responsiveness of the buying firms. Due to the strategic role of purchasing, buyer–supplier relationship or supply management has drawn exceptional interest in SCM literature. However, supply management or purchasing is different from SCM in that SCM includes all aspects from upstream of the flows from supply of raw materials, production and downstream of distribution, and delivery of products and services to customers, whereas supply management or purchasing emphasizes primarily the purchasing and supplier relationship (Chen & Paulraj, 2004).

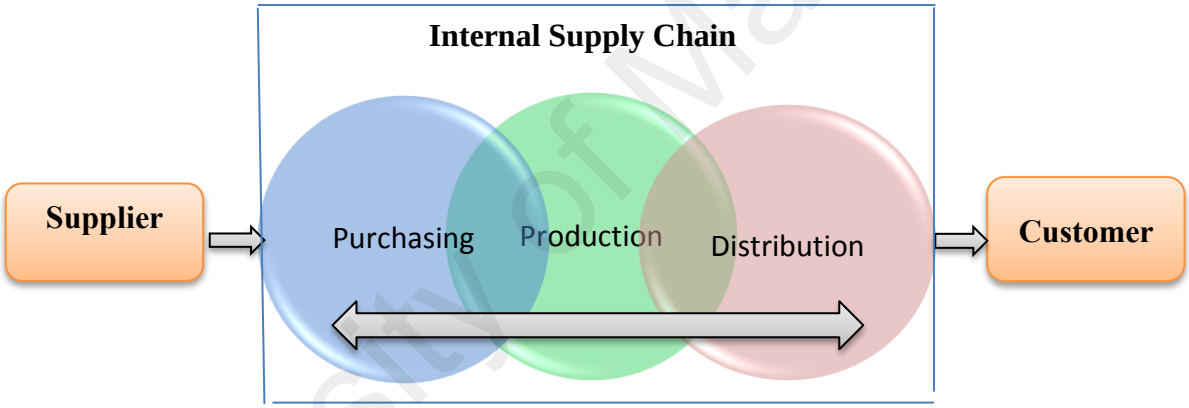


Figure 2.1: Relationship of Supply Chain Management and Supply Management
Source: Chen and Paulraj 2004

2.3 Green Purchasing

Porter (1985) and Ellram and Carter (1994) found that purchasing position plays a key role as gate keeper of a firm. This is because purchasing department has the capacity of controlling the flow of incoming materials within an organization. In addition, purchasing position plays a key liaison role between internal and external stakeholders in creating value for an organization. Carter and Carter (1998) and Preuss (2001) found that green purchasing controls the environment and performance of a supplier. This

view was supported by other researchers in green purchasing (Ambec & Lanoie, 2008; Budeanu, 2009; Sarkis, 2009; Zhu et al., 2011).

Carter and Carter (1998), Zsidisin and Siferd (2001), and Min and Galle (2001) defined green purchasing as an environmentally conscious purchasing initiative that meets the environmental objectives of a firm. Yang and Zhang (2012) indicated that the main responsibility for green procurement is to focus on the total cost by reducing and eliminating waste activities or cost saving programs. Lambert and Cooper (2000), Handfield, Sroufe and Walton (2005) and Rebolledo and Jobin (2013) further stressed that in addition to traditional purchasing that focuses on cost, quality and delivery, and sustainability purchasing plan; green purchasing includes reducing waste, promoting recycling content, reusing, down gauging/reducing the use of resources and substitution of materials.

The studies by Carter and Easton (2011), Carter and Rogers (2008), and Seuring and Müller (2008) stated that with environmental sound practices, green purchasing could add value and increase the reputation and image of a firm. Environmentally sound purchasing practices could achieve multiple benefits. The finding was supported by Zailani et al. (2012b) where firms could enhance their suppliers relationship, reduce cost, and minimize environment impact.

Based on previous literature, the researchers pointed out the many opportunities for research on sustainability supply chain management (Carter & Easton, 2011; Gold, Seuring, & Beske, 2010). Many studies have focused on strategic sourcing and inter-organizational collaboration without focusing on suppliers. Likewise, Carter and Rogers (2008) also highlighted that many studies were centered on ~~macro~~-level supply chain in

terms of environmental, social, and economic criteria, thus lacking in-depth focus on purchasing and suppliers. However, Seuring and Muller (2008) shared the importance of green purchasing from different perspectives in the research. They agree that sustainable supplier management through training and educating suppliers is one of the ways to manage sustainability and to promote firm performance. In addition, the desire of a firm to develop environmentally fit products and processes actually rely on the capacities of suppliers (Humphreys, Wong, & Chan, 2003; Woo, Kim, Chung, & Rho, 2015).

The implementation of environmental practice is significant for many firms. However, Handfield et al. (2002) commented that incorporating green environment practice into the purchasing function would put tremendous pressure and complication on the purchasing process if the purchasing department needs to consider other factors such as cost, quality, lead-time, flexibility while monitoring the environmental performance of a supplier. Hales, Perrilliat and Bhardwaj (2011) pointed firms could incorporate their environmental best practices and plans with the environmental management of their supplier by enhancing the collaboration with a supplier in order to reduce the pressure on the purchasing function. The position of suppliers in an organizational system is such that if firms do not work with suppliers, they are ignoring probably the biggest percentage of environmental effects (Schaper, 2002).

Preuss (2001) and Boiral (1998) stated that involvement of suppliers could improve the product lines of an organization. Sustainable firms require sustainable supply networks (Tate et al., 2012). According to Zsidisin and Siferd (2001), environmental purchasing is still in its initial stages. Hence, future empirical researchers should consider environmental purchasing theories in their study.

In their research, Yen and Yen (2012) found that green purchasing involving cost and process improvement also acts as a change agent for environmental initiatives in supply chain activities. Klassen and McLaughlin (1996) and Woo et al (2016) found that firms could achieve competitive advantage by adopting environmental sound purchasing policy and integrating purchasing activities with environmental objective. The critical role of green purchasing function was further explained by Min and Galle (1997) who found that purchasing function significantly influences environmental and economic performance. De Sousa Jabbour et al. (2015) also emphasized that environmental purchasing activities positively influence the performance of firms.

Table 2.1 provides a summmary of the purchasing practices that was retrieved from 72 articles from previous literature review. These articles are related to purchasing and supply management. The four main activities of green purchasing practices (Supplier selection, development, collaboration and evaluation) that have been identified based on the interview with the six ISO 14001 manufacturing companies and thorough of the past literature review for this study. The important element in purchasing activities are supplier selection, development, collaboration, and evaluation.

Table 2.1 Summary of Green Purchasing Practices

No.	Study	Year	GSS	GSD	GSC	GSE
1	Porter	1985				√
2	Weber, Current and Benton	1991	√		√	
3	Dyer and Ouchi	1993		√		
4	Monczka, Trent and Callahan	1993				√
5	Ellram and Carr	1994		√	√	
6	Hines	1994		√	√	
7	Pearson and Ellram	1995	√	√		
8	Lamming and Hampson	1996	√	√		
9	Azzone and Noci	1996	√			√
10	Dickson,	1996	√		√	
11	Min and Galle	1997		√		√
12	Noci	1997	√			
13	Carter, Ellram and Ready	1998	√			
14	Boiral	1998		√		
15	Walton, Handfield and Melnyk	1998	√			√
16	De Boer, Van De Wegan and Telgen	1998	√			
17	Carter and Carter	1998			√	
18	Krause, Handfield and Scannell	1998				√
19	Carr and Pearson	1999				√
20	Lambert and Cooper	2000		√	√	
21	Hillary	2000	√		√	
22	Krause et al.	2000		√		
23	McCutcheon and Stuart	2000			√	
24	Geffen and Rothenberg	2000		√	√	
25	Preuss	2001		√	√	
26	Zsidisin and Siferd	2001	√			√
27	Min and Galle	2001		√		
28	Lin and Li	2001	√			
29	Bowen, Cousins, Lamming and Faruk	2001a			√	√
30	Hines and Jones	2001			√	
31	Handfield, Walton, Sroufe and Melnyk	2002	√			
32	Quayle	2002		√		
33	Rao	2002			√	
34	Talluri and Sarkis	2002				√
35	Humphreys, Wong and Chan	2003	√			
36	Wen-li, Humphreys, Chan and Kumaraswamy	2003				√
37	Sanchez-Rodriguez, Hemworth and Martinez-Lorente	2005		√		
38	Chan et al.	2006	√			
39	Chin-Chun, Kannan, Leong and Tan	2006	√			
40	Vachon and Klassen	2006		√	√	

Table 2.1: Continued Summary of green purchasing practices

No.	Study	Year	GSS	GSD	GSC	GSE
41	Yuzhong and Liyun	2007	√			
42	Chan and kumar	2007	√			√
43	Modi and Mabert	2007		√		
44	Srivastava	2007		√		
45	Huang and Keskar	2007			√	√
46	Ambec and Lanoie	2008		√		
47	Seuring and Müller	2008		√		
48	Oh and Seung-Kyu	2008		√		
49	Vachon and Klassen	2008			√	√
50	Budeanu	2009		√		
51	Sarkis	2009			√	
52	Ana Beatriz and Charbel	2009	√			
53	Squire, Cousins, Lawson and Brown	2009			√	
54	Gold, Seuring and Beske	2010			√	
55	Bai and Sarkis	2010	√	√		√
56	Ilgin and Gupta	2010		√		
57	Lager and Frishammar	2010			√	
58	Zhu, Sarkis and Lai	2011	√			
59	Carter and Liane Easton	2011		√	√	
60	Kim and Ellegaard	2011				√
61	Kim, Choi, Yan and Dooley	2011	√			√
62	Yang and Zhang	2012	√	√	√	√
63	Zailani, Jeyaraman, Vengasdasan and Premkumar	2012	√	√		√
64	Tate, Ellram and Dooley	2012	√			
65	Yen and Yen	2012			√	
66	Sahu, Datta and Mahapatra	2012	√			√
67	Punniyamoorty, Mathiyalagan and Lakshmi	2012	√			
68	Dobrzykowski et al.	2012			√	
69	Prajogo, Chowdhury, Yeung, and Cheng	2012		√		√
70	Igarashi, De Boer and Fet	2013	√			
71	Ageron, Gunasekaran and Spalanzani	2013	√	√		
72	Kar and Pani	2014	√			
			30	28	24	21
	Total	72	30			
	Percentage		42%	39%	33%	29%

Footnote: "√" indicates the study found specific green practices. GSS: Green Supplier selection, GSD: Green Supplier Development, GSC: Green Supplier Collaboration, GSE: Green Supplier Evaluation.

From the Table 2.1, it is clearly stated that the supplier selection consists of 30 items (42 percent) that have been discussed in the previous literature, followed by supplier development with 28 items (39 percent), supplier collaboration with 24 items (33 percent), and the supplier evaluation contributed to 21 items (29 percent). All these components are directly related to green purchasing practice that will be used in this study.

All the components mentioned above are important for green purchasing practice. Cousins, Lawson, and Squire (2008), Yan (2011) and Tate et al. (2012) highlighted another emerging area of theory development in environmental purchasing and supply management. They determined what drives green behaviours in both buying and supplier firms. The buyer-supplier relationship must move from a control orientation to a collaboration orientation, which in turn requires changes in both processes and incentives. Based on Table 2.1, the green purchasing practice can be broadly classified into four main activities. The four components for green purchasing practice are as follows:

2.3.1 Supplier Selection

Gurel, Acar, Onden and Gumus (2015) stated that supplier selections relate to enviromental purchasing management have become the key factor and main driver for organizational sustainability. However, in setting green supplier selection criteria, firms could be subjected to the regulation of the government or the policy of a buying firm (Sahu, Datta, & Mahapatra, 2012). Igarashi, De Boer and Fet (2013) emphasized the understanding of "green" in the context of the selection of suppliers. Without such understanding, selection might lose its significance, and purchasers might not be able to effectively communicate the relevant 'green' criteria to suppliers.

Lamming and Hampson (1996) are considered as among the pioneers who had suggested and listed the process of supplier selection based on a series of environmental indicators. However there was no standard criterion set for supplier selection process. Subsequently, selection criteria were proposed by Azzone and Noci (1996), Noci (1997), Walton et al. (1998), Ana Beatriz and Charbel (2009) and Govindan, Rajendran, Sarkis and Murugesan (2015) to include environmental performance as one of the supplier selection criteria where environmental perspective is used to design supplier selection system and procedure. Although these studies have highlighted the importance of environment elements, many organizations still failed to incorporate them in their supplier selection process.

The traditional methods in supplier selection and evaluation were based on cost, delivery, and quality (Dickson, 1966; Weber, Current, & Benton, 1991; Ageron et al., 2013; Dey, Bhattacharya, & Ho, 2015; Hamdan & Cheaitou, 2017). However, Lin and Li (2001) stated that in the field of supplier chain management there were few theoretical empirical studies that actually include environmental criteria in supplier selection process. This was validated by Humphreys et al. (2003) and reiterated by Ana Beatriz and Charbel (2009) and reinforced by Gurel, Acar, Onden and Gumus (2015). In the study by Sarkis and Dhavale (2015) proved that evaluating and selecting sustainable suppliers, should take a triple-bottom-line approach and consider business operations as well as environmental impacts and intangible performance, besides only favour profit or the business operations.

Punniyamoorty, Mathiyalagan and Lakshmi (2012) stated that in the present competitive market, the biggest challenge in developing sustainable supplier selection program is partly due to the multidimensional constructs in the selection process. These

constructs are technical capability, production capacity and financial position, strength of management, safety, environmental criteria, and cost factors. All these have major influence in the supplier selection process.

Due to further development in procurement processes, new criteria on supplier selection process such as trade relationship, foreign exchange rate, traffics, customs duties, geographical location, trade restriction, quality management system, and environmental factor have been included in the selection criteria (Kar & Pani, 2014). For example, Humphreys et al. (2003) put environmental safety in running businesses as one of the criteria in their research model. Punniyamoorty et al. (2012) agree that environmental safety is the key consideration in green supply chains.

Yuzhong and Liyun (2007) and Chan, Chan, Lau and Ip (2006) indicated that using safety and environment criteria as the main consideration for supplier selection process is influential in increasing efficiency of the operations of an organization. However, along these lines, Handfield et al. (2002) and Huang and Keskar (2007) affirmed that in reality, these sophisticated and demanding environment criteria are not practiced in supplier selection process. In fact, most firms still opt for criteria that simplify their supplier selection program while an environment management system such as ISO 14001 certifications is treated as a basic fulfillment for supplier selection.

Chin, Kannan, Leong and Tan (2006) revealed that effective supplier selection is an important and critical process to enhance the competitiveness of a firm creating a competitive edge. This is a vital role played by purchasing department to ensure positive impact on firm performance. According to Pearson and Ellram (1995), De Boer, Labro and Morlacchi, (2001), Chan, Wang, Luong and Chan (2009) and Song, Xu

and Liu (2017) the most critical phase in purchasing practices within a firm is the supplier selection process; this is the most important stage in the buying process that determines the sophistication of supplier selection program.

2.3.2 Supplier Development

Handfield and Bechtel (2002), Sancha, Longoni and Giménez (2015) defined supplier development as a program undertaken by buying firms and their suppliers in order to improve the performance or capabilities of suppliers for short and long-term supply needs of the buying firms. Bai and Sarkis (2010) identified supplier development programs that include features such as knowledge transfer, mutual trust development, financial support, collaborative communication, and relationship development and socialization mechanisms. Supplier development program such as education sharing, training class and direct investment towards suppliers have been carried out in Japan (Dyer & Ouchi, 1993; Hines, 1994) and strongly promoted in Japanese industries.

A few studies have found that proper planning and design in supplier development program have positive effect on both car makers and the performance of suppliers (Modi & Mabert, 2007). Quayle (2002) and Hales, Perrilliat and Bhardwaj (2011) suggest that proactive commitment by suppliers on a long-term basis would create a win-win philosophy for continuous improvement. However, this is not the case, as Oh and Seung-Kyu (2008) and Adams et al. (2016) highlighted that studies on how supplier development programs could be developed should be from the perspectives of suppliers. Geffen and Rothenberg (2000) and Awasthi and Kannan (2016) further reinforced the notion that firms have to address the pressures imposed at all levels by external forces, such as regulators, government authorities, and stakeholders. Therefore, environmentally conscious companies should proactively involve their supply base in

their environmental improvement programs when designing environmental activities (Ağan, Kuzey, Acar, & Açıkgöz, 2016).

Even though firms may fully agree that increased coordination with their supply base could promote environmental purchasing activities, Srivastava (2007), Ilgin and Gupta (2010) and Bai and Sarkis (2010) found that a large number of potential green programs have yet to be implemented by many firms. In conclusion, supplier development practice would bring positive impacts on the performance of buying firms (Sanchez-Rodriguez, Hemsworth, & Martinez-Lorente, 2005; Rezaei, Wang, & Tavasszy, 2015.).

2.3.3 Supplier Collaboration

In comparison to environmental assessment, in the research by Bowen et al. (2001a), they affirmed that the involvement of buyers in environmental collaboration requires specific skills and knowledge, such as soft skills in human interactions and communications. The primary role and function of purchasing departments is their capability to collaborate and share information with suppliers. For value creation, Dobrzykowski et al. (2012) found that buying firms would extend their green purcahsing activities to supplier collaboration practice in order to improve the environmental performance of suppliers for mutual benefit.

Successful collaboration requires adequate information, flow, and knowledge sharing among stakeholders, particularly at the supply base (Lager & Frishammar, 2010). Promoting in-depth communication with two-way interaction between buyers and suppliers (Squire, Cousins, Lawson, & Brown, 2009) is a key determinant to obtain external resources and information where suppliers are likely to be more open and

committed to the relationship between buyers and suppliers. Some of supplier environmental collaboration activities include:

1. Supplier education development

   This is a basic education pertaining to environmental issues and environmental management. The purpose is to build awareness of suppliers on green initiatives, practices, and expertise on green information in the same industry (Bowen et al., 2001a; Rao, 2002).

2. Suppliers support development.

   The purpose of this is to assist suppliers and improve their environmental performance by forming green environmental teams to guide suppliers on environmental development program. Provide on-site technical inputs during plant visits and support the financial requirement of suppliers when necessary in order to increase the green environmental performance of suppliers (Hines & Jones, 2001; Walton, Robert, Melnyk, & Steven, 1998; Ağan et al., 2016).

3. Joint ventures

   Both the buying firms and suppliers established a common team, work jointly as a team on a long-term basis to develop new products or projects, such as green innovation, new-product development and clean technology development. Joint venture normally requires knowledge and expertise from both ends to implement a new task (Bowen et al., 2001a; Vachon & Klassen, 2006).

4. Supplier alliance

   The intention is to form a supplier partnership in order to build closer relationships for the benefit of both parties on a long-run basis. Normally this would be developed with reliable suppliers who are willing to work beyond signing basic contract arrangements and a stronger supplier alliance for the benefit of both parties (McCutcheon & Stuart, 2000).

Vachon and Klassen (2006) observed that a lot of involvement and investments have been carried out on the operations and processes of suppliers in order to produce environmentally sound products through collaboration programs. Firms could train their purchasing personnel to enhance collaboration and knowledge, to set objectives, and to evaluate performance based on their understanding of environmental activities. Vachon and Klassen (2008) indicated that supplier collaboration programs on environmental issues would improve the manufacturing performance of buying firms. This is supported by Geffen and Rothenberg (2000) and Hales et al. (2011) who found that strong relationship and close collaboration with suppliers would result in better firm environmental performance.

2.3.4. Supplier Evaluation

Talluri and Sarkis (2002) defined supplier evaluation as an assessment carried out towards current supplier performance and capability. This involves benchmarking performance with other similar companies. The assessment would be used to provide relevant feedback to suppliers as well as input to buying firms for improvement in their long-term performance. Besides contribution to the buying firms, Prajogo, Chowdhury, Yeung and Cheng (2012) stated that the evaluation process is also a means to provide evaluation feedback to suppliers on the expectations of buying firms, hence providing

the directions for future improvement. In order to meet the objectives of the buying firms, supplier evaluation practices have designed to influence the behavior of suppliers to improve supplier capabilities and performance (Kim & Ellegaard, 2011).

Pressey, Winklhofer and Tzokas (2009) agreed that regular evaluation of supplier performance perhaps is one of the most critical tasks of purchasing function. Supplier evaluation becomes important, partly due to the complexity of the buying process and globalization. Huang and Keskar (2007) state that in view of competition among firms, monitoring supplier performance and capability have switched from firm level to supply chain level, where suppliers play the main role that affects supply chain performance. Kim, Choi, Yan and Dooley (2011) indicate that supplier evaluation has been driven by changes in business environment. In the research by Govindan et al. (2015) stressed that the most widely considered in multi-criteria decision making approaches for green supplier evaluation is an environmental management system. These changes, in turn, triggered performance measurement revolution, driven by inadequacy of previous one-dimension financial oriented performance measurement. However, these changes are necessary; otherwise the evaluation process would be limited.

Similarly, Sahu, Datta and Mahapatra (2012) state that conventional evaluations solely focused on cost, delivery, and quality effectiveness have impact on profitability. However, beside economic elements, evaluation has included environmental and social elements in the concept of sustainable business practice. Nevertheless, in the literature, most of the existing supplier evaluation methods fall short of comprehensively assessing suppliers from a triple bottom line perspective.

Monczka, Trent and Callahan (1993) opine that before developing new products and processes with key suppliers, it is necessary to evaluate supplier performance. Similarly, Prajogo et al. (2012) and Dey et al. (2015) also stressed that it is important to evaluate the capability of suppliers in terms of responsiveness, delivery, engineering, design, testing, and tooling ability before integrating suppliers into new-product development.

To improve supplier performance, Krause, Handfield and Scannell (1998) opine that buying firms could provide incentive, training, or initiate competition among suppliers and perform supplier assessment to improve supplier performance. Purchasing is the right party for these activities, as strategic purchasing has positive impact on supplier evaluation, buyer-supplier relationship, and financial performance (Gimenez, Sierra, & Rodon, 2012). This is in line with the research of Wen-li, Humphreys, Chan and Kumaraswamy (2003) and Govindan et al. (2015) who proposed that as strategic purchasing increases, firms should increase their efforts to manage their supply base for closer evaluation and collaboration that could lead to financial performance. Thus, it is a critical for purchasing function to carry out supplier evaluation program to monitor their supplier performance and capability for firm performance.

2.4 Green Purchasing Capabilities

Capability is defined by Kaya and Erden (2008) as the strategic relevant factor that leads to business excellence and exceedingly well performance in all activities and cooperation. In short, capabilities are the bundles or collections of complex individual skills, assets, and knowledge that enable firms to plan their activities and utilize resources in order to achieve the goals and objectives of a firm. Hall (1993) and Chen, and Fong (2012) stated that a firm could achieve sustainable competitive advantage resulting from control of its relevant capabilities. These different capabilities are in the

form of intangible resources, knowledge, skills, networks, and the confidential matters of a company. Another definition by Lau and Wang (2009) described that the continuous accumulation of the personnel experience in utilizing of tangible (physical assets) and intangible resources (information and knowledge) will eventually building the capabilities.

From a different perspective, Ray, Barney and Muhanna (2004) pointed out that capabilties refer to how firms manage their environment functions against their competitors in the market. Capabilities are inherent knowledge that are normally built and taught internally and difficult to be realized (Dierickx & Cool, 1989; Reed & DeFillippi, 1990; Rezaei, Wang, & Tavasszy, 2015). Another view point given by Schroeder, Bates and Junttila (2002) and Winter (2000) is that it is difficult to imitate capabilities. Größler (2007) stressed that capabilities can be defined as the behavior of an organization to perform those activities that are good at supporting the strategy of a firm.

However, Chen et al. (2004) viewed capabilities as the ability of a firm to work closely with a limited number of suppliers and to integrate internally within their supply-chain members in order to create sustainable competitive advantage for long-term mutual gains. In short, core capability in an organization represents the potential dimension of competitiveness in firm performance.

The capabilities of a firm, as pointed out by Amit and Schoemaker (1993) and Williamson, Bhadury, Dobie, Ofori-Boadu, Parker Troy and Yeboah (2012) would only become competitive when the capabilities interact with resources. Effective combination of these resources with implicit or explicit knowledge would create

competitive advantage. This view is aligned with the research by David, Yan and Charles (2008). Resources by themselves cannot bring advantage unless they are well planned into capabilities. In short, an organization can take advantage of their capabilities and use them for long-term benefit by using resources.

Many studies have highlighted procurement as a significant function for firm performance. However, in the research by Ordanini and Rubera (2008), they found that the driver of the procurement capability of a firm is still unknown. Similarly, many studies in operations management (OM) have emphasized on the important roles played by purchasing function in achieving the goals of a firm. However, less attention was given on how purchasing function could develop capabilities in order to positively influence firm performance (Hult et al., 2004; Dobrzykowski et al., 2012).

Sarmiento, Byrne, Contreras and Rich (2007) who supported the view of Collins, Cordon and Julien (1998) found that there is no arranged order to develop manufacturing capabilities. Based on cumulative capabilities models, capabilities could be developed without any fixed sequence. In the manufacturing context, capabilities can be performed in flexible and simple forms in order to achieve higher performance. Slack and Lewis (2002) acknowledged that the roles played by manufacturing strategic capabilities could generate success. These capabilities are used to produce products and services that would contribute to the success of firms. In the research by Chavez, Yu, Jacobs and Feng (2017) highlighted that firms can explore the internal resources such as manufacturing capabilities in order to obtain and sustain over time.

Harris and Ruefli (2000) stated that there is a close relationship between capability and strategy. Some studies have pointed that organizations would establish their capabilities

and then set only strategies to cope with the capabilities. In short, strategies would be selected based on the capabilities of firms. On the other hand, other studies proposed that firms would specially build certain capabilities to support the strategies of a firm (Hsieh & Tsai, 2007). In summary, there is a significant correlational relationship between capabilities, strategic choice, and firm performance in an organization.

Rosenzweig and Easton (2010) highlighted that many manufacturing operations simultaneously focus on multiple capabilities, quality, delivery, flexibility, and cost without compromising the strength of these numerous capabilities and sacrificing performance of other capabilities. However, there is no evidence on the trade-off among these multiple capabilities. Rosenzweig and Eastom (2010) also pointed out that some manufacturers actually do not select their strategies in sequence but rather they set their priority based on actions taken by their competitors or the industry.

In a research by Yung and Chung (2013), they found it important for a firm to identify the relationship between organizational capabilities and strategic choice. The main reason is that resources and capabilities of a firm are actually represented by the committed strategy choice of the managers of a firm (Mintzberg, 1978) for achieving better performance. Some scholars have investigated the implications on performance using different types of organizational capability, namely research and development capability, manufacturing capability, marketing capability, and process capability (Chang, Chiou, & Wang, 2007; Yung & Chung, 2013). Prior studies have found that organizations need to build and uphold inimitable capabilities in order to differentiate them from their competitors. It was proven that there is a positive relationship between organizational capabilities and firm performance. Barratt and Oke (2007) noted that resources which are renowned as organizational capability and are incorporated in

organizational routines or daily activities would enhance productivity. However, in the research by Lun, Shang, Lai and Cheng (2016) stressed that the influence of different categories of organizational capability on performance outcomes remains unclear, where organizational capability could enhance and generate higher revenues; on the other hand, it may also incur higher operating costs.

Purchasing capabilities as defined by Lambert and Cooper (2000), Christopher and Gattorna (2005) refer to cost reduction and continuous flow of raw materials in order to speed up time to market and fulfill the requirement of the market. According to Zsidisin and Ellram (2003), controlling cost is a critical capability for the financial success of a firm. This is partly due to purchases being a major and single largest expenditure. The capability of firms exercising cost reduction program would lead to valuable and non-imitable factors for competitive advantages. Supply management becomes a strategic role when the proportion of purchasing costs is high (Ellram & Carr, 1994; Kocabasoglu & Suresh, 2006). Therefore, financial capability is critical to ease control of total cost. In their research, Lintukangas, Kähkönen and Virolainen (2013) found that the bigger the share of purchase cost in the turnover of a firm, the higher is the need to have a strategy plan in the purchasing actions of a firm. Green initiatives process, especially the innovation of a firm, requires long-term investments (Sharma, Pablo, & Vredenburg, 1999). However, Presley, Meade and Sarkis (2007) revealed that besides internal organizational resources, factors such as human and financial resources, which increase complication for an organization to adopt proactive environmental strategies, could be the main obstacles for firms to implement green supply-chain management.

Liu and Chen (2008) described innovative as one of the common capabilities for a successful organization. Innovative refers to the flexibility and readiness of firms to

adapt to environmental changes by developing and discovering new products, processes and investment in new technologies. This is in line with the research of Ho, Fang and Lin (2011), who hypothesized that those strong design capabilities, would increase the speed in new product developments and commercialization. Based on Resource Based View theory (RBV), design management capability is a dynamic capability that can out-perform competitors (Fernández-Mesa, Alegre-Vidal, Chiva-Gómez, & Gutiérrez-Gracia, 2013).

There are many different capabilities. As mentioned in the research by Penrose (1959) and Wernerfelt (1984) and Hartmann and Germain (2015) the most important capability is integration capability. Teece, Pisano and Shuen (1997) defined integrative capability as the ability of a firm to adopt innovative responses by building, integrating, and combining internal and external capabilities related to corporate environmental practices (Cai & Zhou, 2014). In the opinion of Pagell (2004), integration is a process of interaction and collaboration among supply chain functions across many organizational boundaries to achieve mutual outcomes. Cormican and Cunningham (2007) and Wong and Boon-itt (2008) agreed that high level of integration means seamless integration and collaboration across all functions within business processes. In their research, Choi and Hwang (2015) pointed out that integration refers to closed links with a wide range of stakeholders, including suppliers, customers, governments and non-governmental organizations that are beneficial to firm environmental performance.

As concluded by Chen et al. (2004) and Azadegan et al. (2008) all capabilities could be used to build close working relationship among supply-chain partners. Ellram and Liu (2002) and Singhal and Hendricks (2002) proposed that if capabilities of purchasing and supply management could join together, they could build synergy by leveraging the

inter-organizational benefit which could then lead to sustainable competitive advantage as well as contribute to better financial performance.

However, Größler (2010) stressed that not all capabilities could be utilized at the same level of resources. Some capabilities might have negative effects when paired with others, as trade-off among capabilities might happen. Some literature has suggested that capabilities could be supported when they are developed in the right sequence. As mentioned in the research by Größler (2007), strategic resources and capabilities of a firm depend on each other. However, resources and capabilities would change over time, of which planning and control are required. Therefore, to improve firm performance, there is a need to focus resources on some capabilities when there are changes in strategies or programs.

As seen in Table 2.2, 78 journals were published in the categories related to green purchasing capabilities. The summmary of the green purchasing capabilities in various dimemsions based on previous articles were presented as below. Twelve categories of green capabilities are green manufacturing, organisational, speed, finance, innovation, design, integration, strategy, reversed logistic, resource base, and information and cooperation capabilities. Based on the Table 2.2, the top five main capabilities are selected based on the higher ranking obtained among all these capabilities, and those rejected items shall be consolidated and grouped together as per discussion in 3.3.1.

Table 2.2: Summary of Green Purchasing Capabilities

No	Study	Year	Capability	MC	SC	SP	FC	DC	DS	IC	SG	RC	RS	IF	CP
1	Wernerfelt	1984							√	√					
2	Dierickx and Cool	1989													
3	Barney	1991							√						
4	Stalk	1992			√								√		
5	Amit and Schoemaker	1993	√	√											
6	Ellram and Carr	1994			√		√								
7	Thierry, Salomon, Van Nunen and Van Wassenhove	1995										√			
8	Utterback	1996						√							
9	Bechtel and Jayaram	1997												√	
10	Teece, Pisano and Shuen	1997			√					√					
11	Collins, Cordon and Julien	1998	√												
12	Sharma, Pablo and Vredenburg	1999					√								
13	Giunipero and Pearcy	2000												√	
14	Harris and Ruefli	2000	√												
15	Lambert and Cooper	2000				√									
16	Tukker, Haag, eder, Vercalsteren, Tischner, Charter and Van der Vlugt	2000							√						
17	Barney	2001							√						
18	Bowen, Cousins, Lamming and Faruk	2001a		√	√					√					
19	Mentzer, DeWitt, Keebler, Min, Smith and Zacharia	2001												√	
20	Zsidisin and Siferd	2001									√				
21	Slack and Lewis	2002		√											
22	Carr and Pearson	2002			√										
23	Ellram and Liu	2002			√										
24	Singhal and Hendricks	2002			√										

Table 2.2: continued Summary of Green Purchasing Capabilities

No	Study	Year	Capability	MC	SC	SP	FC	DC	DS	IC	SG	RC	RS	IF	CP
25	Zsidisin and Ellran	2003					√								
26	Carter and Jennings	2004		√											
27	Chen, Paulraj and Lado	2004	√		√										
28	Hult et al.	2004	√												
29	Pagell	2004								√					
30	Ray, Barney and Muhanna	2004	√												
31	Zhu and Sarkis	2004								√					
32	Christopher and Gattorna	2005			√	√									
33	Richey, Genchev and Daugherty	2005				√									
34	Hart	2005													√
35	Large	2005												√	
36	Eltantawy	2005				√	√								
37	Hamner	2006						√							
38	Kocabasoglu and Suresh	2006					√								
39	Barratt and Oke	2007			√										
40	Sarmiento, Byrne, Contreras and Rich	2007	√		√										
41	Chang, Chiou and Wang	2007			√										
42	Cormican and Cunningham	2007								√					
43	Craighead, Blackhurst, Rungtusanatham and Handfield	2007										√			
44	Größler	2007	√												
45	Hsieh and Tsai	2007	√												
46	Presley, Meade and Sarkis	2007					√								
47	Azadegan, Bush and Dooley	2008							√						
48	David, Yan and Charles	2008	√												
49	Hunt and Davis	2008									√				

Table 2.2: continued Summary of Green Purchasing Capabilities

No	Study	Year	Capability	MC	SC	SP	FC	DC	DS	IC	SG	RC	RS	IF	CP
50	Kaya and Erden	2008	√												
51	Liu and Chen	2008						√					√		
52	Ordanini and Rubera	2008	√					√		√	√				
53	Vachon and Klassen	2008								√					
54	Wong and Boonitt	2008								√					
55	Lau and Wang	2009	√						√						
56	Pressey, Winklhofer and Tzokas	2009		√	√		√			√					
57	De Giovanni	2010					√	√							
58	GroBler	2010	√	√											
59	Rosenzweig and Easton	2010		√											
60	Shang, Lu and Li	2010								√					
61	Ho, Fang and Lin	2011							√						
62	Lee and Kim	2011						√							
63	Murillo-Luna, Garces-Ayerbe and Rivera-Torres	2011					√								
64	Paulraj	2011		√	√			√							
65	Santolaria, Oliver-Solà, Gasol, Morales-Pinzón and Rieradevall	2011						√							
66	Sarkis and Lai	2011				√									
67	Wen-hui, Dian-yan and Yu-ying	2011													√
68	Wu, Ding and Chen	2011		√			√			√					
69	Zailani, Eltayeb, Hsu and Tan	2011		√											
70	Dobrzykowski et al.	2012	√												

Table 2.2: continued Summary of Green Purchasing Capabilities

No	Study	Year	Capability	MC	SC	SP	FC	DC	DS	IC	SG	RC	RS	IF	CP
71	Fernández-Mesa et al.								√						
72	Lintukangas, Kahkonen and Virolainen	2013			√		√								
73	Musa et al.	2013			√										
74	Yung and Chung	2013			√										
75	Zhu, Sarkis and Lai	2013		√				√		√					
76	Cai and Zhou	2014		√						√					
77	Choi and Hwang	2015								√					
78	Kafetzopoulos and Psomas	2015						√							
	No of occurrences			12	17	5	11	**9**	8	16	3	2	2	4	2
	Overall percentages (%)			**15**	**22**	6	**14**	**12**	10	**21**	4	3	3	5	3
	Constructs used for study			MC	SC		FC	**DC**		IC					

Footnote: "√" indicates the study found specific green purchasing capabilities.MC: Manufacturing capabilities, SC: Intraorganisational capabilities, SP: Speed to market, FC: Financial capabilities, DC: Innovative capabilities, DS: Design capabilities, IC: Integration capabilities, SG: Strategic capabilities, RC: recovery capabilities, RS: resource bas capabilities, IF; Information sharing capabilities, CP: Cooperative capabilities

Based on the ranking shown in Table 2.2, the selected items are green manufacturing capabilities with 12 items (15 percent), followed by organizational capabilities with 17 items (22 percent), financial capabilities with 11 items (14 percent), innovative capabilities with 9 items (12 percent) and 16 items (21 percent) of the integration capabilities. The twelve green purchasing capabilities can be defined as follows:

1. Strategic capability: This refers to the capability in identifying and developing reliable suppliers that could reduce costs in purchasing transactions while maintaining relationships with external suppliers and internal activities to achieve long-term sustainability goals (Ordanini & Rubera, 2008). It could further facilitate supplier evaluation programs at the strategic management level to maintain a pool of reliable supply base for the company (Zsidisin & Siferd, 2001; Hunt & Davis, 2008).

2. Recovery capability: This refers to the capability to recover as much as possible from the economic and ecological value of used and discarded products, components, and materials in order to reduce waste to a minimum level (Thierry, Salomon, Van Nunen, & Van Wassenhove, 1995). The faster the recovery capability, resources and processes could be deployed and coordinated immediately after a supply-chain disruption, and could reduce the downtime within the supply-chain activities. The speed of recovery capability could overcome the slowing or stoppage of planned product flow and resume activities to the normal and planned level of product flow (Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007).

3. Resource based Capability: These resources are embedded in business processes of a firm. Specific activities within each process that handle the networks within an organized resource are capabilities that can be used to perform business processes (Stalk, 1992). With “higher capabilities," firms can gain competitive advantage over their competitors. By using these basic resources, firms can be protected from imitation and can fully utilize their resources effectively (Liu & Chen, 2008).

4. Innovative capability: Innovative is a broad and multi-dimensional concept that refers to all scientific, technological, organizational, financial, and commercial activities, which lead to the implementation of new technology or improved products or services (Kafetzopoulos & Psomas, 2015). Innovation is the design, invention, development, and/or implementation of new or altered products, services, processes, systems, organizational structures or business models for the purpose of creating new value for customers and financial returns for the firm. (Santolaria, Oliver-Solà, Gasol, Morales-Pinzón, & Rieradevall, 2011). Yoon, Lee and Schniederjans (2016) highlighted innovative capability can also lead to both lower cost and higher revenue for a firm.

5. Speed capability to the market: This refers to the capability to market the speed of selling exceptional green products that are offered to strengthen competitiveness position in the market in order to achieve greater financial performance (Richey et al., 2005). It has a tremendous influence on the green supply chains initiatives of firms because it potentially induces for new product development that could enhance competitiveness in the market (Sarkis, Zhu, & Lai, 2011).

6. Design capability: This capability includes the designs for recycling purpose or green eco-design development capabilities (Lau & Wang, 2009). Eco-design is defined as "the systematic incorporation of life cycle considerations into the design of products, processes or services" (Tukke et al., 2000). It plays a fundamental role in adding sustainable value to the strategy of a firm (Santolaria et al., 2011), and provides competitive advantage to the firm (Azadegan, Bush, & Dooley, 2008) due to its value, rarity, inimitability and non-substitutability (Barney, 1991, 2001; Wernerfelt, 1984).

7. Integration capability: This is the capability to effectively incorporate procurement in the whole supply chain, reducing time-to-market and increasing the fit with market needs (Ordanini & Rubera, 2008). Based on Vachon and Klassen (2008), environmental integration is a direct involvement of a firm with its suppliers and customers to develop environmental solutions for the reduction of environmental impact in the supply chains.

8. Organizational capability: This is the capability of an organization to allocate and coordinate its resources effectively and efficiently (Chang, Chiou, & Wang, 2007). Organizational capability is the ability to empower individuals at all levels within the organization and the ability to manage people by using their knowledge and skills in developing new products and processes to gain competitive advantages towards achieving organizational goals and strategies (Stalk, 1992; Chen, 1999; Chang et al., 2007). Teece et al. (1997) and De Toni, De Zan and Battistella (2016) asserted that it is the capability to cope with changes in the environment.

9. Information sharing: This refers to the capability of the mutual sharing of information as the backbone for a successfully implementation of supply chain philosophy (Bechtel & Jayaram, 1997, Mentzer et al., 2001). Interpersonal communication, as commented by Giunipero and Pearcy (2000) is the most important skill required by purchasers to perform their tasks efficiently. A greater important role of communication is in creating and sustaining supplier-customer relationships (Large, 2005).

10. Cooperative capabilities: This refers to the cooperative capabilities among employees to work together in order to facilitate the implementation of environmental practices for reducing and improving the impact of environmental issues (Hart, 2005). Through cooperation among all parties, the supply chain of a firm could reach mutual understanding, thus contributing to the benefits of reducing risk in the reversed supply chains (Srivastava & Srivastava, 2006).

11. Financial capability: Financial capability is the ability to make environmental investments, such as the green technology and green initiative by an organization (Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2011). The ability of a management to control costs is critical to the financial success of a firm. In view of purchases comprising the largest single expenditure item in most firms, the ability to effectively manage and reduce costs would lead to the accumulation of valuable, non-transferable and non-imitable resources that could bring significant competitive advantage to a firm (Zsidisin & Ellram, 2003).

12. Manufacturing capability: Manufacturing capability relates to all parties and plays a major role when designing manufacturing strategies and programs to improve the performance of the manufacturing systems (Größler, 2010). Manufacturing capabilities allow an enterprise to develop and to exploit resources in order to generate profit through its products and services (Amit & Schoemaker, 1993), where the development of such capabilities is a major task of manufacturing strategy (Slack & Lewis, 2002). Manufacturing capabilities contribute to the success factors of a company in competition and support corporate strategy and successes in the market place. (Dubey, Gunasekaran, & Samar, 2015).

2.5 Institutional pressure

Institutional pressure (INT) explains how three pressures; namely normative, coercive and mimetic isomorphism influence firms to adopt green initiatives (DiMaggio & Powell, 1983). Research by Scott (2001) and Lai, Wong and Cheng (2006) revealed that external forces could motivate firms into adopting organizational activities and influence their strategic actions. Earlier research by Scott (1992) and Delmas and Toffel (2004) found evidence that the responsiveness of an organization, work life initiatives, structure, and practices are affected by institutional pressure. DiMaggio and Powell (1983) asserted that one of the main reasons for firms adopting initiatives is to gain legitimacy. The definition of legitimacy, as given by Suchman (1995) is norms, values, beliefs within socially constructed system that an entity desires. This is a generalized perception or assumption in a form of acceptance within a society. Thus, in order to face external pressure or stakeholders, adoption of certain policies and regulations by an organization might increase its legitimacy to address these issues.

Shi, Tian and Chen (2012) have observed three keys institutional pressures; namely coercive, normative and mimetic isomorphism (DiMaggio & Powell, 1983; Scott, 2005). The coercive isomorphism is referred to government pressure; normative isomorphism represented consumer pressure, whereas the mimetic isomorphism is referred to the pressure imposed by the competitor. All these pressures mentioned below are the main forces for a firm to adopt green initiatives.

2.5.1 Normative Isomorphism

Normative isomorphism refers to the external parties or relevant stakeholders who have interest in an organization and can exert normative isomorphism to influence the decision of a firm (Zhu et al., 2010). Two leading normative pressure are corporate social responsibility and environmental image towards conducts and actions within an organization expected by social organizations, NGOs and professional associations. According to Banerjee (1998), the main responsibility of a firm is to improve its profitability and to ensure regulatory compliance. Darus, Arshad and Othman (2009) pointed an organization is also driven by and responsible for social responsibility, such as customer satisfaction, employee welfare, community improvement, philanthropy, and environment protection in order to promote its corporate image and reputation

2.5.2 Coercive Isomorphism

Coercive isomorphism is pressure due to influence exerted by those in power and authority on the actions of a firm. Pressure imposed by government authority, regulator, government agencies (Rivera, 2004) can coercively influence the actions and decisions of an organization. These pressures are known as fines, trade barriers, rules and regulations. Coercive pressures as defined by DiMaggio and Powell (1983), and Teo, Wei and Benbasat (2003) refer to formal or informal pressures that could be initiated by

parent companies, dominant trading partners, and regulatory agencies on which a firm is dependent on and oblige to follow. This is aligned with the research of Vikram Bhakooa and Choib (2013), who stressed that sometimes, coercive pressures are imposed by corporate headquarter, demanding that its subsidiaries should be obliged to adopt specific rules and regulations.

2.5.3 Mimetic Isomorphism

Mimetic isomorphism is pressure when a firm is trying to mimic other successful organizations in the same industry. The purpose is to benchmark or duplicate the success of its competitors. Zhu et al. (2010) stated that an organization will mimic the practice of successful competitors in the same industry. Hofer et al. (2012) said that the concept of mimetic isomorphism describes how a competing environment could create competitor pressure on firms and force them to focus on their environmental management activity. On the other hand, Darus, Arshad and Othman (2009) found that mimetic isomorphism could arise when a firm responses in an uncertain situation. Generally, firms are more likely to imitate or benchmark practices or actions that are viewed as successful practices in turbulent situation. In addition, firms also follow organizations that are viewed as market leaders in the same industry.

Ethical values and ecological thinking have been incorporated as new perspectives in institutional theory (Ball & Craig, 2010). Sarkis et al. (2011) argued that there is a link between responses to external environmental pressure and internal capabilities of an organization. Several researchers such as Hoffman (1999), Brown, Potoski and Van-Slyke (2006), Maloni and Brown (2006), Fowler and Hope (2007), and Tate et al. (2012) agreed that due to institutional pressures, changes in social value, technologies and regulations do affect decisions made pertaining to environmental activities.

Delmas and Toffel (2008) examined how an organization facing a complex and uncertain situation tends to mimic and benchmark its competitors when adopting environmental management practices. This view is supported by Chin, Choon, Zailani and Vaidyanathan (2013) who examined institutional pressure in an organisation. Zhu et al. (2013) and Vikram Bhakooa and Choib (2013) further commented that an organization tends to model other organizations, which it believes to be well-managed and able to survive in a competitive environment. Using institutional pressure, researchers (Hoffman, 1999; Brown et al., 2006; Fowler & Hope, 2007; Tate et al., 2010) have concluded that regulation; social and economic environments could affect the strategies and decision-making of firms. The reactions of the firms to regulations also affect their environmental activities.

Zhu et al. (2013) concluded that institutional pressure would affect the decision of a firm when implementing green supply-chain management practices. Using mimetic isomorphic pressures, firms tend to imitate successful competitors by adopting green supply-chain management practices in order to increase competitiveness at global levels.

Guide, Srivastava and Kraus (1998) highlighted that governmental and the pressures from customers would continue to push businesses to be more and more sustainable. Governmental legislations and public mandates for environmental accountability have given rise to green concept (Guide et al., 1998; Srivastava, 2007). As pointed out by Zhu et al. (2010), formal and informal environmental education channels have promoted the environmental awareness of the public. Lee and Klassen (2008) pointed out that institutional pressure from government agencies, customers, and competitors directly

motivated companies to implement green initiatives. One very significant example of environmental practices is the ISO 14001 certifications for cleaner production.

It may be concluded that normative, coercive, and mimetic institutional pressures directly or indirectly influence the strategies and decision-making skills of an organization. Dubey, Gunasekaran and Samar Ali (2015) proved normative and coercive pressures generally tend to arise at domestic levels. These pressures could affect the responsiveness of a firm in formulating rules, norms, and values in its environmental policy in order to meet the expectations of various stakeholders. Finally, Sarkis et al. (2011) highlighted that the effect of external pressures on internal capabilities in green supply chain management needs further investigation.

In the research by Hsu, Tan, Zailani and Jayaraman (2013), government, customer, and competitor were used to study the drivers for firms to adopt the green purchasing. This was supported by the research done by Xiao, Zhen, Cun, Da and Liu (2015), regulatory and customer pressures are probably the two most important types of institutional pressure. Similarly, in the research by Tarig, Zailani and Jayaraman (2012), shown that Malaysia firms are motivated by regulator and customer pressures and desire to gain business benefit. Zhu, Feng, and Choi (2017), Shin and Thai (2016) and Zhu et al (2011) agreed the customer collaboration will gain economic performance through corporate environmental management practices.

In conclusion, the three most aggressive institutional pressures studied by many researchers are the government regulatory, consumers and competitors in the institutional environment and green supply chain management (Darnall et al., 2008; Davidson & Worrell, 2001; Delmas & Toffel, 2004; Freeman, 1984; Rao, 2002; Zhu &

Sarkis, 2007; Gonzalez-Torre et al., 2010; Zhu et al., 2011; Sancha, Longoni & Giménez, 2015; Zhu, 2017; Tarig et al., 2012; Zhu, Feng & Choi, 2017). All these pressures have been identified and shall be used in this study

2.6 Resource-Based View Theory (RBV)

Penrose (1959), in a pioneer study on issue pertaining to the resources of firms in respect to competitive positions discovered that firms are involved with a collection of productive resources. The author commented that growth and development in a firm depends on how the firm utilizes and engages its resources. A subsequent research by Peteraf (1993) found that the core competencies of firms are closely related to RBV. It means that the superior bundles of resources of a firm could be used as the foundation to develop the competencies of a firm and could eventually lead to "core" competencies. Andrews (1971) cited in Williamson, Bhadury, Dobie, Ofori-Boadu, Parker troy and Yeboah (2012) worked on an additional step in explaining the linkage of the resources of an organization with its competencies.

The earlier works proved that the Resource-based View Theory (RBV) views organization as an inimitable bundle of resources and capabilities, which if employed in a unique way will lead to the competitive advantage of a firm (Wernerfelt, 1984; Barney, 1991, 2001; Grant, 1991; Peteraf, 1993; Rungtusanatham, Salvador, Forza, & Choi, 2003; McIvor, 2009). Resource-based Theory is sometimes also referred to as 'resource-based view' of a firm (Wernerfelt, 1984; Barney, 1991, 2001; Grant, 1991; Peteraf, 1993). One of the pronounced explanations made by Hart (1995) with perfect clarification on the relationship between resources, capabilities and competitive advantage. Figure 2.2 of resource based view shows the networks that shared by those key authors from whom the core idea comes from. The main ideology of RBV can be

presented when bundles of resources and capabilities are coupled in an organisation to complete certain value-added tasks to enhance the competitive advantage of a firm. Besides, the capabilities are put in place; the advantages gained are gathered from the inimitable resources where it is difficult for the competitors to duplicate it (Hart, 1995).

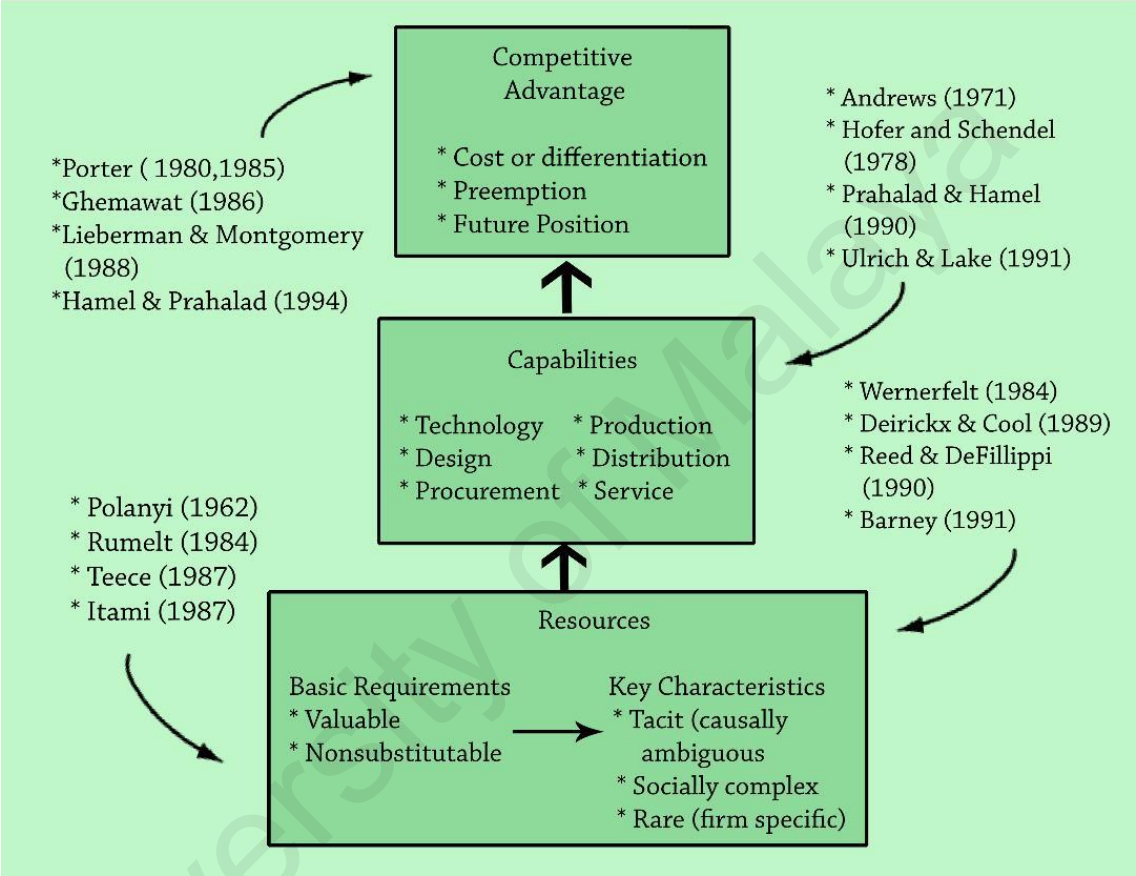


Figure 2.2 Resource Base Views
Source: Hart (1995)

However, a resource that could be turned into the potential competitive advantage of a firm must meet a few criteria. Several authors have discussed five characteristics of a resource that could offer the sustainable competitive advantage of a firm (Barney, 1991; Peteraf, 1993; Rungtusanatham et al., 2003). First, a resource must be valuable to improve the efficiency and effectiveness of a firm in operation. Second, the resource must be rare, so it could be controlled and not easily obtainable by competitors. Third, the resource is imperfect, so it could avoid imitation or duplication by competitors in

identical industry. Fourth, the resource must be imperfectly mobile or unevenly distributed or imitable so that firms could discourage competitors from getting the same resource within their control. Fifth, the resource must not be easily substitutable with equivalent materials for the same application.

Two elements in RBV are resources and capabilities Grant (1991) stated that resources could be considered as core elements in RBV to operate the activities of a firm, whereas the concept of capabilities arises as a result of the ability of a firm to create value by utilizing existing resources through processes to increase its capabilities. Research by Amit and Schoemaker (1993) found that resources and capabilities actually are in nature interdependent. The existence of capabilities is dependent on the source of the resources of a firm.

Größler (2007) agreed that resources in the possession, control or use of a firm are considered as assets in achieving the goals of a firm. There are two types of resources, tangible and intangible resources. Tangible resources refer to customers, staff, or production capacities, whereas intangible resources refer to image, corporate culture, or specific skills. As compared to tangible resources, it is not easy to quantify intangible resources. The RBV theory focuses more on intangible assets. The primary development of RBV focuses on the relationship between resources and capabilities (Grant, 1996). The specific contribution of RBV, based on the research by Mat and Razli (2011), lies in the ability of firms to use their unique bundles of resources to create long-term competitive advantage that challenge competitors to substitute or imitate (Hoopes, Madsen, & Walker, 2003). A different perspective shared by Barratt and Oke (2007) is that synergistic effect of using resources and capabilities, in particular with combination of advantages, could lead to effective utilization of resource and

prevent imitation for the sustainable competitive advantage of a firm. This eventually could lead to the sustainability and better performance of a firm (Dierickx & Cool, 1989; Black & Boal, 1994). In the recent research by Liu, Zhu and Seuring (2017) argued that using resource-based view by focusing on the specific organizational capabilities strategies could support the choice of an organisational strategy that lead to intended environmental management performance. Sancha et al., (2015) believe that the higher the level of firm specific capabilities, it will allow sharing information and coordinating with suppliers that lead to sustainable practices

On the contrary, research by Newbert (2007) provided a new perspective on the RBV theory as compared to current empirical study on RBV. Newbert (2007) and Kraaijenbrink, Spender and Groen (2010) argued that the competitive position of a firm is dependent on its valuable, rare core competencies, and inimitable capabilities rather than merely on its static resources. This is aligned with the study of Mat and Razli (2011) who found that sustainable competitive advantage and high performance cannot be achieved by static resources. Firms must be capable of transforming resources into capabilities. A unique bundle of resources could establish barriers against imitation by competitors, and hence could create sustainable competitive advantage. Several studies have begun to challenge this exclusive assumption. Lee, and Pennings (2001) argued that not only internal resources, but also the supply chain related members could also have great impact on firm performance.

In the competitive market today, firms need to have knowledge capabilities to offer quality products and services at low cost by collaborating with their multiple supply chain members. This view is supported by Priem and Butler (2001) who criticized the RBV as being trapped in an internal perspective, focusing only on inner resources. To

address this theoretical challenge, Dyer (1996), Dyer and Singh (1998) and Knight, Tu and Preston (2014) argued that rather than solely depending on internal resources inter-firm collaborations could contribute to firm competitiveness. Such new perspective of interactive view of RBV has been applied in the concept of environmental sustainability (Christmann, 2000; Shaharudin, Zailani, & Tan, 2014).

There are two schools of thoughts on RBV theory. Azadegan et al. (2008) indicated that RBV theory consists of two prominent viewpoints. The first school of thought is from the static-state perspective (Barney, 1991, 2001; Wernerfelt, 1984), whereas the second school of thoughts focuses on the dynamic capabilities perspective (Eisenhardt & Martin, 2000; Teece et al., 1997). In the research by Chen and Fong (2012) proved that the dynamic capabilities focus on renewal of firms' strategic resources for sustainability of firms within turbulent markets. Dynamic capabilities consider RBV as an evolutionary paradigm subject to further development and enhancement.

However, Rungtusanatham et al. (2003) argued that if a firm controls over internal resources, it can still be considered as having competitive advantage over competitors. An organization can control different stages and types of resources, where these resources are commonly referred to as bundles of resources (Barney, 1991). The so-called different "bundles" of resources should be able to produce different products or services (Wernerfelt, 1984; Conner, 1991; Schulze, 1994) that could lead to the competitive position of a firm.

In conclusion, as pointed out by Penrose (1959), the combination of different resources could reduce imitability and discourage mobility. Wernerfelt (1989, 1995) added that it is more difficult to replicate a particular resource when resources are rooted within a

complex common network. This view is aligned with the research conducted by Wernerfelt (1984), Barney (1991), and Peteraf (1993) who found that firms could achieve sustainable competitive advantage through acquisition of and control over resources. In their research, Wong and Wong (2011) found that heterogeneity of organizational resources have led to differentiation in the competitive advantage of a firm. However, in the research by McIvor (2009), a major concern of the RBV theory is how the internal capabilities of an organization could be developed and compared with the capabilities of the competitors that might affect the competitive position and performance of the former. In summary, Williamson et al. (2012) supported the focus of the RBV on how firms could enhance their internal capabilities towards competitiveness. Therefore, in RBV theory, building capabilities is critically combined with the resources of the firm to achieve competitive advantage for firm performance. As such, Resource-Based View can be seen as an appropriate perspective for considering how purchasing and supply management functions can potentially generate competitive advantage through their sustainability-related activities (Luzzini et al., 2015).

2.7. The Triple Bottom Line (TBL) Performance

The most well-adopted and often-quoted definition of sustainability is from the Brundtland Commission Report, which defines sustainability as "development that meets the needs at the present without compromising the ability of future generations to meet their needs" (Brundtland, 1987).

However, Giunipero et al. (2012) commented that sustainability has increasingly become an important strategic goal recognized by global organizations, yet the

definition is still inconclusive. Berns, Townend, Khayat, Balagopal, Reeves, Hopkins and Kruschwitz (2009) agreed with the view that there is no single recognized definition for sustainability. In short, there is an equivocal definition of sustainability. Despite these confusions on the definition of sustainability, businesses have incorporated sustainability as a major potential issue to be addressed (Berns et al., 2009). On the other hand, Giunipero et al. (2012) affirmed that TBL concept would have determining impact on how businesses think, act, manage, and compete. Since then, many firms have been seriously considering TBL in their business sustainability performance.

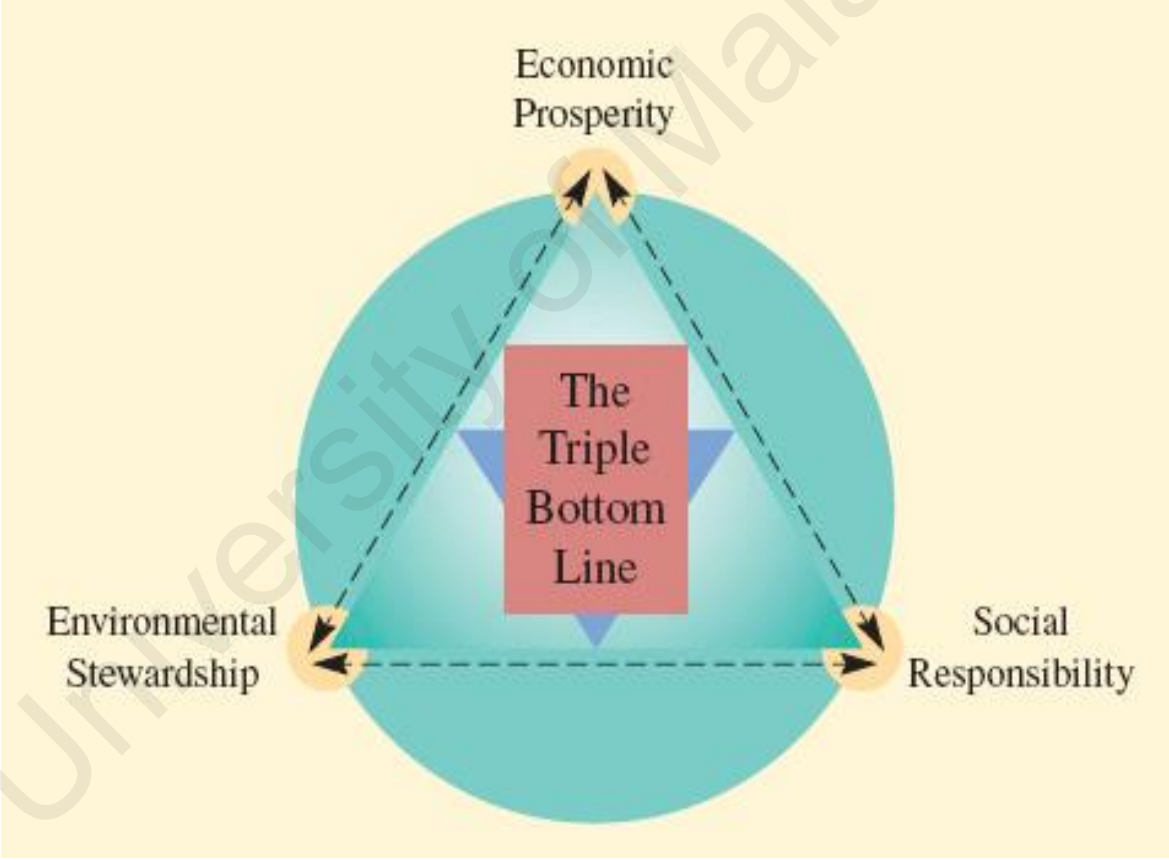


Figure 2.3 Triple Bottom Line Performances
Source: Carter and Rogers (2008)

Elkington (1998, 2004) developed the concept of triple bottom line (Figure 2.3). Literature states that an organizational sustainability at a wider level consists of three dimensions, which are environmental, economic, and social performance. This is

different from the traditional view point which focuses merely on the financial bottom line performance. In TBL, firms must also take into consideration the environmental and social aspect and business sustainability. This was supported by Markley and Davis (2007) who agreed that organization should measure firm performance not only based on traditional financial performance but must also consider the environmental and social dimensions as part of sustainability performance in order to measure their ecological and social responses to environmental issues.

Taking into consideration the macro-viewpoints of TBL concept, Sikdar (2003) and Venkatraman and Nayak (2015) included environmental, economic, and social aspects in the definition of sustainability as a sensible balance for firms to measure their performance based on the three dimensions: environmental stewardship, economic development, and social equity to reflect a complete evaluation for firm performance.

In their research, Stonebraker, Goldhar and Nassos (2009) found that profit maximization has been the main priority for many organizations. In the 1940s, when the rights and needs of people emerged and gained the attention of various stakeholders due to the evolving classical Tayloresque optimization theories, the profit maximization concept was gradually superseded by the increased emphasis on the needs of people. Environmental issue has not gained much more attention, as only minority groups actually appreciated and cared for environmental issues. Even in the 1960s, with the rise of water and air pollution, there was still limited appreciation on environmental issues. However, at the end of twentieth century, in view of the seriousness of global warming, loss of flora and fauna, uncertainties, and changes in weather patterns, concerns about environmental issue started to gain public attention. Thus, some organizations and entities have started to consider issues of sustainability as a trade-off for profits with

social and environmental concerns, compromising profits in order to gain firm sustainability.

TBL, actually, is a direct means by which firms send signals regarding their concern on environmental and social performance to their stakeholders, shareholders and supply-chain partners (Markley & Davis, 2007). The concept of TBL has been widely used in supply-chain management. Hendricks and Singhal (2003) found that the TBL concept has been merged with supply-chain management. Dyllick and Hockerts (2002) and De Giovanni (2010) further explained that in order to achieve long term success and objective within the spirit of sustainability, firms need to compromise short-term profits and consider environmental and social performance as dimensions that translate firm performance into long term success and ensure firm sustainability. In conclusion, a balance and trade off within these dimensions require good balance between long and short-term needs.

2.7.1 Environmental Performance:

Environmental dimensions is defined as the promotion of greater environmental responsibility to encourage development and distribution of environmental friendly technologies by setting objectives, strategies, plans, and mechanisms related to environmental initiatives (Klassen, 2001). Lehtonen (2004) and Winter and Knemeyer (2013) supported this view, and commented that to date, a large proportion of research pertaining to firm sustainability has focused on this dimension.

Montabon et al. (2007) agreed that organizations need to react to the increase difficult environment regulatory requirements imposed by local authorities and stringent requirements from various stakeholders as well as responding to market pressures in

adopting environmental practice and policy. However, Berry and Rondinelli (1998) pointed out that environmental proactive organizations would incur less regulatory-related expenses when compared to those firms that merely aim at compliance with rules and regulations. Being an environmentally proactive firm could bring more business opportunities. Environmentally proactive firms practice ‘‘clean products and processes’’ and voluntarily participate in environmental programs. This opinion was further supported by Montabon et al. (2007) who agreed that proactive approach in environmental programs could lead to efficiency in utilizing resources and greater productivity. Moreover, firms would enjoy more market share and improve profitability, incur lower cost structure, and avoid environmental fines and liabilities. Green supply-chain management plays an important role in environmental issue. The integration with members and departments across organizations promotes synergies that contribute to environmental activities and performance (Darnall, Jolley, & Handfield, 2008a; Gonzalez, Sarkis, & Adenso-Diaz, 2008).

Research by Zhang, Joglekar and Verma (2012) revealed that environmentally sustainable initiatives could improve efficiency in resource utilization and could lead to economic performance. Zhu et al. (2013) agreed that firm competitiveness, using higher eco-efficiency could be improved through sustainable business management. Schaltegger and Wagner (2006) and Lai, Cheng and Tang (2010) indicated that there is new opportunity to increase the competitiveness of a firm by addressing environmental issues to add value to core business programs aside from using new ways of doing business.

In summary, Klassen and McLaughlin (1996), Seuring and Muller (2008) and Nakao, Amano, Matsumura, Genba and Nakano (2007) found positive relationships among

environmental, economic, and social performance. Analysis by Klassen and McLaughlin (1996) proved that there is a positive relationship between environmental performance and firm performance.

2.7.2 Economic Performance:

Economic performance dimension is normally different from the social and environmental dimensions because economic performance, such as efficient utilization of resources and return on investment, are measureable and quantifiable. Winter and Knemeyer (2013) proved that the long-term success and competitiveness of an organization could lead to increased economic performance. Ameer and Othman (2012) mentioned that long-term sustainable management practices could bring higher profit before taxation, significant return on assets, promote sales growth, and give better cash flows from operations that could lead to better economic performance.

From another perspective, firms could also gain economic benefit through green supply-chain management. Montabon et al. (2007), Rao and Halt (2005), and Wong, Lai, Shang, Lu and Leung (2012) indicated that green environmental management has positive effect on the economic performance of an organization. Internal and external green procurement practices could improve environmental and economic performance (De Giovanni, 2012). This view was further explained by Hollos et al. (2012) who found that sustainable supplier cooperation have positive impact on economic performance.

As commented by Dyer and Singh (1998) and Yang, Wang, Wong and Lai, (2008), the formal and informal inter-organizational relationships will promote trust and innovation by minimizing potential risk for firm profitability. One of the main purposes for firms to

pursue environmental management practices was partly to increase the economics of a firm. On the other hand, Ameer and Othman (2012) stressed that integrations and intraorganisational strategic issues and environmental management are associated with improved economic and environmental performance of a firm.

2.7.3 Intangible Performance:

Intangible dimension is at both individuals and organizational levels. Intangible outcomes difficult to quantify such as product image, goodwill and customer satisfaction and loyalty that in the eyes of the stakeholders (ElTayeb et al., 2010). Jamali (2006) proved that intangible bottom line performance relates to social justice, public health, community issues, skills and education, workplace safety, human and labour rights and equal opportunity. Hall and Matos (2010) stressed that intangible or the social dimension is an emerging dimension in the triple bottom line performance. Social dimension became a key challenge in supply-chain management. Firms need to face various stakeholders, handling different requirements and demands, and addressing different opinion and suggestions, which require different solutions for the same problems or issues.

On the other hand, Ellen, Webb and Mohr (2006) shared that an organization could draw the attention of suppliers and customers by enhancing its reputation with its sustainable behavior. Research by Tang and Tang (2012) highlighted that environmental management practices by firms directly improve their corporate reputation and customer satisfaction, which could lead to better economic performance.

However, according to Lehtonen (2004), social phenomena are difficult to be captured and analyzed because these intangible items are not easy for a firm to quantify. Klassen

and McLaughlin (1996) pointed out that intangible factors could bring benefits to employees. However, it is not easy to measure the extent of the benefit of employees because measurement of the performance of employees differs from the measurement of economic performance. Although few empirical studies conducted to investigate the relationship between intangible performance and environmental initiative, there is some empirical evidence available to relate the intangible outcomes in terms of customer loyalty and environmental initiative (Jayaraman & Luo, 2007; Mollenkopf & Closs, 2005).

To conclude, in TBL, environmental performance, economic performance, and social interrelationship carried out by a firm not only positively affects its environment and social performance, but it also promotes long term economic performance and competitive advantage. Carter and Rogers (2008), Godfrey and Manikas (2012) and Alhaddi (2014) proved that applying the concept of interaction of environment, economic, and social aspects is beyond the boundary of an organization. These researchers stressed that it is necessary to cut across and focusing concurrently on all these three dimensionsww. It is more than merely focusing on profit mazimization. Zeng, Chen, Xiao and Zhou (2017) shared Green production practices require complete consideration of environmental, financial, and social performance factors. Therefore, for the sustainability of a firm, incorporating supply-chain activities and green initiatives into the TBL dimensions in the supply-chain management activities of a firm could create long term competitiveness advantage, and organisation's long term objectives.

In conclusion, based on the discussion above, effectively adopting of green initiatives are often a challenging task especially when firms are constrained by their limited resources and capabilities (Klassen & Whybark, 1999; Lee & Klassen, 2008; Wu &

Pagell, 2011; Liu, Zhu & Seuring, 2017). Various stakeholders, such as regulators, customers, competitors have directly imposed pressures on manufacturing firms for green initiatives implementation to achieve firm sustainability.

The research by Wu, Ding and Chen (2012), Clemens and Douglas (2006) highlighted the regulatory, competitive and consumer pressures have the moderation effects on the relationship between firm resources and environmental management practices. This was supported by Bello et al. (2004) and De Clercq et al. (2010), stated that there are moderating effects of the institutional pressures on firm performance. However, the mechanism through which the three forms of pressures have towards a significant positive impact on green purchasing initiative is not consistent among organisations as not all green capabilities are well moderated by institutional pressure.

To overcome the difficulties in green initiatives implementation, manufacturing firms should match their resources and capabilities with their network partners. Tchokogué, Paché, Nollet and Stoleru (2017) pointed out that purchasing professionals need to be equipped with certain traits, such as the capability of monitoring their supply base, furnished with market information and technical capabilities to improve their economic gains through suppliers' integration and collaboration. Newbert's (2007) and Yang (2017) proved that those environmentally proactive firms will be more willing to reallocate their resources and capabilities for successful green initiatives implementation. Wu and pagell (2011) highlighted that manufacturing firms need to be equipped with specific capabilities and abilities coupled with both internal and external resources and capabilities to ease their entire supply chain activities. In the research by Yang (2017), supply chain management has emerged as a key competency that hinge on the firm's ability to develop specific capabilities, such as the ability to collaborate with

their suppliers through information sharing among supply chain partners, and speedy responses to market demands (Huo, 2012)

In the research of Yeung, Zhang and Huo (2009), Laari, Töyli, and Ojala (2017), firms are becoming increasingly dependent on their suppliers to gain competitive advantages and required to address social and environmental issues, besides financial performance. This was supported by Proch, Worthmann and Schlüchtermann (2017) stressed that manufacturing firms generating competitive advantage through their collaboration with the supplier networks. Manufacturers firms in various industries have developed closer relationships for their supplier development programs (Wagner, 2010). This is supported by Awasthi and Kannan (2016), manufacturing firms nowadays enhance their supplier performances through their green supplier development programs. However, selection of the right program for green supplier development is a crucial decision in view of lacking prior experience, limited information, and unpredictable supplier backgrounds.Gimenez and Sierra (2013) emphasized the importance of the supplier assessment and collaboration as critical factors in determining the environmental performance of green purchasing.

The research by Hazen et al. (2014), Waller and Fawcett (20130 and Yang (2017), highlighted that from the RBV perspective, capabilities are an important intangible firm resource where capabilities can be part of an emerging competence of an organisation (Hazen et al., 2014; Schoenherr & Speier-Pero, 2015; Waller & Fawcett, 2013). Also, manufacturing firms survival depends on using their existing capabilities, to enhance and create the new resources and make the capabilities more inimitable (Peteraf, 1993).

Gold et al.(2010), Beske et al.(2014) and Liu, Zhu and Seuring (2017) argued that based on the resource-based view, corporate strategy should be supported by specific organizational capabilities to achieve future performance.

Some firms can perform better than others by looking at the internal resources and capabilities, to generate new knowledge and bring exclusivity to its resource-capability framework (Kraaijenbrink et al., 2010; Song et al., 2007). As such, Resource-Based View can be used as an appropriate perspective for firm sustainability through their purchasing and supply management functions (Luzzini et al., 2015). How integration within an organisation will be the key component of the relationship between resources and capabilities (Rezaei, Wang, & Tavasszy, 2015).

Kim and Rhee (2012) stated that the perspective from both buyers and suppliers is essential when to examine green supply management. However, many prior researchers only focused the green implementation from the buyers' perspective only (Wu et al., 2012; Yang et al., 2013). In the research by Kim & Rhee (2012) stressed that involvement of both the buyers and suppliers are necessary to investigate the sustainability of green supply chain. Thus, an investigation of the impact of the green supply chain on suppliers' competitiveness is required.

Closed and open relations between buyers and suppliers are the key to success on environmental performance (Zsidisin & Hendrick, 1998; Zsidisin & Siferd, 2001). The research by Rao (2005) proved that firms can achieve overall environmental performance through environmentally friendly products supplied by suppliers that using the environmentally friendly technologies.

Suppliers, who represent a critical resource for manufacturing firm sustainability by being proactive in their environmental practice, in this context, manufacturing firms shall integrate sustainable practices in the selection and management of their suppliers (Min & Galle, 1997; Bai & Sarkis, 2010).

Markley and Davis (2007) supported the idea behind the TBL paradigm, that manufacturing firms should consider the ecological and social responses to environmental issues, and not solely focus on traditional bottom line as firm performance. Manufacturing firms need to build their sustainability principle, incorporating with their supply chain management by integrating company's economic, environmental, and intangible objectives to improve the company's long-term performance. Chen et al. (2017) and Luzzini et al. (2015) investigated the effects of intra and inter-firm collaborative capabilities on sustainability in terms of financial, environmental and social and concluded that synchronization of these three dimensions remains as the main challenge for most businesses.

There is a limited number of empirical researches done on the implementation of green purchasing activities in Malaysia. Based on prior empirical research on environmental and green purchasing issues, firms are focused mainly on their own internal activities instead of extended sustainability practices to their external operations, such as using their supply base in supplier selection, development, collaboration, and evaluation, coupled with their internal green purchasing capabilities for firm sustainability. Eltayeb, Zailani and Ramayah (2011) found that many firms have concentrated sustainability efforts only on their internal operations to address the green initiative issue. The perspective of focusing on external operations has created a gap between the conceptual

models and the practical implementations of green purchasing capabilities, green purchasing practices, and triple bottom line performance.

2.8 Proposed Theoretical Framework of the Study

Before the development of the theoretical framework, the first step is to identify the relevant constructs of this study. Intensive review of literature that focus on areas related to supply-chain management and green procurement is required to identify and determine the potential constructs and the possible gaps for this study. This study focuses on green purchasing capabilities, green purchasing practices, triple bottom line performance, and the use of institutional pressure as the moderating variables. For the underlying theoretical development, this study uses RBV theory and institutional pressure, to provide the general perspective of the variables and the relationship between the constructs.

Secondly, interviews with six ISO 14001 manufacturing firms are conducted to finalize the potential constructs relating to green purchasing in Malaysia. The purpose of the interviews is to ensure that the constructs identified from literature review are still relevant and practical when compared to the Malaysian green purchasing context. Based on the outcome of the interviews, the initial framework underwent further evaluation, whereby amendments were made. The proposed framework is then developed for this study.

The proposed framework is used to support the analysis of the results of this research. The proposed framework consists of variables for green manufacturing, integration, intraorganisational, financial and innovative capabilities are the independent variables, green supplier selection, development, collaboration and evaluation are the mediators,

economic, environmental and intangible performance are the dependent variables. Institutional pressures in government, consumer and competitor are used as moderating variables. Figure 2.4 below presents the proposed framework.

2.9 Summary of the Chapter

This chapter explains and defines the concepts and constructs of the study. The chapter proves the concepts, constructs and analyses based on the underpinning theoretical foundations of these empirical studies. Literature reviews have been focused on the areas related to the green purchasing capabilities, green practices, firm triple bottom line, and environmental, economic, and intangible performance. Analysis of literature related to the green purchasing capabilities reveal the twelve types of capabilities: design capabilities, manufacturing capabilities, recovery capabilities, cooperation capabilities, organizational capabilities, resource-based capabilities, integration capabilities, information-related capabilities, strategic capabilities, financial capabilities, capability to market, and innovative capabilities. Additionally, further explanation on the role played by the mediator, the relationship between the green purchasing capabilities and green purchasing practices towards triple bottom line performance.

There are two main theories used to support the theoretical base, and further explain variables and relationships of the study, resource based-view theory and institutional pressure of the firm. This chapter presents an initial theoretical framework that shows the variables and relationships of the study. However, the extent of the applicability of this framework in the context of Malaysia remains to be explored and it will be the subject of the next chapter.

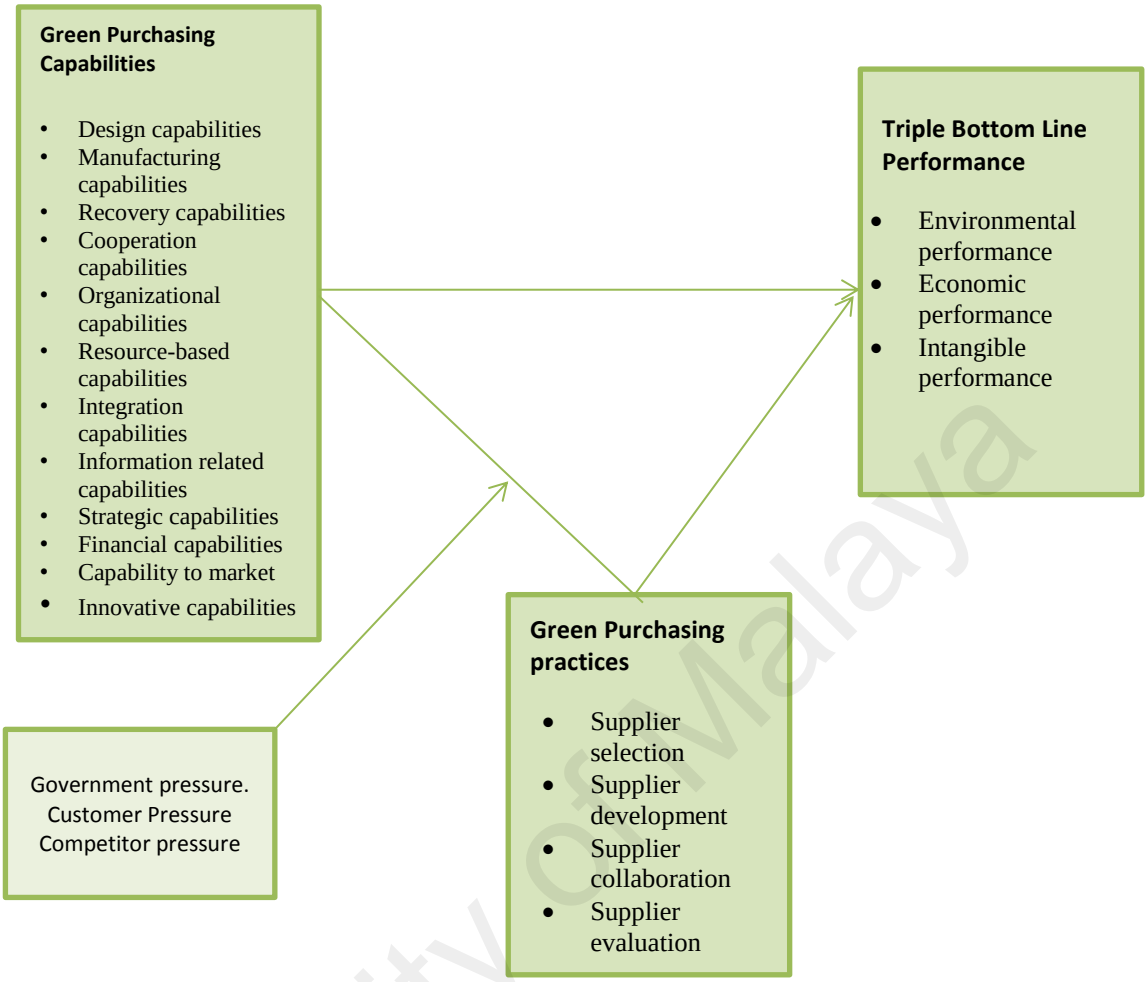


Figure 2.4: Initial Theoretical Framework of the Study

CHAPTER 3: DEVELOPMENT OF THE THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

3.1 Chapter Overview

As mentioned in the previous chapter, this study has developed an unproven theoretical framework or tentative identification of green procurement capabilities, green practices and the impact on firms' Triple Bottom Line (TBL) performance. Given that, this research is aimed at determining and qualifying the variables that can be represented in the Malaysian context. Therefore, it is very important to characterize variables that have already been recognized in the previous chapter, which can characterize the situation in the Malaysian context. The theoretical framework of the study is identified and proposed based on these variables. In this respect, the identified variables would reflect the Malaysian context. The data was collected through in-depth interviews conducted with the representatives of six manufacturers located in central Peninsular Malaysia. Due to the lack of studies on green procurement in Malaysia, especially pertaining to variables that are lacking in the existing literature, interviews are the best method for collecting data.

3.2 Interview Methodology

The main objective of this research is to investigate green procurement capability, practices and the impact on triple bottom line performance, in order to get valid and reliable data on green procurement. The selections of the companies are based on multi-national companies (MNCs) and locally listed companies in Malaysia with ISO 14001 certified environmental management that is generally involved with environmental management and green procurement. The researcher approached eleven companies that are involved in green procurement through telephone calls and emails, briefed them on the purpose of the research, and encouraged them to support and participate in this

research. Out of the eleven companies contacted, six companies were available and participated in the interview. The interviews were carried out with senior purchasing personnel, such as purchasing or procurement managers and purchasing directors of the respective companies to solicit their views and opinions on green procurement. All the six companies that consented to participate in the interview are labelled as Company A, B, C, D, E, and F.

Four of the participating companies are packaging manufacturers, one is a raw material manufacturer and the other is a food and beverages manufacturer. Prior to the interview with the representatives of all these companies, telephone calls were made to remind the interviewees and to fit the time and venue for the interviews. All the interviews were conducted after official working hours to suit the convenience of the respective interviewee's schedules. Table 3.1 presents the background information of the six participating companies:

Table 3.1: Key Profile for all Companies Participating in the Interview

Item	Company A	Company B	Company C	Company D	Company E	Company F
Year Established	1995	1978	1997	1971	1959	1967
Number of Employees	187	150	299	376	389	150
Business Type	FMCG	Packaging	Packaging	Plastic materials	Raw material	Packaging
Annual Sales	RM315 Million	RM380 Million	RM 193 Million	RM 231 Million	RM 1100 Million	RM 185 Million
Products	Consumer product	Paper packaging	2 piece Al can	Lamination base film, PE shrinkable film.	Sugar	Metal container for packaging
Quality Standards	ISO 9001, ISO 14001, HACCP	ISO 9001, ISO 14001	ISO 9001, ISO 22000, HACCP	ISO 9001, ISO 22000, ISO 14001 OHSAS 18001	ISO 9001, ISO 9002, ISO 14001	ISO 9001 ISO 14001

In order to get a clear picture about the companies' green procurement activity, a list of questions was prepared prior to the interviews. The interviews were carried out using seven in-depth semi-structured formats in order to allow additional questions and feedback raised by the interviewees during the interview sessions. The interview questions were designed with the aim of answering the research questions, obtaining further information on green initiatives. The main purpose of the interview is to ensure the constructs or variables used in the study are feasible and practical in Malaysia Context. The questions were designed in both open- and closed-ended formats for the interviewees to express and share their views. The researcher briefed each of the interviewees and shared the objective and purpose of the interview. This was done to ensure that the interviewees have clear ideas about green capabilities and practices and the impact on firm performance in terms of the environmental, economic and social dimensions. There was two-way communication during the interviews that allowed interviewees to raise any question and to share their views and opinions pertaining to their own experience.

Each interview session took about one and a half hours. The researcher took down the points and feedback given by the interviewees on transcripts and prepared the data for subsequent analysis. A summary of the interview questions and transcripts are shown in Appendix C1 and C2 for companies A, B, C, D, E, and F.

3.3. Green Procurement in Malaysia

This section presents the discussion on the extent of the existence of green purchasing capabilities and the triple bottom line with mediating effect of green purchasing practices. This section also discusses the moderating effect of the institutional pressure on green capabilities on the green practices in the context of Malaysia. The analyses of

the data derived from the interviews conducted with the six ISO 14001 certified manufacturers located in central Peninsular Malaysia will be presented in this section. In order to gather more detailed information, in addition to discussions during the interview, the researcher had gathered further data from the respective companies' websites and annual financial reports and reconfirmed and clarified with the interviewees.

3.4 Green Purchasing Capabilities

As discussed in the section 2.4, resulting from the analysis of the literature review in relation to past studies, a total of twelve basic green capabilities variables have been identified, namely: (1) organizational capabilities, (2) manufacturing capabilities, (3) integration capabilities, (4) design capabilities, (5) resource-based capabilities, (6) information capabilities, (7) cooperation capabilities, (8) recovery capabilities, (9) financial capabilities, (10) strategic capabilities, (11) innovative capabilities and (12) speed capabilities to the market. Hence the objective of this section is to evaluate the green purchasing capabilities among the ISO 14001 manufacturing firms in Malaysia, using data collected from interviews.

In the context of direct effects of the green purchasing capabilities on the extent of green purchasing practices, following subsection discusses the green purchasing capabilities in Malaysia according to the representative from Company A.

The purchasing team must be able to work closely with the entire supply chain members. The internal integration of processes with QA, R&D and manufacturing is crucial to the buying of green products for new development to ensure that new products are launch on time. To enlarge the supply base and enhance knowledge and application in the formulation of new raw and packaging materials usage.

Cost saving program is an annual activity Purchasing department is required to cut cost based on the budgeted value. The purchaser must be equipped with the

manufacturing knowledge so that they could work with plant personnel in cost improvement program. Yearly audit is an important activity to ensure that the suppliers meet the green requirements, besides cost cutting.

Based on the above comment, below are the green purchasing capabilities needed for the performance of green purchasing practices:

1. Manufacturing capabilities: Knowledge on the application/usage of raw and packaging materials formulation. The technical knowledge on machineries for cost reduction and energy/utilities usage.
2. Strategy/Organizational capabilities: Capabilities that are needed to plan forward, such as to enlarge the supply base and build a pool of reliable suppliers and for continuous cost improvement and new product development.
3. Integration capabilities: The integration of internal capabilities with the supply chain and external integration with supplier.
4. Financial capabilities: The capabilities for improvement on the overall purchase cost and for managing cost saving programs for green purchasing.
5. Innovation, design and speed: To ensure that new product development are launched on time.

The representative of the Company B described green capabilities in Malaysia as:

The purchasing function that is committed to support the company's position in the value chain and contributing to its competitiveness for the benefit of customers and in compliance with social and environmental requirements.

Overall, coordination with the supply chain, sales and marketing, QA and R&D is crucial. The team must be equipped with commercial awareness/information, with strategic planning for raw and packaging materials to support the local team and to work closely with their HQ.

They need to be proactive to gather market information in terms of supply or cost structure. They must also understand market demands and all new development in order to be more competitive and to maintain their number one position in the overall market

share. The purchaser must have the manufacturing knowledge to ensure that the sourcing process for new items are align with the company's green policy in order to collaborate with the suppliers to ensure the best quality and services are obtained from time to time.

The above statements revealed the green capabilities strategies that could assist in the green purchasing practices as:

1. Financial capabilities: Improving the cost structure to assist their customers in cost reduction program.
2. Innovative capabilities: Continuous improvement in terms of new design and specification in order to maintain their market share.
3. Manufacturing capabilities: Knowledge to ensure that the sourcing process for new items is aligned with the company's green policy, in order to collaborate with suppliers for plant supplies.
4. Strategy capabilities/Intraorganisational: Capabilities that are needed for long term planning for raw and packaging materials and are aligned with the HQ for forward planning.
5. Integration capabilities: The integration of internal capabilities with their supply chain team and with external suppliers.

Meanwhile, the representative from Company C considered green purchasing capabilities in Malaysia as:

Technical knowledge, information, and integration capability, the upstream integration capability is with the suppliers, whereas the downstream integration capability is with their customers in the supply chain. Analyzing cost structure with long term strategic planning to ensure continuous supply of the raw materials (tinplate).

The purchaser must be equipped with the purchasing, sourcing, selecting and evaluating skills to identify a pool of reliable suppliers. The synergy in between the human resources and technical knowhow made them the most well established cans manufacturers in Malaysia.

The above statements indicate the green capabilities strategies that could assist in the green purchasing practices as:

1. Integration capabilities: The ability to collaborate internally with various departments and connect with external parties to improve on the existing process in green initiatives and practices.
2. Financial capabilities: Understand the cost structure, from the input of raw materials to finish goods.
3. Strategy/Organizational capabilities: Able to plan for the long-term.

The representative for Company D viewed green capabilities strategies in Malaysia as:

The requirement for continuous improvement throughout the supply chain for better coordination, alignment within all the departments to achieve company objective. At the same time, coordinating with external suppliers for further improvement, such as development of the new specification in the long run for cost saving program. Purchasing personnel must sharpen their sourcing skills to get latest and cost effective materials and can switch and change the sources as and when required

The green capabilities for Company D are as below:

1. Integration capabilities: The ability to connect with various parties through the internal supply chain processes to improve the working relationship in order to promote green purchasing practices. The integration of internal capabilities of the supply chain members and external integration with suppliers.
2. Financial capabilities: To have better costing knowledge and managing cost in a proper manner.

The representative from Company E considered green capabilities strategies in Malaysia as:

The purchasing team that needs to have manufacturing/technical skills during purchasing, to ensure cost saving for the company, the company requires good refinery management, skills and technical knowhow are required to continuous upgrading of the machinery equipment and plant for better performance.

The purchasers must have the hedging skill for raw sugar in the international market for hedging their raw materials. This is a long-term strategy in their purchase planning. Basic integrating skills such as sourcing, selecting, collaboration with and evaluation of suppliers/agents are critical for the purchasers to ensure that they get the best cost for the company.

The above statements indicate the green capabilities strategies that could assist in the green purchasing practice as:

1. Manufacturing capabilities: Knowledge on the application/usage of raw and packaging materials for cost reduction and energy/utilities usage.
2. Strategy/Resource capabilities: Capabilities that are needed to plan forward, such as enlarging the supply base and managing the cost improvement program.
3. Financial capabilities: The capabilities for improvement on the overall purchase cost and for managing the cost saving program for green purchasing.
4. Integrating capabilities: Possess the basic integrating skills such as sourcing, selecting and collaboration and evaluation with suppliers/agents.

Finally, the representative from Company F viewed the green purchasing capabilities as:

Internal supply chain collaboration, to reduce waste and use resource effectively. The purchaser must have the market information for hedging and work closely with customers for strategic sourcing for LME. The basic technical skills for supplier selection and evaluation, working with customers for new development of cost saving program. Example, such as down gauging/cost saving program for new renovation/design. (Such as 202 lids, down gauge the body of cans).
The green capabilities for company F are as below:

1. Strategy capabilities: Capabilities that are needed to plan forward for firm sustainability.
2. Integration capabilities: Capabilities to connect with their internal and external parties to support the green purchasing practices.
3. Financial capabilities: The capabilities for cost saving program.

In summary, arising from the six interviews, five common green purchasing capabilities in the Malaysian context identified are as follows:

1. Manufacturing capabilities: Knowledge on the application/usage of the formulation of raw and packaging materials. Technical knowledge on machineries for cost reduction and energy/utilities usage.
2. Intraorganisational/strategy capabilities: Capabilities that are needed to plan forward, such as to enlarge supply base, to build a pool of reliable suppliers, working with other functions for continuous cost improvement and new product development.
3. Integration capabilities: The integration of internal capabilities with the supply chain team and external integration with supplier.
4. Financial capabilities: The capabilities for improvement on the overall purchase cost and for managing the cost saving program for green purchasing.
5. Innovative capabilities: To ensure that new product development are launched on time. To be more competitive in the markets.

3.4.1 Conclusion on the Green Purchasing Capabilities in the Malaysian Context

Based on the analysis of the data derived from the interviews, the main green purchasing capabilities in Malaysia are manufacturing capabilities, intraorganisational

capabilities, integration capabilities, financial capabilities and innovative capabilities. The resource base capabilities and organizational capabilities are identified and grouped under the "intraorganisational capabilities" in the interviews while "innovative, design and speed" are grouped under one category, i.e. "innovative capability" as all these capabilities share similar initiatives. A similar basis is applied to "integration and cooperation", as both terms were interchangeably used during the interviews. Information capability was embedded in "integration". Recovery capability was grouped under the "manufacturing capability". All the capabilities stated above are categorized under the resource base capabilities.

The categorization of the respective capabilities dimensions is derived and based on review of the of literature, re-classified and re- defined based on the inputs and comments from the experts from industries, it is matched with the findings of the interviews with the ISO 14001 manufacturers in Malaysia. All these capabilities will be used as independent variables for this study and for the development of the final framework to reflect the green purchasing practices among the manufacturing firms. Hence, the findings from the interviews could be accepted as basis to support the variables for the green purchasing capabilities in the Malaysian context.

3.5 Green Purchasing Practices among Manufacturing Firms

Green purchasing practices are the environmental commitment driven by the strategic level of the purchasing department. Environmental and social problems caused by suppliers are becoming the main focus for many firms as these firms are responsible for their suppliers' actions. Sustainability, besides contributing to their social goals, is the main factor and resource for firm's competitive advantage for corporate survival (Yang, Lin, Chen, & Sheu, 2010).

The main purpose of this section is to present the analysis of the data derived from the interviews on green purchasing practices among the ISO 14001 manufacturing firms in Malaysia. The representative from Company A described the extent of green purchasing practice in Malaysia as:

The main objective of the company is to ensure that health and safety considerations are part of the decision-making processes for purchasing of services, products, equipment and substances. The company is continuously using minimum, rare or specialty items in future new development. Therefore, the company focuses on the selection of approved suppliers, set strict green standard for their suppliers, and on development and collaboration with suppliers. Yearly scheduled audit on the main suppliers will be carried out from time to time.

The representative from Company B viewed purchasing practice as:

Always striving to be a preferred customer to their suppliers. Always work with the suppliers that comply with the United Nations Declaration and Conventions on Human Rights, rights of children, safe and healthy working condition, as well as compliance with the International Labor Organization Conventions. At the moment, all the production waste at their plant or rejects at their customers' plant, together with the paper packaging will be collect back and turned into recycled paper for other purpose/usage. They are very particular about any relevant risk related with suppliers. Therefore, they are very careful in the supplier selection and evaluation, and collaborate closely with the entire supplier chain to ensure that the suppliers meet the company's requirements.

Thus, to a high degree, the environmental requirement or initiatives are always having been taken into consideration for supply base development. Stringent focus on all negotiation with the suppliers. They will only buy from "chain of certified" suppliers. They try to reduce the effects on climate change along the product value chain by monitoring and communicating suppliers' "carbon footprint". Environmental performance is one of the criteria for selecting and evaluating suppliers and for awarding business contracts.

The representative from Company C (a packaging manufacturer for FMCG) described the extent of green purchasing practices as:

Focusing on the environmental issues. The items purchase cannot contain any "banned substances" or "conditionally banned substances". They are very particular in minimizing resources and energy consumption in their manufacturing and distribution activities. Continuous improvement on lightweight packaging that consumes less material will be the top priority in future designs. Therefore, supplier collaboration and

working relationship is very important for further improvement. They are also concern about discharge and pollution from the factory. All the requirements are based on ISO 14001 specifications and environmental guidelines and are part of their corporate social responsibility.

Due to the requirement from their customers, they also requested their suppliers for improvement; such as focusing in recycling and reused, reduce the use of rare natural resources, monitoring energy and water consumption, implementing good manufacturing practice. Setting proper procedures for noise, odor and dust emission and recycling /disposal. Proper handling of hazardous substances in design packaging and transportation.

The representative from Company D indicated the extent of the green purchasing practices as:

This is a locally listed company, producing plastic packaging for all uses. They are one of the major plastic film manufacturers who practices three R principles, reduced, recycled and reused They have three recycle plants to recycle their in-house waste. They collect rainwater for recycling production. Rain water has been used as cooling agent for the recycling process since for most of the machines, 95% of the cooling medium used is water, and it was in a close–loop environment.

For product technology, they work hand in hand with the resin suppliers who are renowned specialists in their own field, such as chemical, petroleum, oil and gas engineering. They also participate in their suppliers' programs, such as new materials development, biodegradable materials, and new product application in resin quality. All these would complement and synergies each other towards sustainability. They also require reports and information on sources of materials for annual evaluation.

The representative from Company E described the extent of the green purchasing practices as:

This is a sugar refinery. Being an innovator and an environmental friendly company, they are the first sugar producer in the region that had succeeded in reducing their energy consumption using a continuous sugar vacuum pan (VKT), recycled vapor from batch pans as the heat source. The wastewater load is very much reduced by recycling, using the NANO filtration system. As a result, the impact on the environment is minimized. Purchasing team has worked closely with reliable contractors and suppliers. Environmental protection criteria are the main criteria when coming to selecting new technologies and equipment. There is big achievement for them, in term of utilizing efficiently in energy, reduced environmental impact with better controlling system, at the same time, reduced consumption of their utilities and consumable materials.

The representative from Company F revealed the extent of green purchasing practice as:

Working closely with those suppliers with green environmental awareness, continuously developing and exploring for new products with improve specification, such as using down gauging materials, reducing thickness of the tin plate for cost improvement, using smaller lid for cost down program. Use nontoxic chemical or inks in their production. Supplier collaboration and evaluation are very critical to ensure that they have a pool of qualified suppliers who can support their green procurement practices. Major suppliers audit will be planned on half-yearly basis to ensure compliance and meeting with their requirements

In summary, it can be concluded that purchasing practices, such as supplier selection, supplier development, collaboration and evaluation are commonly implemented by these companies. During the interviews, the interviewees have emphasized the importance of each practice but not necessarily in terms of priorities. It may be concluded that currently, all the basic green practices are mainly being observed by these Malaysian manufacturers.

3.5.1 Conclusion on the Green Purchasing Practice in the Malaysian Context

Purchasing has evolved from a merely buying function to a strategic function (Ellram & Carr, 1994). Carr and Pearson (1999) found that strategic purchasing has a positive impact on a firm's financial performance. From the analysis of data derived from the interviews, there are four main activities in respect of purchasing practices in the Malaysian context; namely supplier selection, development, collaboration and evaluation. In their research, Large and Thomsen (2011) found that successful implementation of supplier partnership would lead to improved firm performance.

With the increasing role of strategic purchasing, purchasing function is crucial for achieving firm's sustainability. Lamminh and Hampson (1996) found that green supplier relationship strategy directly influenced the purchasing practices in supplier selection, evaluation, development and assessment and that green purchasing practices have a positive impact on firm performance.

3.6 Institutional pressure

A company's business strategies are subjected to institutional pressures from various institutional members, such as key suppliers, consumers, regulatory agencies and competitors. According to the institutional pressure, a company's behavior and reactions are affected by restrictions, expectations and influence of the institutional players. All these forces will influence an organization's responsiveness to formulate norms and value in the institutional environment (DiMaggio & Powell, 1983). Research by Darnall, Jolley and Handfield (2008b) highlighted that institutional pressure will lead to mutual consensus in between the manufacturers, suppliers and customers on how to implement the green initiative. On the other hand, Wu et al. (2012) found that institutional pressure has positive moderating effects on the relationships between the green supply chain drivers and practices. This will support the role played by the institutional pressure as the moderator for this study.

This section examines the role played by institutional pressure in Malaysia context. In this context, below are the observations offered by the respective companies' representatives pertaining to the extent of institutional pressures in Malaysia.

The observations by the representative from Company A:

Government regulation is the main force for compliance, such as water treatment plant, halal certificate and GMP, HACCP requirements are the basic requirements for the implementation of green practices. Consumers' awareness is also another factor for us to implement these initiatives to ensure that the product is free from the hazardous ingredients. In order to be more competitive in the local and global markets, green practices will be able to promote the company's image, increase competitiveness and gain bigger market share in the long run.

The observations of representative from Company B

This is the commitment from the company, or it is more of self-awareness to provide overall competitiveness in the area of quality. In addition, the pressure from the society and consumers' awareness is also another factor for us to implement these initiatives. In order to maintain the number one status in the global market, we must operate and perform better than the competitors to promote a green image.

The observations highlighted by the representative from Company C:

The pressures from their customers, especially for those MNCs and local listed companies, where they need to comply with the groups' standard policies that are implemented worldwide, and compliance with local regulations and requirements, such as reversed logistic, waste treatment and hazardous waste disposal.

The observations by the representative from Company D:

The gradual pressure from the society and consumers' awareness are also the other factors for them to implement these initiatives. Consumers' awareness and compliance with customers' specific restrictions on hazardous substances also led to the implementation of green initiatives by the company. Enforcement by the local authorities, compliance with government regulations in relation to environment matters, such as the handling of the waste discharge or disposal and gas emission are the main forces for them to implement green practices

The observations by the representative from Company E:

Besides meeting the basic environmental requirement set by local authorities, the company is committed on the implementation of green practices to provide overall competitiveness in the global and local market. It can be concluded that this is a self-initiative of the company due to their self-awareness for corporate social responsible.

The observations by the representative from Company F:

It is the company's policy to fulfill the basic requirement set by the local authorities. The company must ensure compliance with the local government regulation and requirement, such as proper disposal of toxic or hazardous materials to meet the ISO 14001 standard. The company must implement green practices in order to ensure that their products meet the rules and regulations set by the authorities, so that they can compete in the local market. Trying to maintain their competitiveness leads them to implement green initiatives.

In summary, the forces of institutional pressure, as highlighted during the course of the interviews are as follow:

1. Regulation – Companies A, C, D, E and F
2. Consumer – Companies A, B, C, D
3. Competitor – Companies A, B, and F

The variables mentioned above, namely: regulation, consumer and competitor are the forces for firms to implement the green procurement. In respect of the implementation of green procurement, it may be concluded that the institutional pressure has played a significant role in affecting green procurement in Malaysia. Quite a number of researchers (Zhu & Sarkis, 2007; ElTayeb et al., 2010; Zhu et al., 2013; Vikram Bhakooa, & Choib, 2013; Huang et al., 2015) have also used regulation, customer and competitor as the three forces of institutional pressure in their studies.

3.6.1 Conclusion on the Institutional Pressure in the Malaysian Context

Regulatory bodies and governments are the main external stakeholders that impose the institutional pressure when it comes to environmental issues (Freeman, 1984; Backer, 2007). The regulatory bodies and governments are typically associated with coercive pressure (Zhu & Sarkis, 2007). To avoid the threat of legal penalties and fines from the regulators and authorities, a business must comply with environmental regulations. Rivera (2004) and Nawrocka (2008) found that regulatory pressure normally arises from the government agencies, and can induce compliance and control of manufacturing firm's activities via regulations and pressure.

Customers' increasingly growing concern with the environmental impact has a strong influence on firms (Handelman & Arnold, 1999), while customers' demand has significantly driven organizations' innovation and change (Rojsek, 2001). Preuss (2002) found that customers' requirements had affected firms' purchasing decision and must be

taken seriously, while Yen and Yen (2012) supported the contention that customers' pressure could directly impact firms' environmental purchasing activities and adoption of green purchasing initiatives.

In the research by Aerts, Cormier and Magnan (2006), they found that competitors' pressure or mimetic isomorphism would more likely force an organization to imitate or benchmark their competitors or those firms that they viewed to be more successful than others. This view further supported by Faizah, Roshayani and Suaini (2009) suggesting that organizations tend to benchmark firms that are in the same industry or same activity or the market's leader. In their research, Chung and Wee (2008) found organizations would pursue internal eco-design initiatives when facing the commercial competitive pressures. Zhu et al. (2013) revealed that mimetic pressures occur when an organization imitates the actions of successful competitors in the industry. When an organization follows or 'mimics' competitors' successful achievement, it can be defined as competitive benchmarking. The rationale is simply to follow the actions of the successful competitors to repeat their successful path.

3.7 The Triple Bottom Line performance among Manufacturing Firms

This section examines the triple bottom line performance, that is, economic performance, environmental performance and intangible performance as part of the requirements in the context of manufacturing firms. Based on the analyses of data derived from the interviews with the six manufacturers (Companies A, B, C, D, E, and F), it can be concluded that in general all these manufacturing firms are found to be practicing green purchasing for their firms' sustainability.

The comment from the representative of Company A is as below:

With their corporate social responsibility, activities focusing on the environmental issues increased the company's image by brand building. They want their consumers to see their products as safe and healthy products, incorporating green initiatives. Their initiatives include supplier collaboration, working closely with suppliers, updating and sharing information to ensure long term benefits in terms of cost, environment and consumer welfare for firm sustainability in the food and beverage industry.

On a similar note, the representative from Company B mentioned that:

The image of transparency, safe, healthy and green environment project a good image for the company. By implementing green procurement, they believe that it would build a solid relationship with their supply base, especially with all the key suppliers, and with trust and mutual advantage, they could strive to be a preferred customer to their suppliers. This was implemented with a clear and precise policy for all the employees. They are continuously setting objective and strategies to improve on the sourcing program, manufacturing excellences and upgrading the transportation activities It shown the commitment from the management to operate their business in an environmentally sound and sustainable manner.

The comment by the representative from Company is as below:

Yes, environmental issues will be the focus in future purchases. The requirement and demand from the customers force them to take steps for continuous improvement in their green practices. They are committed to overall competitiveness in the areas of total quality, services and cost towards customer satisfaction, to ensure total customer satisfaction with their corporate motto of "QUALITY CANS THROUGH TEAM WORK". The long-term plan will be moving forward to better progress and growth, to be a profitable company and yet aiming to be the best of the best in providing packaging solutions for firm sustainability.

Similarly, the representative from Company D stated that:

Cost reduction for customers, better way of using materials, reduce energy and water consumption and use of chemical, and reduce production of waste. More systematic way of disposal or discharge of toxic substances according to regulation.

Yes, through their R&D, they always develop greener packaging solution/improve current specification, reduce usage of toxic and hazardous materials in the production process, and improve formulation for sustainable packaging. It is not easy to capture the intangible benefits, but by focusing on the green concept, they hope to be more competitive and to promote their corporate image in the long run.

Likewise, the representative from Company E indicated that:

There are steps have been introduced to reduce to environmental impact. Improvements in the energy and materials conservation have been taking place to ensure meeting the environment performance. They have achieved stringent growth over the years, not only in increasing the production capacity, but also involved in the technological innovation for cost effective programs. The main achievements are in the areas of energy efficiency, minimizing environmental impact and reduced consumption of utilities and consumable materials. All steps are taken to ensure organizational long-term sustainability.

The same applies to Company F whose representative mentioned that:

Increase customers' satisfaction. They have managed to reduce the impact on the environment by reduction in effluent and emission, efficient in waste and recycle processes and make sustainable use of resources.

Besides meeting compliance with submitting the relevant data on a regular basis to the local regulatory officers, they also focused on reduce, reuse, recycle and dispose principles in their daily operations. Based on cost improvement, innovative capabilities and environmental protection are some of the important criteria in supplier selection. Overall, green purchasing has improved the company's image, quality, cost and competitiveness in order to maintain their market share.

The analysis of the data derived from the interviews revealed that all these companies are implementing green purchasing initiatives that lead to the environmental, economic and intangible performance for their organizations.

3.7.1 Concluding Remarks on the Triple Bottom Line among Manufacturing Firms

Green supply chain initiatives are expected to improve the image of a firm in the eyes of its stakeholders, such as the government agencies, customers, suppliers, employees and the public at large. A firm's positive image is very critical because it could lead to other intangible benefits such like gaining customer satisfaction and loyalty, in addition to improved staff morale (Hoffman, 2001). Some empirical evidence has revealed that environmental initiatives, in general, have significant intangible outcomes on customer loyalty (Hui, Chan, & Pun, 2001; Kassinis & Andreas, 2003; Eltayeb, Zailani, & Ramayah , 2011) and staff morale. In addition, Jayaraman, Yadong and Findley (2007)

agreed that green initiatives could enhance the organizational image and could lead to economic and environmental performance (Zhu & Sarkis, 2004). However, Zailani et al. (2012a) found that there is no any positive relationship between environmental purchasing on the environmental outcome, which reverses the findings made by Bjorklund (2010), who found that contribution of purchasing reduced the impact on the natural environment. Yang et al. (2010) found that firms are increasingly focusing on environmental and social issues that are created by their suppliers and the level of green collaboration with the supplier has a direct influence on environmental performance.

Based on the interviews, it was found that one of the challenges faced by the manufacturers is the difficulty in measuring the intangible benefits. This could be the reason for the lack of availability of systematic monitoring and capturing of the key performance indicators on the environmental purchasing activities of organizations. Thus, this lack of key indicators and capturing system for performance could have led to the findings that environmental purchasing does not contribute towards the environmental performance of an organization. However, in their research, Carter et al. (2000) strongly agreed that environmental purchasing showed a positive effect on the economic, social and environmental performance and it also has a positive effect on a firm's performance in relation to the net income and cost of the goods sold.

3.8 Theoretical Framework

This section introduces the research framework that was used as the basis of this research. Based on the results of the analysis of the data derived from the interviews and taking into consideration the literature reviews. The five green purchasing capabilities are manufacturing capabilities, intraorganisational capabilities, integration capabilities, financial capabilities and innovative capabilities. The four activities which represent

purchasing practices are supplier selection, supplier development, supplier collaboration and supplier evaluation. The triple bottom line is represented by environmental, economic and intangible outcomes.

This study investigates the effects of the green purchasing capabilities on the extent of triple bottom line performance as well as the mediating effect of the extent of green purchasing practice on the relationship between the green purchasing capabilities on the extent of the triple bottom line performance. In addition, this study also investigates the moderating effect of the institutional pressures on the extent of green purchasing capabilities and green purchasing practices in the context of the Malaysian manufacturing sector. The final theoretical framework of the study is shown in Figure 3.1

Figure 3.1: Theoretical Framework of the Study

3.9 Construct Type

Most of the constructs used in this study model were subjected to multiple items. Therefore, it is critical to properly categorize them as formative or reflective before assessing the validity and reliability of the measurement. Measurement model miss-interpreted can lead to measurement error, which in turn affects the validity of a structural model (Jarvis, MacKenzie, & Podsakoff, 2003). The first-order constructs are the green purchasing capabilities, manufacturing, financial, innovative, intraorganisational and integration, while the institutional pressure, regulation,

competitor and customer as moderators are conceptualized as reflective constructs. The second-order constructs are the green purchasing practices and triple bottom line. They are considered as formative construct due to the independent effect of each subscale.

3.10 Research Hypotheses

The theoretical framework of this study consists of the five main hypotheses in addition of the thirty-one sub-hypotheses to examine and reflect the relationship portrayed in the theoretical framework that will be discussed in following sub-sections.

3.10.1 Green Purchasing Capabilities have the Positive Effect on Green Purchasing Practices

In the research by Yang (2017), capabilities being broadly defined as ‘‘complex bundles of skills and collected knowledge couple with their assets that enable firms to integrate activities. Tchokogué, Paché, Nollet and Stoleru (2017) proved manufacturing firms need to possess certain capabilities to perform environment-related competitive advantages,

However, solely depend on these capabilities may not automatically lead to the expected competitive outcome; manufacturing firms need to effectively deploy and exploit the right capabilities for specific green initiative implementation. If the manufacturing firms facing limited resources and capabilities, then develop balancing resources and capabilities with their network partners to face the challenges for adopting their green initiative strategies (Liu, Zhu, & Seuring, 2017).

In this respect, Kerr (2006) emphasized that manufacturing firms require explicit capabilities to implement green environmental practice and activities. Firms should

develop “higher capabilities” which have solid networks of basic resources over their competitors for enhancing firm performance (Black & Boal, 1994; Knight, Tu, & Preston, 2014). In their research, Ordanini and Rubera (2008) highlighted that in view of RBV theory, capabilities are more valuable if combined, this was supported by Mata, Fuerst and Barney (1995), the synergistic effect of different capabilities are crucial, where the effects of such combination often prevent imitation by their competitors. It allows a firm to exploit its resources more effectively (Dierickx & Cool, 1989; Black & Bola, 1994) and led to firm performance.

Zhang, Van Donk and van der Vaart (2016) defined intra-organizational as sharing information technologies within a firm, where it could enhance their internal control capabilities, operation processes, strengthen cooperation performance and improve capacity and capabilities of an organisation. Similarly, Lun, Shang, Lai and Cheng (2016) and Yang (2017) highlighted that organizational capability as organizational characteristics that enable an organization to conceive, choose, and implement strategies as an important source of an organisation’s operational strengths and competitive performance.

In the research by De Toni, De Zan and Battistella (2016) firms need to develop specific capabilities of the organization as a system to cope with different strategies and complexity. Recently, the importance of organizational capability to firm performance and business operations has been well focused. Whereas Lun, Shang, Lai and Cheng (2016) highlighted those firms seeking to maximize financial returns emphasize improvement in their organizational capability.

Gold, Malhotra and Segars (2001) defined innovation is seeming as a collaborative learning process that creating the new external network knowledge from the current knowledge. This is further enhanced by Liu, Huang, Dou and Zhao (2017) proved that a firm's innovation capability, besides depending on its ability to obtain external knowledge but also the firm's ability to identify, apply and judge the value of such knowledge for creating a new product and processes. Lun, Shang, Lai and Cheng (2016) agreed firm's innovation is the improvement of existing business processes, using the new solutions to meet the market requirements.

Liu, Zhu and Seuring (2017) and Shang et al. (2010) shared firm adopting a green design capability shall increase firm's sustained environmentally competitive advantage and such a capability is rather difficult to acquire, imitate, rare and is thus more valuable in long run. Tutar, Nart and Bingöl (2015) highlighted innovation capabilities can assist firms to develop more successful strategies for market performance.

The concept of integration has gained attention in operations and supply chain management literature over the two decades (Ataseven & Nair, 2017). Liu, Zhu and Seuring (2017) indicated that an organization's ability to establish cross-functional collaborative and affiliating relationships with its supply chain members increase customer satisfaction and eventually enhance their firm performance.

The research by Chen, Zhao, Tang, Price, Zhang and Zhu (2017) suggested manufacturing Firms should utilize integrative perspectives such as supplier collaboration and developing trust, can be used to facilitate improved sustainability performance in economic performance and operational performance. Integration

capabilities will help the focal firm to overcome different hurdles and challenges for the adoption of green initiative strategies (Liu, Huang, Dou, & Zhao, 2017).

Based on the literature of the operation management, quality, delivery, flexibility, and cost are the core manufacturing capability dimensions that have been linked to organizational performance. In the research by Chavez, Yu, Jacobs and Feng (2017), shared manufacturing capability refers to the strength of the manufacturers that relative to their primary competitors and should be aligned with the strategic goals of the organization. In the researches by Liu, Zhu and Seuring (2017) and Miller et al. (2010) pointed that the fruitful adoption of a green manufacturing initiative is a complex techniques and processes that must promote internal collaboration with other functional areas, in order to invest in green technologies in manufacturing (Klassen & Vachon, 2003). This was further supported by Chavez, Yu, Jacobs and Feng (2017), Peng et al. (2008) and Terjesen et al. (2011), highlighted using the resource-based view (RBV), it can explain the association between manufacturing capabilities and organizational performance by exploitation of resources such as manufacturing capabilities.

Base on the discussion on green capabilities in section 3.7.1, all the five green capabilities, namely: manufacturing, intraorganisational, integration, financial and innovative lead to the following hypotheses:

H1a: Green manufacturing capabilities have the positive effect on green purchasing practices.

H1b: Green intraorganisational capabilities have the positive effect on green purchasing practices.

H1c: Green integration capabilities have the positive effect on green purchasing practices.

H1d: Green financial capabilities have the positive effect on green purchasing practices.

H1e: Green innovative capabilities have the positive effect on green purchasing practices.

3.10.2 Green Purchasing Practices have the Positive Effect on Triple Bottom Line Performance

Ataseven and Nair (2017) highlighted growing awareness of the requirement for organisation to proactively build sustainability principles into their supply management. Firms increased their efforts in managing suppliers with respect to evaluation and collaboration. Lamminh and Hampson (1996) argued that green purchasing practice has a positive impact on firm performance and is a source of competitive advantage for corporate survival (Yang et al., 2010). In the research by Tate et al. (2012), the researcher has focused exclusively on supplier involvement specifically addressing supplier-related environmental management, where it can play a positive role in shaping environmental practices, without compromising the sustainable in the financial sense and also be socially sustainable. Chen et al. (2017) suggested firms must include the environmental and social impacts when evaluating a firm's performance for firm's long-term survival. Integration of supplier relationships is crucial in regular operation because poor economic, environmental, or social performance will damage its reputation and businesses (Schneider & Wallenburg, 2012).

Integration and recognition of a company's economic, environmental, and social objectives are critical for business processes in order to improve firm’s long-term

sustainable. Song, Xu and Liu (2017) mentioned supply base is one of the most crucial factors for the success of sustainable supply chains, due to collaboration with strong suppliers could improve firm economically, environmentally, and socially performance.

Hence, in view of the above discussion, the proposed hypothesis is as below:

H2: Green purchasing practices have the positive effect on triple bottom line Performance.

3.10.3 Green Purchasing Capabilities have the Positive Effect on Triple Bottom Line Performance

This study assumes that the five green purchasing capabilities (manufacturing capabilities, intraorganisational capabilities, integration capabilities, financial capabilities and innovative capabilities) have a direct positive effect on the extent of the triple bottom line performance. Using the RVB theory, previous literature, as well as the findings from the interviews, it is suggested that green purchasing capabilities are important factors that might lead to being firm sustainability performance. In their research, Lee and Klassen (2008) found that the environmental management capabilities are important to suppliers, where it can reflect on the supplier's capabilities in addressing the environmental problem. Hence, companies with appropriate capabilities of their own and that could control the suppliers would be in the best position to adopt the environmental activities.

Firms can use their manufacturing capabilities to review their product designs, support line disassembly and inspection, focus on reusable product and enhancing component durability for cost improvement for economic performance. On the other hand, using their integration capabilities through internal and external integration and

intercommunication within the supply base, firms can manage not only all parties but could also actually gain considerable advantage out of the integration process for firm performance (Anand & Khanna, 2000). Besides, firms could also enhance their internal innovative capabilities in implementing innovative environmental technologies through the assistance and inputs from their suppliers (Geffen & Rothenberg, 2000). While Hofmann, Theyel and Wood (2012) found that integration of capabilities in collaboration with customers and suppliers by adopting innovation environmental technologies would improve the innovativeness on environmental management practices. In addition, intraorganisational capabilities allow firms to redesign their products and operation processes through collaboration with stakeholders across the supply chain incorporation to support firm performance (Lee & Kim, 2011; Theyel, 2001). However, the research by Sambasivan et al. (2013) proved lack of consensus on financial capabilities towards the economic performance.

Firms sustainability must focus on all these integrated perspective when come to supply chain collaboration with their suppliers. Economic and environmental performance are more highly stressed in the recent researches, while social performance has not been sufficiently explored (Chen et al., 2017)

Thus, based on the above discussion, this study hypothesizes that the five green purchasing capabilities positively affect the environmental, economic and intangible performance. This leads to the following hypothesis:

H3a: Green manufacturing capabilities have the positive effect on triple bottom line performance.

H3b: Green intraorganisational capabilities have the positive effect on triple bottom line

performance.

H3c: Green integration capabilities have the positive effect on triple bottom line performance.

H3d: Green financial capabilities have the positive effect on triple bottom line performance.

H3e: Green innovative capabilities have the positive effect on triple bottom line performance.

3.10.4 Green Purchasing Practices have a positive mediating effect on Green Purchasing Capabilities and Triple Bottom Line Performance

Purchasing function plays an important role in green supply chain management. Thus, it is crucial for purchasing department to develop their green capabilities in their long-term strategy in order to support the business strategy through their green practices. Purchasing function should be directly involved in the business strategy planning process and contribute to the successful implementation of supplier selection, development and the collaboration towards firm performance using their green capabilities (Large & Thomsen, 2011). As strategic purchasing increases, it has directly placed the purchasing and supply management in a central position for sustainability achievement. Thus, it is expected that firms can improve their green purchasing environmental performance besides focusing only on the financial performance.

In the research reported by Wong and Boon-itt (2008), they found that high-level supplier integration in an organization happens when the organization's information systems are linked with that of their suppliers, where both parties, through effective means of communication are able to access real-time information. Also, there should be seamless links in new product development, new design development, technology exchanges, further improvement in the business processes, as well as strong supplier

integration and collaboration (Handfield, 1993). In short, integration with suppliers means changes in terms of attitude from that of rivalry to a more cooperative perspective.

In the past, supplier selection and evaluation were based on the economic criteria such as price, quality and delivery, whereas the environmental and social criteria are always mislaid (Song, Xu & Liu, 2017) Suppliers need to be carefully assessed and selected due to their critical roles in company's sustainability performance. Recently supply management has gained attention in the field of supply chain management, it is important to incorporate the social and environmental parameters into the conventional supplier selection process, besides economic criteria (Chen et al., 2017). In conclusion, the combination of these three dimensions, economic environmental and social will lead to the accomplishment of firm's sustainability.

Based on the above discussion, the proposed hypotheses are as below.

H4a: Green purchasing practices have a positive mediating effect on green manufacturing capabilities and the triple bottom-line performance.

H4b: Green purchasing practices have a positive mediating effect on intraorganisational capabilities and the triple bottom-line performance.

H4c: Green purchasing practices have a positive mediating effect on green integration capabilities and the triple bottom-line performance.

H4d: Green purchasing practices have a positive mediating effect on green financial capabilities and the triple bottom-line performance.

H4e: Green purchasing practices have a positive mediating effect on green innovative capabilities and the triple bottom-line performance.

3.10.5 Institutional Pressure moderates the impact of Green Purchasing Capabilities on Green Purchasing Practices

The institutional pressure has been integrated with new perspectives such as ethical values and ecological thinking to address environmental issues (Ball & Craig, 2010). In addition, external pressures (such as from governments and customers) have an impact on internal purchasing practices (Sarkis et al., 2011). Examples of regulatory mechanisms include standards, laws, procedures, and incentives set by the regulatory bodies to encourage firms to be environmentally responsible. Jennings and Zandbergen (1995) argued that institutional pressures, specifically governmental regulations, have been the main influence for adopting environmental practices. From the motivational perspective, the findings from the interviews conducted for this study suggest that companies are often forced to consider sustainability issues because of customers' expectations. Consumers are beginning to question the environmental effect of the goods that they purchase, with the expectation that the manufacturers comply with the minimum green standards and requirements in their products and process designs. During the interviews, one manager commented that "customers require the suppliers to comply with certain green requirements in the products, such as using non-hazardous ingredients or inputs and increase the recycled content".

Many researchers have identified the three institutional pressures: consumer, regulatory and competitive in their research papers that related to the environmental issues (Darnall et al., 2008; Davidson & Worrell, 2001; Delmas & Toffel, 2004; Freeman, 1984; Rao, 2002; Zhu & Sarkis, 2007; Gonzalez-Torre et al., 2010).

Institutional environment helped companies choose the most effective combination of competitive strategies based on industrial benchmarks (Dimaggio & Powell, 1983) cited in Wu, Ding and Chen (2012) stated that a company's business strategies were affected

by its institutional environment, which included key suppliers, resources, consumers, regulatory agencies and competitors.

Similarly, in the research by Zhu and sarkis (2007), based on the institutional theory, company's behaviors were affected by the external stakeholders such as customer and government agencies; likewise, an organization mimics the actions of successful competitors in the industry and use as their benchmarking in the institutional environment.

Tchokogué, Paché, Nollet and Stoleru (2017) and Meehan et al. (2016) proved that institutional theory is a useful lens to explore the challenges of implementing collaborative procurement in practice because it highlights the tensions between achieving legitimacy and achieving efficiency.

Based on the above mentioned, the proposed hypotheses are as below.

H5a1: Regulation pressure moderates the impact of green manufacturing capabilities on green purchasing practices.

H5a2: Regulation pressure moderates the impact of green integration capabilities on green purchasing practices.

H5a3: Regulation pressure moderates the impact of green financial capabilities on green purchasing practices.

H5a4: Regulation pressure moderates the impact of green innovative capabilities on green purchasing practices.

H5a5: Regulation pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.

H5b1: Customer pressure moderates the impact of green manufacturing capabilities on green purchasing practices.

H5b2: Customer pressure moderates the impact of green integration capabilities on green purchasing practices.

H5b3: Customer pressure moderates the impact of green financial capabilities on green purchasing practices.

H5b4: Customer pressure moderates the impact of green innovative capabilities on green purchasing practices.

H5b5: Customer pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.

H5c1: Competitor pressure moderates the impact of green manufacturing capabilities on green purchasing practices.

H5c2: Competitor pressure moderates the impact of green integration capabilities on green purchasing practices.

H5c3: Competitor pressure moderates the impact of green financial capabilities on green purchasing practices.

H5c4: Competitor pressure moderates the impact of green innovative capabilities on green purchasing practices.

H5c5: Competitor pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.

The theoretical framework of the study shall be evaluated using the five main hypotheses and thirty-one sub-hypotheses that formulated to reflect the relationship represented in the theoretical framework as summarized in Figure 3.1

3.11 Control Variable

To ensure the reliability of the results, there are a few relevant and irrelevant control variables that may affect the results or findings that have been introduced in this study. The potential control variables chosen for this study are the number of employees (firm size), type of the industry and the firm ownership.

Grant, Bergesen and Jones (2002) suggested that firm size can be used as one of the important control variables, where it has been broadly used in the operational and environmental study. One of the good examples that can be observed is the study by Min and Galle (2001) which has highlighted that there is a high possibility for larger firms, rather than smaller firms to adopt the green environmental purchasing. Zhu et al. (2011) found that where larger organizations tend to own more available internal resources and ability to handle more external pressures, they are more prone towards the adoption of the green initiatives. Besides the firms' size, Murillo-Luna et al. (2011) also suggested that many researchers have frequently used the number of employees as a control variable in their studies pertaining environmental issues.

In the research conducted by Murillo-Luna et al. (2011) suggested using the industry type to be used as control variable so that a distinctive types of regulation and experience can be imposed on various sectors. Whereas firm size, firm ownership and industry are used as the control variables in the research by Zhu et al. (2010) for an environmental issue. Thus, it is justified to use firm size, firm ownership and industry as the control variables for further investigation and analysis for this study.

3.12 Summary of the Chapter

This chapter emphasizes on the analysis of the result of the interviews and presents a clearer picture of the green purchasing capabilities and the triple bottom line performance with mediating effect of purchasing practices, and moderating effect of institutional pressure in the Malaysian context that have been previously identified in Chapter 2.

Based on the findings of the interviews, the results show that there are five common green purchasing capabilities in the Malaysian context, namely: manufacturing capabilities, intraorganisational capabilities, integration capabilities, financial capabilities and innovative capabilities. The results from the interviews also revealed that the supplier selection, development, collaboration and evaluation are common green procurement practices that are currently being applied in the Malaysian manufacturing sector. In addition, there are strong indications of a direct impact of the environmental, economic and intangible outcome on firm performance in the Malaysian context.

Moreover, the analysis also revealed that there are interventions in terms of regulations, customers and competitors in adopting a green policy by manufacturers during the process of implementing green initiatives. However, during the interviews, it was found that due to self-initiative, some manufacturers are actually practicing green procurement based on their corporate social responsibility policy. Based on these findings, this study includes the above-mentioned variables in the theoretical framework. The proposed hypotheses attempt to illustrate the effects of green purchasing capabilities of green purchasing practices on firm triple bottom line performance, as well as the moderating effect of the institutional forces.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Chapter Overview

This chapter elucidates the research methodology for this study. A quantitative method was used to collect the primary data relating to the research questions, objectives and hypotheses. This chapter begins with the general research design, describing the unit of analysis, population, sample size and the potential respondents. The subsequent sections discuss the definition of the variables, measurements, questionnaire design and the survey administration. Lastly, the methodology for analyzing the survey data and testing of hypotheses are presented.

4.2 General Research Design:

Based on the research questions, the data was collected using the quantitative survey method. This research study consisted of three stages. The first stage was to identify the major problems, concepts and variables related to this study through extensive review of literature for developing the hypotheses and measurements of the variables. Secondly, in-depth interviews with six purchasing personnel from local established manufacturers were conducted. The purpose of the interview was to establish whether the variables of green purchasing capabilities, green purchasing practices, triple bottom line and institutional pressures could be fully captured; and whether the face validity accuracy of the questionnaire could address the practices within the industry. Thirdly, the primary data was gathered through a questionnaire survey method to investigate and assess the extent of the relationships between green purchasing capabilities and purchasing practices on the triple bottom line, as well as the moderating effects of institutional pressure in the Malaysian context. The advantage of using this quantitative survey is that it could cover wide spread geographical areas in a shorter time at lower cost

(Sekaran, 2003). The following sections describe the methodology by which this research was conducted.

4.3 Population and Sample

The units of the analysis are the service providers and manufacturers certified with ISO 14001 environmental management systems (EMS). The population frame was drawn from local listed and multinational companies across the manufacturing industry. These companies are those who are certified as manufacturing firms in Malaysia, listed in Standard and Industrial Research Institute [SIRIM] and the Federation of Malaysian Manufacturers' [FMM] directory and certified with ISO 14001 environmental management system. This study focused on the ISO 14001 certification manufacturing firms as they are more likely to adopt and implement green practices requirements in relation to their suppliers on the green activities (Darnall et al., 2008; Zhu et al., 2010).

The total sample was drawn from all the ISO 14001 certified companies in Malaysia, certified by SIRIM and those listed in the FMM's 2014 directories (FMM, 2014). A total of 396 ISO 14001 certified companies are listed in SIRIM's list, while 434 companies with ISO 14001 certifications are listed in the FMM's directory. After matching the two lists and eliminating the duplications, the total sampling frame for ISO 14001 certified service and manufacturing companies in Malaysia are 704 companies. The difference was due to SIRIM's list that includes only companies certified by SIRIM, whereas the FMM's list includes those companies that are certified by SIRIM as well as by other certifying bodies. The sampling technique employed is census sampling since the research took the population as the sampling frame. All the 704 companies were included due to the small sampling frame and the high possibility of a low response from the mail survey (Sekaran, 2003). After eliminating the 25

companies that had participated in the pilot study and 6 companies used for the interview, the remaining number of the sample size is 673 ISO 14001 manufacturing firms.

4.4 Respondents

The respondents consisted of senior purchasing professionals with designations such as purchasing or procurement manager, director or general manager. Each of the purchasing professionals served as a key informant. According to Philips (1981), high-ranking respondents tend to be more reliable sources of information than their subordinates.

This study focused solely on green purchasing capabilities, green purchasing practices towards the triple bottom line and moderated by the institutional forces. In this case, the right person would be the one who have the knowledge pertaining to this area to provide the required data and information. The respondents should be those holding post related to purchasing/procurement. However, in some companies, where the purchasing function is operated under the supply-chain or operation management, the supply-chain or operation managers or directors would also be the appropriate person to be respondents.

According to Bowman and Ambrosini (1997), compiling data from a single respondent could lead to potential bias and misleading results. Nevertheless, in this study, using single respondent is justifiable, as not all managers may be knowledgeable in green procurement. In addition, the ideal respondents should be those holding managerial positions as they would have an overall knowledge and experience regarding procurement/purchasing activities. Procurement, purchasing or supply chain managers

are suitable respondents in view of the nature of their job scopes and responsibilities in the purchasing function. However, at least 35 companies were selected for multiple respondents (at least two respondents per company) to test for any significant differences among using single and multiple respondents.

4.5. Development of the Survey Instrument.

Based on the extensive review of previous literature, the survey instrument was further enhanced using the inputs from interviews. The review of literature focused on the areas of green purchasing capabilities, green purchasing practices, resource-based theory, institutional pressure and triple bottom line performance. A few instances of research were found to have used similar measures to assess these. The variables were selected based on reliable and validated measures found in literature in relation to green purchasing. In order to achieve a high degree of the content validity, multiple indicators were used to measure each of the underlying constructs. The measures for each construct were based on the literature review.

4.5.1 Item for Green Purchasing Capabilities

According to Alvarez, Lorenzo and Sanchez (2011), capabilities are a complex set of individual skills, assets and knowledge that firms used very efficiently in the areas of manufacturing, advertising, promotion and distribution. The green capabilities identified for this study consist of five dimensions; namely, green manufacturing capabilities, integration capabilities, financial capabilities, innovative and intraorganisational capabilities. This study used a 5-point Likert scale for all the dimensions in relation to the extent of green purchasing initiative. The scale ranges from 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree. The overall operational

definitions and measurements for each of the green purchasing capabilities are discussed in the following sub-sections.

4.5.1.1 Green Manufacturing Capabilities

Größler and Grubner (2006) stated that from a manufacturing strategy perspective, manufacturing capabilities are combinations of delivery, flexibility and cost that would contribute to company's success factors and competitive advantage which could help in the company's success in the marketplace.

In addition, Talbot et al. (2007) indicated that the scope of manufacturing capabilities include the ability for cost reduction, introduction of new technology and enhancing the working environment. Organizations can improve their performance through environmental friendly production, not only within their own factories, but throughout the entire production chain (Größler & Grubner, 2006). For this study, ten items were adopted from Bowen et al. (2001a), Paulraj (2011), Zailani et al. (2011), GroBler (2010), Pressey et al. (2009), Cai and Zhou (2014), De Giovanni (2010), Carter and Jennings (2004) and Zhu et al. (2013). The green purchasing manufacturing capabilities are shown in Table 4.1 below:

4.5.1.2 Green Integration Capabilities

According to Flynn et al. (2010), internal integration refers to the different departments and functional areas within an organization working and operating as part of an integrated process. Internal integration could break down functional barriers and prompt cooperation rather than operating within a functional silo manner within the respective department.

Table 4.1: Items for Green Manufacturing Capabilities

No	Green manufacturing capabilities	Source
1	Makes sure that products have recyclable or reusable contents.	Zailani et al. (2011), Carter and Jennings (2004)
2	Offers environmentally sound products with higher utilization capacity to reduce materials during production.	GroBler (2010), Zailani et al. (2011)
3	Offers environmentally sound products with higher utilization capacity to reduce energy usage during production.	GroBler (2010), Zailani et al. (2011)
4	Focuses on process capabilities, records of continuous cost reduction in core processes for product improvement.	Pressey et al. (2009)
5	Establishes production planning and control that focus on materials optimization.	Zhu et al. (2013)
6	Implements process design that concentrate on less natural resources consumption in the operations.	De Giovanni (2010), Paulraj (2011)
7	Substitutes the polluting/hazardous materials with more environmentally friendly alternatives.	Paulraj (2011), Zailani et al.(2011)
8	Implements improved advanced technology and method through the use of fewer materials of energy efficiency methods.	Cai and Zhou (2014)
9	Sources some materials from environmentally sound sources.	Bowen et al. (2001a)
10	Develops new skills for product and green technology process that focus on waste reduction.	Bowen et al. (2001a)

Wong and Boon-tt (2008) pointed out that most of the supply-chain literature explained collaboration capability as the integration within functions in terms of linking the processes, information and physical flows as the integration of the supply chains. When there is on time information sharing, effective means of communication and seamless link with the business process with the supplier, it is considered as high-level link in between these two parties.

The nine items for integration capabilities were adopted from Shang, Lu and Li (2010), Zhu and Sarkis (2004), Musa et al. (2013), Pressey et al. (2009), De Giovanni (2010),

Wu, Ding and Chen (2011), Zhu et al. (2013), Bowen et al. (2001a) and Pressey et al. (2009). The measures for green purchasing integration capabilities are shown in Table 4.2 below:

Table 4.2: Items for Green Purchasing Integration Capabilities

No	Green integration capabilities	Source
1	Obtains cross-functional cooperation from suppliers for environmental improvements.	Shang et al. (2010), Zhu and Sarkis (2004), Zhu et al. (2013), Pressey et al. (2009)
2	Establishes written policies and procedures with key suppliers for implementation of green purchasing for firm's sustainability.	Bowen et al. (2001a)
3	Establishes long-range plan with key suppliers for implementation of green purchasing for firm's sustainability.	Musa et al. (2013), Shang et al. (2010), Zhu and Sarkis (2004)
4	Establishes proper communication systems to support exchange of information with suppliers.	Pressey et al. (2009)
5	Ensures that environmental issues are well communicated among the environmental functions and all other departments.	Wu and Pagell (2011)
6	Ensures that the purchasing function works closely with other functions for green purchasing strategies and long term purchasing plan.	Bowen et al. (2001a), Pressey et al. (2009)
7	Ensures that the purchasing function works closely with suppliers for long term purchasing plan.	De Giovanni (2010)
8	Provides suppliers with the design specifications with environmental requirements.	Wu and Pagell (2011)
9	Assists suppliers to establish their environmental management systems.	De Giovanni (2010)

4.5.1.3 Green Financial Capabilities

Firms must discover innovative ways to recover value on the use of capital, technology and work force in order to manage costs to a minimum level (Richey et al., 2005). Murillo-Luna et al. (2011) agreed that financial capabilities are related to the ability of firms to make environmental investments, such as green technology. According to Qi, Sum and Zhao (2009) low cost manufacturing is the priority for all firms to maintain

profitability by getting more orders. In such situation, Kazan, Özer and Cetin (2006) further expressed that the main task of manufacturing firms is to support their business investments by controlling low cost operations to improve their financial performances and create opportunities for the future.

In this context, eight items that reflect financial capabilities were adopted from Lintukangas et al. (2013), Eltantawy (2005), Paulraj (2011), Pressey et al. (2009), Wu and Pagell (2011), and De Giovanni (2010). The measures of green purchasing financial capabilities are shown in Table 4.3 below:

Table 4.3: Items for Green Financial Capabilities

No.	Green financial capabilities	Source
1	Purchasing capabilities influence the financial performance of an organization.	LintuKangas et al. (2013), Eltantawy (2005)
2	Cost management strategy is an increasingly important consideration.	Eltantawy (2005)
3	Focuses on environmental investment to gain high opportunity cost.	Wu and Pagell (2011)
4	Focuses on investment by replacing the existing technologies with the latest technologies in green activities.	De Giovanni (2010)
5	Provides financial reserve for investment in advanced technologies, including environmental solutions.	Wu and Pagell (2011)
6	Allocates the total capital budget in the investment of suppliers' green operation.	Paulraj (2011)
7	Invests in the purchase of green materials activities.	Wu and Pagell (2011)
8	Commits financial resources for green procurement program.	Pressey et al. (2009)

4.5.1.4 Green Innovative Capabilities

Hales, Perrilliat and Bhardwaj (2011) found that the key growth for an organization is innovation. The flow of innovation of both products and processes can be improved in the long term when there is close involvement by a company's key suppliers.

Firms need to be dynamic, innovative and speedy to accommodate the changing needs of customers. Firms must continuously update their capabilities to remain competitive in the market, where the updates are always resulted from the application of creative approaches of doing business. Richey et al. (2005) noted that enhanced innovative capability or the ability to be innovative could eventually lead to greater collaboration and performance when a firm's resources are committed to a project. Hence, five items that reflect innovative capabilities were adopted from Ordanini and Rubera (2008), Zhu et al. (2013), Paulraj (2011), Hamner (2006) and Lee and Kim (2011). The measures of the green purchasing innovative capabilities are shown in Table 4.4 below:

Table 4.4: Items for Green Innovative Capabilities

No.	Green innovative	Source
1	Procurement department is slow in adapting to market changes and new product requirements.	Ordanini and Rubera (2008)
2	Procurement department contributes to reduced lead time and speeding up the time to market.	Ordanini and Rubera (2008)
3	Designs products for reuse, recycle, recovery of materials and component parts.	Zhu et al. (2013), Hamner (2006)
4	Provides the design specifications or gets suppliers' green innovation production inputs during the product development stage.	Zhu et al. (2013), Paulraj (2011), Lee and Kim (2011)
5	Internal cultural emphasis is on innovation and R&D in environmental friendly products.	Paulraj (2011)

4.5.1.5 Green Intraorganisational Capabilities

Due to competitive pressures, purchasing function has secured its role in a strategic position within a firm (Ellram & Carr, 1994; Rajagopal & Bernard, 1994; Pearson & Gritzmacher, 1990; Paulraj et al., 2006; Bai & Sarkis, 2010). In their research, Carr and Pearson (2002) defined strategic purchasing as the involvements in planning, controlling, evaluating and implementing process and the highly important and routine sourcing decisions. The purchasing function can tap on a firm's existing capabilities and resources to carry out all activities for long-term objective and competitive advantage. Selection of suppliers is based on environmental and social criteria, rather than traditionally based on costs, quality and responsiveness of suppliers. Pressey et al. (2009) highlighted that strategic purchasing objectives require a more proactive action in controlling the supply base and continual evaluation and appraisal. Purchasing departments should have long term purchasing plans that are consistent with the company's strategy and objectives and work closely with other functional managers in order to establish purchasing plans with their key suppliers.

In this research, a total of eight items that reflect the intraorganisational capabilities were adopted from Musa et al. (2013), Carr and Pearson (2002), Zhu et al. (2013) and Pressey et al. (2009). The measures of green purchasing intraorganisational capabilities are shown in Table 4.5.

4.5.2 Item for Green Purchasing Practices

Environmentally conscious purchasing focuses on cost reduction, eliminating hazardous items, reducing waste and increase the use of the recycled content in order to meet environmental objectives (Carter & Carter, 1998; Min & Galle, 2001; Zsidisin & Siferd, 2001). Ana and Charbel (2009) suggested that firms could improve their suppliers'

environmental performance through their supply chain integration to reduce their environmental impacts. According to Oh and Seung-Kyu (2010), based on the resource-based view (RBV) perspective, firms can secure competitive advantage by gaining resources or capabilities from other firms through inter-firms collaboration or strategic alliances.

Table 4.5: Items for Green Intraoranisational Capabilities

No	Green intraorganisational capabilities	Source
1	Establishes objectives for purchases of green products and services.	Musa et al. (2013)
2	Conducts awareness-training program on green purchasing.	Musa et al. (2013)
3	Assembles a "Green Team" to identify key players and other resources.	Zhu et al. (2013)
4	Establishes a process for working together to create a timeline, budget and meeting schedule.	Zhu et al. (2013)
5	Assigns responsibilities.	Zhu et al. (2013)
6	Gets support from the top management.	Carr and Pearson (2002)
7	Reviews existing purchasing policy drivers and practices.	Pressey et al. (2009)
8	Targets environmental problems and identify solutions under the green procurement / purchasing program.	Zhu et al. (2013)

Cousins, Lawson and Squire (2008) highlighted effective partnership with suppliers. Firms must continuously manage and monitor their suppliers' performance across multiple dimensions, both the tangible dimensions such as operation performance and the intangible dimensions, such as the relationship status, and providing feedback for improvement to allow corrective actions to be undertaken. The success of close relationship with the supply base is vital for efficient and effective sourcing of goods and services to meet environmental objectives.

This study used a 5-point Likert scale for all dimensions of green purchasing practices. The scale ranges from 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree. The operational definitions and measurements for each dimension of green purchasing practices are illustrated in Table 4.4.2.1.

4.5.2.1 Green Supplier Selection

According to Chin et al. (2006), supplier selection is a crucial process that addresses how strategic selection of suppliers could enhance competitive advantage. In their research, Pearson and Ellram (1995) highlighted the fact that the new supplier selection phase is the most critical practice through the buying process in upstream supply chain design. Ageron et al. (2013) pointed out that the traditional way of supplier selection and evaluation is based on quality, costs, lead-time and delivery. However, in the empirical studies by Jabbour, Frascareli and Jabbour (2015), Igarashi, De Boer and Michelsen (2015), they mentioned that firms not only employed the conventional way, but have also considered environmental criteria in supplier selection practices. Humphreys, Huang and Cadden (2005) opined that the environmental aspects and criteria must be considered when selecting suppliers. Hence, eight items that reflect green supplier selection were adopted from Paulraj (2011), Zhu et al. (2013), De Giovanni (2010), Ladd and Badurdeen (2010), Reuter et al. (2010) and Bowen et al. (2001). The measures of green purchasing selection are shown in Table 4.6.

4.5.2.2 Green Supplier Development

According to Krause (1999), Oh and Seung (2008) and Rezaei et al. (2015) supplier development can be defined as the effort of the buying firms to improve their suppliers' performance and their capabilities to meet the buying firms' long-term supply

requirement. Firms can leverage on supplier development programs to expand their suppliers' performance and capability for their own benefits.

Table 4.6: items for Green Supplier Selection

No.	Green supplier selection	Source
1	Suppliers are selected based on their environmental competency to support buying firm's environmental objectives such as reduction in waste.	Paulraj (2011), Zhu et al. (2013), De Giovanni (2010), Ladd and Badurdeen (2010)
2	Suppliers are selected based on their environmental competency to support buying firm's environmental objectives such as reduction in air emissions.	Paulraj (2011), Zhu et al. (2013), De Giovanni (2010), Ladd and Badurdeen (2010)
3	Suppliers are selected based on their environmental competency to support buying firm's environmental objectives such as reduction in hazardous substances.	Paulraj (2011), Zhu et al. (2013), De Giovanni (2010), Ladd and Badurdeen (2010)
4	Suppliers are selected based on their technical and eco-design capabilities.	Paulraj (2011)
5	Suppliers are selected based on their ecological production capabilities.	Paulraj (2011)
6	Suppliers are selected based on their abilities to develop environmental friendly goods.	Paulraj (2011)
7	Suppliers are selected based on environmental and social criteria, rather than using traditional suppliers based on costs, quality, and responsiveness of suppliers.	Reuter et al. (2010)
8	Requirements are on suppliers to have an environmental management system.	Bowen et al. (2001a)

In their research, Oh and Seung (2008) pointed out that supplier development programs that include training; direct investment and education that positively affected the long-term relationships, and practicing a win-win attitude and continuous improvement of both the buying firms and the suppliers. In spite of their observations, a handful of researchers had actually examined supplier development from the suppliers' perspective and supplier capabilities for development.

Six items that reflect green supplier selection are adopted from Zhu et al. (2013), Yen and Yen (2012), De Giovanni (2010), Tate et al. (2012), Miemczy (2008), Bowen et al. (2001a), Krause, Scannell and Calantone (2000), Gimenez and Sierra (2013) and Klasen and Vachon (2003). The measures of green supplier development are shown in Table 4.7 below:

Table 4.7: Items for Green Supplier Development

No.	Green supplier development	Source
1	Cooperates with suppliers to use environmental friendly packing such as using degradable and non-hazardous materials.	Zhu et al. (2013)
2	Cooperates with suppliers to use environmental packaging such as lightweight packaging.	Yen and Yen (2012)
3	Guides suppliers to establish their own environmental programs.	De Giovanni (2010)
4	Develops mutual understanding with suppliers of environmental criteria and performance.	De Giovanni (2010), Tate et al. (2012), Miemczy (2008)
5	Provides training/education to suppliers' personnel.	Bowen et al. (2001a), Krause et al. (2000), Gimenez and Sierra (2013), Klasen and Vachon (2003)
6	Visits to supplier' premise to help them improve their performance.	Bowen et al. (2001), Krause et al. (2000), Gimenez and Sierra (2013), Klasen and Vachon (2003)

4.5.2.3 Green Supplier Collaboration

In the research by Dobrzykowski et al. (2012) it was found that creating value to support firm performance lies in the procurement function, which is the main purpose for purchasing departments. Inter-company collaboration can be in many forms, such as alliances, joint ventures and partnerships. In addition, Lager and Frishammar (2010) found that integral collaborative activities within each structure require exchange of information flow and sharing of knowledge between the parties involved.

Value creation for collaboration and sharing of information with suppliers hinges on the firms' capabilities, where such collaborative exchanges allow purchasing departments to create value for the firms. However, many firms are still struggling to achieve success in this regard in their research, Tsai, Tsai and Wang (2012) found that collaboration is a learning process to gain external knowledge. During this process, the level of accumulation of technological knowledge is dependent on identify and utilizing effectively the external learning process, thus improving the effect of external linkage on product innovations.

In this research, six items that reflect the green supplier selection were adopted from Carter and Carter (1998), Tate et al. (2012), De Giovanni (2010), Bowen et al. (2001b), Gimenez and Sierra (2013), Ordanini and Rubera (2008), Wu and Pagell (2011), Zhu et al. (2013), Paulraj (2011), Carr and Pearson (1999) and Yan (2011). The green supplier collaborations are shown in Table 4.8.

Table 4.8: items for Green Supplier Collaboration

No	Green supplier collaboration	Source
1	Establishes joint decision about ways to reduce overall environmental impact of the buying firm's products.	Carter and Carter (1998), Tate et al. (2012), De Giovanni (2010), Bowen et al. (2001b), Gimenez and Sierra (2013)
2	Open to sharing information with suppliers and with other departments.	Ordanini and Rubera (2008)
3	Cooperates with suppliers for green environmental objectives.	Wu and Pagell. (2011), Zhu et al. (2013), Paulraj (2011), De Giovanni (2010)
4	Conducts strategic joint planning to anticipate and resolve environmental related problem.	De Giovanni (2010), Carr and Pearson (1999)
5	Collaboration with suppliers to provide materials, equipment, parts and/or services that support the buying firm's environmental goals.	Paulraj (2011)
6	Look for synergetic ways to do business together with suppliers.	Yan (2011)

4.5.2.4 Green Supplier Evaluation

According to Prajogo et al. (2012), supplier assessment is the evaluation of the suppliers' capability and performance compared to other similar companies in the industry. The purpose in the long run is to provide the necessary feedback and inputs to the buying firms for the latter's performance. Sundtoft Hald and Ellegaard (2011) defined supplier evaluation process as the purpose of measuring the efficiency and effectiveness of suppliers' performance in their actions and practices.

In the research by Pressey et al. (2009), it was found that selecting the "right" suppliers and systematic evaluation of suppliers' performance has become an important purchasing function and activity. The main reasons could be due to business complexities and the trend of globalization affecting the buying firms' preference that influenced the buying decision-making. Prajogo et al. (2012) agreed that supplier evaluation becomes a critical responsibility and process of purchasing function to monitor and evaluate suppliers' performance and capability. This practice should provide evaluation feedback and expectation of the buying firms towards their suppliers' performance for further improvement. It also provides an opportunity for firms to develop critical product and process categories with their key suppliers using the evaluation inputs.

In this research, six items that reflect the green supplier selection were adopted from Bowen et al. (2001a), Wu and Pagell (2011), Zhu et al. (2013), Paulraj (2011), Gimenez and Sierra (2013), Klasen and Vachon (2003), Krause et al. (2000), and Tate et al. (2012) as shown in Table 4.9.

Table 4.9: Items for Green Supplier Evaluation

No.	Green supplier evaluation	Source
1	Builds environmental criteria into the vendor's assessment system/supplier questionnaire.	Bowen et al. (2001a)
2	Implements second tier supplier environmental friendly practice evaluation.	Wu and Pagell (2011), Zhu et al. (2013)
3	Conducts regular environmental audits on suppliers' internal operation/management.	Paulraj (2011), Wu and Pagell (2011), Zhu et al. (2013), Gimenez and Sierra (2013), Krause et al. (2000)
4	Assesses suppliers' performance through formal evaluation, using established guideline and procedure.	Klasen and Vachon (2003), Gimenez and Sierra (2013), Krause et al. (2000)
5	Develops improvement plan, assesses feedback and performance.	Tate et al. (2012), Gimenezand and Sierra (2013)
6	Recognizes suppliers' achievement in the form of awards for good performance.	Klasen and Vachon . (2003), Tate et al. (2012), Bowen et al. (2001a)

4.5.3 Items for Triple Bottom Line Performance

Environmental issues are considered as an integral part to achieve firms' sustainability. The main challenges for many firms are how to balance the environmental issues and firms' business practices in a vibrant, complex and uncertain situation.

According to Gimenez et al. (2012), firms could gain positive financial performance through engaging in intangibles and environmentally responsible behavior. Nevertheless Jamali (2006) pointed out that there are challenges faced by organizations, including how they can accomplish and balance all the three dimensions (environment, economic and intangible) and how to merge all these inter-related activities for overall corporate performance. Wua and pagellb (2011) supported the contention that to achieve firms' sustainability, firms should integrate all these values, issues and processes to maximize the positive impacts in order to generate added economic, social and environmental value to the firms.

This study used a 5-point Likert scale for all dimensions of green purchasing practices. The scale ranges from 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree, with statements suggesting the outcomes actually apprehended by a firm. The definitions of these three dimensions of outcomes: environmental, economic and intangible and their measurements are illustrated as follows.

4.5.3.1 Environmental Outcomes

Environmental outcomes for firms' sustainability can be achieved through green initiatives at the plant level. The green initiative and a firm's supply chain capability always lead to compliance with environmental standards. It is often related to pollution, waste and emission reduction, energy consumption efficiency, decrease in consumption of hazardous/harmful materials and decrease in frequency of environmental accidents (Gimenez et al., 2012).

A total of seven items for environmental outcomes were adopted from Zailani et al. (2012a), Zhu et al. (2013), Wu and Pagell (2011), Perotti, Zorzini, Cagno and Micheli (2012), Klasen and Vachon (2003), Rao and Holt (2005), Paulraj (2011), and Gimenez and Sierra (2013). The measures for the environmental outcomes are shown in Table 4.10.

4.5.3.2 Economic Outcomes

Economic performance refers to the impact of firms' green initiative that should lead to firms' overall financial performance. Simpson (2012) opined how manufacturing enterprises pursue to implement environmental management practices at the plant level in order to manage their production or manufacturing costs effectively, increase their productivity and sales that eventually lead to profitability.

Table 4.10: Items for Environmental Outcomes

No.	Environmental outcomes	Source
1	Significant reduction in consumption of hazardous materials and harmful/toxic materials.	Zailani et al. (2011a), Zhu et al. (2013), Wu and Pagell (2011), Perotti et al. (2012), Klasen and Vachon (2003)
2	Significant increase in reuse, recycle and recovery of materials, component or parts.	Wu and Pagell (2011), Klasen and Vachon (2003), Rao and Holt (2005).
3	Significant reduction in air emission.	Zhu et al. (2013), Perotti et al. (2012), Paulraj (2011), Klasen and Vachon (2003), Rao and Holt (2005).
4	Significant reduction in water and solid waste.	Zhu et al. (2013), Perotti et al. (2012), Paulraj (2011), Klasen and Vachon (2003), Rao and Holt (2005).
5	Significant decrease in frequency of environmental accidents.	Zhu et al. (2013), Paulraj (2011).
6	Significant reduction in energy consumption.	Perotti et al. (2012), Paulraj (2011).
7	Significant improvement in the overall environmental performance of the buying firm.	Rao and Holt (2005), Gimenez and Sierra (2013), Zhu et al. (2013), Wu and Pagell (2011).

In their research, Zhu et al. (2013) highlighted that firms which address environmental issues would have increased opportunities for competitiveness in the market and explored new ways of doing business as firms' core value. Studies have shown that corporate internal and external green management practice has positive effects on an organization's economic performance (Montabon et al., 2007; Rao & Holt, 2005; Wong et al., 2012). In their research, Ramirez, Gonzalez and Moreira (2014) found that long-term orientation in sustainable green management practice would be important for return on assets, sales growth, cash flows and profit before taxation from operations. In addition, Zhu et al. (2013) and Jamali (2006) agreed that sustainable supplier collaboration has positive significant effects on economic performance.

Six items for economic outcomes were adopted from Zhu et al. (2013), Perotti et al. (2012), Paulraj (2011), Wu and Pagell (2011), De Giovanni (2010), Kazan et al. (2006), Corsten and Felde (2005) and Carr and Pearson (2002), the measures of economic outcomes are shown in Table 4.11.

Table 4.11: Items for Economic Outcomes

No.	Economic outcomes	Source
1	Decrease in cost of materials purchased.	Zhu et al. (2013), Perotti et al. (2012), Paulraj (2011), Wu and Pagell (2011)
2	Decrease in cost of energy consumption.	Zhu et al. (2013), Perotti et al. (2012), Wu and Pagell (2011), Paulraj (2011)
3	Decrease in fees for waste treatment/discharge.	Zhu et al. (2013), Perotti et al. (2012), Paulraj (2011)
4	Decrease in fine for environment accidents.	Zhu et al. (2013)
5	Increase in market share, revenue and return on investment.	Perotti et al. (2012), De Giovanni (2010), Paulraj (2011). Kazan et al. (2006), Corsten and Felde (2005), Carr and Pearson (2002)
6	Increase in cost of operating, training and purchasing of environmental friendly materials and activities.	Perotti et al. (2012)

4.5.3.3 Intangible Outcomes

Intangible outcomes are the new core components of corporate sustainability. Intangible outcomes are difficult to be measured, as their internal and external stakeholders are customers, suppliers, employees and the general public (Lee, Geum, Lee, & Park, 2012). Jamali (2006) further explained that intangible bottom line opportunities incorporate issues which are related to social benefits, such as, human and labor rights, workplace safety and conditions, community and social justice and public health. All these expectations are from the diverse internal and external groups of stakeholder.

Seven items for intangible outcomes were adopted from Rao (2002), Kassinis and Andreas (2003), Rao and Holt (2005), Gimenez and Sierra (2013), Qi, Sum and Zhao (2009), Paulraj (2011), De Giovanni (2010), Hillestad, Xie and Haugland (2010) for this study. The measures for the intangible outcomes are shown in Table 4.12

Table 4.12: Items for Intangible Outcomes

No.	Intangible outcomes	Source
1	Improvement in the level of firm's image in the eyes of public.	Rao (2002), Kassinis and Andreas (2003), Rao and Holt (2005), Gimenez and Sierra (2013), Qi et al. (2009)
2	Improvement in environmental reputation of the firm.	Rao and Holt (2005), Gimenez and Sierra (2013)
3	Improvement in overall stakeholder health and benefits.	Paulraj (2011), De Giovanni (2010)
4	Improvement in occupational health and safety of employees.	Paulraj (2011), De Giovanni (2010)
5	Improvement in community health and safety.	De Giovanni (2010)
6	Reduction in environmental impacts and risks of products and services to public.	Paulraj (2011), De Giovanni (2010)
7	Strengthening of the firm's corporate brand as innovative, socially responsible and environmentally aware.	Hillestad et al. (2010)

4.5.4 Items for Institutional Pressures

According to the institutional pressure, the pressures imposed by the authorities and external stakeholders will affect the firm's behavior when they formulate their policy, values and strategic. Under the pressure of the institutional pressure, Wu, Ding and Chen (2012) and Wong and Boon-itt (2008) pointed out that many companies are forced to adopt proactive environmental initiatives, adjust their business models and reallocate their resources due to institutional pressures.

This study used a 5-point Likert scale for all dimensions of green purchasing practices. The scale ranges from 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree. The operational definitions of these three dimensions of regulation, customer and competitive pressures are explained below.

4.5.4.1 Regulation Pressures

Regulation pressure refers to the coercive mechanisms that induced obligations or incentives to perform a specific practice (Scott, 2001). It refers to legislation; standard and rule, which includes the elements of obligations and incentives set by local or foreign governments, international organizations or parent companies that influence manufacturing firms to practice green initiatives. In their research, Wong and Boon-itt (2008) identified governmental or regulative pressure as the main external driver that inspires firms to adopt green environmental initiatives. Zuckerman (2000), Wong and Boon-itt (2008) and Burritt and Schaltegger (2014) pointed out that many studies had focused on institutional pressure, particularly on the regulative pressure that requires firms to look into the environmental management practices such as ISO 14001 certification or green practice on the investment recovery.

Seven items that reflect the above-mentioned elements of regulations were identified for this study. All these items are adopted from Carter and carter (1998), Darnall (2006), Zailani et al. (2011), Bowen et al. (2001b) and Wu and Pagell (2011). The measures of regulation pressure are shown in Table 4.13

4.5.4.2 Customer Pressures

As similar to regulations, customer pressure is considered as one of the powerful mechanisms that induced firm green initiatives. Consumers are important stakeholders

who influenced the requirement of products that are more environmental friendly, even though the products may carry small price premium. Waddock and Bodwell (2002) emphasized that environmental friendliness is through the product physical appearance.

Table 4.13: Items for Regulation Pressures

No.	Regulation pressures	Source
1	Adopting green practices to reduce or avoid the threat of current or future government environmental legislations.	Carter and Carter (1998).
2	Facing large number of environmental regulations or restrictions imposed by the government.	Darnall (2006), Zailani et al. (2011).
3	Attempting to go beyond basic compliance with laws and regulations on environmental issues.	Bowen et al. (2001b).
4	Facing frequent government inspections or audits to ensure compliance with environmental laws and regulations.	Zailani et al. (2011).
5	Financial incentive offered by the government, such as grants and tax reductions are significant motivators for firms to adapt to green purchasing initiatives.	Zailani et al. (2011).
6	Green environmental management has been influenced by government's environmental regulations.	Wu and Pagell (2011).
7	Facing potential conflicts between products and environmental regulations that affect green environmental management.	Wu and Pagell (2011).

Clement (2005) stated that the increased desire of customers to purchase from more reliable and responsible companies given the rising purchasing power of these customers indirectly determined the environmental standards for firms' compliance with specific green initiatives. Six items that reflected these elements were adopted from Carter and Carter (1998), Zailani et al. (2012a), Wu and Xiao (2014), Carter and Ellram (1998) for this research. The measures of customer pressures are shown in Table 4.14

Table 4.14: Items for Customer Pressures

No.	Customer pressures	Source
1	Major customers frequently require firms to adopt green supply chain initiatives.	Carter and Carter (1998), Zailani et al. (2012a).
2	Major customers have clear policy statements regarding their commitments to the environment.	Carter and Ellram (1998).
3	Requirements from consumer associations to be a more environmentally conscious firm.	Carter and Ellram (1998), Zailani et al. (2012a).
4	Believes that increase in consumers' awareness on environmental protection would increase in green consumption.	Wu and Xiao (2014).
5	Major customers always reject products if they contain hazardous elements.	Zailani et al. (2012a).
6	Major customers always reject products if they do not contain recyclable or reusable contents.	Zailani et al. (2012a).

4.5.4.3 Competitor Pressures

Firms may be pressured to imitate their competitors' business model and strategy. Vikram Bhakooa and Choib (2013) found that when organizations are faced with an uncertain environment, they may benchmark their behavior against that of successful organizations within their industry by studying the industry's trend and try to follow those they think are performing. In addition, Wu et al. (2012) agreed that competitive pressures are causing companies to use their internal organizational resources more efficiently, strengthen their competitive advantage and improve their performance. In the study by John, Cannon and Pouder (2001), they found that firms sometimes implement environmental friendly programs and new technology without studying their impacts, but rather due to competitive pressure, especially when organizations are operating in an intense competitive and uncertain situation, they would mimic or benchmark their performance against their competitors.

Six items that reflect these elements were adopted from Lin and Sheu (2012), Eltayeb et al. (2010) and Wu and Pagell (2011). The measures for competitor pressures are shown in Table 4.15.

Table 4.15: Items for Competitor Pressures

No.	Competitor pressures	Source
1	Main competitors have adopted green vendor certification have benefited greatly.	Lin and Sheu (2012).
2	Main competitors have adopted green vendor certifications are perceived favorably by customers.	Lin and Sheu (2012).
3	A successful and big firm in the industry has adopted green initiative.	Eltayeb et al. (2010).
4	The industry generally believes that green initiative is considered as important for improving organization image.	Eltayeb et al. (2010).
5	The industry generally believes that green initiative is the most appropriate initiative to achieve business objectives.	Eltayeb et al. (2010).
6	Green environmental management has been effected by competitors and green environmental protection strategy.	Wu and Pagell (2011).

4.6 Questionnaire Design

The survey questionnaire was developed based on the above-mentioned measurements. A total of six sections and one hundred and three items pertaining to green purchasing capabilities, green purchasing practices, triple bottom line performance and institutional pressures were designed.

Section A aims at soliciting the background information related to the firms. This section includes questions, such as, nature of the business, type of industry, number of employees (firm size), age of the firm, status of ownership, number of suppliers, origin of the purchased materials and efforts in purchasing programs. The objective of soliciting such information is to understand the characteristics and nature of the firms.

This will allow the researcher to identify similar and atypical features of the firms. Section B pertains to questions related to the five types of the green purchasing, namely; manufacturing capabilities, intraorganisational capabilities, integration capabilities, financial capabilities and innovative capabilities.

Section C contains items on the extent of green purchasing practices in supplier selection, development, collaboration and evaluation. Section D includes items on institutional pressure from the government, customers and competitors. Section E includes items for the triple bottom line performance. Lastly, in section F, the questionnaire ends with the questions pertaining to personal information of the respondent. In order to reduce the sensitivity and biases (Sekaran, 2003) a copy of the questionnaire is attached in Appendix A2.

4.7. Pre-Testing of the Questionnaire

Pre-testing of the questionnaire was conducted to test the validity and reliability of the variables indicated in the questionnaire. Content validity is used to ensure all the measures are appropriate to measure the concepts that are supposed to be measured during this study (Sekaran, 2003). The reliability test is to assess the internal stability and consistency of the measures for each variable (Hair, Anderson, Tatham, & Black, 1998).

4.7.1 Validity Testing

The measurement was developed by adopting the previous research; and specifically designed to suit the content of this study. Pre-testing evaluation is to validate the content and to verify that the measurement of variables can actually measure the concept of this

study (Sekaran, 2003). Validity test is carried out by referring to the pre-test method suggested by Hsu, Tan, Zailani and Jayaraman (2013).

For validity testing, there are two stages need to be carried out. At the first stage, face validities for the variables were validated by two academic staff of a public university in Malaysia and four practitioners who are holding senior positions in companies with ISO 14001 certification and located in central of West Malaysia. The two academicians are associate professors, while the four practitioners have immense experience in the field of purchasing, procurement, supply management and supply-chain management. All these respondents were requested to provide feedbacks on the questionnaire in terms of definition, language clarity and rationale of the questions, logical flow of sentences and the comprehensive design, to ensure that the concepts could be properly measured. Amendments were made as per suggestions from the respondents.

At the second stage of pre-testing, a set of questionnaires were distributed to each of twenty-five ISO 14001 certified companies located in central part of West Malaysia. The twenty-five companies were selected using convenience sampling method, based on SIRIM and FMM's listing. The purpose of this pilot test was to clear up ambiguities, to assess the appropriateness and conception of the questions in the questionnaire (Sekaran, 2003). Simultaneously, the intention was to obtain feedbacks on the general structure and sequence of the questions in the questionnaire. Several telephone calls were made to all the respondents in advance to explain the main purpose of this research and the intention for the pre-test. Only 16 respondents provided feedback and returned the questionnaire on time. A few attempts were made to get feedback from the remaining respondents but failed. Thus, the response rate was 60 percent and at least 12

responses could be considered appropriate and acceptable (Hill, 1998; Isaac & Michael, 1995).

4.7.2 Reliability Testing

The reliability test was conducted using responses from the sixteen respondents shown in Table 4.16. Although the sample size of sixteen respondents is small, reliability test still can be conducted confidently, as shared by Pallant (2005), to reflect the consistency of the measures. For reliability of the measures, Cronbach's Alpha coefficient is used, and the results are shown in the Table 4.16. The results of the pre-testing show that the values fall within the range of 0.69 and 0.90, and most of the values of the Cronbach's Alpha are closed to the threshold of 0.70 as suggested by Nunnally (1978). Therefore, the results of pre-tested can be considered as the acceptable level of reliability. After the pilot test, minor amendments were made to improve the overall design of questionnaire.

Table 4.16 Pre Test Questionnaire Reliability

Variable	Number of Items	Cronbach's Alpha
Green manufacturing capabilities	10	0.873
Green integration capabilities	9	0.908
Green Financial capabilities	8	0.885
Green Innovative capabilities	5	0.880
Green intraorganisational capabilities	8	0.951
Green supplier selection	8	0.911
Green supplier development	6	0.691
Green supplier collaboration	6	0.811
Green supplier evaluation	6	0.793
Regulation pressure	7	0.841
Customer pressure	6	0.694
Competitor pressure	6	0.908
Environmental performance	7	0.750
Economic performance	6	0.807
Intangible performance	7	0.871

4.8 Survey Administration

The first sample size is 704 firms. After 25 firms were used for the pilot study and 6 firms were used for the interviews for initial framework development, the remaining sample size made up to 673 firms. After completing the pre-testing process, a total of 708 sets of questionnaires, attached with self-address return envelope and covering letter endorsed by the School of operation UM, were sent to the ISO 14001 certified manufacturing firms by post and email, addressed to those involved in buying activities; such as purchasing, procurement, supply chain and operation personnel. On top of these 708 sets, 35 sets were mailed to the same companies, with attention to other departments, in order to test whether any significant differences were encountered on using single and multiple respondents in the Malaysia context. It meant that only 673 firms were involved in this survey as 35 respondents were from the same companies.

The covering letter explained the general instruction on how to complete the questionnaire and the purpose and benefits of the study. Assurance of confidentiality of the participant's information was clearly stated in the letter. Besides, respondents may opt to furnish their email address if they are interested to obtain the research findings. The purpose of the offer was to encourage more and sincere participation. A copy of the covering letter is presented in Appendix A1.

The first reminder by letters and emails were sent and phone calls were made after one month of sending the questionnaire to the respondents in order to encourage them to respond. The first reminder letter is presented in Appendix A3. A copy of second reminder letter is shown in Appendix A4. Together with email, phone calls were used to follow up with the respondents, a month from the date of sending the first reminder letter. The data collection stopped after four months from the commencement date.

4.9 Data Analytical Technique

The statistical techniques used for this study are described as below:

4.9.1 Descriptive Statistics

According to Sekaran (2003), the purpose of using descriptive statistics is to summarize and report the features and characteristic of the data, such as percentage, median, mean, range, standard deviation and frequency. All these parameters would be applied in this research to describe the features and nature of the firms and respondents' profiles, as well as to measure the variables for this study.

4.9.2 Statistical Analysis Techniques

This study used the Statistical Package for Social Sciences (SPSS) software 22.0 and software package Smart-PLS, Version 2.0.M3 (Ringle, Wende, & Will, 2005) to analyze the survey data. Structural equation modeling (SEM) analysis is to validate the measurement model and structural model. This study used a two-stage model process. The first stage is to assess the measurement model and the second stage would evaluate the structural model relationship among the constructs (Hair et al., 1998). SEM method consists of two main choices, covariance and variance based. The covariance based comprises of AMOS, LISREL and EQS, whereas variance based includes the PLS-Graph and Smart PLS (Chin & Newsted, 1999). Which method is to be used will depend on the purpose and the objective of the research. In general, the covariance based SEM is used when the research is meant for theory testing and developing, whereas the use of variance based SEM is more for causal predictive analysis in a complex situation or where the purpose of the research is not to explore for theoretical findings (Barclay, Higgins, & Thompson, 1995).

SEM technique was used for this study due to several reasons. Firstly, it can be conducted for confirmatory factor analysis (CFA) to examine the measurements (Kelloway, 1996), where SEM would account for the structural errors to enhance the validity of the results. Secondly, it can provide measures with multiple relationships concurrently for the fitness of the model. Thirdly, SEM can explain the significance of each relationship in between the hypothesized variables. Lastly, it allows for the computing of the direct and indirect relationships among the variables towards the dependent variables (Kelloway, 1998; Schumacher & Lomax, 1996). This is the strength of partial least square (PLS) if compared with another statistical technique such as multiple linear regressions methods that only limited to assessing the direct relationship between the variable.

The purpose of this study is on the causal predictive analysis. Therefore, a component-based SEM technique, namely partial least square (PLS) is chosen for this study. There are two steps to estimate the measurement and structural model in PLS. The first step is to validate the measurement using the confirmatory factor analysis. The second step is to fit the structural model using path analysis and latent variables. These two steps would examine the relationships between the underlying variables of the study (Anderson & Gerbing, 1988; Bollen, 1989).

The reasons to use PLS in the estimation of the measurement and structural model area are: Firstly, PLS can assess and measure the theoretical constructs and estimates the hypothesized relationship between the constructs (Barclay et al., 1995). Secondly, PLS is prediction oriented and suitable for this research to predict the effects of the mediating effect of green purchasing practice on green purchasing capabilities towards the triple bottom line performance, to explore the moderating effect of the institutional

pressure for green capability and practices. Thirdly, PLS can handle formative, reflective or combination of both indicators in the latent constructs, and it can also support the second order constructs (Chin & Gopal, 1995; Lohmöller, 1989; Wold, 1982), such as the green purchasing practice and triple bottom line. Fourth, PLS requires minimal demands in terms of sample size, such as 10 times of the total indicators used in complex studies, or 10 times of the larger number of independent constructs on an endogenous construct (Chin, 1998; Chin & Newsted, 1999). Fifth, PLS is suitable for complex models using large constructs and sub-constructs in the study (Wold, 1982), and can account for the measurement errors and examine the significance of the structural model concurrently. Sixth, PLS considers the measurement error and it does not assume the multivariate normality when analyzing the structural model.

4.9.3 The Assessment of the Measurement Models

The main criteria used for this study, to test for the integrity of the measures, are validity and reliability. Reliability can be defined as whether the measuring instrument has internal stability and consistency to measure whatever concept it is supposed to measure (Sekaran, 2003), whereas validity is a test of how well a measuring instrument can measure any particular concept that it is intended to be measured (Sekaran & Bougie, 2010).

4.9.3.1 Internal Reliability Consistency Analysis

The first step in the PLS-SEM analysis is to examine the internal consistency reliability of the measurement model (or outer model). The purpose is to identify the relationships between the indicators and the latent constructs that are intended to be measured. In short, it measures how well the indicator's load onto the theoretically defined constructs. To further assess reliability, Cronbach’s Alpha and composite reliability were applied in

this study. The thresholds of Cronbach's Alpha are either met or close to 0.70 (Nunnally, 1978); or the values that fall in the range of 0.60 and above, as suggested by Sekaran (2003), are an acceptable level of reliability. The range for the composite reliability varies between 0 and 1, where a higher value reflects a higher level of reliability. In order to get a higher reliability level, composite reliability is considered a more rigorous method to be used, if compared with the Cronbach's Alpha (Chin, 1998), to assess whether the specific indicator is sufficient to represent the respective constructs (Fornell & Larcker, 1981).

4.9.3.2 Construct Validity

To test validity, two types of validities, convergent validity and discriminant validity (Chin, 1998) were applied in this study. Convergent validity refers to the degree to which similar theoretical constructs are highly correlated with each other, or it refers to set of items which shared a high proportion of variance in common (Campbell & Fiske, 1959). The discriminant validity can be referred to as the degree of differences of a given construct that is dissimilar from other constructs for the study. To conclude, the goodness of fit in the measurement models can be explained by these two validities, construct and discriminant validities.

4.9.3.3 Convergent Validity

Convergent validity is referred to as the standard loading of each indicator, and its proposed underlying construct is significant (Anderson, 1987) and the value proposed must be above 0.7 (Nunnally, 1978). There are two ways to establish the convergent validity, either using the outer loading of the indicators, or the average variance extracted (AVE). To determine individual item reliability, it looks at their loadings on the respective constructs. If there is high outer loading on a construct, it indicates that

the associated indicators are much in common, and this is considered as high indicator reliability. According to Chin (1998), the standardized loadings should be greater than 0.5. However, in general, the indicators with outer loadings of between 0.40 and 0.70 should be considered for removal from the scale, only when deleting the indicator leads to an increase in the composite reliability or the AVE is above the suggested threshold value.

4.9.3.4 Discriminant Validity

Discriminant validity is referred to as the extent of how much a construct is different from or correlates with other constructs. It also evaluates to what extent the indicators represent only a single construct in an empirical study (Hair et al., 1998). There are two procedures that could be used in assessing the discriminant validity (Chin, 1998; Gefen & Straub, 2005). One of the methods is by examining the cross loading. The measures of the construct should be different and should load more strongly on the hypothesized construct than other constructs, which means that the loading should be greater than the cross loadings. The Fornell and Larcker (1981) criterion using the average variance extracted (AVE) is the second approach to assess whether the measures for each construct shares greater variance if compared with other latent constructs. In short, the square root of the AVE for an individual construct is larger than the variance shared between the construct and other constructs in the model (Chin, 1998). The value should be greater than 0.5 as recommended by Fornell and Larcker (1981), which means that the construct accounts for at least 50% of the measurement variance.

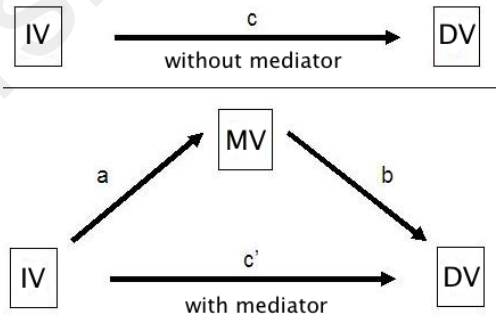
4.9.3.5 Assessment of the Structural Model

The structural models would be established after the measurement models have been examined. Once the structural models have been finalized, hypothesis testing would

proceed. The structural models reflected the causal relationships between the latent constructs and the structural models can be used to estimate the predictive power and move on to analyze the hypothesized relationships among all the latent constructs in this empirical study. Using the R-square value, the predictive power of the research model and the path coefficients could determine the strength of the hypothesized relationships of the independent and dependent latent constructs in the study.

4.9.4 Mediating Effect

The mediating effect explains how an independent variable could lead to changes in the dependent variables. The mediator can be defined as the third variable that is placed in between the relationship between two variables (Baron & Kenny, 1986). In general, a mediator is responsible for the entire relationship between a predictor (the independent constructs) and an outcome (dependent constructs). The single mediator model for the path diagram is presented as below:



Three regression equations are used to investigate mediation

$$\text{Model 1: } Y = i1 + cX + e1 \quad (1)$$

$$\text{Model 2: } Y = i2 + c'X + bM + e2 \quad (2)$$

$$\text{Model 3: } M = i3 + aX + e3 \quad (3)$$

c is a total effect, which represents the total relationship between the independent variables and dependent variables without consideration of other variables. (Without the mediator).

c' is a direct effect which accounts for the relationship between X and Y adjusting for the effect of M, a mediator (with a mediator).

b is the parameter relating the mediator to the dependent variable adjusted to the effect of the independent variable.

a represents the relationship between X and M.

ab is the combination of a and b. This mediating effect is known as the indirect effect. **c** is the total effect, and the indirect effect (**ab**) is also equal to the different between **c** and

c'. In short, it can be concluded that the total effect is the sum of a direct effect and an indirect effect.

4.9.5 Moderating Effect

The samples were divided into groups, based on the moderator variable in the multi-group comparison, where each group of the observations in the model proposed is estimated separately. Moderating effects refer to the statistically significant differences in path coefficients between sub-samples. The moderating effect was tested using a *t* test with mutual standard errors. This method is known as the parametric approach, where differences between the path estimators are tested for significant with a t-test (Chin, 2000). In this study, the impact on the institutional pressure using different mechanisms can be shown by comparing models resulting from path estimators across

groups. According to Chin (2000), the pair-wise t-tests of the structural differences can further be tested for its significance, using the following formula:

$$t = \frac{Path_{sample1} - Path_{sample2}}{\sqrt{s.e._{sample1}^2 + s.e._{sample2}^2}}$$

Which:

$Path_{sample}$: original sample estimate for the path coefficient in both subsamples respectively

s:e: **sample** standard error of the path coefficient in both subsamples respectively (gained from the boot strapping procedure implemented in PLS).

The t-test degrees of freedom (df) would then have to be computed as follows (Chen, Hrdle, & Unwin, 2008).

$$df = \frac{\left(s.e._{sample1}^2 + s.e._{sample2}^2\right)^2}{\left(\frac{s.e._{sample1}^2}{m+1} + \frac{s.e._{sample2}^2}{n+1}\right)} - 2$$

4.10 Summary of Chapter

This chapter presents the methodology used for this research. The total populations of 704 firms used in this study are ISO 14001 certified manufacturing firms in Malaysia. The sampling method used for this study is based on census method, which means that the 673 ISO 14001 certified companies in Malaysia (after eliminating the 25 companies that had participated in the pilot study and 6 companies used for interview) are included as the sample frame for this research. The measurements of the variables are adopted from previously used measurements in the literature.

However, the validities of the variables used were reconfirmed and reassured through interviews with six ISO 14001 manufacturing firms. This is a quantitative research, and the data collection is by using questionnaire. The targeted respondents are purchasing, procurement, supply and supply chain and operation managers. This group of respondents would have vast professional experience and knowledge on purchasing, to participate in the survey. The statistical techniques used for data analysis include SPSS (Statistical Package for Social Sciences) software 22.0, descriptive statistic, structural equation model (SEM) software package Smart-PLS, Version 2.0.M3. SEM consists of two steps: first to validate the measurement models, followed by establishing the structural models, as well as the hypotheses testing that will be discussed in detail in the following chapter.

CHAPTER 5: SURVEY FINDINGS

5.1 Chapter Overview

This chapter presents the findings of the quantitative survey of ISO 14001 manufacturing firms in Malaysia. There are six main sections in this chapter. The first section presents the overview of the general description of the survey respondents. It includes the data screening, response rate, non-response bias and the common method bias. The second section presents the general description of the respondents, including profile of the firms, reasons for embarking on green purchasing and the efforts towards green purchasing programs. The third section presents the descriptive analysis, including the profile of the respondents and the descriptive statistic on green purchasing capabilities, green purchasing practices, triple bottom line and the institutional pressure. The overall assessment of measurement models and the establishment of the structural models are presented in the fourth section. The fifth section shares the hypothesis testing and summary of the section. The final section concludes with a short summary of the chapter.

5.2 Data Screening

The Statistical Package Social Science (SPSS) of version 22.0 was used to screen the survey data. The Tables 5.1 and 5.2 showed the outliers and missing data that found during the process of filtering the master data collection list. The univariate outliers were checked based on frequency distributions of Z scores of the observed data, as suggested (Kline, 2005). However, no univariate outlier was identified for this study, because it used a 5 - point Likert scale ranging from 1 to 5. For imputed data Outliers were defined through univariate (histograms, box-plots and standardised Z score). In large sample size, Absolut (Z) > 3.5 indicates an extreme observation (Hair et al., 1998). The result showed that the standardised (z) scores of the imputed variables ranged from

3.50 to 2.92, indicating that none of the variables exceeded this threshold. The result for outliers was shown in Table 5.1.

Table 5.1: Outliers

	Minimum	Maximum
Zscore(MSCOP)	-2.37	2.01
Zscore(MSCP)	-3.10	2.38
Zscore(MSDC)	-3.27	2.07
Zscore(MSEN)	-2.39	2.09
Zscore(MSEO)	-2.35	2.93
Zscore(MSFC)	-2.67	2.34
Zscore(MSGSC)	-3.23	2.44
Zscore(MSGSD)	-3.04	2.39
Zscore(MSGSE)	-3.00	2.36
Zscore(MSGSS)	-3.19	2.44
Zscore(MSIC)	-3.06	2.03
Zscore(MSIP)	-2.45	2.20
Zscore(MSMC)	-3.19	1.93
Zscore(MSRP)	-3.50	2.63
Zscore(MSSC)	-2.47	2.25

As the items of the questionnaire were ordinal variables, the four missing data were identified and replaced, with the median of each variable prior to analysis. The result of the missing data was shown in Table 5.2.

Table 5.2: Missing Data

Indicator	Sample	Replacement number
MC7	65	4
FC5	82	3
FC8	154	3
IP7	56	1

5.3 Response Rate

This study used the quantitative survey methodology to collect data from ISO 14001 certified manufacturing firms for analysis. The data was used to assess the measurement models, structural models and for hypothesis testing. The initial sample size of the study

was 704 firms. After using 25 firms for the pilot study and 6 firms for the interviews for initial framework development, the remaining sample size is 673. Total of 708 sets of questionnaire were sent by post and email to the relevant purchasing, procurement and supply chain personnel, operation and other departments. Out of these 708 sets of questionnaire, 35 sets were mailed to the same company (which means that only 673 firms were involved in this survey, as 35 respondents were from the same companies). These 35 sets of questionnaires were sent, with attention to other departments in order to get their views and feedbacks on the green purchasing adoption. After sending two reminder letters, making telephone calls and sending reminders through e-mails, 176 questionnaires were received. However, 13 sets were rejected as the questionnaires were only partially filled. Only 163 sets of questionnaire were finally usable. Based on the 163 respondents, the response rate is 23% and the response rate details presented in Table 5.3. In view of the generally low response rate using the mail survey for the study, such response rate is acceptable according to Sekaran (2003). The response rate for the survey is summarized in Table 5.3.

Table 5.3: Response Rate for the Survey

Total sets of questionnaire sent to potential respondents	**708**
Total sets of questionnaire returned	**176**
Unusable set of questionnaire (partially completed)	**13**
Final sets of usable questionnaire	**163**
Total response rate (Usable and unusable sets)	**24.85%**
Usable response rate for analysis	**23.0%**

5.3.1 Non-Response Bias of this Study

Non-response bias is concerned with systematic differences that could exist between respondents who participated in the survey and non-respondents. Armstrong and Overton (1997) highlighted that non-respondents are similar to respondents who participated very late in the survey base the assessment of the non-response bias on the

proposal. Accordingly, they recommend comparing the responses, whether received early or late to test for the presence of a non-response bias. Early responses in this study mean those questionnaires that were received before the first reminder (i.e. within the first 30 days), whereas the late responses were questionnaires received after the first reminder. Based on this criterion, 58 sets of questionnaire received were considered as "early" whereas 105 sets were considered as "late" responses.

Hence, the sample data were divided into two parts based on the date of receipts of the questionnaire is shown in appendix B8. The constructs Likert-scaled indicators of the early and late responses were tested for significant differences by means of Mann-Whitney-U-test. The findings show that the null hypothesis for early and late responses do not differ, where the P value is > 0.05 for all the indicators. This is a very satisfactory result, as there is no significant difference between the early and late responses; therefore the conclusion is that non-response bias does not exist in this study. (The findings are presented in Appendix B8).

5.3.2 Common Method Bias

By using self-reporting for quantitative survey, there is a high possibility of encountering the critical issue of common method bias. Since this study was carried out as a single data collection method depending on the key participants to obtain feedbacks, therefore, common method bias could probably occur. Although several efforts have been made to reduce such bias during the instrument development stage, the potential of common method variance may not be eliminated. Common-method variance (CMV) is the simulated variance that is attributable to the measurement method rather than to the constructs, where the constructs measures are represented or equivalently as systematic error variance shared among variables measured with and

introduced as a function of the same method and/or source. To test for common method bias, Podsakoff and Organ (1986) suggested conducting an unconstrained, single factor analysis for models that intend to measure multiple constructs. In this study, Harman's (1976) single-factor test was applied. The results shown in Table 5.4 indicate that the first factor accounts for 41.04% of the overall variance and conclusion can be made that common method variance probably does not affect the results of this analysis (Podsakoff & Organ, 1986). For data output, please refer to appendix B9.

Table 5.4: Common Method Bias

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	43.096	41.044	41.044

5.3.3 Response Bias between Purchasing and Non - Purchasing Personnel

The main respondents for the quantitative survey were based on the self-reporting focusing on the single department that directly involved in the purchasing activities. Therefore, there is a high possibility of encountering the critical issue of response bias. To test for response bias on purchasing and non-purchasing department, in this study, differences between purchasing and non-purchasing personnel was done using Mann-Whitney-U-test for significant difference. The results shown out of the 105 items, only 18 items were significantly different between purchasing and non-purchases, where the P value is < 0.05 for all the indicators. It means the 83 % were same. The conclusion can be made that response bias for purchasing and non-purchasing probably does not affect the results of this analysis. (Please refer to appendix B10).

5.4 Overall profile of the ISO 14001 Manufacturing Firms

The profile of the responding firms is presented in Table 5.5. A total of the 23.9% are from the food and food related packaging industry, followed by 22.7% from electrical

and electronics industry, while 5.5% are from the chemical and chemical products industry. Basic metal, metal and machinery made up of 6.1%. Only 2.5% are from wood product and furniture, 9.8 % are from rubber and plastic products, and 1.2 % are from the textile and apparels, whereas 28.2% are from the other manufacturing sector, such as printing, packaging, semiconductor, automotive, pharmaceutical and service industries.

The results show that most of the firms are well established, with 71.8% having operated for more than 20 years, while 19.6% have been operating for between 11 and 20 years, whereas 8.6% have been in business for less than 10 years. The results show that 41.7% are considered as large firms with 500 to more than 1000 employees. The medium-size firms in the range of 100 to 500 employees made up of 43%, while 15.3% have less than 100 employees. As for ownership status, 48.5% are local and local joint venture firms and 43.6% are MNCs. The other ownership status comprises of 8 % Taiwanese or Singaporean joint ventures companies. The results indicate that the percentages of local and local joint ventures versus the MNC companies are almost equal.

Regarding the types of product, 49.1% of the firms produce consumer products, 40.4% produce industrial products, while 10.4% produce both industrial and consumer products. Almost 42.3% of the firms have more than five suppliers, 47.2% firms have two to three main suppliers, and 7.4% have four to six suppliers while 3.1% have a single supplier. The findings reveal that 83.4% have established relationships with their major suppliers for more than five-years, while 16.6% have maintained their relationships with their supplier for less than five years. In terms of the relationships with customers, 66.8% of the firms maintained such relationships for more than ten

years, whereas the remaining of 33.2% maintained their relationship for less than 10 years.

About 53.4% of the firms obtained their inputs from the global markets. The remaining firms obtained their inputs from domestic and regional sources. More than half of the firms, 58.9% do not actively participate in any association and programs that related to green environmental procurement, while the remaining of 41.1% does participate in green activities. However, the results show that 65% of the respondents have in fact been putting in efforts to purchase green products, 17.2% are not making any effort to buy green products, while 17.8% actually are not sure whether their firms are putting in any effort to purchase green products.

5.5 Reasons for Embarking on Green Purchasing

Table 5.6 presents the results for the reasons of ISO 14001 manufacturing firms embarking on green purchasing. Almost 70% of the respondents agreed that green products help to protect the environment, while 45.4% agreed that purchase of green products is mandated by policy, regulation or executive order. The findings regarding regulation pressure in the Malaysian context support this view. Meanwhile 43.6% agreed that green environment is better for the health of employees. Only 13.5% perceived that green products help save money, which is consistent with the finding of no significant relationship between financial capabilities and the contribution to the triple bottom line. Only 1.2% stated that green purchasing actually improved companies' image. Finally, 1.8% of the respondents do not know the reason why manufacturing firms are embarking on green purchasing programs.

Table 5.5: Profile of the ISO 14001 Sample Firms

		Frequency	Per cent
Type of the industry	Electrical and Electronics Products	37	22.7
	Chemicals & Chemical Products	9	5.5
	Food related items.	39	23.9
	Basic Metals, Metal & Machinery.	10	6.1
	Wood Products & Furniture	4	2.5
	Rubber & Plastic Products	16	9.8
	Textiles and Apparels	2	1.2
	Other manufacturing sector	46	28.2
No of employees	less than 100	25	15.3
	100 – 200	35	21.5
	251 – 500	35	21.5
	501 – 1000	23	14.1
	more than 1000	45	27.6
Age of the firm	less than 10 years	14	8.6
	11 - 20 years	32	19.6
	20 - 30 years	42	25.8
	more than 30 years	75	46.0
Type of product	Consumer products	80	49.1
	Industrial products	66	40.5
	Others	17	10.4
Number of the supplier	single supplier	5	3.1
	2-3 suppliers	77	47.2
	4-6 suppliers	12	7.4
	more than 5 suppliers	69	42.3
Supplier relationship length	Less than 5 years	27	16.6
	6-10 years	45	27.6
	11-15 years	29	17.8
	More than 15 years	62	38.0
Customer relationship length	Less than 3 years	8	4.9
	4-10 years	46	28.2
	10-15 years	40	24.5
	more than 15 years	69	42.3
Source of inputs	Domestic	30	18.4
	Regional/Asian	45	27.6
	Global	87	53.4
	Others	1	0.6
Green participation	No	96	58.9
	Yes, please specify	67	41.1
Ownership status of the firm	Malaysian fully owned	51	31.3
	Local and foreign joint venture	28	17.2
	Owner to American company	12	7.4
	Owner to Japanese company	25	15.3
	Owner to European company	34	20.9
	Other Ownership	13	8.0
Effort to purchase green products	No	28	17.2
	Yes	106	65.0
	Not sure	29	17.8

Table 5.6: Reasons for Embarking on Green Purchasing

No	Items	Frequency	Per cent
1	Green products help protect the environment.	115	70.6
2	Purchasing green products is mandated by policy, regulation or executive order.	74	45.4
3	Green products are better for employees' health.	71	43.6
4	Green products help save money.	22	13.5
5	Others.	2	1.2
6	Don't know.	3	1.8

5.6 The Company's Effort towards Green Purchasing Program

Table 5.7 shows the mean scores and standard deviations for implementing green purchasing program by the ISO 14001 manufacturing firms. The results show that getting feedback from end users to address problems as soon as they arise is the most adopted green purchasing program (M = 3.227, SD = 1.024). Two programs share the second ranking, namely, "research environmentally preferable alternatives to evaluate available price, environmental attributes and performance of potential substitutes" (M = 3.213, SD = 0.991) and "evaluate bids to assess both mandatory requirements and desirable attributes" (M = 3.213, SD = 1.020). The third priority is revising bid specifications to educate and get feedback from vendors about their specifications (M = 3.206, SD = 1.004). The fourth priority is to establish a process for working together to create a timeline, budget and meeting schedule (M = 3.156, SD = 1.136), follow by "prioritize contracts to look for products with greatest impact or low hanging fruit" (M = 3.057, SD = 1.068) as the firth main concern. The sixth important program is to track and publicize successes to quantify economic and environmental benefits (M = 3.036, SD = 0.992). The seventh significant program is to define the scope to the EPP initiative to view existing policy drivers and practices (M = 2.993, SD = 1.066). The eighth important program is to "advertise the availability of environmentally preferable products on new contracts to educate using web sites, purchasing bulletins, EPP guides"

(M = 2.908, SD = 1.068). The least priority of the green purchasing program is to "assemble a "Green" team to identify key players and other resources" (M = 2.872, SD = 1.200).

The conclusion is that, on the average, Malaysian firms put in efforts on getting feedbacks and address the problems as soon as they arise. Conversely, forming a green initiative team in advance to address and monitor potential issues, seem not to be the main priority program. The findings indicate that manufacturing firms in Malaysia are rather more on corrective action than taking the preventive measure to address green issues in their working environment. The sequences of priorities are presented in the Table 5.7 below.

Table 5.7: Descriptive Statistic for items Related to Company's Effort towards Green Purchasing Program

NO	Items	M	SD
1	Get feedback from end-users to address problem as soon as they arise.	3.227	1.024
2	Evaluate bids to assess both mandatory requirements and desirable attributes.	3.213	1.020
3	Research environmentally preferable alternatives to evaluate available price, environmental attributes and performance of potential substitutes.	3.213	0.991
4	Revise bid specifications to educate and get feedback from vendors about "specs."	3.206	1.004
5	Establish a process for working together to create a timeline, budget and meeting schedule.	3.156	1.136
6	Prioritize contracts to look for products with greatest impact or low hanging fruit.	3.057	1.068
7	Track and publicize successes to quantify economic and environmental benefits.	3.036	0.992
8	Define the scope of the ERP initiative to view existing policy drivers and practices.	2.993	1.066
9	Advertise the availability of environmentally preferable products on new contracts to educate using web sites, purchasing bulletins, EPP guides.	2.908	1.068
10	Assemble a "Green" team to identify key players and other resources.	2.872	1.200

5.7 Descriptive Analysis

5.7.1 Descriptive Analysis for Green Purchasing Capabilities, Green Purchasing Practices, Institutional Pressure and Triple Bottom-Line Performance.

The emphasis throughout this study is on the mediating effects of green practices in between the relationship of green capabilities and triple bottom line and the moderating effect of institutional pressure towards green purchasing capabilities and green purchasing practices. All the variables using descriptive statistics are evaluated using the mean scores (M) and standard deviations (SD). The descriptive statistics for survey data on all the constructs are presented in Table 5.8. The study used a 5 points Likert scale, ranging from "1 = strongly disagree", "2 = disagree", "3 = neutral", "4 = agree" and "5 = strongly agree". Table 5.8 shows the summary of the mean and SD for all the constructs. For green purchasing capabilities, the most adopted green purchasing capability in the Malaysian industry is manufacturing capabilities (M = 3.644, SD = 0.703), followed by innovative capabilities (M = 3.448, SD = 0.749), financial capabilities (M = 3.423, SD = 0.673), integration capabilities (M = 3.402, SD = 0.786) and the lowest is intraorganisational capabilities (M = 3.392, SD = 0.715).

For green practices, there is no significant variability among all the purchasing practices, with the mean scores being between 3.2 and 3.277, which indicate that all the practices are of equal importance. However, the overall scores of below 3.5 indicate that green practices are not highly adopted in the Malaysian context. The results revealed that the highest priority in green practice adopted is supplier collaboration, consisting of six indicators (M = 3.277, SD = 0.705), follow by eight indicators measurement of the supplier selection (M = 3.266, SD = 0.711). Supplier development with six indicators ranked as the third priority (M = 3.24, SD = 0.738), while the lowest ranking is supplier evaluation (M = 3.239, SD = 0.747) with six indicators for measurement. This indicates that on the average, Malaysian firms' adoption of green purchasing practices is slightly

above average. However, green purchasing valuation is the last priority. The results are consistent with findings that manufacturing firms in Malaysia are taking more corrective actions rather than preventive actions to handle the green environmental issues.

Table 5.8 shows that the overall mean scores for institutional pressure range from 3.2 to 3.35. Regulation pressure, with seven indicators, have the highest mean (M = 3.347, SD = 0.628), followed by the customer pressure, with six indicators (M = 3.265, SD = 0.730). The lowest is competitor pressure with six indicators (M = 3.235, SD = 0.915). Generally, the mean scores are below 3.5 and slightly more than 3.0, which mean that institutional pressures are generally imposed on the manufacturing firms. Nevertheless, the highest impact is from the regulation pressure.

The findings for triple bottom line performance indicate that the average mean score for environment and intangible performance is more than 3.5. The mean score for economic performance is below 3.5, while the overall mean score is 3.337. Environmental performance, with seven indicators has the highest mean (M = 3.601, SD = 0.669), followed by intangible performance, with seven indicators (M = 3.58, SD = 0.644), while economic performance is the lowest (M = 3.337, SD = 0.568).

5.7.2 Profile of the Respondents of ISO 14001 Manufacturing Firms

The profiles of respondents are shown in Table 5.9. The categories shown are department, position in the company, years in the organization, gender, age and education. Of the 163 respondents, the gender distribution is 51.5% (84) males and 48.5% (79) females. The age for the respondents ranged from 20 to 50 years and above. The age group of between 20 and 30 years made up of 10.4%, while 31.3% are between

31 and 40 years. Those in the age group from 41 to 50 years made up of 42.3% whereas 16% fall under the age group of 50 years and above. Based on the age category, the respondents are considered as matured working adults, as the majority of nearly 90% are between the ages 30 to 50 years.

Table 5.8: Descriptive statistic for Items Related to Green Purchasing Capabilities, Green Practices, Institutional Pressure and Triple Bottom Line

No	Items	M	SD
	Green purchasing capabilities		
1	Green manufacturing capabilities	3.644	0.703
2	Green innovative capabilities	3.448	0.749
3	Green financial capabilities	3.423	0.673
4	Green integration capabilities	3.402	0.786
5	Green intraorganisational capabilities	3.392	0.715
	Green purchasing practices		
1	Green supplier collaboration	3.277	0.705
2	Green supplier selection	3.266	0.711
3	Green supplier development	3.240	0.738
4	Green supplier evaluation	3.239	0.747
	Institution pressure		
1	Regulation pressure	3.347	0.628
2	Customer pressure	3.265	0.730
3	Competitor pressure	3.235	0.915
	Triple bottom line performance		
1	Environmental performance	3.601	0.669
2	Intangible performance	3.580	0.644
3	Intangible performance	3.337	0.568

Overall, the respondents are considered as well educated, with 63.8% having bachelor degrees; 10.4% with the master degrees and 3.1% with professional qualifications, while 17.8% are diploma holders. Those with of SPM/STPM qualifications made up of 4.9%. For the position held, 19.6% of the respondents hold executive positions, 66.9% hold the positions of manager, while 13.5% hold the GM or director position.

In terms of department, those who are directly involved in the buying activities, 35% are attached to the purchasing department, 20.2% are attached to the procurement

department, followed by the 10% who are from the supply-chain department and 20.2% from the operation department. Respondents from other departments that are direct and indirectly involved in the purchasing functions made up of 14.1%. The findings show a mixed category in terms of working experience. About 40.5% of the respondents have worked for more than ten years, 17.8% have seven to ten years and 18.4% have four to six years of working experience in their respective firms, while 23.3% have one to three years of working experience. The findings indicate that all these respondents should be able to express their perceptions in terms of green procurement in their own working environment as the majority of 77% have been working in their respective firms for more than four years.

Table 5.9: Profile of Respondent:

Variables	**Level**	**Frequency**	**Per cent**
Department	Purchasing	57	35
	Procurement	33	20.2
	Supply chain	17	10.4
	Operation	33	20.2
	Others	23	14.1
Position	Executive	32	19.6
	Manager	109	66.9
	GM director	22	13.5
Number of years	1 - 3 yrs.	38	23.3
	4 - 6 yrs.	30	18.4
	7 - 10 yrs.	29	17.8
	>10 yrs.	66	40.5
Gender	Male	84	51.5
	Female	79	48.5
Age	20 – 30	17	10.4
	31 – 40	51	31.3
	41 – 50	69	42.3
	> 50	26	16
Qualification	SPM/STPM	8	4.9
	Diploma	29	17.8
	Degree	104	63.8
	Master	17	10.4
	Professional	5	3.1

5.7.3 Green Manufacturing Capabilities

The result for manufacturing capabilities shown in Table 5.10 indicated that "focuses on process capabilities, records of continuous cost reduction in core processes for product improvement" (M = 3.847, SD = 0.836) is the highest adopted indicator. On the other hand, "implements process design that concentrates on fewer natural resources consumption in the operations" is the lowest adopted indicators (M = 3.515, SD = 0.898). In summary, the mean scores for all the indicators are more than 3.5 which means that manufacturing capabilities are generally highly adopted by manufacturers in the Malaysian context.

Table 5.10: Descriptive Statistic for Items Related to Manufacturing Capabilities

No	Items	M	SD
1	Makes sure that our products have recyclable or reusable contents.	3.528	1.032
2	Offers environmentally sound products with higher capacity utilization to reduce materials during production.	3.540	0.918
3	Offers environmentally sound products with higher capacity utilization to reduce energy usage during production.	3.626	0.950
4	Focuses on process capabilities, records of continuous cost reduction in core processes for product improvement.	3.847	0.836
5	Establishes production planning and control that focus on materials optimization.	3.810	0.900
6	Implements process design that concentrate on less natural resources consumption in the operations.	3.515	0.898
7	Substitutes the polluting/hazardous materials with a more environmentally friendly alternatives.	3.748	0.919
8	Implements improved advanced technology and method through the use of less materials or energy efficiency methods.	3.669	0.943
9	Sources some of materials from environmentally sound sources.	3.632	0.868
10	Develops new skills for product and process green technology that focus on waste reduction.	3.521	0.905
	Total	3.644	0.703

5.7.4: Green Integration Capabilities

To ensure "that environmental issues are well communicated among the environmental function and all other departments" is the most important for integration capabilities (M = 3.546, SD = 1.007), while to assist "suppliers to establish their environmental management systems" is of the lowest concern (M = 3.160, SD = 0.949). In summary, the mean scores for all the indicators range from between 3.160 to 3.546, and the average mean score is 3.40, which indicates that integration capabilities are important for green purchasing capabilities in the Malaysian context. The result is shown in Table 5.11

Table 5.11: Descriptive Statistic for Items Related to Integration Capabilities

No	Items	M	SD
1	Obtains cross-functional cooperation from suppliers for environmental improvements.	3.393	0.885
2	Establishes written policies and procedures with key suppliers for implementation of green purchasing for firm's sustainability.	3.325	0.987
3	Establishes long-range plan with key suppliers for implementation of green purchasing for firm's sustainability.	3.301	0.982
4	Establishes proper communication systems to support exchange of information with suppliers.	3.521	0.870
5	Ensures that environmental issues are well communicated among the environmental function and all other departments.	3.546	1.007
6	Ensures that the purchasing function works closely with other functions for green purchasing strategies.	3.429	0.875
7	Ensures that the purchasing function works closely with suppliers for long range purchasing plan.	3.521	0.912
8	Provides suppliers with the design specifications with environmental requirements.	3.423	0.929
9	Assists suppliers to establish their environmental management systems.	3.160	0.949
	Total	3.402	0.786

5.7.5 Green Financial Capabilities

The results presented in Table 5.12 show that "cost management strategy is an increasingly important consideration" (M = 4.037, SD = 0.888) is the highest priority

for financial capabilities. On the other hand, allocating "the total capital budget in the investment of suppliers' green operation" (M = 3.160, SD = 0.909) is the lowest priority In summary, the mean scores which range from 3.160 to 4.037 show that there are vast differences in the adoption of green financial capabilities among the ISO 14001 certified manufacturers in Malaysia.

Table 5.12: Descriptive Statistic for Items Related to Financial Capabilities

No	Items	M	SD
1	Purchasing capabilities influence the financial performance of the organization.	3.669	0.889
2	Cost management strategy is an increasingly important consideration.	4.037	0.888
3	Focuses on environmental investment to gain high opportunity cost.	3.362	0.881
4	Focuses on investment by replacing the existing with the latest technologies in green activities.	3.319	0.873
5	Provides financial reserve for investment in advanced technologies, including environmental solutions.	3.331	0.854
6	Allocates the total capital budget in the investment of suppliers' green operation.	3.160	0.909
7	Invests in the purchasing of green materials activities.	3.282	0.879
8	Commits financial resource for green procurement program.	3.227	0.925
	Total	3.423	0.673

5.7.6 Green Innovative Capabilities

The results in Table 5.13 show that "procurement department contributes to reducing lead time and speeding up the time to market" (M = 3.699, SD = 0.847) has the highest mean among all the indicators. Meanwhile to provide "the design specifications and gets the suppliers' green innovation production inputs during the product development stage" has the lowest mean (M = 3.245, SD = 0.903). In summary, the mean scores for all indicators range from 3.245 to 3.699, which show that generally the adoption by firms in Malaysia for innovative capabilities, are diverse.

Table 5.13: Descriptive Statistic for Items Related to Innovative Capabilities

No.	Items	M	SD
1	Procurement department is fast in adapting to market changes and new product requirements	3.577	0.909
2	Procurement department contributes to reducing lead time and speeding up the time to market.	3.699	0.847
3	Designs products for reuse, recycle, recovery of materials and component parts	3.393	0.939
4	Provides the design specifications and gets the suppliers' green innovation production inputs during the product development stage.	3.245	0.903
5	Internal cultural emphasis is on innovation and R&D in environmental friendly products.	3.325	0.902
	Total	3.448	0.749

5.7.7 Green Intraorganisational Capabilities

The results in Table 4.14 show that getting "support from the top management" (M = 3.620, SD = 0.869) is the highest adoption, whereas assembling "a 'green' team to identify key players and other resources" (M = 3.141, SD = 0.929) has the lowest mean. In summary, the mean scores for the indicators range from 3.141 to 3.620, which indicate that the acceptance of intraorganisational capabilities is not consistent among the organizations in the Malaysian context.

Table 5.14: Descriptive Statistic for Items Related to Intraorganisational Capabilities

No	Items	M	SD
1	Establishes its objective for purchases of green products and services.	3.307	0.870
2	Conducts awareness-training program on green purchasing.	3.264	0.955
3	Assembles a "Green" Team to identify key players and other resources.	3.141	0.929
4	Establishes a process for working together to create a timeline, budget and meeting schedule.	3.429	0.868
5	Assigns responsibilities.	3.491	0.863
6	Gets support from the top management.	3.620	0.869
7	Reviews existing purchasing policy drivers and practices	3.509	0.781
8	Targets environmental problems to solve under the green procurement / purchasing program.	3.374	0.840
	Total	3.392	0.715

5.7.8 Green Supplier Selection

The results in Table 5.15 show that "suppliers are selected based on their environmental competence to support our environmental objective such as reduce in hazardous substances" (M = 3.387, SD = 0.951) is most important among all the indicators. Meanwhile "suppliers are selected based on environmental and social criteria, rather than using traditional suppliers based on cost, quality, and responsiveness of suppliers" (M = 3.196, SD = 0.815) has the lowest mean. In summary, the mean scores for all the indicators range from 3.196 to 3.387, and the average mean score is less than 3.3 which indicates that generally, there is low adoption of supplier selection in the Malaysian context.

Table 5.15: Descriptive Statistic for Items Related to Supplier Selection

No	Items	M	SD
1	Suppliers are selected based on their environmental competence to support our environmental objective such as reduce in waste.	3.227	0.856
2	Suppliers are selected based on their environmental competence to support our environmental objective such as reduce in air emissions.	3.209	0.812
3	Suppliers are selected based on their environmental competence to support our environmental objective such as reduce in hazardous substances.	3.387	0.951
4	Suppliers are selected based on their technical and eco-design capability.	3.344	0.898
5	Suppliers are selected based on their ecological production capabilities.	3.245	0.794
6	Suppliers are selected based on their ability to develop environmentally friendly goods.	3.301	0.833
7	Suppliers are selected based on environmental and social criteria, rather than using traditional suppliers based on cost, quality, and responsiveness of suppliers.	3.196	0.815
8	Requirements are on suppliers to have an environmental management system.	3.221	0.868
	Total	3.266	0.711

5.7.9 Green Supplier Development

The results in Table 5.16 show that cooperating "with suppliers to use environmental friendly packaging such as using degradable and non-hazardous materials" (M = 3.503, SD = 0.912) is the highest adoption among all the indicators. On the other hand, guiding "suppliers to establish their own environmental programs" (M = 3.129, SD = 0.897) is the lowest priority. In summary, the mean scores for all the indicators range from 3.129 to 3.503. In general, adoption of supplier development is considered to have low priority while adoption of usage of non-hazardous materials has been the main emphases.

Table 5.16: Descriptive Statistic for Items Related to Supplier Development

No	**Items**	**M**	**SD**
1	Cooperates with suppliers to use environmental friendly packaging such as using degradable and non-hazardous materials.	3.503	0.912
2	Cooperates with suppliers to use environmental packaging such as lightweight packaging.	3.442	0.924
3	Guides suppliers to establish their own environmental programs.	3.129	0.897
4	Develops a mutual understanding with suppliers of environmental criteria and performance.	3.282	0.864
5	Provides training/education to these suppliers' personnel.	2.939	0.954
6	Visits our suppliers' premise to help them improve their performance.	3.147	0.944
	Total	3.240	0.738

5.7.10 Green Supplier Collaboration

The results in Table 5.17 show that looking for "synergetic ways to do business together with the suppliers" (M = 3.368, SD = 0.846) has the highest mean, whereas conducting "strategic joint planning to anticipate and resolve an environmental related problem" (M = 3.160, SD = 0.808) has the lowest mean. In summary, the mean scores for all the indicators range from 3.160 to 3.368, which indicate that overall the adaption of supplier collaboration among all firms are considered to be consistent, although of low priority.

Table 5.17: Descriptive Statistic for Items Related to Supplier Collaboration

No	**Green Supplier collaboration**	**M**	**SD**
1	Establishes joint decision with supplier about ways to reduce overall environmental impact of our products.	3.209	0.857
2	Opens to sharing information with suppliers and with other departments.	3.319	0.829
3	Cooperates with suppliers for environmental objectives.	3.307	0.796
4	Conducts strategic joint planning to anticipate and resolve environmental related problem.	3.160	0.808
5	Collaborates with suppliers to provide materials, equipment, parts and /or services that support our environmental goals.	3.301	0.876
6	Looks for synergetic ways to do business together with the suppliers.	3.368	0.846
	Total	3.277	0.705

5.7.11 Green Supplier Evaluation

The results in Table 5.18 show that developing "improvement plan, assesses feedback and performance" (M = 3.368, SD = 0.889) is most important among all the priorities. However, "implements second tier supplier environmental friendly practice evaluation" (M = 3.067, SD = 0.897) has the lowest mean. In summary, the mean scores for all the indicators range from 3.067 to 3.368. The average mean is 3.277, which generally indicates that adoption of green supplier evaluation is not high in the Malaysian context.

Table 5.18: Descriptive Statistic for Items Related to Supplier Evaluation

No	**Items**	**M**	**SD**
1	Builds environmental criteria into the vendor assessment system/supplier questionnaire.	3.276	0.918
2	Implements second tier supplier environmental friendly practice evaluation.	3.067	0.897
3	Conducts regular environmental audits on our suppliers' internal operation/management.	3.117	0.939
4	Assesses our suppliers' performance through formal evaluation, using established guideline and procedure	3.356	0.901
5	Develops improvement plan, assesses feedback and performance.	3.368	0.889
6	Recognizes suppliers' achievement in the form of awards for good performance.	3.252	0.891
	Total	3.239	0.747

The above results indicate that generally the adoption for green purchasing practices is low in the Malaysian context. This can be proven as the average mean score for all the categories are less than 3.3.

5.7.12 Regulation Pressure

The results in Table 5.19 show that "always attempt to go beyond basic compliance with laws and regulations on environmental issues" (M = 3.558, SD = 0.817) is the most important pressure for firms. Meanwhile, "financial incentives offered by the Malaysia government, such as grants and tax reductions are significant motivators for my firm to adopt green purchasing initiative" (M = 3.098, SD = 0.883) is the lowest pressure faced by firms. In summary, the mean scores for all the indicators range from 3.098 to 3.558, indicating that the pressure faced are different among the firms in Malaysia.

Table 5.19: Descriptive Statistic for Items Related to Regulation Pressure

No	**Items**	**M**	**SD**
1	Through adopting green purchasing initiatives have tried to reduce or avoid the threat of current or future government environmental legislations.	3.399	0.813
2	Industry is facing large number of environmental regulations or restrictions imposed by the government.	3.466	0.898
3	Always attempt to go beyond basic compliance with laws and regulations on environmental issues.	3.558	0.817
4	Facing frequents government inspections or audits to ensure that it is in compliance with environmental laws and regulations.	3.362	0.948
5	Financial incentives offered by the Malaysia government, such as grants and tax reductions, are significant motivators for my firm to adopt green purchasing initiative.	3.098	0.883
6	Green environmental management has been influenced by government's environmental regulations.	3.319	0.928
7	Facing potential conflicts between products and environmental regulations that affect its green environmental management.	3.227	0.826
	Total	3.347	0.628

5.7.13 Customer Pressure

The results in Table 5.20 show that "believes with the increase in consumers' awareness on environmental protection will increase in green consumption" (M = 3.515, SD = 0.863) is the critical pressure for firms. Meanwhile "my firm's major customers always reject my firm's products if they do not contain recyclable or reusable contents" (M = 2.785, SD = 0.980) is the less critical pressure faced by firms. In summary, the mean scores for all the indicators range from 2.785 to 3.515, indicating that customer pressure faced by firms are vastly different among all the ISO 14001 firms.

Table 5.20: Descriptive Statistic for Items Related to Customer Pressure

No	**Items**	**M**	**SD**
1	Major customers frequently require my firm to adopt green purchasing initiatives.	3.387	0.964
2	Major customers have clear policy statements regarding their commitments to the environment	3.405	0.947
3	Receives requirements from consumer associations to be a more environmentally conscious firm.	3.141	0.881
4	Believes with the increase in consumers' awareness on environmental protection will increase in green consumption.	3.515	0.863
5	My firm's major customers always reject my firm's products if they contain hazardous elements.	3.356	1.104
6	My firm's major customers always reject my firm's products if they do not contain recyclable or reusable contents.	2.785	0.980
	Total	3.265	0.730

5.7.14 Competitor Pressure

The results in Table 5.21 show that "the industry in generally believes that green initiative is considered as important for improving organization image" has the highest competitor pressure (M = 3.460, SD = 0.925), Meanwhile "main competitor that have adopted green vendor certification has benefited greatly" has the lowest pressure (M = 3.147, SD = 0.944). In summary, the mean score for all the indicators range from 3.147

to 3.460. The average mean is less than 3.3, which indicates that the overall pressure faced by firms is not very intense in Malaysia.

5.7.15 Environmental Performance

The results in Table 5.22 show that "significant improvement in the overall environmental performance of our company" (M = 3.663, SD = 0.780) is the most important performance. On the other hand, "significant reduction in air emission" (M = 3.515, SD = 0.789) is the least important for environmental performance.

Table 5. 21: Descriptive Statistic for Items Related to Competitor Pressure

No	Items	M	SD
1	Main competitors that have adopted green vendor certification have benefited greatly.	3.147	0.944
2	Main competitors that have adopted green vendor certifications are perceived favorable by customers.	3.184	0.925
3	A successful and big firm in my firm's industry has adopted green initiative.	3.153	0.913
4	Industry generally believes that green initiative is considered as important for improving organization image.	3.460	0.925
5	Industry is in generally believes that green initiative are the most appropriate initiative to achieve business objectives.	3.276	0.925
6	Green environmental management has been affected by competitors and green environmental protection strategy.	3.19	0.991
	Total	3.235	0.915

In summary, the mean scores shown in Table 5.22 for all the indicators range from 3.515 to 3.663 which show high concern of firms on environment performance. The overall mean score is more than 3.5, which indicates that environmental performance is a main concern for manufacturing firms in the Malaysian context.

Table 5.22: Descriptive Statistic for Items Related to Environmental Performance

No	Items	M	SD
1	Significant reduction in consumption of hazardous materials and harmful/toxic materials.	3.583	0.776
2	Significant increase in reuse, recycle and recovery of materials of component or parts.	3.546	0.763
3	Significant reduction in air emission.	3.515	0.789
4	Significant reduction in water and solid waste.	3.613	0.856
5	Significant decrease in frequency of environmental accidents.	3.638	0.852
6	Significant reduction in energy consumption	3.65	0.821
7	Significant improvement in the overall environmental performance of our company.	3.663	0.78
	Total	3.601	0.669

5.7.16 Economic Performance

The results in Table 5.23 show that "decreased its fine for environment accidents" (M = 3.552, SD = 0.787) is the most critical performance. Meanwhile, "decreased its cost of materials purchase" (M = 3.153, SD = 0.836) has the lowest mean score. In summary, the mean scores for all the indicators range from 3.153 to 3.552. The average mean score is less than 3.4, indicating a low perception on economic performance when compared with environmental performance.

Table 5.23: Descriptive Statistic for Items Related to Economic Performance

No	Items	M	SD
1	Decreased its cost of materials purchase.	3.153	0.836
2	Decreased its cost of energy consumption.	3.405	0.858
3	Decreased its fees for waste treatment/discharge.	3.294	0.838
4	Decreased its fine for environment accidents.	3.552	0.787
5	Increased its market share, revenues and return on investment.	3.307	0.731
6	Increased its cost of operating, training, and purchasing of environmental friendly materials and activities.	3.313	0.733
	Total	3.337	0.568

5.7.17 Intangible Performance

The result in Table 5.24 show that "improvement in occupational health and safety of employees" (M = 3.742, SD = 0.806) has the highest mean, whereas "improvement in overall stakeholder welfare of betterment" (M = 3.368, SD = 0.737) is of the least importance for firms in the Malaysian context. In summary, the mean scores for all the indicators range from 3.368 to 3.742. The average mean is more than 3.5, which shows that intangible performance (M = 3.58) and environmental performance (M = 3.60) are perceived to be equally important for manufacturing firms in Malaysia.

Table 5.24: Descriptive Statistic for Items Related to Intangible Performance

No	Items	M	SD
1	Improvement in the level of its image in the eyes of public.	3.485	0.688
2	Improvement in environmental reputation of our company.	3.558	0.779
3	Improvement in overall stakeholder welfare or betterment.	3.368	0.737
4	Improvement in occupational health and safety of employees.	3.742	0.806
5	Improvement in community health and safety	3.638	0.838
6	Reduction in environmental impacts and risks of products and services to public.	3.656	0.789
7	Strengthening the company's corporate brand as innovative, socially responsible and environmentally aware.	3.613	0.796
	Total	3.58	0.644

5.8 Structural Equation Model (SEM)

The statistical techniques used for this study have been discussed in the previous chapter. Using SEM to handle complicated multiple independent and dependent variables simultaneously allow for automatic correction for measurement errors (Anderson & Gerbing, 1988) and also allows for either continuous or discrete data to be examined (Tabachnick, Fidell, & Osterlind, 2001). A two-stage procedure is firstly, to

test the integrity of measures, using validity and reliability test to validate the measurement model. Secondly, the proposed structural model is analyzed for hypothesis testing and justification by using the smart PLS for the analysis.

5.8.1 Internal Consistency Reliability

The first step in PLS-SEM analysis is to analyze the measurement model (or outer model) and to specify the relationships between the indicators and the latent construct that are intended to be measured and how well the indicators load on the theoretically defined constructs. The first criterion to be evaluated is the internal consistency reliability. Cronbach's alpha and composite reliability measures will be used to further assessed for reliability of the constructs. The thresholds of Cronbach's alpha are either met or close to 0.70 as suggested by Nunnally (1978). The Cronbach's alpha and composite reliability of all reflective constructs is reported in Table. 5.25. Cronbach's alpha values ranged from 0.8 to 0.95, which are acceptable for exploratory research. The composite reliability varies between 0 and 1, which higher values indicating higher levels of reliability. The composite reliability technique is a more demanding in assessing whether the specific indicators are sufficient in their illustration of respective constructs, if compared with Cronbach's alpha (Chin, 1998) (Fornell & Larcker, 1981). As shown in Table 5.25 the results indicate that composite reliability for each construct is above 0.7 and this agreed with the threshold indicated by Segars (1997). Both results from the Cronbach's alpha and composite reliability provide strong evidence for scale reliability of reflective constructs.

5.8.2 Construct Validity

Two types of validity, convergent validity and discriminant validity (Chin, 1998) are used to validate the measurement models and offer some evidence of the goodness of fit of the measurement model.

Convergent validity specifies the degree to which theoretically similar constructs are highly correlated with each other. Anderson (1987) identified the convergent validity is used to assess whether each indicator's standard loading on its proposed underlying construct is significant, with threshold is above 0.7 (Nunnally, 1978). According to Chin (1998), standardized loadings should be greater than 0.50. Table 5.25 shows the loading result. Examining the weights and loadings for each of the 15 constructs and 105 items, the results show two item loadings below the acceptable value, which were under the financial capabilities, FC1 (Purchasing capabilities influence the financial performance of the organization) and FC2 (Cost management strategy is an increasingly important consideration) were removed. Indicators with weaker outer loadings are sometime retained as the basis of their contribution to content validity. However, indicators with very low outer loadings should however always be eliminated from the scale (Hair, Ringle, & Sarstedt, 2011). The results presented in Table 5.25 illustrate the recommendations regarding indicator deletion based on the outer loadings. All the remaining elements met the 0.70 standardized loading prescribed by Chin (1998), signifying that the measures were adequate in their validity individually.

Based on the 105 original items, the loadings for each measurement item were analyzed. The result shown 103 items have loadings of greater than the recommended value of 0.70 (Chin, 1998). However, after re-run and re-evaluation for the modified model, it was decided to keep all items, except for FC1 and FC2. These two items were dropped

from the model because the loadings is less than the recommended value (<0.5). Most items are significantly highly loaded on their proposed factors with loadings of above 0.7 (Refer Table 5.25).

Table 5.25 presents the results for the average variance extracted (AVE). It is a summary indicator of convergent validity of constructs. This criterion is defined as the grand mean value of the squared loadings of the indicators associated with the constructs. AVE for all constructs shown in Table 5.25 is above 0.5, indicating that latent constructs can account for at least 50 per cent of the variance in the items and the measurement scale has adequate convergent validity (Hair, Black, Babin, & Anderson, 2006, 2010). Average Variance Extracted (AVE) is higher than 0.5. However, following Fornell and Larcker (1981) AVE of 0.4 can be accepted if AVE is less than 0.5, but composite reliability is higher than 0.6, the convergent validity of the construct is still adequate. In this case, the results show that the score for AVE for EO is 0.4956. However, this can be kept as the composite reliability is higher than 0.70, thus the convergent validity of the construct is still adequate.

Table 5.25: The results of Convergent Validity

Construct	Item	Initial Model	Modified Modl	AVE	Composite Reliability	Cronbach's Alpha
MC	MC1	0.664	0.664	0.5911	0.9351	0.9226
	MC2	0.792	0.792			
	MC3	0.786	0.786			
	MC4	0.813	0.813			
	MC5	0.770	0.770			
	MC6	0.783	0.783			
	MC7	0.832	0.832			
	MC8	0.772	0.772			
	MC9	0.766	0.766			
	MC10	0.695	0.695			
IC	IC1	0.830	0.830	0.7113	0.9567	0.9488
	IC2	0.873	0.873			
	IC3	0.855	0.855			
	IC4	0.831	0.831			
	IC5	0.870	0.870			
	IC6	0.866	0.866			
	IC7	0.847	0.847			
	IC8	0.894	0.894			
	IC9	0.711	0.711			
FC	FC1	0.471	DELETED	0.759	0.9499	0.9366
	FC2	0.408	DELETED			
	FC3	0.846	0.844			
	FC4	0.868	0.880			
	FC5	0.861	0.860			
	FC6	0.839	0.867			
	FC7	0.863	0.877			
	FC8	0.880	0.900			
DC	DC1	0.838	0.838	0.692	0.9182	0.8887
	DC2	0.830	0.830			
	DC3	0.821	0.821			
	DC4	0.796	0.796			
	DC5	0.873	0.873			
SC	SC1	0.812	0.812	0.6735	0.9428	0.9308
	SC2	0.812	0.812			
	SC3	0.803	0.803			
	SC4	0.818	0.818			
	SC5	0.820	0.820			
	SC6	0.814	0.814			
	SC7	0.839	0.839			
	SC8	0.847	0.847			

Table 5.25: continued The results of Convergent Validity

Construct	Item	Initial Model	Modified Model	AVE	Composite Reliability	Cronbach's Alpha
GSS	GSS1	0.852	0.852	0.6932	0.9475	0.9368
	GSS2	0.869	0.869			
	GSS3	0.831	0.831			
	GSS4	0.844	0.844			
	GSS5	0.847	0.847			
	GSS6	0.829	0.829			
	GSS7	0.788	0.788			
	GSS8	0.797	0.797			
GSD	GSD1	0.780	0.780	0.6504	0.9177	0.8923
	GSD2	0.816	0.816			
	GSD3	0.858	0.858			
	GSD4	0.820	0.820			
	GSD5	0.766	0.766			
	GSD6	0.796	0.796			
GSC	GSC1	0.789	0.789	0.7118	0.9367	0.9191
	GSC2	0.828	0.828			
	GSC3	0.884	0.884			
	GSC4	0.843	0.843			
	GSC5	0.873	0.873			
	GSC6	0.841	0.841			
GSE	GSE1	0.831	0.831	0.683	0.9279	0.9061
	GSE2	0.856	0.856			
	GSE3	0.857	0.857			
	GSE4	0.855	0.855			
	GSE5	0.851	0.851			
	GSE6	0.696	0.696			
RP	RP1	0.745	0.745	0.516	0.8807	0.843
	RP2	0.763	0.763			
	RP3	0.795	0.795			
	RP4	0.754	0.754			
	RP5	0.643	0.643			
	RP6	0.734	0.734			
	RP7	0.568	0.568			
CP	CP1	0.849	0.849	0.5879	0.8938	0.8571
	CP2	0.882	0.882			
	CP3	0.789	0.789			
	CP4	0.726	0.726			
	CP5	0.741	0.741			
	CP6	0.573	0.573			

Table 5.25: continued The results of Convergent Validity

Construct	Item	Initial Model	Modified Model	AVE	Composite Reliability	Cronbach's Alpha
COP	COP1	0.851	0.851	0.7246	0.9404	0.9243
	COP2	0.858	0.858			
	COP3	0.858	0.858			
	COP4	0.817	0.817			
	COP5	0.895	0.895			
	COP6	0.826	0.826			
EN	EN1	0.803	0.803	0.6911	0.9399	0.9251
	EN2	0.813	0.813			
	EN3	0.785	0.785			
	EN4	0.882	0.882			
	EN5	0.836	0.836			
	EN6	0.799	0.799			
	EN7	0.896	0.896			
EO	EO1	0.695	0.694	0.4956	0.8547	0.8021
	EO2	0.770	0.770			
	EO3	0.691	0.691			
	EO4	0.703	0.703			
	EO5	0.718	0.718			
	EO6	0.653	0.653			
IP	IP1	0.849	0.849	0.6891	0.9394	0.9246
	IP2	0.841	0.842			
	IP3	0.793	0.793			
	IP4	0.845	0.845			
	IP5	0.845	0.845			
	IP6	0.850	0.850			
	IP7	0.785	0.785			

MC: Manufacturing capabilities, IC: Integration capabilities, FC: Financial capabilities, DC: Innovative capabilities, SC: Intraorganisational capabilities. GSS: Green supplier selection, GSD: Supplier development, GSC: Green supplier collaboration, GSE: Green supplier evaluation, RP: Regulations pressures, CP: Customer pressures, COP: Competitor pressures, EN: Environmental performance, EO: Economic performance, IP: Intangible performance

5.8.3 Discriminant Validity

Discriminant validity determines the extent to which one construct is different from all other constructs in the research model. Two steps were used to assess the validity. First is to examine for the cross loading, and then follow by comparing the square root of the AVE for each construct with its correlation with other constructs (Chin, 1998).

The results presented in Table 5.26 show that the loadings and cross loading indicate that all the measurement items were loaded highly on their own latent construct than other constructs. The scores shown (diagonally and in bold) the elements that represent the square root of the AVE score (off-diagonal elements are the correlations between constructs). It shows that every square root of AVE is larger than inter-construct correlations, indicating that the variance explained by the respective construct is larger than the measurement error variance (Fornell & Bookstein, 1982).

From the findings shown in Table 5.26, the square roots of AVE values range from 0.7 to 0.91, proving that all the average variance extracted (AVE) are greater than the recommended 0.50 level. AVE loading of greater than 0.5 implies that the construct accounts for at least 50% of measurement variance. AVE for each construct is significantly greater than any correlation between the constructs (as shown diagonally and in bold). Those constructs share greater variance with their own measures than with other constructs in the model. In this case, discriminant validity of the measurement instrument is validated.

The Smart PLS algorithm function also produces the cross loadings which is another criterion for evaluation the discriminant validity of a questionnaire. Appendix B11 shows the output of cross loading for all constructs and indicators. According to these results all measurement items loaded higher against their respective intended latent variable compared to other variables, the results also confirmed that the loading of each block is higher than any other block in the same rows and columns. Thus, the cross loading output confirmed the measurement model's discriminant validities are satisfied. This study, therefore confirmed the discriminant validity of all constructs.

Table 5.26: Correlation of Latent Variables and Discriminant Validity

	COP	CP	DC	EN	EO	FC	GSC	GSD	GSE	GSS	IC	IP	MC	RP	SC
COP	0.851														
CP	0.767	0.798													
DC	0.468	0.505	0.832												
EN	0.432	0.494	0.477	0.831											
EO	0.446	0.526	0.445	0.611	0.704										
FC	0.482	0.477	0.604	0.481	0.505	0.871									
GSC	0.646	0.679	0.590	0.562	0.537	0.669	0.844								
GSD	0.538	0.611	0.560	0.547	0.514	0.584	0.784	0.806							
GSE	0.604	0.672	0.570	0.606	0.635	0.573	0.694	0.741	0.826						
GSS	0.612	0.623	0.534	0.556	0.586	0.613	0.765	0.759	0.683	0.833					
IC	0.610	0.616	0.647	0.609	0.636	0.652	0.675	0.649	0.693	0.673	0.843				
IP	0.574	0.514	0.490	0.617	0.665	0.556	0.632	0.509	0.565	0.602	0.613	0.830			
MC	0.545	0.587	0.663	0.638	0.560	0.695	0.690	0.670	0.672	0.670	0.743	0.641	0.769		
RP	0.570	0.606	0.392	0.485	0.464	0.348	0.408	0.422	0.570	0.483	0.510	0.410	0.458	0.718	
SC	0.570	0.592	0.630	0.634	0.656	0.693	0.700	0.632	0.685	0.684	0.754	0.665	0.730	0.468	0.821

MC: Manufacturing capabilities, IC: Integration capabilities, FC: Financial capabilities, DC: Innovative capabilities, SC: Intraorganisational capabilities. GSS: Green supplier selection, GSD: Supplier development, GSC: Green supplier collaboration, GSE: Green supplier evaluation, RP: Regulations pressures, CP: Customer pressures, COP: Competitor pressures, EN: Environmental performance, EO: Economic performance, IP: Intangible performance.

5.8.4 Second Order CFA

The hierarchical component model was originally suggested by Wold (1982) and Chin, Marcolin and Newsted (2003) to assess for higher order or a second-order factor by observing the factors in the first-order variables. After running the PLS algorithm (Reinartz, Krafft, & Hoyer, 2003), there were repeated obvious variables used in the model, which means that all these repeated manifest items are repeated higher-order constructs.

Collinearity arises when two indicators highlighted are correlated. When more than two indicators are involved, it is called multicollinearity. Each indicator's tolerance or variance inflation factor (VIF) value should be higher than 0.20 and lower than 5. Otherwise, eliminating the indicators, merging the indicators into a single index, or creating higher-order constructs to treat the collinearity problem would be considered. In this study, green purchasing practices and triple bottom line are proposed as a second order formative construct. The first-order latent variables, green purchasing capabilities and institutional pressure were saved for the second-order analyses for green purchasing practice and triple bottom line. This is considered the most preferable statistical technique to handle higher second order constructs.

The measurement items for the first orders have been examined in terms of validity, reliability, convergent and discriminant validity of the measures in the above section (in Table 5.25) before proceeding to the validity of the second-order factor model. The results indicate that all the first-order constructs have reliable and valid multiple-item scales. To validate the second-order model of green purchasing practices and triple bottom line, the collinearity assessment needs to be carried out to get the variance inflation factor (VIF). The analysis of the variance inflation factor (VIF) for green

practices and triple bottom line is shown in the Table 5.27. All the constructs shown in Table 5.27 are less than 5, indicating that the indicators can account for at least 80 percent of the variance in the items, and the measurement scale has to quantify the severity of collinearity among the indicators in a formative measurement model.

Table 5.27: Multicollinearity Evaluation for Second Order Formative Constructs

	Green purchasing practices,			**Triple bottom line**	
	Tolerance	VIF		Tolerance	VIF
MSGSS	0.337	2.967	**MSEN**	0.551	1.814
MSGSD	0.278	3.6	**MSEO**	0.548	1.823
MSGSC	0.307	3.26	**MSIP**	0.517	1.934
MSGSE	0.407	2.459			

5.9 Assessment of the Structural Model

Using the adequacy of the measurement model established in previous section, the subsequent step would be the evaluation or creation of the structural model by analyzing the internal mode and establishment of hypothesis testing. In order to perform such task, the data were then run by using the 5000 bootstrapped samples for all the 163 cases per sample. This study subsequently used t-test to examine the path loading in between the constructs in order to identify its significance effect.

5.9.1 Path Model - The Total Effect of the Green Purchasing Capabilities and the Triple Bottom Line Performance.

Figure 5.1 provides the graphical representation of the path modeling for green capabilities and triple bottom line without the mediating and moderating effect. It presents the path coefficients (β) and significance for the structural model. The findings show that the R^2 coefficient is 0.683. The results show that not all relationships were

found to be significant. The importance of these findings is discussed in detail in the next chapter.

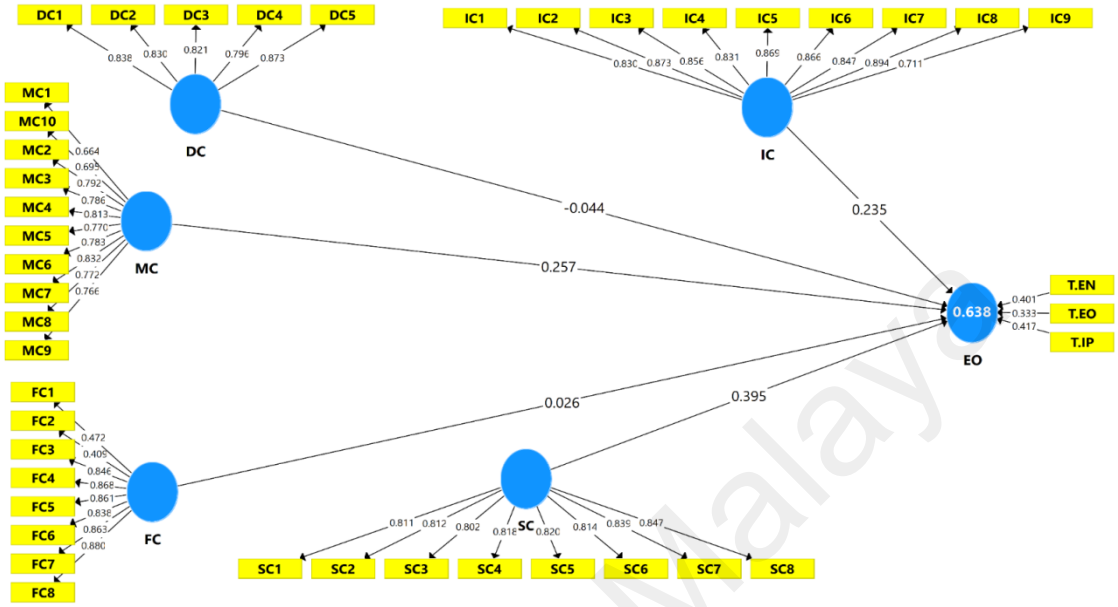


Figure 5.1: The Relationship between Green Capabilities and Triple Bottom Line Performance

Table 5.28 shows the relationships between green purchasing capabilities (IVs) and triple bottom line (DVs) without the mediator and moderator. The R^2 value for the relationships of five green purchasing capabilities (MC, FC, SC, IC and DC) and green practice is 0.638, suggesting that 63.8 per cent of the variance in TBL can be explained by MC, FC, SC, IC and DC. The significant paths suggest that the green manufacturing capabilities ($\beta = 0.257$, $P < 0.05$), integration capabilities ($\beta = 0.235$, $P < 0.05$) and intraorganisational ($\beta = 0.395$, $P < 0.05$) capabilities have significant impact on the triple bottom line.

Based on the findings, intraorganisational capabilities have the most significant impact on the TBL. On the other hand, innovative capabilities ($\beta = -0.044$, $P > 0.05$) and financial capabilities ($\beta = 0.026$, $P > 0.01$) do not have significant impact on the triple bottom line. Thus, H3a, H3b, and H3c are supported, whereas H3d and H3e are not

supported. A comprehensive discussion of the magnitude of the significant path coefficients and non-significant findings are presented in chapter 6.

Table 5.28: The Total Impact without the Mediator and Moderator Effect.

Path	β Original	β Bootstrap	SE	t value	p value
DC -> TBL	-0.044	-0.041	0.069	0.635	0.526
FC -> TBL	0.026	0.038	0.089	0.294	0.769
IC -> TBL	0.235	0.230	0.092	2.556	0.012
MC -> TBL	0.257	0.255	0.102	2.513	0.013
SC -> TBL	0.395	0.392	0.098	4.032	0.000

5.9.2 Path Model a - The Mediating Effect of Green Purchasing Capabilities and Green Purchasing Practices

Figure 5.2 provides the graphical representation of the path modeling for mediating effect of green capabilities and green purchasing practice. It presents the path coefficients (β) and significance for the structural model. The finding shows that the R^2 coefficient is 0.707. The results show that not all the relationships were found to be significant. The detail of these research findings will be further discussed in the next chapter. The R^2 value for the relationship between the five green purchasing capabilities (MC, FC, SC, IC and DC) and the green practice is 0.707, which suggests that 70.7 per cent of the variance in green purchasing practices can be explained by MC, FC, SC, IC and DC.

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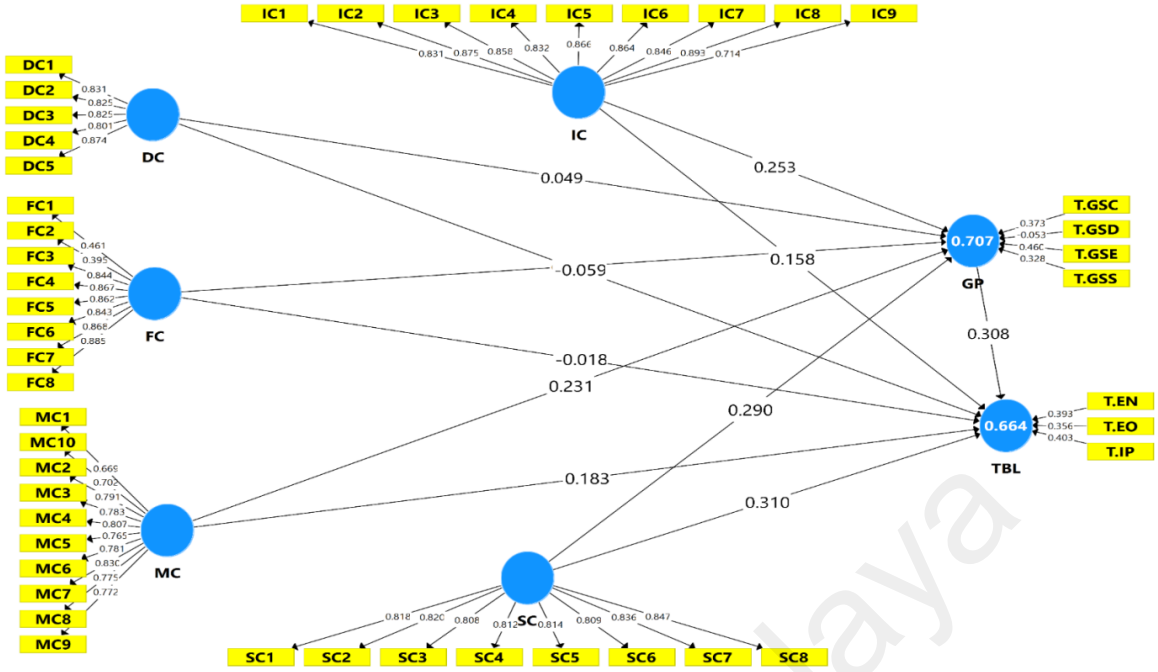

Figure 5.2: Mediating Effect of Green Purchasing Capabilities and Green Purchasing Practices

Table 5.29 shows the results indicating that MC (β = 0.231, P < 0.05), IC (β = 0.253, P < 0.05), SC (β = 0.290, P < 0.05) and FC (β = 0.059, P < 0.0 5) are positively related to green purchasing practices, whereas DC (β = 0.049, P > 0.05) is not significant. The result shows that the P value for FC is 0.049. However, the result is acceptable. There is a significant impact as the value is < 0.05. Figure 5.2 shows the significant path which suggests that all the capabilities have significant impact on the green purchasing practices with R^2= 0.707. Thus, H1a, H1b, H1c and H1d are supported, whereas H1e is not supported.

Table 5.29: The Impact of Green Purchasing Capabilities and Green Purchasing Practice

Path a	β Original	β Bootstrap	SE	T value	P
DC -> GP	0.049	0.048	0.080	0.612	0.271
FC -> GP	0.127	0.126	0.076	1.664	0.049
IC -> GP	0.253	0.257	0.091	2.769	0.003
MC -> GP	0.231	0.232	0.070	3.307	0.001
SC -> GP	0.290	0.289	0.096	3.020	0.001

5.9.3 Path Model b – The Mediating Effect of Green Purchasing Practices and Triple Bottom Line.

Based on Table 5.30, the findings indicate that there is significant mediating effect between the triple bottom line and green purchasing practices. The value for ($\beta = 0.308$, $P < 0.001$) supports a direct impact for GP and TBL. Green purchasing practices have significant impact on the triple bottom line, thus H2 is supported.

Table 5.30: The Effect of Green Purchasing Practices and Triple Bottom Line

Path b	β Original	β Bootstrap	SE	T value	P
Path b					
GP -> TBL	0.308	0.311	0.088	3.526	<0.001

5.9.4 Path Model c' - The Direct Effect of the Green Purchasing Capabilities and the Triple Bottom Line.

Figure 5.2 provides the graphical representation of the path modeling for direct mediating effect of green purchasing practice on green purchasing capabilities towards the triple bottom line performance. It presents the path coefficients (β) and significance for the structural model. The findings show that the R^2 coefficient is 0.664. The results show that not all the relationships are significant. The importance of these findings will be discussed in detail in the next chapter.

On the prediction of the TBL, the R^2 value of 0.664 suggests that 66.4 per cent of the variance in TBL can be explained by MC, IC, DC, FC, SC and GP. The hypothesized MC ($\beta = 0.183$, $P < 0.01$), IC ($\beta = 0.158$, $P < 0.01$), SC ($\beta = 0.310$, $P < 0.01$) and GP ($\beta = 0.308$, $P < 0.01$) are positively related to TBL, whereas DC ($\beta = -0.059$, $P < 0.01$) and FC ($\beta = -0.018$, $P < 0.01$) are not related to TBL.

Table 5.31 shows the direct mediating impact of green purchasing practices on green purchasing capabilities towards the triple bottom line performance. Green purchasing practices is formally hypothesized to be the mediator in the relationship between the green capabilities and triple bottom line constructs. A model comparison analysis was conducted to test the proposed mediating effect of green purchasing practices.

The results indicating that manufacturing capabilities, ($\beta = 0.183$, $P < 0.05$), intraorganisational capabilities ($\beta = 0.310$, $P < 0.05$), integration capabilities ($\beta = 0.158$, $P < 0.05$) and green purchasing practice ($\beta = 0.308$, $P < 0.001$) have significant direct impact on triple bottom line. However, the impact of intraorganisational was found to have the most significant effect when compared with MC and IC. The findings indicate no direct impact of innovative capabilities ($\beta = -0.059$, $P > 0.05$) and financial capabilities ($\beta = -0.018$, $P > 0.05$) on the triple bottom line. These results provide support for H4a, H4b, and H4c and reject H4d and H4e.

Table 5.31: The Direct Impact of Green Capabilities and Triple Bottom Line

Path	β Original	β Bootstrap	SE	T value	P
Path c'					
DC -> TBL	-0.059	-0.053	0.060	0.977	0.165
FC -> TBL	-0.018	-0.009	0.084	0.220	0.413
IC -> TBL	0.158	0.154	0.094	1.686	0.047
MC -> TBL	0.183	0.179	0.092	1.996	0.024
SC -> TBL	0.310	0.304	0.091	3.402	<0.001

5.9.5 Path Model ab – The Direct Mediation Effect of Green Purchasing Practice on Green Purchasing Capabilities and Triple Bottom Line Performance

The method to assess the mediation effect in path models will be by examining the relationship of the direct link between two latent variables (path c) and the indirect link via the potential mediator variable (path a) from the predator to the mediator and path b

from the mediator to the endogenous variable. Mediating effect can be assumed if H0: a × b = 0 can be rejected. The common method used for testing mediating effects is the Sobel (1982) test. This approach examines the relationship between the independent variable, dependent variable compared to the relationship between the independent variable and dependent variables, including the mediation construct (Helm, Eggert, & Garnefeld, 2010).

To test the mediating effects for this study, the significance test is conducted by carrying out the bootstrapping the sampling distribution of the indirect effect, which works for simple and multiple mediator models (Preacher & Hayes, 2008). Bootstrapping makes no assumptions about the shape of the variables' distribution or the sampling distribution. The approach is therefore, perfectly suited for the PLS-SEM method. In addition, the approach exhibits higher levels of statistical power compared to the Sobel test.

The variance accounted for (VAF) determines the size of the indirect effect in relation to the total effect. Thereby, can determine how much of the target constructs' variance is explained by the indirect relationship via the mediator variable. If the indirect effect is significant but does not absorb any of the exogenous latent variable's effect on the endogenous variable, the VAF is rather low. This occurs when the direct effect is high. In this situation, the VAF would be less than 20%, and one can conclude that no mediation takes place. In contrast, when the VAF has very large outcomes of above 80%, one can assume a full mediation. In other hands when the VAF is larger than 20% and less than 80% can be characterized as partial mediation (Hair, Hult, Ringle & Sarstedt, 2014; Hair, 2015)

Table 5.32 shows the mediating effect of green purchasing practices on green purchasing capabilities (IV) and triple bottom line (DV). According to these results the mediating effect of green purchasing practices on relationship between green manufacturing capabilities ($\beta = 0.071$, $P < 0.05$), integration capabilities ($\beta = 0.078$, $P < 0.05$) and intraorganisational capabilities ($\beta = 0.089$, $P < 0.05$) with triple bottom line were statistically significant.

Based on the findings all indirect effects (ab) and also direct effects (c') of green manufacturing capabilities, integration capabilities and intraorganisational capabilities were indicated that green purchasing practices partially mediated the effect of these three independent variables on TBL. The results shown the VAF for these three paths were 33.05%, 27.95% and 22.30%, which are more than 20% and less than 80% indicating a partial mediation. On the other hand, the innovative capabilities ($\beta = 0.015$, $P < 0.05$) and financial capabilities ($\beta = 0.039$, $P < 0.05$) were not mediated by green practices toward the triple bottom line. In conclusion, both were not mediated by green practices toward the triple bottom line.

Table 5.32: The Mediating Effect of Green Practices on Green Purchasing Capabilities and Triple Bottom Line.

	Ab	**SE**	**z value**	**p value**	**VAF**	**Result**
DC -> GP->TBL	0.015	0.026	0.582	0.561	---	No Mediation Effect
FC -> GP->TBL	0.039	0.025	1.536	0.126	---	No Mediation Effect
IC -> GP->TBL	0.078	0.035	2.214	0.028	33.051	Partial Mediation Effect
MC -> GP->TBL	0.071	0.031	2.311	0.022	27.953	Partial Mediation effect
SC -> GP->TBL	0.089	0.043	2.062	0.041	22.306	Partial Mediation effect

Based on the findings, a comprehensive discussion on the magnitude of the significant path coefficients and non-significant findings is presented in the next chapter.

5.9.6 Goodness Fit for the Model

PLS model does not have a global indicator that would assess the overall goodness of the models. Therefore, in order to assess the goodness of the model, the global fitness (GoF) was calculated as the criterion to assess the goodness fit for the model (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). The GoF is a geometric average of all commonalities and the R^2 in the model. Below is the GoF used as an index to validate models with the PLS.

$$\text{GoF} = \sqrt{\overline{Communality} * R^2}$$

Table 5.33 The Criterion of Global Fitness

Variables	R Square	Communality	GOF
DC		0.692	
FC		0.603	
GP	0.709	0.785	0.696
IC		0.712	
MC		0.591	
SC		0.673	
TBL	0.661	0.753	0.672

The results show that the GoF of the model for green purchasing practice current models for GP and TBL are 0.696 and 0.672 respectively. A value of higher than the threshold of GoF > 0.5 shows that the data set is valid, and the structural equations are well defined and offer good representation of the models. The results shown in Table 5.33 confirmed that the model is fit as the GoF is more than 50% of the reachable fitness.

5.9.7 Predictive Relevance Q^2

To evaluate the predictive relevance of the proposed model, cross-validated redundancy method (Geisser, 1974; Stone, 1974) was applied to study the proposed models. As there were 163 observations, an omission distance of D = 7 was considered in this analysis. These methods were evaluated separately as there were two endogenous constructs in this research.

The Q2 value should be more than zero to prove predictive relevance for a particular endogenous construct. The results of the construct cross-validated redundancy estimation show that the Q^2 values for green purchasing practice (GP) is 0.5557, and the triple bottom line (TBL) is 0.4886. All are well above the threshold requirement, which imply that the model has predictive relevance for these constructs. The results are show in table 5.34.

Table 5.34: Results of R^2 and Q^2 Values in the Model

Endogenous Latent Variable	R^2 Value	Q^2 Value
GP	0.709	0.5557
TBL	0.661	0.4886

Effect Size f^2 and q^2

The f2 effect size (f^2 and q^2) was used to examine if a specified exogenous construct is omitted from the model and whether it would have a basic impact on the endogenous constructs. (Hair et al., 2014). All these changes would be reflected on the change of R^2 value that is used to evaluate the impact. The effect size (f^2 and q^2) can be calculated as:

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}} \qquad q^2 = \frac{Q^2_{\text{included}} - Q^2_{\text{excluded}}}{1 - Q^2_{\text{included}}}.$$

Where both R^2 and Q^2 included and excluded are values of the endogenous latent variable, a selected exogenous latent variable is included in or excluded from the model. The values for q^2 effect sizes are 0.02 (small), 0.15 (medium) and 0.35 (large) are guideline values to determine the effects of the predictive relevance of an exogenous variable (Cohen, 1988). The results presented in Table 5.35 show that all predictors, DC, FC, IC, MC, SC have small effect size on the green purchasing practice and triple bottom line.

Table 5.35: Results of Effect Size f^2 and q^2 for all Exogenous Variables

	TBL		***GP***	
Predictor	f^2	q^2	f^2	q^2
DC	0.004	0.028	0.003	0.023
FC	0.002	0.001	0.021	0.014
IC	0.025	0.022	0.069	0.027
MC	0.028	0.027	0.062	0.036
SC	0.090	0.045	0.093	0.040
GP	0.072	0.049	-	-

F^2: the relative impact of an exogenous construct on an endogenous construct
q^2: the relative predictive relevant of an exogenous construct (predictor) on an endogenous construct

5.9.8 Moderating Effect of Institution Pressure on Green Purchasing Capabilities and Green Purchasing Practices.

The analysis started with testing the moderating effect of institutional pressure on the relationships between the green capabilities and green practices. The proposed path model was then applied to study the relationships between the low and high level of the institutional pressure for regulation, customer and competitor pressure, in order to determine the effect at low and high level of the moderator. Table 5.36 shows the frequency distribution of dichotomized variables in between the low and high level of the institutional pressure.

5.9.9 Multi Group Analysis

One of the common approaches used in analyzing the moderating effects in the path models is the multiple group analyses. Group comparison applied in PLS (Chin, 2000) using the dichotomous or dichotomized variables (which are not discrete) could provide valuable information and insights. It is impossible to compare groups using global criterions in the PLS analysis. However, it is possible to compare the path coefficients in between two groups at a time. In this case, it can be estimated whether each of the distinct sub-samples allows for interpretation of the differences in effects between groups.

Prior to the multi group analysis for testing the moderating effect of regulation pressure (RP), customer pressure (CP) and competitor pressure (COP), the over-all mean scores for RP, CP and COP were computed using the related items. In the next step, the medians of distribution for these three variables were calculated and applied as cut-off points for categorizing RP, CP and COP that shown in Table 5.36.

Table 5.36: Frequency Distribution of Institutional Pressure

	Median	Level	Frequency	Percent
RP	**3.29**	Low (<3.29)	82	50.3
		High (≥3.29)	81	49.7
CP	**3.33**	Low (<3.33)	81	49.7
		High (≥3.33)	82	50.3
COP	**3**	Low (<3)	82	50.3
		High (≥3)	81	49.7

5.9.10 Moderating Effect of Regulation Pressure

Table 5.37 shows the relationships among the variables in both the low and high level of the regulation pressure. The model as a whole shows significant change after the introduction of the moderating effect of regulation pressure. The findings show that manufacturing and innovative capabilities have high effect at the low level of moderator

and low effect at the high level of regulation pressure. Meanwhile integration capabilities, intraorganisational capabilities and financial capabilities were found to have low effect when regulation pressure is at the low level and high effect when the regulation pressure is at the high level. Based on these results, it may be summarized that regulation pressure moderates the relationships of all components of green capabilities. However, it needs to further determining whether there is moderating effect of regulation pressure on the green purchasing capabilities.

Table 5.37: The Relationship between the Low and High Level of Regulation Pressure

RP	Path	β Original	β Bootstrap	SE	t value	P value
LOW	DC -> GP	0.083	0.069	0.135	0.617	0.539
	FC -> GP	0.037	0.059	0.155	0.236	0.814
	IC -> GP	0.110	0.117	0.163	0.675	0.501
	MC -> GP	0.403	0.399	0.124	3.243	0.002
	SC -> GP	0.279	0.289	0.133	2.102	0.039
HIGH	DC -> GP	0.023	0.040	0.104	0.224	0.823
	FC -> GP	0.302	0.285	0.106	2.852	0.006
	IC -> GP	0.251	0.271	0.112	2.252	0.027
	MC -> GP	0.051	0.058	0.103	0.495	0.622
	SC -> GP	0.334	0.314	0.128	2.607	0.011

Figure 5.3 shows low level for regulation pressure and significant impact on green purchasing practice (R^2= 0.612) and Figure 5.4 show high level of regulation pressure and significant impact on green purchasing practice (R^2= 0.742). The computation output getting from figure 5.3 and 5.4 shall be used to further determine whether there is any significant impact of the moderating effect of regulation pressure on green purchasing capabilities toward the green purchasing practice.

Table 5.38 shows the moderating effect of regulation pressure on green capabilities and practices. Even though regulation pressure moderates the relationships of all

components of green capabilities, however, regulation pressure shows significant moderating effect only on green manufacturing capabilities and green practices (z = 2.183, ρ < 0.05), but shows no moderating effect between the other four capabilities; namely, integration, innovative, intraorganisational and financial capabilities. Thus, H5a1 is supported, whereas H5a2, H5a3, H5a4 and H5a5 are not supported.

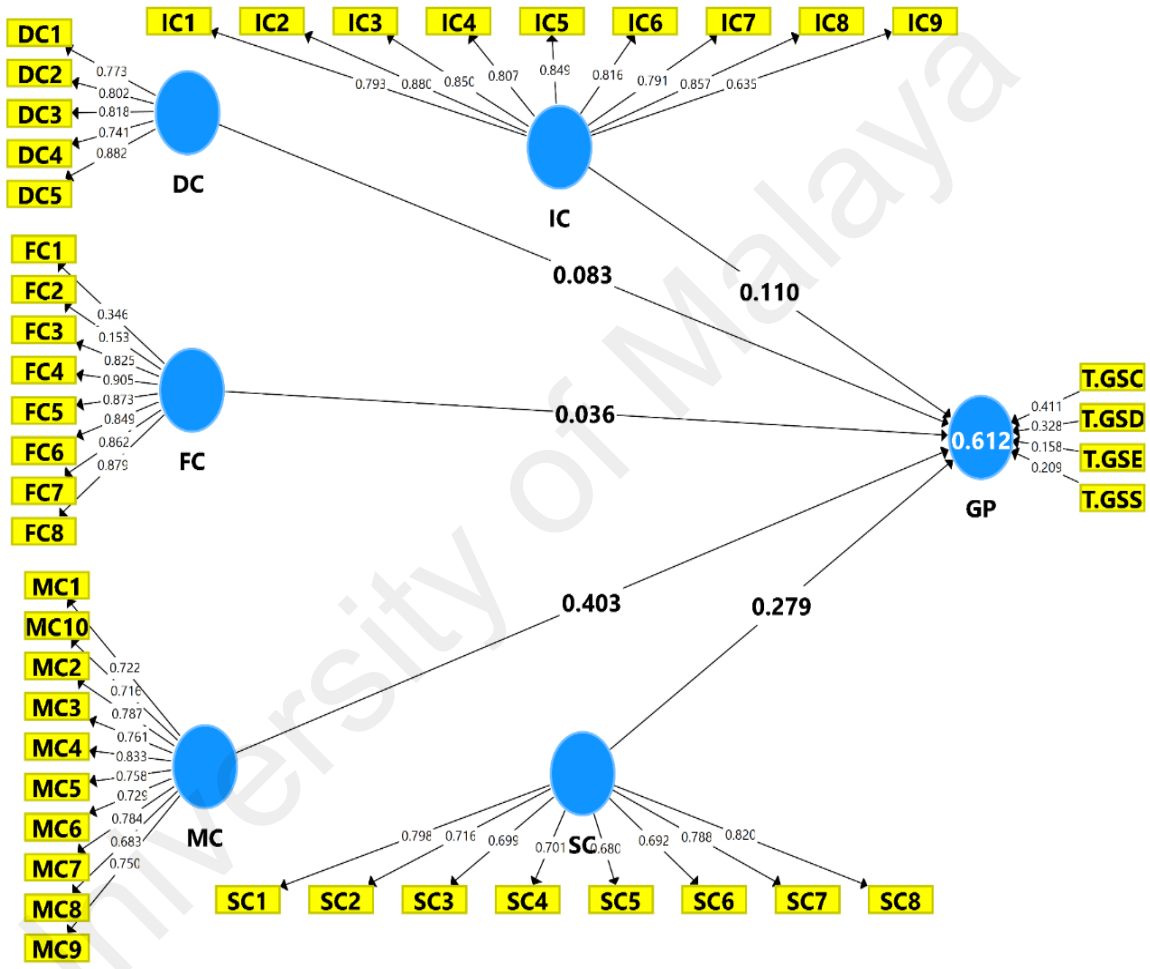

Figure 5.3: The Relationship between Green Purchasing Capabilities and Green Purchasing Practices at Low Level of RP

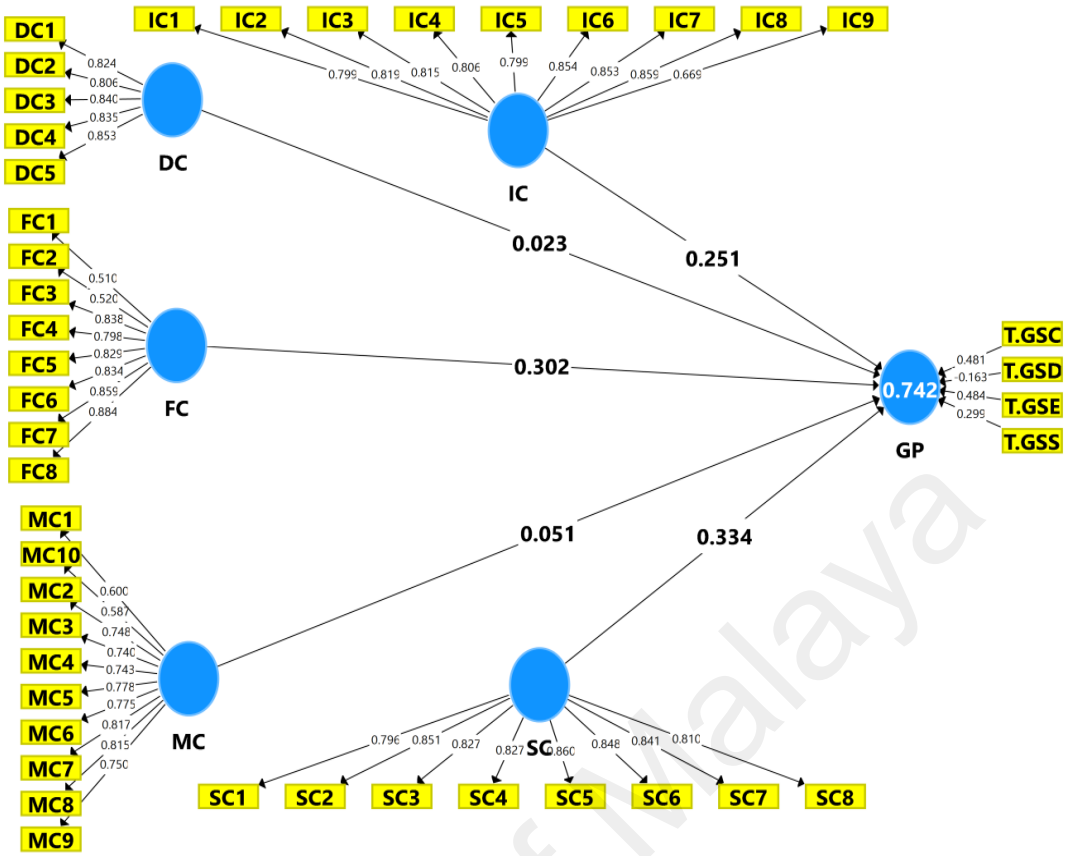

Figure 5.4: The Relationship between Green Capabilities and Green Purchasing Practices at High level of RP

Table 5.38: The Moderating Effect of Regulation Pressure on Green Purchasing Capabilities and Practices.

Path	β Low	β high	SE	Z	P
DC -> GP	0.083	0.023	0.170	0.353	0.362
FC -> GP	0.037	0.302	0.187	-1.417	0.078
IC -> GP	0.110	0.251	0.197	-0.716	0.237
MC -> GP	0.403	0.051	0.161	2.183	0.015
SC -> GP	0.279	0.334	0.184	-0.300	0.382

5.9.11 Moderating Effect of Competitor Pressure

Table 5.39 shows the relationship between the low and high level of competitor pressure. The model as a whole shows significant change after the introduction of the moderating effect of competitor pressure. The findings show that financial capabilities and integration capabilities have low effect at low level of moderator and high effect at

high level of competitor pressure. Meanwhile manufacturing capabilities are found to have high effect when competitor pressure is at the low level and low effect when competitor pressure is at the high level. However, innovative capabilities and intraorganisational capabilities are not fluctuated a lot at high and low level of competitor pressure. Based on the findings, it may be summarized that competitor pressure moderates the relationships of all components of green capabilities. However, whether there is any significant effect for all the components need to be further tested.

Figure 5.5 shows the low level of competitive pressure and the significant impact on green purchasing practice (R^2 = 0.589) and Figure 5.6 shows the high level of competitive pressure and the significant impact on green purchasing practice (R^2 = 0.723). The output from figure 5.5 and 5.6 shall be used to determine the significant impact of the moderating effect in between the green purchasing capabilities and the green purchasing practice. The results in Table 5.40 shown that not all relationships were found to be significant impact even though competitor pressure moderates the relationship of all component of green capabilities,

Table 5.39: The Relationship between the Low and High Level of Competitor Pressure

COP	Path	β Original	β Bootstrap	SE	t value	P value
LOW	DC -> GP	0.046	0.035	0.134	0.344	0.732
	FC -> GP	0.047	0.058	0.138	0.342	0.733
	IC -> GP	0.041	0.052	0.165	0.245	0.807
	MC -> GP	0.490	0.503	0.131	3.753	0.000
	SC -> GP	0.241	0.240	0.154	1.566	0.121
HIGH	DC -> GP	0.050	0.069	0.113	0.447	0.656
	FC -> GP	0.263	0.239	0.133	1.977	0.052
	IC -> GP	0.361	0.375	0.121	2.990	0.004
	MC -> GP	0.036	0.041	0.087	0.416	0.679
	SC -> GP	0.247	0.238	0.112	2.194	0.031

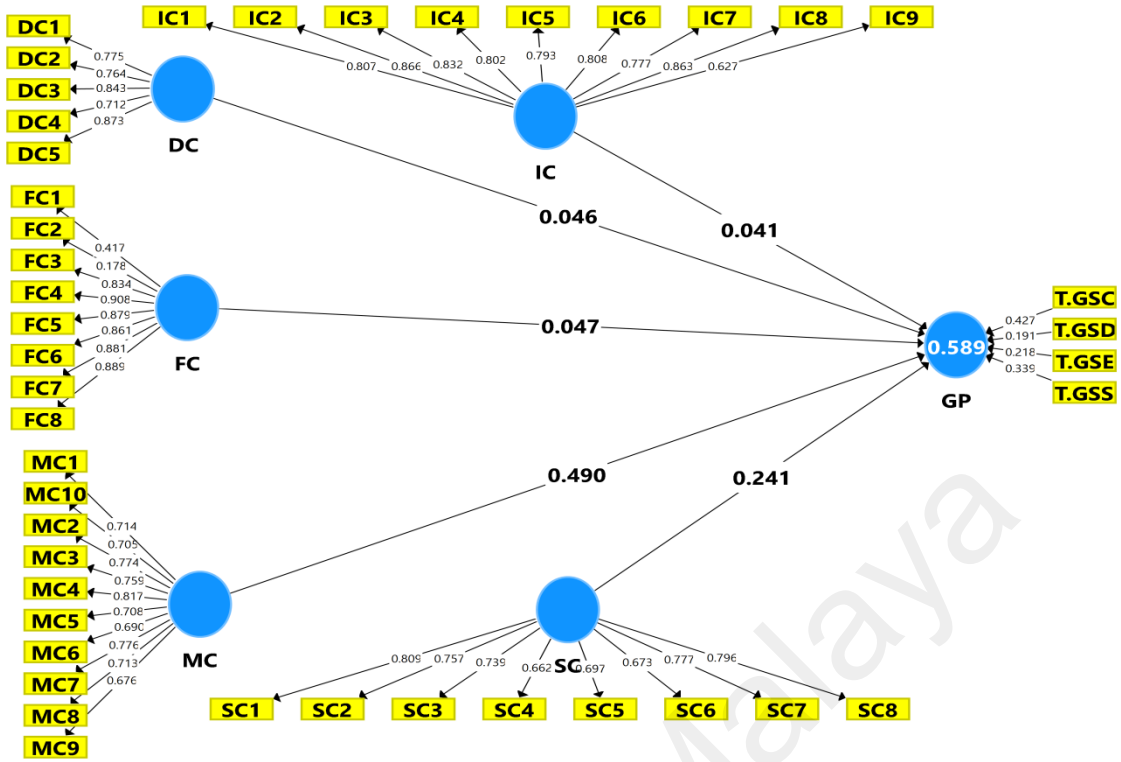

Figure 5.5: The Relationship between Green Purchasing Capabilities and Green Purchasing Practices at low level of COP

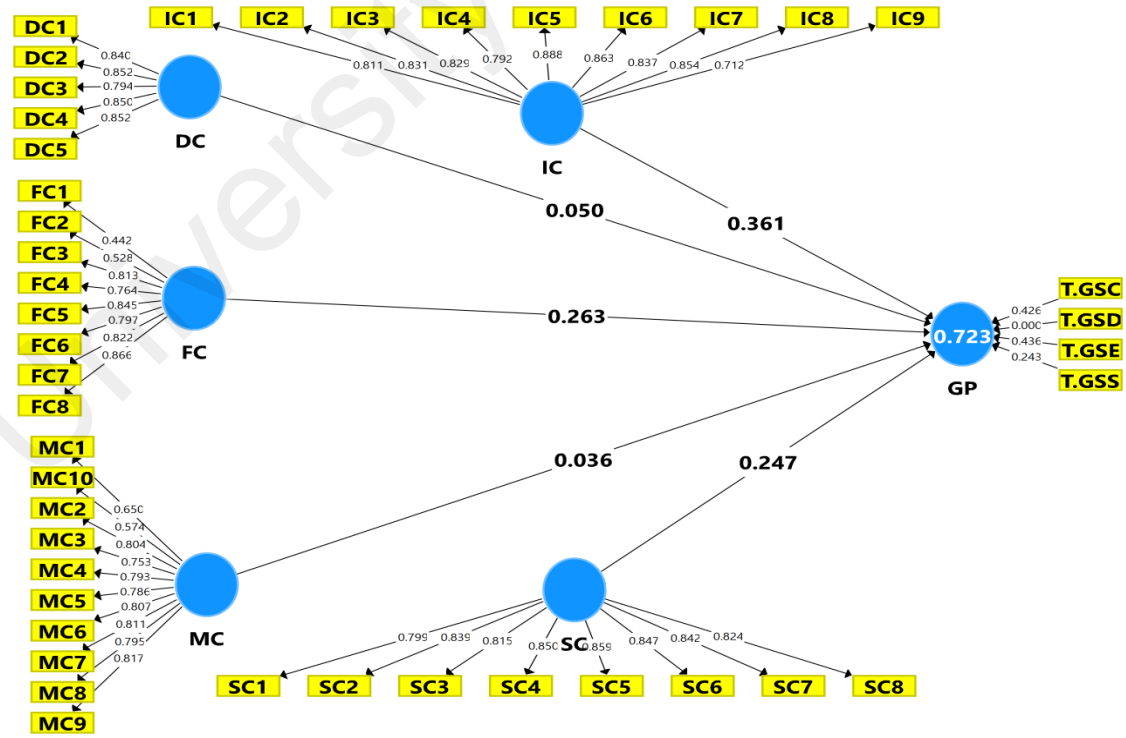

Figure 5.6: The Relationship between Green Purchasing Capabilities and Green Purchasing Practices at high level of COP

Table 5.40 presents the results of the moderating effect of competitor pressure on green capabilities and practices. Competitor pressure shows moderating effect only on the green manufacturing capabilities and green practices ($z = 2.896$, $\rho < 0.05$). Meanwhile, it was found that competitor pressure has no significant moderation effect on any of the four capabilities (integration, innovative, intraorganisational and financial) with green purchasing practices. Thus, H5c1 is supported, whereas H5c2, H5c3, H5c4 and H5c5 are not supported.

Table 5.40: The Moderating Effect of Competitor Pressure on Green Purchasing Capabilities and Green Purchasing Practices.

Path	β_{Low}	β_{high}	SE	Z	P
DC -> GP	0.046	0.050	0.175	-0.025	0.490
FC -> GP	0.047	0.263	0.192	-1.126	0.130
IC -> GP	0.041	0.361	0.205	-1.566	0.059
MC -> GP	0.490	0.036	0.157	2.896	0.002
SC -> GP	0.241	0.247	0.191	-0.028	0.489

5.9.12 Moderating Effect of Customer Pressure

Table 5.41 shows the relationship between the low and high level of customer pressure. The model as a whole shows changed after the introduction of the moderating effect of customer pressure. The findings show that integration capabilities and financial capabilities are almost the same at high and low level of the customer pressure level, Meanwhile manufacturing capabilities and innovative capabilities have high effect at the low level of moderator and low effect at the high level of customer pressure. Whereas intraorganisational capabilities are found to have low effect when customer pressure is at the low level and high effect when customer pressure is at the high level. Based on these findings, it may be summarized that customer pressure moderates the relationships of all components of green capabilities.

Table 5.41: The relationship between the Low and High Level of Customer Pressure

CP	Path	β Original	β Bootstrap	SE	t value	P value
LOW	DC -> GP	0.111	0.098	0.113	0.978	0.331
	FC -> GP	0.124	0.124	0.123	1.005	0.318
	IC -> GP	0.248	0.262	0.144	1.715	0.090
	MC -> GP	0.366	0.375	0.126	2.898	0.005
	SC -> GP	0.089	0.092	0.122	0.730	0.468
HIGH	DC -> GP	-0.030	-0.012	0.104	0.291	0.772
	FC -> GP	0.122	0.126	0.122	1.003	0.319
	IC -> GP	0.264	0.272	0.133	1.988	0.050
	MC -> GP	0.067	0.073	0.101	0.661	0.510
	SC -> GP	0.492	0.469	0.129	3.823	0.000

Figure 5.7 shows the low level of customer pressure and the significant impact on green purchasing practice ($R^2 = 0.635$) while and Figure 5.8 shows the high level of customer pressure and the significant impact on green purchasing practice ($R^2 = 0.698$). The computation output getting from Figure 5.7 and 5.8 shall be used to further determine whether there is any significant impact of the moderating effect of customer pressure on green purchasing capabilities toward the green purchasing practice. The results in Table 5.42 shown that not all relationships were found to be significant.

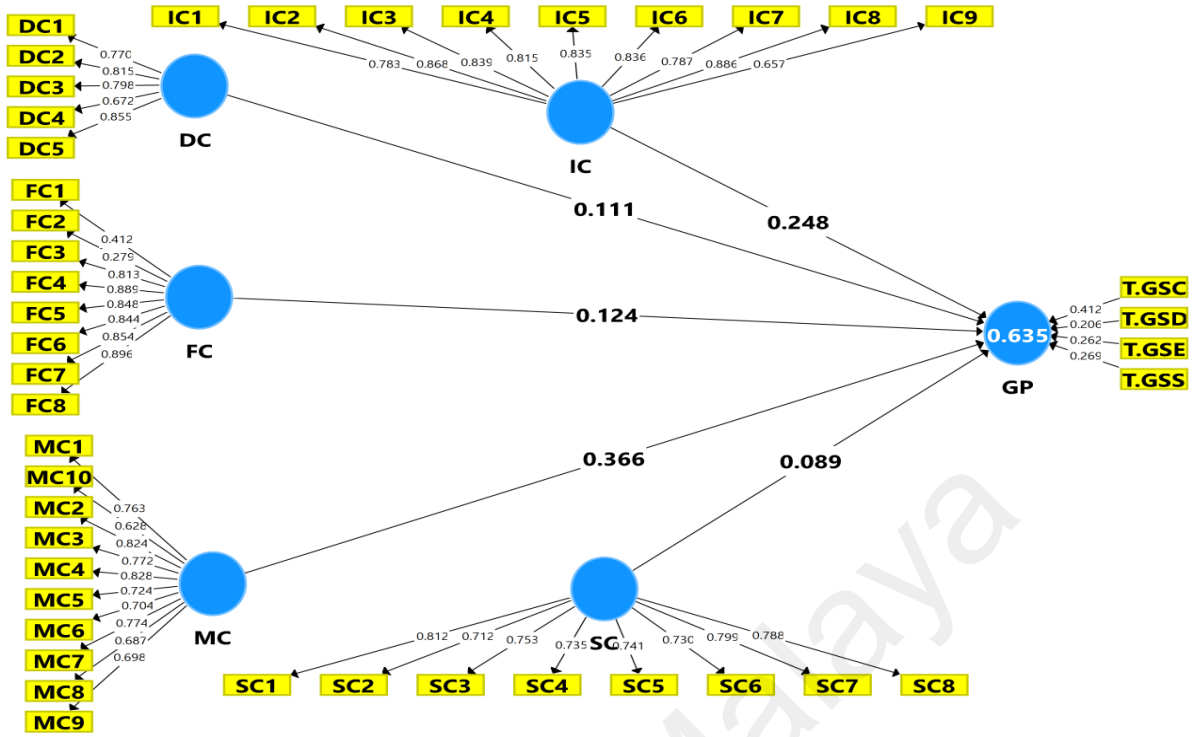

Figure 5.7: The Relationship between Green Purchasing Capabilities and Green Purchasing Practices at low level of CP

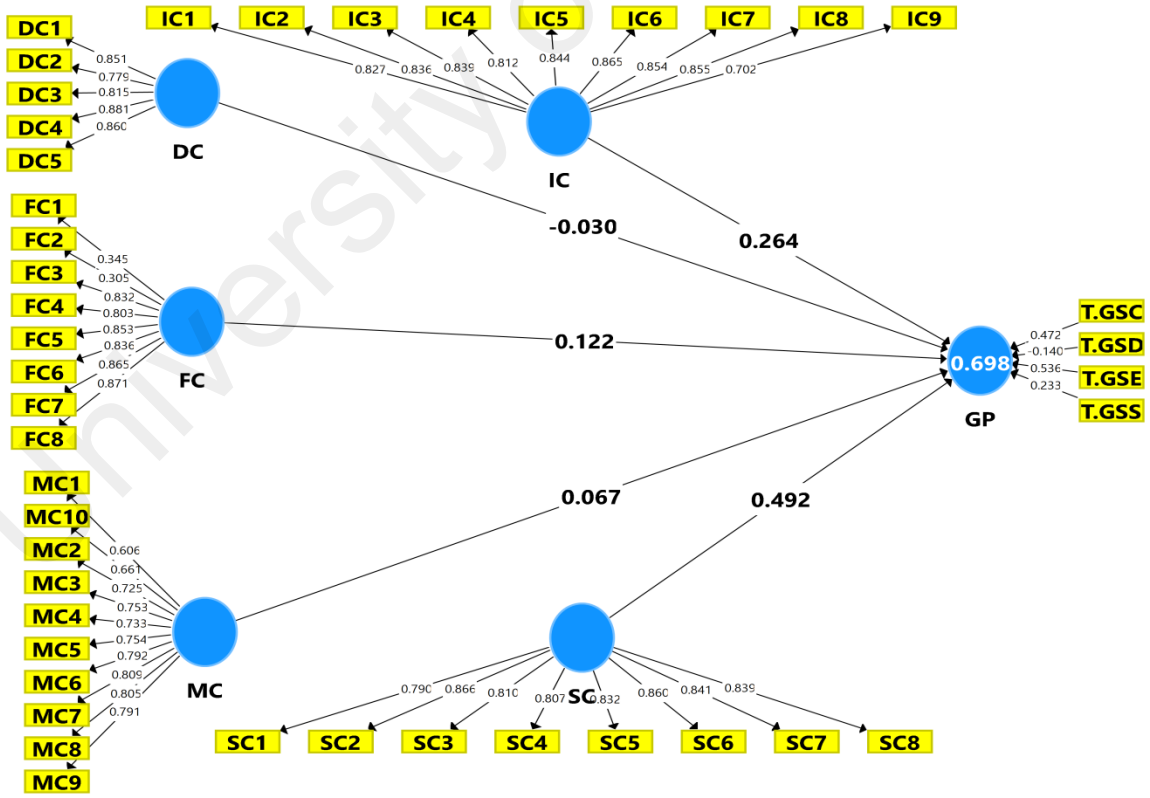

Figure 5.8: The Relationship between Green Purchasing Capabilities and Green Purchasing Practices at high level of CP

The results presented in Table 5.42 indicate that only green manufacturing capabilities (Z = 1.854, P < 0.05) and intraorganisational capabilities (Z = 12.268, P < 0.05) are significantly moderated by customer pressure. This means that firms that have significant positive inclinations to respond to their manufacturing and intraorganisational capabilities with high level of customer pressure towards these capabilities. On the other hand, customer pressure does not appear to have moderating effect between the other three green capabilities (innovative, financial and integration). Therefore, the other hypotheses concerning the moderating effect of customer pressure on the relationship between these three capabilities and customer pressure are not supported. Thus, H5b1 and H5b5 are supported, whereas H5b2, H5b3 and H5b4 are not supported.

Table 5.42: The Moderating Effect of Customer Pressure on Green Purchasing Capabilities and Green Purchasing Practices.

Path	β_{Low}	β_{high}	SE	Z	P
DC -> GP	0.111	-0.030	0.154	0.917	0.180
FC -> GP	0.124	0.122	0.173	0.009	0.496
IC -> GP	0.248	0.264	0.196	-0.083	0.467
MC -> GP	0.366	0.067	0.161	1.854	0.034
SC -> GP	0.089	0.492	0.178	-2.268	0.012

5.10 Result of Hypotheses Testing

The results of the hypothesis testing are shown in Table 5.43. The R-Square values path coefficients (β), t-value and significant values for the structural models are presented in Table 5.43. The findings confirmed that not all the relationships are significant. The importance of the findings is discussed in the next section.

Table 5.43: Result of Hypothesis testing					
No	Hypothesis	B	t/z value	P value	Result
Green Purchasing Capabilities have the Positive Effect on Green Purchasing Practices					
H1a	Green manufacturing capabilities have the positive effect on green purchasing practices.	0.231	3.307	0.001	Supported
H1b	Green intraorganisational capabilities have the positive effect on green purchasing practices.	0.290	3.020	0.001	Supported
H1c	Green integration capabilities have the positive effect on green purchasing practices.	0.253	2.769	0.003	Supported
H1d	Green financial capabilities have the positive effect on green purchasing practices.	0.127	1.664	0.049	Supported
H1e	Green innovative capabilities have the positive effect on green purchasing practices.	0.049	0.612	0.271	Not Supported
Green Purchasing Practices have the Positive Effect on Triple Bottom Line Performance					
H2a	Green purchasing practices have the positive effect on triple Bottom line performance	0.308	3.526	0.000	Supported
Green Purchasing Capabilities have the Positive Effect on Triple Bottom Line Performance					
H3a	Green manufacturing capabilities have the positive effect on triple bottom line performance.	0.257	2.513	0.013	Supported
H3b	Green intraorganisational capabilities have the positive effect on triple bottom line Performance.	0.395	4.032	0.000	Supported
H3c	Green integration capabilities have the positive effect on triple bottom line performance	0.235	2.556	0.012	Supported
H3d	Green financial capabilities have the positive effect on triple bottom line performance.	0.026	0.294	0.769	Not Supported
H3e	Green innovative capabilities have the positive effect on triple bottom line performance.	0.044	0.635	0.526	Not Supported

Table 5.43: continued Result of Hypothesis testing					
No	Hypothesis	B	t/z value	P value	Result
Green Purchasing Practices have a positive mediating effect on Green Purchasing Capabilities and Triple Bottom Line Performance					
H4a	Green purchasing practices have a positive mediating effect on green manufacturing capabilities and the triple bottom-line performance.	0.071	2.411	0.009	Supported
H4b	Green purchasing practices have a positive mediating effect on green intraorganisational capabilities and the triple bottom-line performance	0.089	2.293	0.012	Supported
H4c	Green purchasing practices have a positive mediating effect on green integration capabilities and the triple bottom-line performance.	0.078	2.177	0.016	Supported
H4d	Green purchasing practices have a positive mediating effect on green financial capabilities and the triple bottom line performance.	0.039	1.504	0.067	Not supported
H4e	Green purchasing practices have a positive mediating effect on green innovative capabilities and the triple bottom-line performance.	0.015	0.602	0.274	Not Supported
Institutional Pressure moderates the impact of Green Purchasing Capabilities on Green Purchasing Practices					
H5a1	Regulation pressure moderates the impact of green manufacturing capabilities on green purchasing practices.	--	2.183	0.015	Supported
H5a2	Regulation pressure moderates the impact of green integration capabilities on green purchasing practices.	--	-0.716	0.237	Not supported
H5a3	Regulation pressure moderates the impact of green financial capabilities on green purchasing practices.	--	-1.417	0.078	Not supported
H5a4	Regulation pressure moderates the impact of green innovative capabilities on green purchasing practices.	--	0.353	0.362	Not supported
H5a5	Regulation pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.	--	-0.300	0.382	Not supported

Table 5.43: continued Result of Hypothesis testing					
No	Hypothesis	β	t/z value	P value	Result
H5b1	Customer pressure moderates the impact of green manufacturing capabilities on green purchasing practices.	--	1.854	0.034	Supported
H5b2	Customer pressure moderates the impact of green integration capabilities on green purchasing practices.	--	-0.083	0.467	Not Supported
H5b3	Customer pressure moderates the impact of green financial capabilities on green purchasing practices.	--	0.009	0.496	Not Supported
H5b4	Customer pressure moderates the impact of green innovative capabilities on green purchasing practices.	--	0.917	0.180	Not Supported
H5b5	Customer pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.	--	-2.268	0.012	Supported
H5c1	Competitor pressure moderates the impact of green manufacturing capabilities on green purchasing practices.	--	2.896	0.002	Supported
H5c2	Competitor pressure moderates the impact of green integration capabilities on green purchasing practices.	--	-1.566	0.059	Not Supported
H5c3	Competitor pressure moderates the impact of green financial capabilities on green purchasing practices.	--	-1.126	0.130	Not Supported
H5c4	Competitor pressure moderates the impact of green innovative capabilities on green purchasing practices.	--	-0.025	0.490	Not Supported
H5c5	Competitor pressure moderates the impact of green intraorganisational capabilities on green purchasing practices.	--	-0.028	0.489	Not Supported

5.11 Control Variable for Green Purchasing Capabilities:

Based on previous studies, the control variables used in this study are number of employees (firm size), type of industry and firm ownership in order to ensure the reliability of results.

In the research by Min and Galle (2001), who revealed that the propensity for adoption of green procurement would be high for larger and established firms than for smaller firms. This is supported by Grant et al. (2002), they pointed out that firm size is one of the common control variables used in operational and environmental research. In their research, Zhu et al. (2011) stressed that due to available internal sources and external pressure imposed by the public on larger firms, as these firms are more inclined towards the adoption of green practices.

Another important control variable is the number of employees, which is commonly used in many studies on firm's environmental practices (Murillo-Luna et al., 2011; Zhu & Geng, 2013). This study uses firm size, ownership and types of industry as the control variables. Firm size was also used as the control variable in the study by Lai and Wong (2012). Therefore, using firm size, ownership and types of industry as the control variables is supported in this study.

The data for the number of employees is parametric. One-way Anova is used to evaluate whether the number of employees has any significant effect on green purchasing capabilities. The results presented in Table 5.44 indicate that there is correlation between green manufacturing capabilities, integration and financial capabilities and the number of employees (firm size), where the P value < 0.05.

Table 5.44: Control Variable-Size of Firms Using One Way Anova

	Level	M	SD	F	p value
MC	less than 100	3.364	0.779	2.628	0.037
	100 – 200	3.751	0.676		
	251 – 500	3.766	0.69		
	501 – 1000	3.383	0.642		
	more than 1000	3.753	0.669		
IC	less than 100	2.933	0.764	4.357	0.002
	100 – 200	3.406	0.814		
	251 – 500	3.552	0.789		
	501 – 1000	3.198	0.584		
	more than 1000	3.647	0.752		
FC	less than 100	3.195	0.521	3.051	0.019
	100 – 200	3.439	0.725		
	251 – 500	3.464	0.642		
	501 – 1000	3.152	0.658		
	more than 1000	3.644	0.678		
DC	less than 100	3.336	0.727	1.244	0.294
	100 – 200	3.44	0.807		
	251 – 500	3.629	0.578		
	501 – 1000	3.217	0.751		
	more than 1000	3.493	0.818		
SC	less than 100	3.13	0.745	2.107	0.082
	100 – 200	3.454	0.69		
	251 – 500	3.4	0.663		
	501 – 1000	3.207	0.656		
	more than 1000	3.578	0.75		

Some of the companies' feature which is non-parametric in nature, not continuous or categorical, such as ownership status and nature of the business were subjected to Kruskal-Wallis test. Using ownership status as the control variable, the results presented in Table 5.45 indicate that integration and intraorganisational capabilities have significant relationships with ownership status. However, the results presented in Table 5.46 show that types of industry as the control variable have no significant relationships with all the green capabilities. In conclusion, based on the overall control variables mentioned above, for ISO 14001 certified companies in Malaysia, the most significant effect of control variables is firm size.

Table 5.45: Control Variable - Firm Ownership Using Kruskal Wallis Test

	Level	M	SD	$\chi 2$	p value
MC	Malaysian fully owned	3.496	0.704	10.301	0.067
	Local and foreign joint venture	3.443	0.782		
	Owner to American company	3.883	0.772		
	Owned to Japanese company	3.908	0.53		
	owned to European company	3.653	0.729		
	Other ownership	3.9	0.443		
IC	Malaysian fully owned	3.155	0.694	13.403	0.02
	Local and foreign joint venture	3.278	0.767		
	Owner to American company	3.5	0.907		
	Owned to Japanese company	3.68	0.767		
	owned to European company	3.526	0.841		
	Other ownership.	3.692	0.729		
FC	Malaysian fully owned	3.314	0.547	9.385	0.095
	Local and foreign joint venture	3.223	0.754		
	Owner to American company	3.552	0.694		
	Owned to Japanese company	3.47	0.62		
	owned to European company	3.596	0.791		
	Other ownership.	3.625	0.604		
DC	Malaysian fully owned	3.38	0.736	5.462	0.362
	Local and foreign joint venture	3.314	0.715		
	Owner to American company	3.867	0.64		
	Owned to Japanese company	3.496	0.712		
	owned to European company	3.447	0.844		
	Other ownership.	3.523	0.751		
SC	Malaysian fully owned	3.267	0.67	11.36	0.045
	Local and foreign joint venture	3.13	0.801		
	Owner to American company	3.531	0.845		
	Owned to Japanese company	3.64	0.632		
	owned to European company	3.548	0.694		
	Other ownership.	3.433	0.607		

Table 5.46: Control Variable – Type of Industry Using Kruskal Wallis Test

	Level	Mean	SD	$\chi 2$	p value
MSMC	Electrical and Electronics Products	3.795	0.648	4.169	0.654
	Chemicals & Chemical Products	3.678	1.076		
	Food Products and Beverages	3.577	0.64		
	Basic Metals, Metal & Machinery.	3.5	0.596		
	Wood Products & Furniture	3.425	1.078		
	Rubber & Plastic Products	3.594	0.546		
	Textiles and Wearing Apparels	3	1.131		
	Other manufacturing sector	3.667	0.75		
MSIC	Electrical and Electronics Products	3.664	0.832	9.751	0.136
	Chemicals & Chemical Products	3.358	1.153		
	Food Products and Beverages	3.274	0.73		
	Basic Metals, Metal & Machinery.	3.344	0.707		
	Wood Products & Furniture	2.861	0.681		
	Rubber & Plastic Products	3.438	0.398		
	Textiles and Wearing Apparels	2.944	0.236		
	Other manufacturing sector	3.377	0.831		
MSFC	Electrical and Electronics Products	3.662	0.693	12.354	0.055
	Chemicals & Chemical Products	3.556	0.869		
	Food Products and Beverages	3.381	0.552		
	Basic Metals, Metal & Machinery.	3.188	0.72		
	Wood Products & Furniture	3.188	0.711		
	Rubber & Plastic Products	3.344	0.567		
	Textiles and Wearing Apparels	2.313	0.972		
	Other manufacturing sector	3.389	0.68		
MSDC	Electrical and Electronics Products	3.454	0.754	3.896	0.691
	Chemicals & Chemical Pro Ducts	3.622	1.07		
	Food Products and Beverages	3.492	0.649		
	Basic Metals, Metal & Machinery.	3.46	0.508		
	Wood Products & Furniture	3.45	0.929		
	Rubber & Plastic Products	3.513	0.712		
	Textiles and Wearing Apparels	2.6	0.283		
	Other manufacturing sector	3.383	0.824		
MSSC	Electrical and Electronics Products	3.568	0.742	7.523	0.275
	Chemicals & Chemical Products	3.611	0.943		
	Food Products and Beverages	3.247	0.709		
	Basic Metals, Metal & Machinery.	3.375	0.54		
	Wood Products & Furniture	2.563	0.657		
	Rubber & Plastic Products	3.414	0.579		
	Textiles and Wearing Apparels	3.313	0.619		
	Other manufacturing sector	3.402	0.705		

5.12 Summary of the Chapter

This chapter presents the analysis of data and the results of the survey of ISO 14001 manufacturing firms pertaining to green purchasing in Malaysia. A total of 163 usable sets of the questionnaires were received in this quantitative survey, indicating a response rate of 23%. Different statistical techniques have been used for data analyzed. The first part analyzes the companies' features, evaluate for non-response bias and common bias method and the results indicated no evident of non-response bias and common method bias in the sample. Subsequent analysis proceeded with descriptive analysis, followed by the measuring of the multiple items to simultaneously assess the dimensionality, reliability and validity of measurement instrument, measurement model and structural model by using SEM analysis. Based on the analysis of composite reliability, Cronbach's alpha, convergent and discriminant validity, the test results confirmed the validity and reliability of the measurement models and suitability to establish the structural models. The path models were used to identify the mediating and moderating effects. Finally, hypothesis testing was carried out to test the underlying theoretical variables of this study. The findings analysis can be summarized as follows:

- Green manufacturing capabilities have the positive effect on triple bottom line performance.
- Green intraorganisational capabilities have the positive effect on triple bottom line performance.
- Green integration capabilities have the positive effect on triple bottom line performance.
- Green manufacturing capabilities have the positive effect on green purchasing practices.
- Green intraorgansational capabilities have the positive effect on green purchasing practices.
- Green integration capabilities have the positive effect on green purchasing practices.

- Green financial capabilities have the positive effect on green purchasing practices.
- Green purchasing practices have the positive effect on triple bottom line performance.
- Green purchasing practices have a positive mediating effect on green manufacturing capabilities and the triple bottom-line performance.
- Green purchasing practices have a positive mediating effect on green integration capabilities and the triple bottom line performance.
- Green purchasing practices have a positive mediating effect on green intraorganisational capabilities and the triple bottom line performance.
- Regulation pressure moderates the impact of green manufacturing capabilities on green purchasing practice.
- Customer pressure moderates the impact of green manufacturing capabilities on green purchasing practice.
- Customer pressure moderates the impact of green intraorganisational capabilities on green purchasing practice.
- Competitor pressure moderates the impact of green manufacturing capabilities on green purchasing practice.

This chapter presents the research findings and analysis using the data collected from the ISO 14001 manufacturing firms in Malaysia. The detail discussion, theoretical and practical implications, limitations of the study shall be highlighted for future research direction. The conclusions and findings of the study will be discussed in the next chapter.

CHAPTER 6: DISCUSSION AND CONCLUSION

6.1 Chapter Overview

The final chapter presents the discussions on the overall findings of this study, the conclusions drawn from the previous chapters, the implications, limitations and suggestions for future research. This chapter is divided into four main sections. Following this overview, the first section summarizes the overall descriptive analysis and findings for this study. The second section presents the discussions on these findings. The third section highlights the theoretical and practical implications of the study. The fourth section presents the limitations of this study and suggestions for future research. The last section will be a brief of the final conclusion of this study.

6.2 Summary of Findings

This study focuses on green purchasing capabilities and green purchasing practice towards triple bottom line performance, using institutional pressures as a moderator. The focus of the study is in the context of the ISO 14001 accredited manufacturing firms in Malaysia. The ultimate objective of the research is to examine the mediation effect of green purchasing practice on purchasing capabilities towards the triple bottom line performance and the moderating effect of institutional pressures on green purchasing capabilities and green purchasing practices among the ISO 14001 manufacturing firms in Malaysian context.

Based on the literature review and primary data derived from the interviews with six manufacturers in Malaysia, the variables, that are the focus of this study, were identified. They are: four categories of green purchasing practices (i.e. green supplier selection, development, collaboration and evaluation), five categories of green purchasing capabilities (namely: manufacturing, integration, intraorganizational,

financial and innovative capabilities), three categories of potential outcomes (namely: environmental, economic and intangible outcomes) and three categories of institutional pressure (in terms of regulation, competitor and customer).

The relationships between the above-mentioned variables are demonstrated in a conceptual framework in Figure 3.1. Five main hypotheses have been developed from the variables to support the framework which are as follows.

1. Green purchasing capabilities have the positive effect on green purchasing practices.
2. Green purchasing practices have the positive effect on triple bottom line performance.
3. Green purchasing capabilities have the positive effect on the triple bottom line performance.
4. Green Purchasing Practices have a positive mediating effect on Green Purchasing Capabilities and Triple Bottom Line
5. Institutional pressure moderates the impact of green Purchasing Capabilities on green purchasing practices.

The objectives of this research are listed below:

1. To investigate the effects of the relationship between green purchasing capabilities and green purchasing practices.
2. To examine the effects of the relationship between green purchasing practices and firm triple bottom line performance.

3. To investigate the effect of the relationship between green purchasing capabilities and triple bottom line performance.
4. To assess the mediation effect of green purchasing practices on the relationship between green purchasing capabilities and firm triple bottom line performance.
5. To evaluate the moderating effect of institutional pressure on green purchasing capabilities and green purchasing practices.

A quantitative survey was conducted to collect data from the ISO 14001 certified manufacturing firms in Malaysia. A total of 708 questionnaires were mailed to relevant personnel of purchasing as well as other departments. A set of 163 usable questionnaires were received, representing a response rate of 23%. Based on the early and late responses, it was concluded that non-response bias does not exist in this study. By using self-reporting for quantitative survey, there is a high possibility of encountering the critical issue of common method bias. The results indicate that the first factor accounts for 41.04% of the overall variance and it can be concluded that common method variance probably does not affect the results of this analysis (Podsakoff & Organ, 1986). The test for response bias was conducted by using 23 sets of questionnaires received from personnel of the departments that are not directly involved in the purchasing activities, such as sales, R&D and quality assurance. The results indicated that there were no significant differences between these two groups of respondents for all items.

The results of the descriptive analysis indicated that out of the total 163 respondents, 51.5% are males and 48.5% are females. The age of the respondents ranged from approximately 20 years to 50 years and above. About 90% of the respondents are between 30 to 50 years old, indicating that they are matured working adults. In terms of the length of service, 58.3% have worked for 7 or more years in their respective firms.

The results revealed that the majority of the respondents are well educated, with 74.2% having bachelor and master degree. Out of the total respondents, 80.4% hold managerial and senior managerial positions, such as general managers or directors. A total of 85.4% hold designated titles related to purchasing, procurement and supply chain. Those who do not hold such designated titles (under operation) but are directly involved in the purchasing functions made up 14.1% of the respondents.

In terms of the profile of the firms, 46.6% are in the food and food related packaging industry and the electrical and electronics industry. Meanwhile, 28.2% are from other manufacturing sectors such as printing, packaging, semiconductor, automotive, pharmaceutical and the service industries. A total of 25.1% are from sectors involved in chemical and chemical products, basic metals, metal and machinery, wood products and furniture, rubber and plastic products, and textile and apparels. The findings show that most of the firms are well-established, with 82.0% having been in operation for more than 20 years and 19.6% have been operating for between 11 and 20 years. The results show that 41.7% are considered as large firms, with the number of employees ranging from 500 to more than 1000 workers, and 43.0% are the medium size firms with 100 to 500 workers. The results also indicate that collectively about 50.0% are local and local joint venture companies, while the others are MNCs. In terms of the type of products, the data shows that 49.1% of the firms are producing consumer products, 40.4% producing industrial products, while 10.4% are concurrently producing both industrial and consumer products.

The result revealed that 47.2% of the firms have 2 to 3 main suppliers, 42.3% have more than 5 suppliers, 7.4% have 4 to 6 suppliers and 3.1% have a single supplier. The findings revealed that 83.4% and 16.6% of the firms respectively maintained more than

5 years and less than 5 years of relationship with their major suppliers. Meanwhile, 66.8% and 28.2% of the firms respectively maintained more than 10 years and less than 10-year relationship with their customers. The results show that 53.4% of the firms obtained their inputs from global sources, while the remaining obtained theirs from domestic and regional sources. A total of 58.9% do not participate in green procurement programs, although 65.0% are actually putting in efforts to purchase green products while 17.8 % respondents are not sure whether their firms are putting in any effort to purchase the green products.

The scale used for this study is a 5 point Likert scale. This scale ranges from 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. The most adopted green purchasing capabilities are manufacturing capabilities (mean = 3.6), whereas the least is intraorganisational capabilities (mean = 3.4). Among all the purchasing practices, the mean ranges from 3.200 to 3.277. The highest priority in green practices being adopted is supplier collaboration and the lowest is the supplier evaluation. Even though the results indicate that all the practices are equally important yet the green practices are not adopted at a high priority by the manufacturing firms in Malaysia. The results derived from the interviews with the six manufacturing firms indicate that collaboration and supplier selection have significant effects on the firm performance. This result is consistent with that of the quantitative empirical study, which concluded that adoption of supplier selection and collaboration is more important as compared to the adoption of supplier evaluation and development, in terms of contribution to the firm performance.

In the case of institutional pressure, the average mean ranges from 3.20 to 3.35, indicating a low-pressure impact. The highest institutional pressure is from the

regulation pressure followed by customer pressure, while the lowest is from competitor pressure. As perceived by the respondents, for the triple bottom line performance, the environmental performance is the main contribution with a mean greater than 3.60 followed by an intangible performance with a mean greater than 3.50 and the economic performance with a mean less than 3.50. The average score of 3.5 for the TBL performance shows that collectively there is a positive perception of the triple bottom line performance in Malaysia's manufacturing firms.

The results show that 70.0% of the respondents agreed that the main reason for embarking on green purchasing is that green products help protect the environment, while approximately 45.0% agreed that purchasing green products is mandated by policy and regulation and is better for the health of the employees. Only 13.50% perceived that green products help save the cost, which is consistent with the findings of no significant mediating effect of financial capabilities on the triple bottom line performance. On the other hand, 1.80 % of the respondents do not know the reason why manufacturing firms are embarking on the green purchasing program. Regarding the firm's efforts in relation to green purchasing program, the overall mean scores of less than 3.50 indicate low adoption of green purchasing program. The findings show that on an average, Malaysian firms do put in efforts on getting feedback from end-users to address problems as soon as they arise. However, assembling a green team to identify key players and other resources is not a priority program in Malaysia.

This result indicates that manufacturing firms in Malaysia are more reactive rather than proactive in taking corrective actions and preventive measures to address green issues at their workplace. Based on the control variable for green purchasing capabilities, it shows there is no significant relationship between all the green capabilities and type of

industry. Meanwhile, the results indicate that integration and intraorganisational capabilities have significant relationships with ownership status. On the other hand, the results indicate that number of employees (firm size) is a correlation of green manufacturing capabilities, integration and financial capabilities. In conclusion, both firm ownership status and number of employees do have a direct relationship with the green purchasing capabilities in Malaysia's context.

PLS analysis was used to test the hypotheses of this study. As recommended by Hair et al. (1998), this is a two-stage model building process to analyze data. For the first stage, the adequacy of the measurement model is assessed followed by the examination of the structural relationship in the second stage. The first measure to be evaluated will be the internal consistency reliability by using Cronbach's alpha and composite reliability. In order to provide some evidence regarding the goodness of fit of the measurement model, two types of validities: convergent validity and discriminant validity are used to validate the measurement model. The results show two item loadings below the acceptable value under the financial capabilities, FC1 and FC2 that were removed. After analyzing the measurement model, the next step is to evaluate or generate a structural model and to test the proposed hypotheses.

The first hypothesis predicts that green purchasing capabilities have significant effects on the green purchasing practices. The results showed that green manufacturing, integration, intraorganisational and financial capabilities have significant direct impact on the green purchasing practices. On the other hand, green innovative capabilities have no significant effect on green purchasing practices. These results generally indicate that green manufacturing capabilities and intraorganisational capabilities have the most significant impact on the green purchasing practices.

The second hypothesis predicts that green purchasing practices have significant effects on the TBL. This study provides evidence that firms increased their efforts in managing suppliers and that green purchasing practices play an important role in allowing buyer and supplier firms to establish the common norm and interpersonal linkages in order to facilitate joint problem solving and information integration for firm performance (De Souse Jabbour et al., 2015).

The third hypothesis predicts that green purchasing capabilities have significant effects on the triple bottom line performance. The results showed that green manufacturing, integration and intraorganisational capabilities have significant direct impact on the triple bottom line performance. On the other hand, green innovative capabilities and financial capabilities have no significant effect on TBL performance. These results generally indicate that green financial has a positive significant impact on the green purchasing practices; however, there is no relationship toward the triple bottom line performance.

The fourth hypothesis predicts that green purchasing practices mediate the green purchasing capabilities and TBL. The results indicate that green manufacturing, integration and intraorganisational capabilities have significant mediating effects on the TBL. On the contrary, innovative and financial capabilities are not mediated by green practices towards the triple bottom line. With regard to the direct impact on green capabilities and TBL, the results show that there is a direct impact of green financial capabilities towards the TBL. However, regarding the mediating effect of green purchasing practices, there is no significant mediating effect between the green financial capabilities and triple bottom line performance.

The fifth hypothesis predicts that there are moderating effects of institutional pressure on green purchasing capabilities and the green purchasing practices. The results show that the regulation, competitor and customer pressure show significant moderating effect between the green manufacturing capabilities and green practices. Conclusively, there are no moderating effects of regulation, customer and competitor pressure on green integration, intraorganizational, innovative and financial capabilities, except that the customer pressure has moderating effect on intraorganisational capabilities.

However, using multiple group analysis to divide the sample size into groups, according to the low and high level of the moderator, the results indicate that innovative capabilities do have the same effect at the low and high level of regulation pressure. Financial and integration capabilities effects are greater when the regulation pressure is higher and the manufacturing capabilities effect is more at a low level of moderator. As for competitor pressure, the findings show that innovative and intraorganisational capabilities have the same effect at the low and high level of moderator. As for customer pressure, the findings show that financial and integration capabilities have the same effect at the low and high level of moderator. On the other hand, intraorganisational capabilities effect is more at a high level of moderator and the manufacturing capabilities effect is more at a low level of moderator.

The major findings of this study can be summarized as below:

- Green manufacturing, integration, financial and intraorganisational capabilities have the positive effects on green purchasing practices. Innovative capabilities do not have the effect on green purchasing practices.
- There is positive effect of green purchasing practices on the triple bottom line performance.

- Green manufacturing, integration and intraorganisational capabilities have the positive effect on TBL performance. Innovative capabilities and financial capabilities do not have significant effect on TBL performance
- Green purchasing practices partially mediate green manufacturing, integration, and intraorganisational capabilities on the triple bottom line performance.
- Financial and innovative capabilities show no direct impact and mediating effect on the triple bottom line performance.
- Regulation, customer and competitor pressures have the positive moderating effects on green manufacturing. However, only customer pressure has a significant effect on intraorganisational capabilities. In contrast, there are no moderating effects in terms of regulation, customer and competitor pressures on financial, innovative and integration capabilities.

6.3 Discussion

This section presents the discussion on the findings of the study using data analysis from the previous section. The discussion will be based on the theoretical perspective, empirical evidence, literature review and the findings from the interviews conducted at the initial stage of the study. The discussion covers the effects of green purchasing capabilities on green purchasing practice, the effects of green practices and TBL, the effect of green capabilities on TBL performance, the mediating effects of green practices, the moderating effects of the institutional pressures and the control variables on the ISO 14001 certified manufacturing firms in Malaysia.

6.3.1 The Relationship between Green Purchasing Capabilities and Green Purchasing Practices

The results of the study show that green manufacturing capabilities have significant effects on green purchasing practices (supplier selection, development, collaboration

and evaluation). The results are consistent with the findings by Tippayawong, Tiwaratreewit and Sopadang (2015), De Sousa Jabbour et al. (2015) and González-Benito (2005) who found that manufacturing capabilities could lead to lower raw materials costs and increased production efficiency by using inputs with low environmental impact that generate little or no waste or pollution. There is a general tendency among the Malaysian firms to place a higher priority on green purchasing manufacturing capabilities which becomes the main criteria while adopting green purchasing practices.

As with the effect of manufacturing capabilities, the results of the study show those green intraorganisational capabilities have significant effects on green purchasing practices. Intraorganisational capabilities could lead to organizational performance, which is consistent with the study by Größler and Grubner (2006) and Chavez, Yu, Jacobs and Feng (2017) who highlighted that a "fit" between the internal capabilities and the external requirements from competition and the environment is necessary for an organization to achieve success. This is supported by Ziegler and Rennings (2004), Wagner and Bode (2008) and Castka and Prajogo (2013) who also found that internal organizational capabilities for the environmental management systems such as ISO 14001 could facilitate eco-innovation owing to the strong organizational capabilities of firms in environmental management.

The significant effects of integrative capability on green practices were found in this study. Integration capability is the ability to incorporate the purchasing function effectively into the whole supply chain function, speedily reaching the market and increased the "fit" with market needs. It enables the firm to collect, combine, and internalize all activities and contribute to competitive advantage and firm performance.

This finding is aligned with the research by Grekova, Calantone, Bremmers, Trienekens, and Omta (2015) and Vachon and Klassen (2008) who proved that a collaborative environmental activity with suppliers plays a crucial role in eliminating environmentally harmful materials or processes. The inter-firm trust and collaboration capabilities are the key factors that affect the extent to which firms engage in cooperation for green practices. This finding is also consistent with that of Flynn et al. (2010) and Ellegaard and Koch (2012) who found that low internal integration generates clumsy operations and purchasing manners that negatively affect supplier resource mobilization. A company with low integration between the corporate functions would perform worse than their competitors with high integration and could lead to competitive inconsistency. Hartmann and Germain (2015) and Ellegaard and Koch (2012).found that firms' internal characteristics and integration capabilities are important determinants of innovation and drivers of competitive advantage. Cai and Zhou (2014) and Flynn et al. (2010) also found that the ability to introduce eco-innovation depends on internal drivers such as integrative capability, which is the key determinant of eco-innovation performance.

However, the findings which do not support integration capabilities will lead to eco-innovation. Even though integration capabilities significantly affect green practices, yet they do not promote eco-innovation performance in Malaysia content. The results of the study show that green innovative capabilities have no significant effect on the green purchasing practices. Innovation is the process of discovery and development of the new products, ability to manage innovation through awareness of new idea about the competing innovations and new design ideas. However, the results contradict that of Tutar, Nart and Bingöl (2015) and Liu et al. (2008), who found that innovation goals are

often related to internal flexibility to adapt to environmental changes and innovative capability is one of the common capabilities of successful organizations.

During the interviews, most of the interviewees actually agreed that financial capabilities are necessary skills for green purchasing practices. This is supported by the quantitative findings even though financial capabilities ranked the lowest in terms of significant effects of the adoption of green practices despite of the importance of these criteria in purchasing activities. The results of the statistical analysis show that green financial capabilities do not have very significant effect on the green purchasing practices ($P < 0.0495$). Among the possible explanations for the low significant effect of green financial capabilities are the high costs of adopting green purchasing and less visibility of the economic benefit from the manufacturers' perspective (Tippayawong et al., 2015; Min & Galle, 2001). Despite the low significant effect of green financial capabilities on the green purchasing practices, the finding is consistent with that of Woo et al. (2015), who found that suppliers with higher information sharing capabilities would improve their environmental collaboration, contribute to cost reduction and achieve a firm competitive advantage.

Größler (2010) found that not all the capabilities can be maximized and interacted optimally. It can be assumed that some patterns of capability development are more common among organizations than others. In conclusion, the results of this study found strong evidence that hypothesis of green manufacturing, integration, financial and intraorganisational capabilities have a significant effect on green purchasing. The uses of the four core capability dimensions are consistent with the findings of previous empirical studies, where specified capabilities are crucial for firm performance. This research found that innovative capability is not a highly-adopted core dimension by

firms in Malaysia. Based on the resource based view, this research found some fundamentals with a new perspective on green capabilities for manufacturing firms in Malaysia. These capabilities could create sustainable competitive advantage by allowing a firm to build and leverage beneficial inter-organizational relationship. Rashid et al. (2015) and Chen et al. (2004) emphasized that when green capability is merged with competitive strategy, it would be a significant predictor of firm performance.

6.3.2 The Relationship between Green Purchasing Practices and Triple Bottom Line Performance

The results of the study show that there is a positive effect of green purchasing practices (supplier selection, development, collaboration and evaluation) on the triple bottom line performance (environmental outcomes, economic outcomes and intangible outcomes). Bildsten (2015) pointed out that green purchasing practices are motivated by the strategic level within the purchasing department and the level of commitment of a firm on the environmental initiatives. Green purchasing mainly deals with the environmental performance of the suppliers, even though collaborations with suppliers do bring benefit to manufacturing firms. However, in the research by Leppelt et al. (2013), they found that firms must be responsible for environmental and social problems caused by their suppliers in the process of collaboration and development. In their research, Sundtoft Hald and Ellegaard (2011) and Govindan et al. (2015) found that strategic purchasing has a positive impact on firm supplier evaluation system and could improve buyer and supplier relationship as well as financial performance. Therefore, the green initiatives would bring competitive advantage as strategic purchasing would increase firms' efforts in managing suppliers with respect to the collaboration and evaluation processes.

The results of the study show insignificant variability among all the purchasing practices as the mean ranges from 3.200 to 3.277, which means that green purchasing

practices are not highly adopted by manufacturing firms in Malaysia even though there is awareness regarding the importance of the implementation of green purchasing practices for the firms and society. Based on the findings of this study, all the green purchasing practices are considered to be of equal importance. However, the highest priority in green practices adopted by Malaysian firms is supplier collaboration (mean = 3.277) followed by supplier selection (mean = 3.266), supplier development (mean = 3.240) and the lowest is the supplier evaluation (mean = 3.239). The results indicate that collaboration of supplier and supplier selection has a significant effect on firm performance which is consistent with the quantitative empirical findings. The below findings were gathered from the interviewees:

"The major capabilities are integration; manufacturing and financial are the key capabilities required by the purchasing personal will link to selection and collaboration with the suppliers, and eventually will contribute to the firm performance".

However, during the interviews, it was found that supplier development might be perceived as less important when compared to the evaluation in the context of Malaysia.

The study provides evidence that supplier collaboration plays an important role as it allows the buying firms to establish common link and norm for joint decision making with the suppliers, to improve their overall performance. This view is consistent with the findings of Woo et al. (2015) and Bowen et al. (2001a), who found that purchasing personnel equipped with specific knowledge and skills in environmental purchasing will improve suppliers' environmental performance that will eventually benefit the buying firms. The main supplier environmental collaboration would involve supplier education, supplier support and joint venture activities. In particular, Vachon and Klassen (2008) indicated that supplier collaboration on environmental issues is related to the improvement of manufacturing performance. Similarly, Liu, Zhu and Seuring (2017)

and Hales et al. (2011) found that close working relationship and collaboration with suppliers in the manufacturing setting could result in the improvement in environmental performance.

Nevertheless, the results of this research contradict that of Das, Narasimhan and Talluri (2006) and Cousins and Lawson (2007). who found that there are potential risks and financial disadvantages in collaboration activities. For instance, if the buying firms over-invest in the jointly or integrated projects that carry out together with their supplier, there is a high possibility for the supplier to share their commonly developed knowledge, knowhow and technology with the buying firm's competitors.

The finding is consistent with the findings of an empirical research by Tate et al. (2012) and Hamdan and Cheaitou (2017) who found that supplier selection and management decision that are related to environmental purchasing management are among the biggest drivers of sustainability of an organization and the footmark for its products. Understanding the meaning of "green" in the context of an organization's purchasing function, in particular, when it comes to the selection of suppliers, has been emphasized and supported by Igarashi et al. (2013). However, Sarkis and Dhavale (2015), in the opinion that company may be concerned that it is not giving enough weight to environmental and social responsibility aspects and focusing too much attention to the business operations during the supplier selection process,

The finding on supplier development is consistent with that of Bai and Sarkis (2010), who found that supplier development programs included financial investment, knowledge transfer, trust building and basic norm development. In short, it is proven that supplier development practice could improve environmental performance of

suppliers where it have positive effects on the buying firm purchasing performance, which is consistent with the findings by Sánchez-Rodríguez et al. (2005) and Awasthi and Kannan (2016). However, the result shows that there is a low level of green supplier development in the Malaysian firms. One of the potential reasons could be that firms do not want to see the supply chains becoming greener at the expense of poorer business performance by compromising on their costs, poor delivery, design and quality of their products. Therefore, a green supplier development program requires better planning in green management.

Selection of the "right" suppliers and evaluating their performance is critical due to the complexity of present day buying decisions and changing buyer preferences in the globalization processes (Sarkis & Dhavale, 2015; De Boer et al., 2001). A systematic and periodic evaluation of supplier's performance by the purchasing function perhaps is one of the most vital activities in the purchasing department. This finding is consistent with that of Dey et al. (2015), who reported that strategic supplier performance evaluation is one of the most important functions within the supply chain management. Firms with proper evaluation system and organizational capabilities have experienced substantial improvement of supplier performance in terms of their supply chain cost, delivery and the service level as well as positive impact on their operating performance in the reduction of inventory and waste at every stage of production.

From the descriptive analysis, the findings show that to address the problems, Malaysian firms put in efforts for corrective actions instead of providing incentives to suppliers to improve their performance as preventive measures. Working closely and directly with suppliers on training or other activities in order to assemble a proactive green team to identify potential issues is not a priority in Malaysia. This result indicates

that manufacturing firms in Malaysia take more corrective actions rather preventive measures to address the green issues. In short, it may be assumed that manufacturing firms in Malaysia are not specifically addressing the issue of periodic supplier evaluation in order to persuade their suppliers to adhere to certain practices to improve their environmental performance and to adopt more proactive practices.

The research by Ladd and Badurdeen (2010), who found that existing supplier evaluation method and system used by leading companies fall short of a comprehensive assessment of supplier from a triple bottm line perspective. In spite of the increasing emphasis on promoting sustainable business practices that concentrate on reducing environmental impact, promote societal well-being and economic benefits, conventionally, with regard to supplier evaluation, most firms focus only on cost, quality and delivery effectiveness, as profitability. These authors suggested that there should be on-going work to develop methods for sustainable supplier evaluation such as a selection metrics that could be used to evaluate suppliers from each of the TBL perspectives. In this case, this study is in line with the above suggestion based on the triple bottom line performance for firm's green purchasing practices in Malaysia's context.

Carter and Rogers (2008), Jabbour, Jabbour, Latan, Teixeira and De Oliveira (2014) and Venkatraman and Nayak (2015) highlighted that sustainable green purchasing and supplier relationship management is crucial in companies' sustainability efforts across all the three dimensions of the TBL. As mentioned by Leppelt et al. (2013), a firm's corporate image in economic, intangible and environmental behavior heavily depends on each and every supply chain link, including the suppliers and sub-suppliers for sustainability performance. According to Harwood and Humby (2008), there must be

internal alignment among these three pillars to avoid short-term economic perspective from being the main motivators which focus on cost savings and other financial orientation measures. This is supported by Leppelt et al. (2013), who suggested that to ensure firm sustainability, manufacturing firms need to manage their suppliers' sustainability performance by taking TBL into account, with clear communication, to support and manage the internally and externally integrated approach by continuously enhancing the relationship with the supply base.

6.3.3 The Relationship between Green Purchasing Capabilities and The Mediating Effects of Green Purchasing Practices on Triple Bottom Line Performance.

The research finding shows that there is a positive total effect of green manufacturing capabilities, green integration capabilities and green intraorganisational capabilities on the triple bottom line performance. Meanwhile, there is no total effect of green innovative and green financial capabilities on the TBL performance. These result findings are the same for the mediating effect where the results of the study found that there is a positive partial mediating effect of green purchasing practices (supplier selection, development, collaboration and evaluation) on the green manufacturing capabilities, green integration capabilities, green intraorganisational capabilities and the triple bottom line performance (Environmental outcomes, economic outcomes, intangible outcomes). However, there is no mediating effect of green innovative and green financial capabilities on TBL performance.

There is a partial mediating effect of green purchasing practice on these three capabilities (Manufacturing, integration and intraorganisational capabilities) and triple bottom line performance. The partial effect is due to the total effect of these three green capabilities (manufacturing, integration and intraorganizational) towards the TBL performance regardless of any mediating effect of green purchasing practice on these

three capabilities. The result shows that the main contribution to the three dimensions is the environment, followed by the intangible and then by the economic performance. The finding of the study indicate that green innovative capabilities and financial capabilities have no significant mediating effect on green purchasing practices and the triple bottom line performance.

The two-hypothesized relationships on the innovative and financial capabilities that are not supported in the study require further explanation. From the field interviews, it was noted that those firms that meet the environmental compliance and standards would eventually reduce resource consumption using hazardous materials and reduce cost resulting from green purchasing practices and capabilities. These firms achieved economic performance sustainability on their financial profitability by increasing productivity, sales and cost reduction (Woo et al., 2016). The qualitative finding is consistent with that of previous empirical research which found that the firms will improve their financial performance with proactive environmental initiatives. This new paradigm argues that going green actually makes good business sense for an organization (Orsato, 2006; Casadesus-Masanell, Crooke, Reinhardt, & Vasishth, 2009). The benefits include financial benefits for firms that invest in environmental proactivity as supported by Sambasivan et al. (2013). However, the quantitative research finding is consistent with that of Ambec and Lanoie (2008) who agreed that the conventional thinking still persists, where green environmental management practice actually brings little or no financial benefits to an organization. This quantitative study and the previous by Rao and Holt (2005) found that green initiatives could lead only to environmental performance without any economic benefits and competitiveness. This is consistent with the findings of De Giovanni (2012) and Gimenez, Sierra and Rodon (2012) These researchers found no significant relationship between environmental proactivity and the

financial related performance, despite the reports by some researchers that there is a positive impact of environmental practices on firm's financial performance. Sambasivan et al. (2013) highlighted the lack of the consensus among different empirical research meaning that there is an ongoing debate on this issue, which has not been completely and adequately addressed.

In the empirical research by Gonzalez-Benito (2005), it was found that the relationship between business performance and proactive environmental issues are inconclusive. Walley and Whitehead (1994) and Newton and Harte (1997) found that the implementation of proactive measures on the environmental issue could be costly and impractical for many firms. In addition, Yang and Zhang (2012) and He et al. (2015) concluded that the cost of environmental management actually hindered green practices of Chinese enterprises. However, Claver, Lopez, Molina and Tari (2007) and Molina-Azorín et al. (2009) suggested that going green is good for business, at least for the improvement of financial performance.

This study is consistent with the study by Tippayawong et al. (2015), who found that in order to promote green performance in the manufacturing sector to fulfill the regulatory requirement and compliance and meeting customers' demand, firms' manufacturing performance practices might not be evidently effective for financial performance. Besides, green sourcing might not necessarily contribute to economic performance, cost and complexity being the major obstacles for smooth implementation of a successful green supply chain management. Nevertheless, firms should continue practicing green initiatives to strive for better financial performance, while at the same time; there is still a need to explore more cost effective and easier solutions for future economic environmental sustainability. Based on their empirical research, Aragón-Correa,

Hurtado-Torres, Sharma and Garcia-Morales (2008) and Sangwan (2011) found that business organizations and other stakeholders are still struggling to identify the "fit" between the economic model and environmental elements that are suitable for businesses and for ease of implementation.

Green purchasing practices were found to have no significant effects on the innovative capabilities and the triple bottom line, which is consistent with the findings by Cai and Zhou (2014). It is unclear whether innovation directly or indirectly affects an individual firm's eco-innovation responses and performance. A great deal of research based on case studies or focusing on narrow sectors has been conducted in the developed economic environment, yet the results could not be used as the benchmarks for the developing countries but could only be used to enhance the knowledge of policy makers, regulators and managers on the firms' eco-innovative responses and performance.

The research finding is inconsistent with that of Chang and Fong (2012) who highlighted that proactive environmental innovative capability has a positive significant impact on firm performance. Huang and Shih (2009) and Claver et al. (2007) agreed that green concepts, ideas and creativities must be incorporated by firms in their processes, products and services in order to increase performance. Thus, companies could benefit by engaging in green innovation or environmental management practices. The finding of this study contradicts that of Rashid et al. (2015) and Amores-Salvadó et al. (2014), who found a significant effect of environmental product innovation and green image on firm performance. This research finding, however, is in contrast with that of Kafetzopoulos and Psomas (2015) who found that purchasing function can contribute to environmental design. This research is not align with the comment made

by Horbach, Rammer and Rennings (2012) that eco-innovation is a strategy for sustainable development and decrease in environmental costs for an organization.

The results of the study show that green purchasing practices have significant effects on the green manufacturing capabilities and triple bottom line. Green manufacturing practice has the highest adoption among all the capabilities in the Malaysian firms. It was found that green manufacturing practices were strongly correlated with TBL and were highly associated with environmental performance, which is consistent with the findings by Tippayawong et al. (2015). On the other hand, the results are consistent with the study from Kamboj, Goyal and Rahman (2015), where they have suggested that manufacturing capabilities directly contribute to the triple bottom line in terms of financial performance.

These findings are also consistent with that of Qi et al. (2009), who found that manufacturers using their green purchase capabilities, prioritizing and emphasizing on their operations in terms of cost, quality, flexibility and delivery, have a positive impact on firm performance. In short, manufacturing capabilities, in general, would lead to a positive effect on financial performance. González-Benito (2005) and Hartmann and Germain (2015) found a strong positive relationship between environmental proactivity and operational performance. To be sustainable, it is important for firms to design and implement a better system that could reduce waste through improvement in the quality of the product, system and processes (Lindsey, 2011). In the research by Castka and Prajogo (2013), found that firms that internalize ISO 14001 experienced environmental benefits such as reduced pollution or reduced energy consumption

However, the findings of the study of Aragón-Correa and Rubio-López (2007) and Johnstone, Labonne and Thevenot (2008) who found that firms with the ISO 14001 certification do not necessarily translate into good environmental performance. If a firm adopts green manufacturing capabilities, it must be reflected in its ability to reduce costs of raw and packaging materials, to use recycled and reused materials that directly contributed to the triple bottom line performance, but not just being accredited with ISO 14001 certifications.

The results of the study show that green purchasing practices have significant effects on the green intraorganisational capabilities and triple bottom line, which is consistent with the findings of study by Chang and Fong (2012), who revealed that companies that encouraged intraorganisational and inter-organizational green knowledge sharing had positive effects on the firm performance. Similarly, Luzzini et al. (2015) and Zhang, Van Donk and van der Vaart (2016) believed that building organizational capability and competitive advantage from the inside out has become and would continue to be a primary management agenda. Größler and Grubner (2006) and Lun, Shang, Lai and Cheng (2016) argued that green intraorganisational capabilities eventually could lead to the firm performance. The research by Woo et al. (2016) and Chavez et al. (2017) found that internal capabilities and strength of a company actually affect performance by meeting the external environmental requirements and that competition is necessary for an organization to achieve success.

The results of this study show that the green purchasing practices have significant effects on the green integration capabilities and triple bottom line, which is consistent with the findings by Cormican and Cunningham (2007), who pointed out that purchasing function and effective planning of materials are among the essential

competencies required for successful supplier integration. Carter et al. (2000) and Úbeda et al. (2015) pointed out that purchasing function has changed over the years and it would continue in such manner in the future. In their research, Úbeda et al. (2015) stressed that the role of purchasing personnel has evolved to become "relationship manager", bringing together the internal and external relevant parties to facilitate decision making. On the other hand, in the research by Choi and Hwang (2015), they found that firms that implement green practices such as closed collaboration with their supply chain partners are more likely to experience high financial performance than those who do not have such strong collaborations. However, the finding is not aligned with the recent research done by Liu et al. (2017) pointed that there is negetive moderates effect by environmental proactivity on internal integration capability and green purchasing.

In conclusion, manufacturing firms started to integrate green activities into their supply chain management system. According to Winter and Knemeyer (2013), till date, there is a high proportion of researchers focusing on sustainability in terms of the triple bottom line performance. The challenge faced by organizations today is how an organization manages to balance all these three dimensions and responsibilities at different stages of development and the TBL integration into the diversity of an organization thereby managing the trade-off between these three dimensions for an overall corporate performance.

Even those companies that have incorporated sustainability policies are finding it a challenge to tackle the sustainability issues in practice. The question is whether the TBL integration is practically feasible and realistic to enhance the process. Even though environmental reporting is well established, however, financial reporting is still facing

challenges. There is indeed no precise data capturing the process for the integration of the social and environmental elements into the traditional financial performance for accounting and reporting purpose.

The findings on the mediating effect are consistent with that of the research by Hall and Matos (2010), which found that emphasis on the social dimension of sustainable development is emerging as the key challenge in sustainability supply chains due to the fact that a firm, in tackling the same situation, is dealing with the diversity and complexity of the various stakeholders that hold different opinions. However, this contention contradicts the findings of the interviews conducted with the six manufacturers, where an intangible factor is not found to be the emerging factor for triple bottom line. In conclusion, the findings show that environmental purchasing activities positively affect firm TBL performance and that purchasing and supply managers should focus on such activities. Gold, Hahn and Seuring (2013) opined that since dealing with TBL integration cannot be discounted, therefore managing of sustainability remains a challenge.

6.3.4 The Moderating Effects of Institutional Pressure on Green Purchasing Capabilities and Green Purchasing Practices

This study examined the moderating effects of institutional pressure namely regulation, customer and competitor pressure on the relationships between the green purchasing capabilities and the green purchasing practices.

The results of the study indicate that all these pressures only moderate the relationships between green manufacturing capabilities and green purchasing practices (green supplier selection, development, collaboration and evaluation). There is no significant moderating effect of regulation, customer and competitor pressure on green integration,

green financial, green innovative and green purchasing intraorganisational capabilities and on the green purchasing practices except that the customer pressure was found to have a significant effect on the intraorganisational capabilities.

Institutional pressure, particularly regulation, is the key external driver that influences the manufacturing firms to adopt green purchasing initiatives, forcing them to adopt environmental management practices such as internal green supply chain management practices with ISO14001 certification. Regulation pressure comes from the government and other regulatory bodies. In this regard, institutional pressure has provided the logical understanding on how the effect of external pressures could actually influence a firm's sustainability performance (Sherer, Meyerhoefer, & Peng, 2016).

The results of the study show that the influence and control on a manufacturing firm's activities via regulation have a positive effect on green purchasing (Rivera, 2004). This finding is also consistent with that of the research by Handfield, Walton, Seegers and Melnyk (1997), Butler (2011) and Lannelongue et al. (2012) which found that the major driver that affects the green purchasing is regulation pressure. Firms are forced by regulations to adopt green initiative to ensure a continuous supply of green inputs in order to produce green products. In conclusion, firms must comply with the environmental regulations to avoid threat of regulators taking legal actions, imposing penalties and fines for non-compliance.

The moderating effect of regulation pressure on green manufacturing capabilities is substantial. The result of this study is consistent with the empirical finding of Min and Galle (2001), Preuss (2002), Walker, Sisto and McBain (2008) and Laari et al. (2016) who found that regulation is the major factor that drives green manufacturing

capabilities, such as prohibiting the use of hazardous or toxic elements in the Malaysian context Eltayeb et al. (2010). However, in their research Carter and Jennings (2004) found no direct relationship between the involvements of purchasing function with government regulations.

Walker and Preuss (2008) highlighted that customers have increasingly expressed their environmental concerns and this strong pressure actually exerts direct influence on firms' decision making. However, according to Rojsek (2001) and Yen and Yen (2012), the pressure and demands from customers had significantly driven organization innovation and management change, whereby customer pressure had forced firm purchasing function to seriously engage in environmental purchasing activities.

This study shows that customer pressure also has a significant effect on green manufacturing capabilities, which is consistent with the findings of Lin and Sheu (2012). The increased desire of customers to purchase from responsible companies becomes an important issue, where customers are indirectly setting the environmental standards for firms to comply by adopting specific green purchasing initiatives. The significant effect of customer pressure on green practices found in this study is consistent with that of Kammerer (2009) and Huang et al.(2015) who found a similar effect of customer pressure on firms to reduce the amount of harmful substances used in their production lines.

There is also a significant effect of customer pressure on intraorganisational capabilities. Walker and Preuss (2008) and Laari et al. (2016).agreed that customers could exert significant pressure on firms to comply with environmental purchasing and could have a direct impact on firm's environmental purchasing activities. In their research, Woo et al.

(2015) highlighted that firm intraorganisational capabilities include collaboration and cooperative process to achieve efficient flows of resources among the supply chain partners and strategic alignment to increase organizational performance. Carter and Jennings (2004) and Percy Marquina (2012) pointed out that the involvement of purchasing function in corporate social responsibilities are gradually getting public attention due to the increasingly expressed concerns from customers with respect to the environmental impact and issues.

Mimetic pressure occurs when an organization mimics the actions of successful competitors in the same industry. Firms may follow or ‘‘mimic’’ competitors merely due to the latter’s success. Zhu et al. (2010) pointed out that Japanese organizations always engage in proactive environmental practices in order to lead their competitors. In contrast to green manufacturing capabilities, this study found no moderating effect on integration, innovative, intraorganisational and financial capabilities in the Malaysian context. However, it should be noted that the contrasting findings could be attributable to green purchasing practices in response to social and environmental problems encountered by Malaysian firms as compared to those in developed countries. Therefore, firms countering similar organizational environment (supply chain network) might display different behavior in their interactions at the firms’ level.

Unlike the effect of green manufacturing capabilities, the findings show no moderating effects of integrative capabilities on green capabilities and green purchasing practices which contradict the findings by Li and Ye (2011), who found that integrative capability depends not only on internal drivers but also on many external drivers such as environmental regulations, customers’ green demands and competitors’ pressure to promote their internal integrative capabilities. In short, the external drivers indirectly

strengthen integrative capability through internal drivers. On the other hand, Hofer et al. (2012) found that a firm's environmental management activities are driven by competitors' environmental activities. The effect of competitors' activities on the buying firm's environmental activities is more obvious among the more profitable and smaller firms.

Institutional pressure is found to have no significant effects on innovative capabilities, which are contrary to the findings by Frondel, Horbach and Rennings (2007) and Kammerer (2009) who revealed that more stringent environmental regulations would boost eco-innovation through a reactive strategy to reduce the production costs of complying with environmental regulations. Studies by Brunnermeier and Cohen (2003), Kneller and Mandelson (2012) and Zeng et al. (2017). also found that regulatory pressure plays significant role in driving eco-innovation. The findings of this study also contradict that of Handfield and Bechtel (2002), Huang et al. (2015) who found that customers' green demands could also underline firms' motivation to implement eco-innovation.

Clark (2005) pointed out that other external pressures originate from competitor firms, which triggered firms to develop new materials, technology, and equipment to improve their innovative abilities. Because of strong competitive pressure, firms imitate the eco-innovation practices of their competitors to establish a good market image and gain more market share (Li & Ye, 2011), while external competitive pressure directly influence the firms to improve their environmental performance and product quality, thus contributing to their eco-innovative capabilities (Hicks & Dietmar, 2007).

This study found no significant effects of institutional pressure on intraorganisational capabilities. Delmas and Toffel (2004) revealed that different organizational strategies would have an influence on how a firm adopts its environmental management practices depending on the forces imposed by the institutional pressure. In relation to the concept of mimetic isomorphism, Zhu et al. (2011) explained how a competitor's environment management performance actually could create peer pressure on firms to formulate their environment management activities. In the research by Yen and Yen (2012) and Dubey et al.(2015), they stressed that top management plays an important role in influencing a firm's activities, policies and behavior pertaining to the adoption of environmental management. Similarly, Tate et al. (2012) highlighted that purchasing and supply chain managers, through their daily activities could influence companies to establish and maintain a competitive advantage through environment friendly practices. The findings of this study revealed that firms in Malaysia actually are proactive in their organizational strategies, responding and adopting environment management practices without any pressure imposed by institutional pressures.

Overall, the findings of this study are not consistent with that of Choi and Hwang (2015), who found that the effects of environment collaboration with different parties such as suppliers, customers, government and non-governmental organizations could be beneficial to a firm's environmental performance. The results of investigating the moderating effects on green purchasing practices and capabilities indicate that Malaysian firms do not strongly respond to institutional pressures, as not all institutional pressures have the influence the green capabilities in relation to the green purchasing practices.

One of the possibilities for manufacturing capabilities were prone to the institutional pressures could be due to support and enforcement gave by the government. Based on the budget of 2014, Malaysia Government had announced the provision of investment tax allowance, income tax exemption on the purchase of green technology assets, have been verified by the Malaysian Green Technology Corporation (MGTC) ,encourage usage of green technology services and system to enhance firms' development of green technology (Malaysian Investment Development Authority, 2018) The way governments set policy and impose taxes should help efforts towards the greening of the environment. In the research by Laari et al. (2016) highlighted that regulation is the main factor to drive green manufacturing capabilities.

The significant moderating effect of customer pressure on green manufacturing capabilities means that customers exert pressures on the focal firms to adopt green initiatives. In the research by Anbumozhi and Kanda (2005) advocated that due to customer Pressure and their expectations for green products, manufacturers need to focus on their green manufacturing, in order to reduce usage of raw materials, with low environmental impacts, energy consumption and emphasis on occupational safety issue to improved corporate image (Porter & Van der Linde, 1995). Green manufacturing includes meeting customer demands for environmental products, (Dubey, Gunasekaran, & Samar Ali, 2015). Due to pressure from competitor's pressure, more organizations in Malaysia have taken an environmentally conscious approach towards designing their manufacturing green initiative in order to gain the competitive advantage versus their competitor. (Dubey, Gunasekaran, & Samar Ali, 2015)

However, the study indicated that green innovation; integration and financial capabilities were not significant moderated by the institutional pressures. One of the possibilities of the contributing factor to the above finding could be the lack of availability of systematic monitoring or relevant indicator performance to evaluate for the environmental aspect of the organization. Another possibility could be manufacturers are more focus on the short-term benefit than long-term gain in their environmental adoption of green initiative. (Zailani, Jeyaraman, Vengadasan, & Premkumar, 2012). The high possibility could be such externally oriented initiatives require considerable costs, resources and capabilities (Min & Galle, 2001), at the same time, expected benefits, cost savings, marketing opportunities and financial returns will be the priority for firms instead of focusing on innovation, integration with external parties or invest resources and cost on green financial capabilities. Firms may lose their focus and be implementing basic capabilities to conduct their daily activities.

Another possibility could be manufacturing firms are focused on their upstream activities, such as establishing a stronger partnership with suppliers on green-purchasing practices. Therefore, less effort due to resource constraints becomes focused on their integration, innovation and financial capabilities from them to produce better and greener quality goods may not be able to stir up the innovative capability of the manufacturing firms. (Lee, Ooi, Chong, & Seow, 2014) .Hence it is not surprising that the impact of the moderating effect has the least impact on green innovation, integration and financial capabilities among organizations in Malaysia.

With a growing recognition by the Malaysian government of the importance of sustainability, firms in Malaysia, it is critical to conduct further surveys to explore the main reasons why innovation, integration, intraorganisation and financial capabilities

were not moderated by institutional pressures. Therefore, firms must be more sensitive towards their customers, needs and wants and competitors pressures to achieve firm sustainability (Chin et al., 2013).

However it may be concluded that generally, the tendency is that Malaysian firms are prone to react to the pressure imposed by regulation, customer, and competitor with respect to green manufacturing capabilities as compared to other capabilities. In their research, Sarkis et al. (2011) emphasized that based on the institutional pressure, there is a link between the external pressure and internal capabilities, the findings are partial align as not all except green manufacturing capabilities are well moderated by institutional pressure.

6.4 Implication of the Study

These subsequent sections will present the theoretical and practical contributions, the limitations of the study. The suggestions for future research and development will be discussed in detail. Finally, a research conclusion will be presented at the end of the chapter. Discussions on the implications are divided into two parts namely implications in relation to the theoretical aspects and the practical aspects.

6.4.1 Theoretical Implication

Several implications can be derived from this research that could contribute to the application of resource-based view theory and institutional pressure in green purchasing. This study attempts to enrich the present theories. Several implications can be derived from this research that could contribute to the development and application of resource base theory and institutional pressure in green purchasing. Implications from the theoretical perspectives are presented below.

This study extends prior research by offering a holistic perspective on green purchasing, identifying capabilities that can predict the triple bottom line from the perspective of resource based view (RBV) theory, and enhancing it with the institutional pressure supported by empirical evidence. Prior research in green purchasing tends to relate green purchasing in terms of financial returns on investment and return on assets, where green issues were not the main emphasis. This study uses RBV theory as the theoretical foundation to explain the significant relationship of green purchasing capabilities on the extent of the triple bottom line among manufacturers in Malaysia.

By expanding the RBV theory, this study enhances building of the theory for overall contributions to the green purchasing capabilities and reveals the relationship of each of the capabilities and the significant effects on the green purchasing practices. Using the RBV theory, it provides a logical explanation and argument for the underlying constructs, to further explain and review the relationships in between the constructs towards the impact of triple bottom line performance.

The findings of the study indicate that manufacturing capabilities, integration capabilities and the intraorganisational capabilities have positive effects on the extent of the triple bottom line performance. Using the RBV theory and based on previous literature, as well as the findings of the interviews, it may be suggested that these three green purchasing capabilities could be used in relation to firm's sustainability performance. Thus, companies with the internal potential green capabilities would be in an advantageous position to adopt green environment activities. Such suggestions are supported by the work done by Hart (1995) and Zhu and Sarkis (2004), who found the importance of firms' internal capability factors in achieving sustainable competitive advantage.

The findings could contribute to the knowledge on the potential of mediator role in green purchasing practices on green capabilities and TBL performance in relation to firm sustainability performance among Malaysian manufacturers. In addition, by using RBV's focus firms could enhance their internal capabilities towards competitive advantage and for firm performance.

With reference to the RBV theory, based on the empirical literature review, firms depend on their valuable, rare and inimitable capabilities and core competencies rather than on their static resources. However, solely depending on these resources is inadequate for firms to gain sustainable competitive advantage. Firms must be capable resources into their capabilities accordingly for firm performance (Ferreira & Azevedo, 2008). In order, not to be imitated by competitors, firms need to transform resources into their capabilities, then only can they create unique resources that are hard to duplicate by other firms (Mat & Razli, 2011). The relatively high explanatory power of this research model could be used to validate the internal green capabilities of these theories in the green purchasing environment towards the triple bottom line performance.

The coercive, normative and mimetic (DiMaggio & Powell, 1983; Scott, 2001) pressures that are referred to as the institutional pressure from the government, customers and competitors might influence firms to adopt green activities (Shi et al., 2012). In their study, Zhu et al. (2013) and Delmas and Toffel (2004) have concluded that institutional pressure could influence an organization's responsiveness, practices and decision making, which implied that institutional pressure is the most suitable to explain the mechanisms for green purchasing practices and capabilities in the Malaysian context. Similarly, Hoskisson, Eden, Lau and Wright (2000) hypothesized that using

institutional pressure is the new perspective in the emerging economies. However, this theory has limited use in the empirical studies even though it is proven to be the most applicable paradigm for explaining the enterprise behavior by some theorists. Tate et al. (2012) found that the development of environmental purchasing theory and practice could provide great opportunities for academic research. Thus, the findings of this study could be used as an early stage of development in green environmental purchasing by academic researchers.

This research reflects the holistic view of firm sustainability and performance achieved through green purchasing capabilities and practices, with institutional pressure being a moderator. The findings of this study show that firms do not respond to the external influences in a similar manner. However, it does contribute to those who wish to develop theories and conduct future research in green purchasing practices. It shows the forces required and various capabilities, with high and low impacts as indicators useful for regulators and policy makers, statutory bodies, linked companies and suppliers in managing their green purchasing practices.

Finally, the findings did not reveal how the effect of external pressure could influence firm sustainability performance. There are still pending issues on how the external pressure using the institutional pressure would affect the internal capabilities of the RBV theory in green environment that need further investigation. According to Zsidisin and Siferd (2001), the theory of environmental purchasing is still in its early stage of development and the integration of established theories into environmental purchasing needs further empirical studies.

6.4.2 Practical Implications

The formalization of the green purchasing environment framework could help managers to easily recognize and be aware of the complexity of the business environment where firms could exploit the full potential of green environment in order to adapt to the changing environment. The findings of this study indicate that benefits accumulating from green purchasing capabilities in enhancing firm's TBL performance cannot be under-emphasized. Managers and executives should look beyond conventional insights of purchasing only in cost-reduction, deliveries and quality and improvement in efficiency.

In fact, with the building and improvement of firm capabilities and understanding the type of capabilities mostly adopted in general, firms could take the opportunity by using their supply networks to integrate and re-design their internal capabilities to gain the greatest advantage. Similarly, rather than following what the majority of other competitors do, firms should develop a specific and exclusive set of strategic capabilities that could effectively allocate and manage resources among various department and across functions or business units' base on capabilities which are more important for organizational survival and success in a changing environment (Gratton & Ghoshal, 2005).

Practitioners should find that an organization could estimate potential business benefits and costs at the corporate level. There is a need to understand the values and principles need to be addressed in order to know an organization's current weaknesses and strengths, threats and opportunities so that the organization could strategically manage its environmental, economic, and intangible performance. This study is useful in

assessing organizations' needs in terms of the effectiveness of their green purchasing practices.

Green procurement offers firms with significant opportunities for enhancing internal flexibility and adaptability for firm sustainability, reconfiguring and redesigning resources and competency to adapt to the changing environment. Implementing green environmental strategy would allow innovation and upgrading of facilities that might be more inimitable and valuable for organizational competition (Sambamurthy, Bharadwaj, & Grover, 2003).

The mediating role of green purchasing practices on the green capabilities and triple bottom line firm performance also provides a systematic scheme for senior managers to establish and execute green purchasing strategy. The implementation and value creation of green purchasing could be implemented in a more sequential process, commencing from focusing on the capabilities to support, build and enhance the overall business operations by incorporating green practices strategy and allow the firm to compete in a changing environment. To achieve such objective, managers need to identify specific dimensions of green capabilities that are needed and to examine how to leverage these capabilities for firm sustainability.

In their research, Tate et al. (2012) found that sustainable firms required sustainable supply networks. Firms are beginning to recognize the role played by suppliers in sustainability initiatives. Seuring and Muller (2008) recognized the importance of suppliers in sustainable supply chain management and supplier's management as the way to manage sustainability risks and performance. The findings of this study provide

a clear picture and better idea on how to work with a reliable pool of the suppliers for firm sustainability.

The findings pertaining to the moderating effect could be used to assist the policy makers in emerging countries, such as Malaysia, particularly in setting appropriate policies and strategies for improving their green purchasing. The findings could contribute towards raising awareness among public policy makers and academic researchers pertaining to green environmental issues. Such awareness could contribute towards firm sustainability through environmental green purchasing capabilities and green practices. Practitioners could rely on these findings to implement better evaluation and benchmark their firms' efforts in green purchasing.

Firms should shift their viewpoint in regarding the green procurement as just a temporary or ad hoc project. In fact, firms should continue with such commitments that may last for a relatively longer time. Therefore, managers should realize that it is necessary to establish long-term and systematic supporting programs to facilitate an integration of green procurement practices by incorporating green procurement into their daily business operations and employees' work processes and activities.

This research could contribute towards raising awareness of green environmental issues among supply chain managers and their abilities to implement green purchasing. Besides, for those who are already engaged in some form of environmental management system, this research could contribute towards further enhancing their awareness and understanding of green purchasing potentials. Such awareness could contribute towards the successful implementation of green purchasing collaboration with suppliers.

Based on their research, Yen and Yen (2012) found that purchasing is an important function in these changing environmental initiatives in the supply chain. Klassen and McLaughlin (1996) suggested that sound purchasing policies and practices integrated with firm environment goals would lead to firm competitive advantage. Purchasing function could influence the environmental design and significantly affect the environmental performance and improve firm economic position (Min & Galle, 1997). These findings show that supply manager should focus on environmental purchasing activities that positively affect the firm performance (Yen & Yen, 2012). The results could provide a strategic perspective for manufacturing firms on how to tap into the purchasing professionals' capabilities for firm performance and sustainability.

6.5 Limitations of the Study

This study is not without its limitations, which should be taken into account before drawing any generalization or conclusion. Several limitations have been identified and discussed below.

First, the interview sample is only limited to six manufacturing firms. The quantitative content analysis to develop the concept, constructs and the theoretical framework for the study is based on the findings from the interviews. Interviewing a larger sample would allow a more in-depth analysis that could lead to more accurate results and theoretical framework that really reflect the situations in Malaysia. In addition, the generalization of the findings might not be applicable to different industries facing different challenges, culture, purchasing behavior and structures. Therefore, the results of this study should be interpreted with appropriate check and balance before any generalization could be made.

Second, the focus of the research is on several green capabilities and practices that could influence the triple bottom line. There are, however, many other green capabilities and practice dimensions that could be included in the framework to make it more complete. In addition, there are many other variables that are not included in this study but might have a significant effect on the green purchasing capabilities and practices and that might have direct or indirect effect on the TBL performance. Besides, other moderators such as culture, structure, knowledge management and power allocation might lead to different findings.

Third, the study measured the variables at a single point in time. Performance variables are potentially subject to change over time. For this study, responses to the changing environment were not covered, thus limiting the generalization of the findings. Further research should, in particular, investigate green capabilities, practices and TBL performance over time, especially in an environment of changing regulations and dynamic economic conditions. Therefore, longitudinal studies might be suggested for causal relationships with more accurate results.

The study selected only the ISO 14001 manufacturing firms in Malaysia and the participants are also from these firms. Other certified manufacturing firms or the small and medium enterprises (SMEs) are excluded. In this case, the structure, behavior to develop the framework, constructs and even the indicators used in the research would also be totally different due to diverse industries. Therefore, the relevance of the current purchasing measure, capabilities and green practices undertaken may be different, thus, the finding of the results must be treated with wisely when applied to other non-ISO 14001 manufacturing firms or other countries other than Malaysia.

This study used a single respondent from each manufacturing firms. The data collected from a single respondent from each firm using the self-reported measures might be subject to certain drawbacks and biases during assessments as it might not represent the whole organization. Even though in this study the samples included 23 respondents who are not directly involved in procurement activities, the results show no significant difference in the findings. Previous studies have suggested that there are no major concerns with single respondent as long as they are knowledgeable and their experience with the particular field could assist in overcoming potential problem with common method variance (Vachon & Klassen, 2006). Even though multiple respondents are encouraged and more favorable, yet a single respondent for this research was used based on the respondent's experience and Knowledge in purchasing.

Using quantitative research method, the triple bottom line performance outcome is computed, based on respondents' perception rather than on the direct observations or actual data. Besides, the survey instrument relied on self- reported measures that often attract criticism that the self-reporting will lead to response bias and inaccuracy. As such the findings could be regarded as poor indicators of actual outcomes.

6.6 Directions for Future Research

Below are the suggestions for future studies where researchers may focus on to address the following issues.

Green procurement is a new and emerging concept in the Malaysian context. There is lack of literature in this area. This study is considered as an early stage effort to empirically investigate green capabilities and green practices in relation to the triple bottom line performance. Future studies could utilize the concepts and findings of this

study to further investigate and clarify the issues and relationships for all the constructs in this study in the context of Malaysia.

This study investigated internal green capabilities and green practices. However, future studies could further investigate issues pertaining to external environmental collaboration between the capabilities and practices among suppliers, customers and internal capabilities that might affect green capabilities and practices that lead to the triple bottom line performance. Such a more holistic empirical study could reveal a more comprehensive picture of green environment in the Malaysian context.

Future research could consider using more in-depth environmental moderators as well as investigate specific constructs from different perspectives. In addition, moderators could also be applied to investigate and to gain more insights into the relationships between green procurement and triple bottom line outcome and to seek more explanation on what enhances the effects of green practices on the outcomes.

In terms of geographic location, future research should examine firms in other locations and countries as different market sizes, cultural, political, economic and institutional background might be the key factors influencing the implementation of the green purchasing by firms in different locations or countries. The findings of this research could be special and unique only to Malaysia and might not be relevant and representative of other developing countries such as Thailand, Vietnam or Indonesia. An in-depth study on green capabilities, practices and performance at various stages is recommended for further understanding the impact of the green procurement on firm performance at different stages. Such research project requires many financial and human resources, which was not possible in the current research. Future research could

also incorporate time factor into the green procurement by conducting longitudinal examinations for the multiple facets of green procurement to enrich the understanding of how the green procurement contributes to triple bottom line and firm performance, thus ensuring that the findings are more robust.

Future research could apply quantitative method, using data based on the objective observations instead of perceptions measure. It is also suggested that using multiple respondents instead of a single set of respondents could lead to the possibility of the existence of biases and common method bias. A researcher could consider using different or multiple methodologies to validate the findings. Besides, future research should verify the findings of this study using covariance based tools. Even though the results of this study can be regarded as being representative of the perceptions of the ISO 14001 manufacturing firms by using PLS with smaller sample size, however, to support the generalizability of the research, it should consider using the larger samples size of the results between industries.

The findings showed that innovative and financial capabilities were not being the main outcomes for the findings; however, these two capabilities are critical and important for purchasing activities. Future research could explore why both capabilities are not the prominent factor contributing to firm performance. The researchers could study the potential impact of innovative and financial capabilities and the relationship between green practices and triple bottom line performance. These are the main areas that need further investigation in the Malaysian context.

This research focused on perspectives of the buying-firms without taking into consideration the perspectives of suppliers or sub-suppliers. Further research should, in particular, examine green capabilities, practices and TBL from both perspectives.

6.7 Conclusion

Environmental issues have dramatically increased consumers' awareness of environmental problems. Increasing pressure from key institutional stakeholders such as government regulators, customers and competitors is forcing firms to change their business performance, focusing on ecological value creation besides quality and cost factors. Firms have to improve on their proactive environmental management practices such as reducing sources of waste, promoting recycling, reuse, reduction and substitution of materials in their purchasing of inputs towards their economic, financial and intangible performance.

Studies on green concept are at an early stage in a developing country like Malaysia. Being located at the beginning of the forward flow of materials within an organization, purchasing professionals must be able to incorporate their green capabilities, expand their sensitivity and be proactive in implementing sustainable purchasing. Purchasing professionals need to communicate, network and coordinate with all the internal and external stakeholders, especially with their suppliers for environmental performance and firm sustainability. Green capabilities are considered as "what can be done" by organizations to achieve a particular goal, and to utilize their current capabilities, to identify the capabilities required to build and leverage the benefits of intraorganisational relationships to gain sustainable competitive advantage towards sustainability and firm TBL performance.

The mediating effects of green purchasing practices on the green capabilities are found to be significantly positive on environmental, intangible and economic performance. Purchasing professionals should reconsider and redesign their purchasing practices, especially in the selection and collaboration of decisions pertaining to the environmental impact on their immediate suppliers which have become a challenging task for many companies. Firms could benefit by promoting high level of supplier development, collaboration and evaluation to ensure an exchange of information flow and sharing of knowledge between the parties involved. Value creation for collaboration and sharing of information with suppliers hinges on the purchasing capabilities, where such collaborative exchanges could create value in procurement and lead to firm sustainability in the long run (Gimenez & Sierra, 2013).

From the theoretical perspective, the RBV theory provides the fundamental theoretical understanding of the effects of green capabilities on the adoption of green practices and firm performance. It appears to be providing the proper base for understanding the positive effects of green capabilities on the green practices in Malaysian context. Firms should understand the impact of institutional pressure in terms of regulation, customers and competitor pressures that could affect the implementation of their green strategies and could reduce or minimize the potential forces that could affect their decision making and policy setting processes, manage trade-offs between green options and business benefits when facing these pressures.

The Malaysian Government has been committed to improve green government procurement (GGP) processes as outlined in the 10th Malaysia Plan. The objective is to minimize degradation of the environment, to have zero or low greenhouse gas (GHG) emission, to cope with the rapidly changing global economy. GGP is a relatively new

concept; there is no policy, regulation and legal framework with regards to GGP at this point of time. In order to promote green purchasing nationwide, the government needs to cascade down to the private sectors, leading to a sustainable development policy goal to achieve an inclusive and sustainable, high-income nation by 2020 (Sambasivan et al., 2013).

This study is based on interviews, literature review and quantitative research to answer the research questions and to test the hypotheses for green procurement by ISO 14001 accredited manufacturing firms. The general findings revealed that green procurement is very important for firm sustainability, although this is still a new and emerging concept in the Malaysian context. This study can be used as the basic reference to expand and enhance knowledge as well as investigate the importance of adopting green purchasing. Overall the result of this study shows that the green capabilities and green practices are important for firm sustainability in terms of environment, intangible and economic performance. These findings basically offer answers to previously raised research questions. The hypothesized effects of mediating effect of green practices on green capabilities and TBL performance are validated. This study tried to set solid theoretical and empirical basis on green issues in Malaysia. The mechanism underlying how green capabilities create value for green practices and TBL performance in this changing environment is manifested in the positive relationships towards firm performance.

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LIST OF PUBLICATIONS AND PAPERS PRESENTED

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Foo, M.Y (2017). Developing Conceptual framework for Green Purchasing Capabilities and Practices towards Triple Bottom Line Performance. International Conference on Business, Accounting, Finance and Economics (BAFE), UTAR, Kampar, Perak, Malaysia.

Foo, M.Y., Kanapathy, K., & Zailani, S. (2017). The Moderating effect of Institutional Pressure on Green Purchasing Capabilities and Practices. Will be submitted to International Journal of Emerging Markets.