Middle East Journal of Entrepreneurship, Leadership and Sustainable Development

Vol. 1, No. 1 2017

FACTORS INFLUENCING GOVERNMENT GREEN PROCUREMENT PRACTICES: STRUCTURAL EQUATION MODELLING ANALYSIS

Khairul Naim Adham*

National Biodiversity Centre Core Team,
Biodiversity and Forestry Management Division,
Ministry of Natural Resources and Environment, Malaysia

E-mail: khairulnaim@nre.gov.my

Chamhuri Siwar

Emeritus Professor and Principal Research Fellow,
Institute for Environment and Development (LESTARI),
National University of Malaysia (UKM), Malaysia

E-mail: csiwar@ukm.my

ABSTRACT

Purpose: The purpose of this paper is to examine the effect of seven exogenous latent constructs namely

1. Environmental Knowledge (ENK)
2. Environmental Concern (ENC)
3. Perceived Costs Efficiency and Business Benefits (PCE)
4. Perceived Product and Supplier Availability (PPS)

*Corresponding author

5. Organisational Incentives and Pressures (OIP)
6. Policies and Regulations (PR) and
7. perceived benefits of implementation tools and competency (PBI) on Government Green Procurement (GGP) practices.

Design/methodology/approach: The theoretical framework of this study is built based on the institutional theory, underpinned by previous researchers' conceptual models. This study uses Structural Equation Modelling (SEM) analysis to determine a measurement model that best fits data at hand and a structural model to test the causal relationship among the constructs.

Findings: This study finds that all latent exogenous constructs in this study have a positive and significant effect on latent endogenous constructs that is GGP practices ($p < 0.05$).

Original/value of the paper: This study is one of the first attempts to empirically investigate the practice of GGP in Malaysia.

Practical implications: At the government level, the findings of this study will assist the government in formulating strategies towards the implementation of GGP in a more systematic and effective manner. At the suppliers' level, the findings will help suppliers to make adaptations in fulfilling the government's requirements.

***Keywords*:** Government Procurement; Government Green Procurement; GGP; Structural Equation Modelling; SEM; Institutional Theory.

Reference to this paper should be made as follows: K. N. Adham and C. Siwar (2017) 'Factors Influencing Government Green Procurement Practices: Structural Equation Modelling Analysis', *Middle East Journal of Entrepreneurship, Leadership and Sustainable Development*, Vol. 1, No. 1, pp.61–88.

INTRODUCTION

Government procurement, which refers to the acquisition of supplies, services and works in accordance with government rules and regulations, plays a crucial role as a catalyst for economic and social development in particular to stimulate innovation, enhance competitiveness of local companies, encourage investments and instill business confidence in Malaysia (Adham and Siwar, 2012). Government procurement is vital to Malaysia's socioeconomic development as it represents 24–33% of its Gross Domestic Product (GDP) (Adham and Siwar, 2011) and the proportion is higher than some other countries (Adham and Siwar, 2012). In addition, government procurement has the potential to be an instrument to conserve and minimise the negative impact on the environment or otherwise known as Government Green Procurement (GGP). However, studies on GGP are still limited and its concept is relatively new in Malaysia even though many countries have benefited economically, socially and environmentally by implementing it. Thus, this empirical study seeks to understand factors that influence GGP practices in the context of Malaysia to contribute to the enrichment of knowledge in the domain of government procurement and GGP.

LITERATURE REVIEW

Government green procurement

Governments could potentially use their huge purchasing power to spur the use of environmentally friendly products and services. The use of government procurement for

environmental protection purposes is being promoted under various terms such as GGP, Green Public Procurement (GPP) and Environmentally Preferable Purchasing (EPP). Other related terms include environmentally responsible public procurement, sustainable public procurement and environmental product procurement (Adham and Siwar, 2012; IGPN, 2010; Michelsen and Boer, 2009). In the context of Malaysia, GGP is defined as the acquisition of products, services and works in the public sector that takes into account environmental criteria and standards to conserve the natural environment and resources that minimises and reduces the negative impacts of human activities (KeTTHA, 2010). Green procurement considers the issue of sustainability in purchasing as an additional input to the traditional purchase criteria such as cost, quality and delivery (Lambert and Cooper, 2000). Green procurement initiative is to ensure that the products or materials purchased meet environmental objectives such as reducing resource waste, promote recycling, reuse, source reduction and material substitution (Carter et al., 1998; Min and Galle, 2001; Zsidisin and Siferd, 2001). According to Geng and Doberstein (2008), the effective implementation of GGP could offer greater impacts for developing countries as many of them are facing natural resource scarcities. Benefits associated with the implementation of GGP are not only limited to the environment but also on the economic and social aspects (Barr et al., 2005; Chen, 2005; Ho et al., 2010; McCrudden, 2004; Parikka-Alhola, 2008; UNDP, 2008). This study defines GGP as government procurement activities that can reduce the impact on the environment. Literatures highlight numerous factors related to GGP practices, among which are Environmental Knowledge (ENK); Environmental Concern (ENC); Organisational Incentives and Pressures (OIP); Policies and Regulations (PR); Perceived Costs Efficiency and business benefits (PCE); Perceived Product and Supplier Availability (PPS) and Perceived Benefits of Implementation tools and competency (PBI). The following parts explain each of these factors.

Environmental knowledge

ENK includes environmental awareness among individuals, the relationship between several aspects of the environment, and awareness to protect the environment for future generations (Kumar, 2012). Fryxall and Lo (2003) and Vazifehdousta et al. (2013) defined ENK as a general knowledge of facts, concepts, and relationships related to nature and the ecosystem. According to Haron et al. (2005), ENK is one's ability to understand and assess the impact of society on the ecosystem, while according to Kaplan (1991) and Nik Abdul Rashid (2009), ENK is the knowledge of a person on an issue that significantly affects the decision-making process. In general, the literature review demonstrates that knowledge and awareness of the environment are related to environmental attitude and behaviour (Diekmann and Preisendorfer, 2003). Hines et al. (1987) cited knowledge as the most important predictor in determining an action concerning the environment. According to Park et al. (1994) and Dispoto (1977), environment knowledge has a positive relationship with behaviour. The study by Chan (1998), Chan and Lau (2000), Getzner and Grabner-Krauter (2004), Wahid et al. (2011), Schiffman and Kanuk (2010), Haron et al. (2005) and Vining and Ebreo (1990) showed that knowledge on green products has a significant effect on attitude, behaviour and consumer involvement in green purchasing. According to Laroche et al. (2001), knowledge, values, and attitudes affect environmental awareness and behaviour. ENK has a significant impact on consumer intention to purchase green products (Kaufmann et al., 2011). Haron et al. (2005) in their study in Malaysia found that ENK correlated positively with attitudes, behaviour and involvement. The effect of the lack of knowledge in the decision-making process has been reported by Gelderman et al. (2006), Laroche et al. (2001), Oskamp et al. (1991), Verdugo (1996) and Walker and

Brammer (2009). Walker and Brammer (2009) stated that one of the obstacles in implementing sustainable procurement is the low level of awareness. In the context of this study, awareness and understanding of the GGP concept is important to enable an organisation to implement it effectively. This study defines ENK as knowledge and awareness about the environment which enhances the ability to understand the issues and the environmental impact and help in decision-making.

Environmental concern

ENC is an affective trait that shows concern/fear, consideration, and whether an individual likes or dislikes the environment (Sinnappan and Abdul, 2011; Yeung, 2004). ENC indicates the general orientation of the individual to the environment (Kim and Choi, 2005). According to Maloney and Ward (1973), ENC is the level of emotion, knowledge and willingness to change behaviour, while Said et al. (2003) referred to ENC as a belief, standpoint and the level of concern held by an individual about the environment. Lee (2008) and Wahid et al. (2011) defined ENC as the level of emotional involvement in environmental issues. ENC has a significant impact on green purchase behaviour (Minton and Rose, 1997; Wahid et al., 2011) and influences green purchase behaviour directly (Antil, 1984; Barr et al., 2005; Kim and Choi, 2005; Lee, 2008; Mayer et al., 2012; Milfont and Duckitt, 2004; Roberts and Bacon, 1997; Van Liere and Dunlap, 1980). Individual concern on environmental issues is found to be a predictor of green purchasing behaviour (Chan, 1996) because highly environmentally concerned users tend to buy eco-friendly products (Mainieri et al., 1997). Chase and Smith (1992) reported that a majority of users stated that their purchases are influenced by ENC. ENC has gradually become part of the corporate culture (Honey et al., 2002). Businesses, governments and consumers are becoming increasingly aware and concerned about environmental issues (Martinsons et al., 1996) and more individuals are aware that their purchasing has an impact on the environment (Sabri and Teoh, 2006). Increasing ENC has a substantial impact on the behaviour of consumers and further expands the market of eco-friendly products (Schlegelmilch et al., 1996). This study refers ENC as level of concern of someone on the environment in terms of emotions, beliefs and values that influence the action.

Organisational incentives and pressures

In general, incentives and organisational pressures support change towards sustainability (Gonzalez-Padron et al., 2008; O'Brien, 1999). Incentives and organisational pressures are the extent of top-level management support and the processes and organisational structures that support or hinder the implementation of green practices (Bansal and Roth, 2000; Walker and Brammer, 2009). In the context of environmental management, incentives and organisational pressures are the pressure that drives the internal and external environmental management practices of a firm (Clemens and Douglas, 2006; Eltayeb et al., 2010). According to Eltayeb et al. (2010), incentives and organisational pressures include pressure from upper management and customers as well as the need to comply with certain rules and regulations. Suppliers, customers and community stakeholders are those who are able to motivate organisations to implement environmentally friendly practices (Chien and Shih, 2007; Greenwood, 2001; Hervani et al., 2005). Leadership and support from senior management are also important in driving the implementation of sustainable procurement (Bansal and Roth, 2000; Brammer and Walker, 2011). The management is important in shaping the organisation

(Oliver, 1991) as its awareness on the importance of protecting the environment will influence the environmental management system in the organisation (Zsidisin and Hendrick, 1998).

Walker and Brammer (2009) found that top management support is a catalyst for the implementation of sustainable procurement. Brammer and Walker (2011) found that lack of top management support is one of the major obstacles in implementing sustainable procurement. Management can influence by developing organisational policies that clearly outline the organisation's desire to engage in socially responsible behaviour, to create an organisational culture, and facilitate and promote the attributes of good corporate citizenship (Carter and Jennings, 2000). External pressures that influence the implementation of green supply chain management include regulations, markets, suppliers, competitors (Hervani et al., 2005; Sarkis, 1998; Zhu and Sarkis, 2006); customers, regulators and NGOs (Hall, 2000; Hervani et al., 2005); as well as the community and the media (Henriques and Sadorsky, 1996). Consumer pressure is an important external pressure (Doonan et al., 2005) in order to achieve sustainable solutions (Zhu and Sarkis, 2006) because users as key stakeholders can exert pressure on suppliers (Doonan et al., 2005; Lin, 2007; Peng and Lin, 2008) to expand their environmental practices (Anbumozhi and Kanda, 2005). The study by Carter and Carter (1998), Carter et al. (1998) and Preuss (2001) found the impact of consumer pressure and social responsibility on green purchasing practices. In the Malaysian context, the study by Eltayeb et al. (2010) found that consumer pressure affects the implementation of green purchasing among Malaysian producers who have EMS certification. Awareness on the importance of protecting the environment, particularly at the global level has put pressure and encouragement on firms to improve their environmental performance (Sarkis and Tamarkin, 2005; Yang and Zhang, 2012; Zhu and Sarkis, 2006). This study describes OIP as incentives and internal and external pressure from the top management of the organisation, customers, suppliers, competitors, the media and NGOs/ communities to implement the GGP.

Policies and regulations

Public policy and legislation are important in regulating public procurement (New et al., 2002; Trepte, 2004). External systems such as rules, regulations, professional standards, organisational interests and social beliefs affect the decisions, behaviour and organisational structure (Meyer et al., 1987; Oliver, 1991). In the context of green purchasing practices, Min and Galle (2001) and Preuss (2001) found that there is a positive and significant relationship between the regulation and green procurement practices. According to Walker and Brammer (2009), government PR are a catalyst for the implementation of sustainable procurement and green purchasing practices (Eltayeb et al., 2010; Min and Galle, 2001). In the context of green supply chain management practices, environmental regulations are a major factor influencing green supply chain management practices (Hall, 2000; Sarkis, 1998; Zhu and Sarkis, 2006). Governments not only serve as the largest buyers, but they also act as regulators for the implementation of green procurement at the same time (Faith et al., 2006; McCrudden, 2004). Some of the actions that can be taken by the government are restricting/banning products that pollute the environment and health, enforce rules for the production of green products, and implement awareness campaigns and environmental education (Sinnappan and Abdul, 2011). The government plays an important role in shaping the green purchase behaviour in the community (Sinnappan and Abdul, 2011; Tsen et al., 2006). According to Thomson and Jackson (2007), green procurement can be encouraged through relevant legislation. Hui et al. (2001) reported the importance of government PR to encourage the adoption of green production and

Handfield et al. (1997) reported the role of government regulation in raising environmental awareness. Firms can take advantage of the government's policy to meet the needs of users and at the same time explore new business opportunities (Sinnappan and Abdul, 2011). In addition, Chien and Shih (2007) showed that the regulatory/international agreements also affect environmentally friendly practices. This study defines PR as GGP policy and regulations enacted and enforced to encourage organisations to implement GGP practices.

Perceived costs efficiency and business benefits

According to Preuss (2009), environmental initiatives usually involve cost implications. Brammer and Walker (2011) reported financial constraints as the biggest obstacle to implement sustainable procurement and the fear of rising cost is the main barrier to take into account environmental factors in the procurement process (Min and Galle, 2001). Hence, financial viability and cost effectiveness play an important role (Brammer and Walker, 2011) in promoting environmentally friendly procurement practices. Procurement cost (Salam, 2008a,b) and expected business benefits affect the implementation of green purchasing (Eltayeb et al. 2010; Forman and Jorgensen, 2004; Preuss, 2001). The study by Blumberg (1999), Eltayeb et al. (2010), Min and Galle (2001), Preuss (2001) and Ravi et al. (2005) showed that the expected business benefits have a significant impact on green procurement. Expected business benefits in the forms of cost savings, marketing opportunities and financial returns from the sale of green products can be a catalyst for green initiatives (Eltayeb et al., 2010). This shows that the profitability of the business and financial returns are an important objective for any organisation to implement environmentally friendly practices. In the context of green procurement, business organisations will only participate if they are able to see its potential in enhancing the business benefits of GGP. Eltayeb et al. (2010) found business benefits to be the main criteria in implementing green procurement for Malaysian EMS certified companies. Firms need to look at the profitability of the business to justify the costs incurred to comply with environmental standards (Anbumozhi and Kanda, 2005) as the performance of an organisation is measured by the extent to which organisations are able to achieve the objectives of the organisation (Daft, 1995). That is why organisations are reluctant to implement sustainable procurement if the profits are not clear (Rao and Holt, 2005). This study defines PCE and business benefits as the extent to which an individual or organisation believes that GGP can cut costs and increase revenue and profit to the organisation.

Perceived product and supplier availability

The availability of suppliers, products and services also significantly affect the implementation of sustainable procurement (Brammer and Walker, 2011). Availability of suppliers, products and services is essential to promote and implement sustainable procurement (Walker and Brammer, 2009). In the context of purchasing social responsibility, the lack of product or service can be a barrier to its implementation as organisations face difficulties in obtaining supplies of resources (Carter and Jennings, 2000). Literatures show that GGP can be encouraged if the organisation can get eco-friendly products and services easily and their performance is comparable to conventional products (Salam, 2008a,b). Producers affect the performance of the entire supply chain (Sarkar and Mohapatra, 2006) in which the supplier-producer relationship is important to enhance competitiveness (Cannon and Homburg, 2001; Sheth and Sharma, 1997). Environmental purchasing activities will be facilitated by increasing collaboration with suppliers and the downstream supply chain, including retailers (Carter and Carter, 1998).

According to Salam (2008a,b), business partners influence the implementation of green purchasing. This study defines PPS as the extent to which an individual or organisation believes the availability of environmentally friendly products and suppliers can assist organisations in implementing GGP.

Perceived benefits of implementation tools and competency

Organisations require skills, competencies and tools to implement sustainable procurement (Brammer and Walker, 2011). However, Snell (2006), Cooper et al. (2000) and Maignan et al. (2002) found that most purchasing managers themselves are not willing to implement sustainable procurement practices because they are uncertain about the social and ethical issues in the procurement process. Lack of training and tools to implement GPP is one of the constraints in the implementation of GPP in the EU (Bouwer et al., 2005). One of the mechanisms that can be implemented is to provide a practical tool for GGP implementation. According to Walker and Brammer (2009), the organisation requires implementation tools to enable organisations to effectively implement sustainable procurement. GPP can be implemented using a number of tools such as LCC analysis (that takes into account the cost of acquisition, operation, maintenance and disposal throughout the life cycle of products, services and works), eco-label, internet tools and printed publications such as guidelines, directories and brochures (Bouwer et al., 2005; EU, 2011). Green procurement can be encouraged by providing relevant information (Thomson and Jackson, 2007). The Internet tool has become an important and effective instrument in the training of procurement officers and in conveying the information to the buyers (Bouwer et al., 2005). Over the past few years, internet tools, guidelines, other tools and GGP information have been helpful in implementing GGP (Clark, 2007). This study defines PBI as the extent to which an individual or organisation believes the benefits of GGP implementation tool and competency can help organisations to implement GGP.

METHODOLOGY

Sampling and data collection

The population is senior government procurers from all the 24 government ministries in Malaysia and the top management of government suppliers that obtained government contracts via tender in 2011 and 2012 (population size of 568). Based on Cochran's sample size formula (Bartlett et al., 2001; Cochran 1977), the sample size for this study is 500 comprising of 255 respondents from government procurers and 245 respondents from top management of government suppliers. The sample size is adequate to meet the minimum sample size required by Structural Equation Modelling (SEM) as suggested by Chua (2009); Hair et al. (2006, 2010); Kline (1998); Schumacker and Lomax (2004) and Awang (2013). Stratified proportionate random sampling technique was used. This study conducted a survey using an online questionnaire and survey form. Five points Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. The scale items to measure the exogenous latent constructs and the endogenous latent construct in Table 1 were adapted from the scale items used by Carter et al. (2000), Carter (2004), Carter and Jennings (2000), Chan (2001), Eltayeb et al. (2010), Haron et al. (2005), Kim and Choi (2005), Lin and Sheu (2012), Sabri and Teoh (2006), Salam (2008a,b); Sidique et al. (2010), Sinnappan and Abdul (2011), Sparks and Shepherd (1992), Walker and Brammer (2009) and Yang and Zhang (2012). The selected scale items have shown high reliabilities of at least 0.70. The scale items were modified to match the study's objectives.

Table 1: Scale items

Construct	*No. of Items*
GGP practices	7
Adapted from Carter et al. (2000), Carter (2004), Carter (2005), Carter and Jennings (2000), Eltayeb et al. (2010), Kim and Choi (2005), Sabri and Teoh (2006), Sinnappan and Abdul (2011), Walker and Brammer (2009) and Yang and Zhang (2012)	
My organisation uses Value Management (VM) and/or life cycle costing in implementing its procurement	
My organisation uses recycle packaging and/or reduces packaging material in implementing its procurement	
My organisation gives priority to suppliers that have environmental management certification	
My organisation procures environmentally-friendly products and services	
My organisation requires suppliers to comply with environmental criteria	
My organisation avoids buying products containing hazardous material and toxic material	
My organisation provides design specifications to suppliers that include environmental requirements for purchased items	
Environmental knowledge	6
Adapted from Chan (2001), Haron et al. (2005) and Sidique et al. (2010)	
The use of environmentally-friendly products would reduce pollution	
Birds and fishes are being poisoned by mercury	
The use of environmentally-friendly products would reduce wasteful use of natural resources	
Environmental degradation will not affect the quality of life*	
The number of polluted rivers in the country are increasing	
The use of public transport would reduce environmental pollution	
Environmental concern	6
Adapted from Sinnappan and Abdul (2011), Kim and Choi (2005) and Sabri and Teoh (2006)	
I am concerned about the environment because I believe environmental protection starts from me	
I have participated and am directly involved in protecting the environment	
I often think of how to improve the environmental quality	
Humans must live in harmony with nature to ensure sustainable livelihood	
I am worried about the climate change phenomenon that affects the world's population	
Organisational incentives and pressures	5
Adapted from Carter and Jennings (2000), Eltayeb et al. (2010), Lin and Sheu (2012) and Salam (2008a,b)	
My organisation has a environmental protection policy	
Stakeholders have asked my organisation to implement green procurement	

Table 1: Scale items *(continued)*

My top management provides incentives to encourage green procurement practices	
My organisation's major customers frequently require my organisation to adopt green procurement	
My employees have shown commitment in implementing green procurement	
Policies and regulations	6
Adapted from Carter and Jennings (2000), Eltayeb et al. (2010) and Sinnappan and Abdul (2011)	
The government policy and regulation has greatly influenced my organisation in consuming/producing environmentally-friendly products/services/works	
Incentive provided by the government encourages green procurement practices in my organisation	
Government should formulate policy and enforce law and regulation in relation to GGP	
My organisation should comply with the strict government environmental protection regulation	
Government inspections or audit on my organisation will ensure my organisation complies with laws and regulations on green procurement	
My organisation should comply with the regulation imposed by international organisation/foreign countries	
Perceived costs efficiency and business benefits	6
Adapted from Carter (2005), Eltayeb et al. (2010), Lin and Sheu (2012), Salam (2008a,b), Sinnappan and Abdul (2011) and Yang and Zhang (2012)	
I think other organisations have benefited greatly when they implement green procurement	
I think organisations that implement green procurement will have a better image	
I think successful organisations are those that have implemented green procurement	
I think a large number of organisations in Malaysia especially big organisations implement green procurement	
I think other organisations implement green procurement to achieve business objectives	
I think other organisation's productivity and profits will increase when they implement green procurement	
Perceived product and supplier availability	6
Adapted from Carter and Jennings (2000), Sparks and Shepherd (1992), Lin and Sheu (2012), Salam (2008a,b) and Sinnappan and Abdul (2011)	
I feel other organisations use environmentally-friendly products and services because they are easy to obtain	
I think other organisations use/produce environmentally-friendly products and services because there is sufficient suppliers in the country	
I think local suppliers/producers are capable of supplying/producing environmentally-friendly products and services of quality which meets international standards	

Table 1: Scale items *(continued)*

I think local suppliers/producers are capable of supplying/producing environmentally-friendly products and services within the required time	
I think local producers/suppliers are able to supply/produce environmentally-friendly products according to the required quantity	
I think producers/suppliers of environmentally-friendly products and services have efficiently performed their tasks	
Perceived benefits of implementation tools and competency	5
Adapted from Carter et al. (2000), Carter and Jennings (2000), Eltayeb et al. (2010), Rahbar and Wahid (2011), Sinnappan and Abdul (2011) and Walker and Brammer (2009)	
I think eco label products and services will help other organisations in the implementation of GGP	
I think the information on GGP is easy to obtain by other organisations	
I think green procurement could be implemented by my organisation if there is a practical tool (directory, eco label, LCC, EMS)	
I think GGP guidelines and manuals help to facilitate the implementation of GGP	
I think my organisation needs specific skills to perform VM, life-cycle analysis, and life cycle costing	
Total	46

Note: *Reverse coded items.

Data analysis

Data from the questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) version 19 and the Analysis of Moment Structures (AMOS) version 18. This study used the SEM analysis to determine the measurement model that best fit data at hand and structural model to test the causal relationship among the constructs (Arbuckle and Wothke, 1999). SEM is a multi-variable analysis that combines the concepts of factor analysis and multiple regression analysis (Chua, 2009; Hair et al., 2006), analysis of the relationship (path), MANOVA analysis (Chua, 2009) and is synonymous with the Covariance Structure Analysis or the Covariance Structure Modelling (Awang, 2013). SEM is a statistical measure of the second generation (Awang, 2013), which is an extension to the method of the General Linear Model (GLM) (Chua, 2009) analyses inter-relationship amongst constructs with multiple indicators effectively, accurately and efficiently (Awang, 2013). SEM allows researchers to support the theories that have been developed as well as to choose the best model by extending the standard multivariate analysis methods including regression, factor analysis, correlation and analysis of variance (Awang, 2013; Chua, 2009).

The underpinning theory

Theoretical framework of this study is built based on the institutional theory (a branch of organisational theory), and underpinned by previous researchers' theoretical framework including Brammer and Walker (2011), Carter and Jennings (2000), Chien and Shih (2007),

Eltayeb et al. (2010), Kim and Choi (2005), Lin and Sheu (2012), Wahid et al. (2011), Nik Abdul Rashid (2009), Salam (2008a,b), Sinnappan and Abdul (2011), Walker and Brammer (2009) and Yang and Zhang (2012). In general, the institutional theory examines how external pressures influence a company (Hirsch, 1975) and it emphasises the role of social and cultural pressures on organisational practices and structures (Scott, 1992). Within the institutional theory, there are three forms of isomorphic drivers namely, coercive, normative and mimetic (DiMaggio and Powell, 1983). Coercive pressures come from formal or informal forces from those in power, that is, the government and other stakeholders in the form of rules and regulations, firm's mission, etc. Normative drivers cause enterprises to conform in order to be perceived as having legitimate organisational activities (Sarkis et al., 2010). Mimetic pressures occur when enterprises imitate the actions of successful competitors in an attempt to replicate the path of their success (Aerts et al., 2006). This study proposes a theoretical framework related to coercive, normative and mimetic pressures in Figure 1 and hypothesises that all exogenous latent contructs have a positive and significant effect on GGP practices.

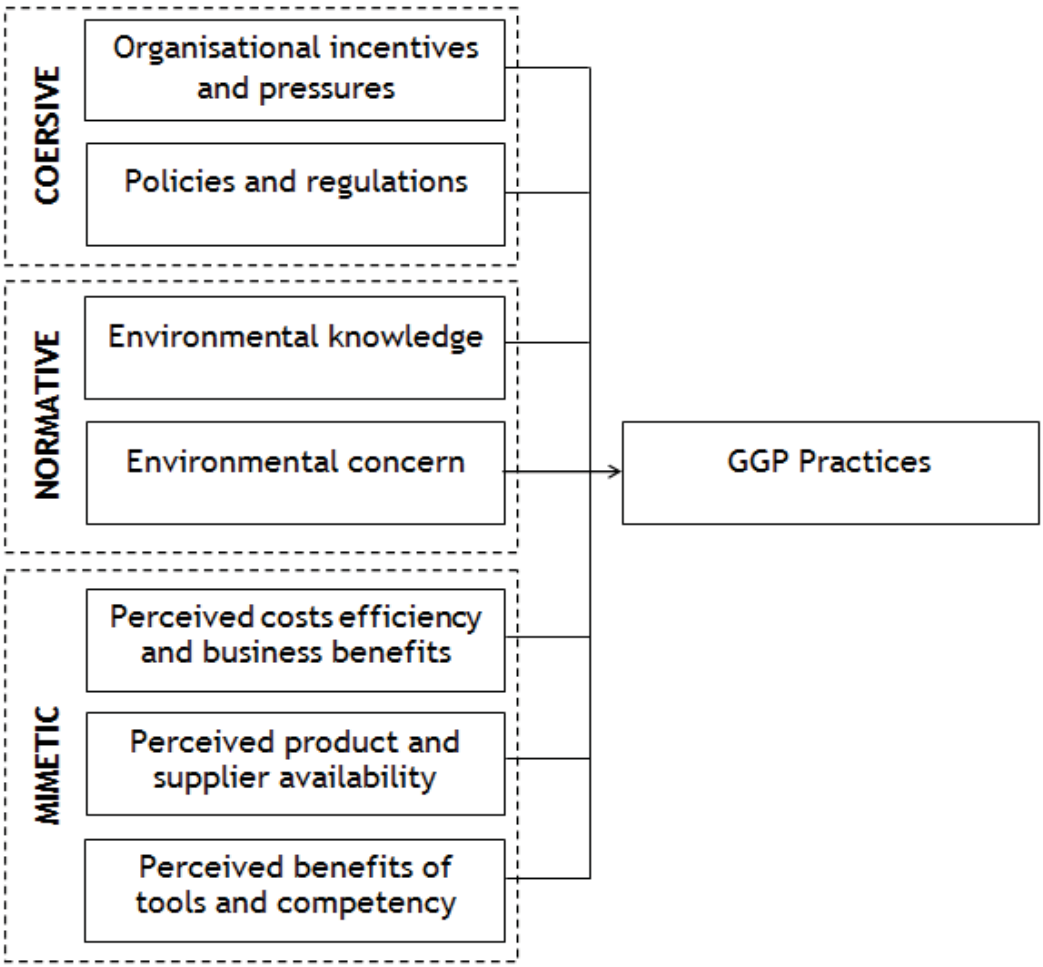

Figure 1: Theoretical framework

FINDINGS

A total of 219 respondents took part in the survey with a response rate of 43.8%. A total of 112 (51%) respondents are government procurers and 107 (49%) respondents are government suppliers. The percentage of respondents shows a balanced composition of government procurers and suppliers.

Exploratory factor analysis

Exploratory Factor Analysis (EFA) was performed for testing the validity of the scale items used in measuring the constructs. A Principal Component Analysis (PCA) was conducted on the 46 scale items using the varimax rotation method. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value of 0.919 is above the acceptable level of 0.5 and the Bartlett's test of spherecity is significant ($p < 0.05$). According to Malhotra (2004), high KMO value between 0.5 and 1.0 shows that the factor analysis is appropriate. Table 2 presents the varimax rotated components matrix, which indicates the factor loading for each item. Two items (PR6 and GGP6) were deleted due to low factor loading and they have cross loaded significantly across factors 1 to 8. Reliability analysis using Cronbach's alpha coefficients shows that the Cronbach's alpha value is higher than 0.75, which exceeds the minimum value of 0.70 (Nunnally, 1978). Hence, it can be concluded that the scale items have an acceptable level of reliability and no serious problem of multicollinearity exists.

Table 2: Rotated component matrix

Item	*Factor*							
	1	2	3	4	5	6	7	8
PPS1	0.851							
PPS5	0.848							
PPS3	0.832							
PPS4	0.828							
PPS2	0.821							
PPS6	0.812							
OIP1		0.853						
OIP3		0.839						
OIP4		0.783						
OIP5		0.780						
OIP2		0.778						
ENK1			0.836					
ENK3			0.816					
ENK5			0.809					
ENK6			0.786					
ENK4			0.786					
ENK2			0.782					
PCE4				0.746				

Table 2: Rotated component matrix *(continued)*

PCE1				0.745				
PCE6				0.716				
PCE3				0.705				
PCE5				0.683				
PCE2				0.681				
PR3					0.743			
PR1					0.732			
PR6*		0.395			0.693			
PR2					0.692			
PR5					0.686			
PR4					0.681			
GGP1						0.669		
GGP7						0.667		
GGP6*	0.339					0.658		
GGP3						0.639		
GGP2						0.637		
GGP4						0.633		
GGP5						0.630		
ENC5							0.859	
ENC1							0.826	
ENC2							0.808	
ENC3							0.805	
ENC4							0.800	
PBI1								0.775
PBI4								0.702
PBI2								0.692
PBI3								0.684
PBI5								0.678
α	0.93	0.84	0.83	0.91	0.75	0.95	0.94	0.91

Notes: *Dropped items; Extraction Method: PCA; Rotation Method: Varimax with Kaiser Normalisation.

Confirmatory factor analysis

Confirmatory Factor Analysis (CFA) was performed to assess the unidimensionality, validity and reliability of the measurement model, and to examine the problem of multicollinearity before modelling the structural model. Literatures suggest that unidimensionality is achieved if the factor loading is 0.5 or higher for newly developed scale items and 0.6 or higher for established scale items; Cronbach's Alpha value is 0.7 or higher; Construct Reliability (CR) is above 0.6 and Average Variance Extracted (AVE) is above 0.5; and the problem of multicollinearity exists if the correlation between contructs is higher than 0.85 (Awang, 2013). Figure 2 shows the standardised estimate of factor loadings, correlation between constructs

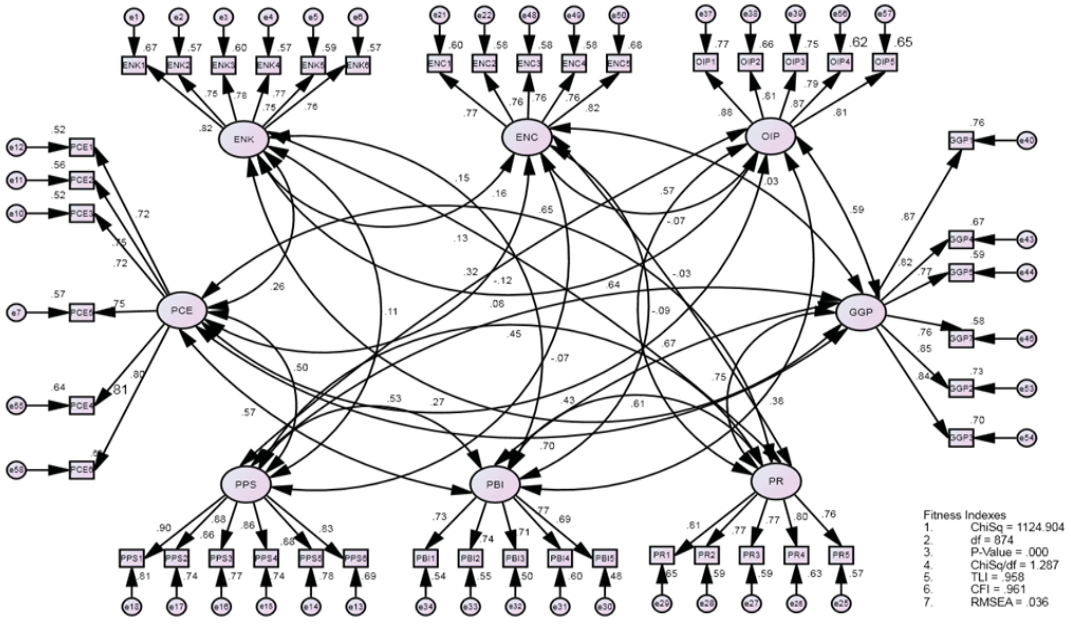

Figure 2: Measurement model (standardised estimate)

Table 3: Unidimensionality, validity and reliability of measurement model

Construct	*Item*	*Factor Loading*	*Cronbach's alpha (Above 0.7)*	*Construct realibility (CR) (Above 0.6)*	*Average Variance Extracted (AVE) (Above 0.5)*
ENK	ENK1	0.821	0.898	0.898	0.595
	ENK2	0.752			
	ENK3	0.776			
	ENK4	0.753			
	ENK5	0.767			
	ENK6	0.756			
ENC	ENC1	0.774	0.883	0.883	0.602
	ENC2	0.758			
	ENC3	0.763			
	ENC4	0.760			
	ENC5	0.824			
OIP	OIP1	0.878	0.918	0.918	0.691
	OIP2	0.812			
	OIP3	0.867			
	OIP4	0.789			
	OIP5	0.807			

Table 3: Unidimensionality, validity and reliability of measurement model *(continued)*

PR	PR1	0.809	0.886	0.886	0.608
	PR2	0.768			
	PR3	0.768			
	PR4	0.796			
	PR5	0.758			
PCE	PCE1	0.722	0.891	0.891	0.577
	PCE2	0.746			
	PCE3	0.719			
	PCE4	0.798			
	PCE5	0.753			
	PCE6	0.813			
PPS	PPS1	0.899	0.948	0.949	0.756
	PPS2	0.862			
	PPS3	0.876			
	PPS4	0.863			
	PPS5	0.883			
	PPS6	0.833			
PBI	PBI1	0.733	0.849	0.850	0.532
	PBI2	0.739			
	PBI3	0.708			
	PBI4	0.773			
	PBI5	0.692			
GGP	GGP1	0.874	0.924	0.924	0.671
	GGP2	0.852			
	GGP3	0.836			
	GGP4	0.820			
	GGP5	0.766			
	GGP7	0.761			

and the R^2 for each item. Factor loadings are recorded between 0.69 and 0.90 and R^2 range from 0.48 to 0.81. Table 3 presents the results of unidimensionality, validity and reliability of the measurement model.

In evaluating the fitness of the model, this study uses Chi square (χ^2) (Byrne, 2010; Wheaton et al., 1977); Root Mean Square of Error Approximation (RMSEA) (Awang, 2013; Browne and Cudeck, 1993; Byrne, 2010; Joreskog and Sorbom, 1989); Comparative Fit Index (CFI) (Awang, 2013; Bentler, 1990); Tucker-Lewis Index (TFI) (Bentler and Bonett, 1980) and Chi Square/Degrees of Freedom (Chisq/df) (Arbuckle, 2007; Arbuckle and Wothke, 1999; Awang, 2013; Marsh and Hocevar, 1985; Yoon, 2002). Table 4 presents the suggested level of acceptance for each index whilst Table 5 reports the fitnesss index for the measurement model examined in this study.

Table 4: Index category and the level of acceptance

Index Category	*Name of Index*	*Level of Acceptance*
Absolute fit	Discrepancy Chi Suare (Chisq; χ^2)	$P > 0.05$ (sensitive to sample size > 200) (Wheaton et al., 1977)
	Root Mean Square of Error Approximation (RMSEA)	RMSEA < 0.08 (range 0.05–0.10 is acceptable) (Browne and Cudeck, 1993; Joreskog and Sorbom, 1989)
Incremental fit	Comparative Fit Index (CFI)	CFI > 0.90 (0.95 is a good fit) (Bentler, 1990; Byrne, 2010)
	Tucker-Lewis Index (TLI)	TLI > 0.90 (0.95 is a good fit) (Bentler and Bonett, 1980)
Parsimonious fit	Chi Square/Degress of Freedom (Chisq/df; CMIN/DF)	Chisq/df < 5.0 (the value should be below 5) (Arbuckle, 2007; Arbuckle and Wothke, 1999; Marsh and Hocevar, 1985), low value is require (Yoon, 2002)

Table 5: Fitness indexes for measurement model

Category	*Name of Index*	*Suggested Index Value*	*Index Value*	*Remark*
Absolute fit	χ_2	>0.05	1124.904	The required level is achieved
	RMSEA	<0.08	0.036	The required level is achieved
Incremental fit	CFI	>0.90	0.961	The required level is achieved
	TLI	>0.90	0.958	The required level is achieved
Parsimonious fit	Chisq/df	<5.0	1.287	The required level is achieved

CFA result shows that the measurement model is acceptable and fits the data since unidimensionality, validity and reliability of the measurement model exceed the required level and the problem of multicollinearity does not exist as the correlation between contructs is lower than 0.85.

Normality

Assessment of normality for the data is conducted to assess the data distribution. Result indicates that the value of skewness for the dataset is within −0.627 to 0.660. This shows that the dataset is normaly distributed as the value of skewness falls within the range of −1.0 to 1.0. The Mahalanobis Distance indicates that there are no outliers in the data.

Structural model

Sructural model was performed to analyse the correlational relationship and causal effects among the constructs based on the hypothess. Figure 3 shows the standardised beta estimate, factor loadings, and R^2 for each item.

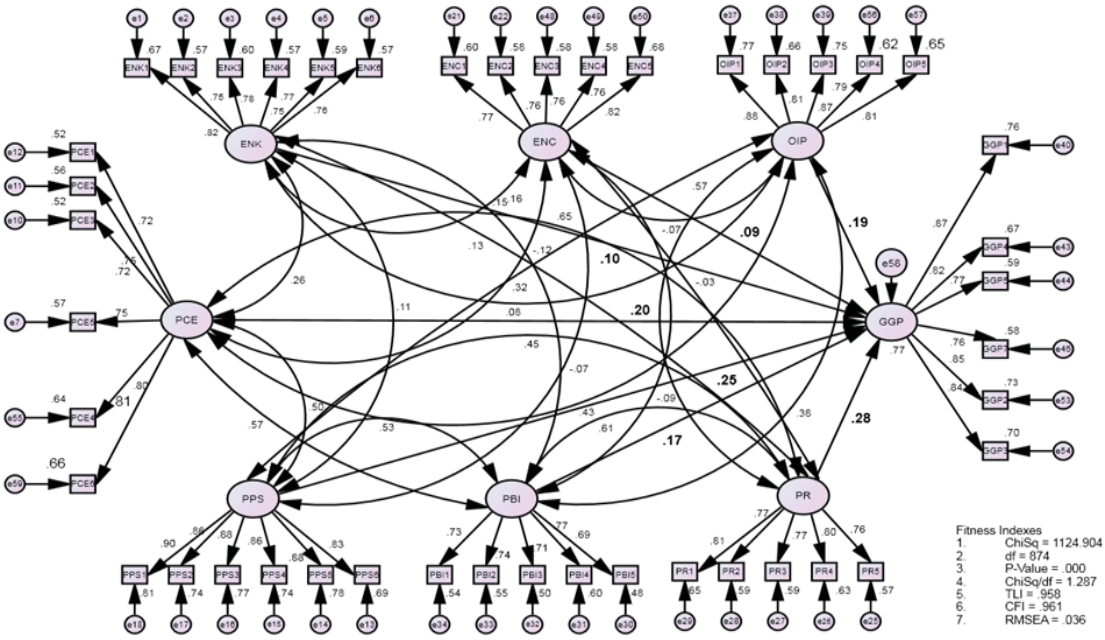

Figure 3: Structural model (standardised estimate)

Table 6: Squared multiple correlations (Group number 1 – Defaut model)

Construct	*Estimate*	*Construct*	*Estimate*	*Construct*	*Estimate*
GGP	0.771	OIP2	0.660	PPS2	0.743
PCE6	0.661	OIP1	0.771	PPS3	0.767
OIP5	0.652	PBI1	0.538	PPS4	0.744
OIP4	0.623	PBI2	0.546	PPS5	0.779
PCE4	0.636	PBI3	0.502	PPS6	0.694
GGP3	0.699	PBI4	0.597	PCE1	0.521
GGP2	0.725	PBI5	0.479	PCE2	0.557
ENC5	0.679	PR1	0.655	PCE3	0.518
ENC4	0.578	PR2	0.589	PCE5	0.568
ENC3	0.582	PR3	0.589	ENK6	0.571
GGP7	0.580	PR4	0.633	ENK5	0.589
GGP5	0.586	PR5	0.575	ENK4	0.567
GGP4	0.673	ENC2	0.575	ENK3	0.602
GGP1	0.763	ENC1	0.599	ENK2	0.565
OIP3	0.751	PPS1	0.808	ENK1	0.674

The correlation estimate for each pair of exogenous latent construct indicates that the exogenous latent constructs are not correlated since their correlation is not strong at below 0.85 (between −0.119 and 0.646).

Table 7: The standardised regression weight (Group number 1 – Defaut model)

Construct	*Path*	*Construct*	*Standardised beta estimate*
GGP	<---	PCE	0.199
GGP	<---	OIP	0.192
GGP	<---	ENC	0.091
GGP	<---	ENK	0.096
GGP	<---	PR	0.285
GGP	<---	PBI	0.169
GGP	<---	PPS	0.255

Table 6 presents the squared multiple correlations which are the variance of the constructs. It shows the ability of the predictor in explaining its variance. It is estimated that the predictors of GGP explain 77.1% of its variance or error variance. In other words, the error variance of GGP is approximately 22.9% of the variance of GGP itself.

Table 7 presents the standardised regression weight. It shows that GGP goes up by 0.199 standard deviations when PCE goes up by 1 standard deviation; GGP goes up by 0.192 standard deviations when OIP goes up by 1 standard deviation; GGP goes up by 0.91 standard deviations when ENC goes up by 1 standard deviation; GGP goes up by 0.96 standard deviations when ENK goes up by 1 standard deviation; GGP goes up by 0.285 standard deviations when PR goes up by 1 standard deviation; GGP goes up by 0.169 standard deviations when PBI goes up by 1 standard deviation and GGP goes up by 0.255 standard deviations when PCE goes up by 1 standard deviation.

The standardised regression weight shows that ENK, ENC, OIP, PR, PCE, PPS and PBI are positively correlated to GGP (ENK: b= 0.096; ENC: b = 0.091; OIP:b = 0.192; PR: b = 0.285; PCE: b = 0.199; PPS: b = 0.255 and PBI: b = 0.169). In other words, ENK, ENC, OIP, PR, PCE, PPS and PBI significantly contribute towards increasing GGP practices. The results also show that higher ENK, ENC, OIP, PR, PCE, PPS and PBI reflect a higher GGP adoption.

Table 8 presents the regression weights, Standard Error (S.E.), Critical Ratio (C.R.), and *P*-value for constructs that were used for results interpretation and decision concerning the hypothesised relationships. Estimate shows that PCE goes up by 1 unit when GGP goes up by 0.279 units; OIP goes up by 1 unit when GGP goes up by 0.251 units; ENC goes up by 1 unit when GGP goes up by 0.151 units; ENK goes up by 1 unit when GGP goes up by 0.134 units; PR goes up by 1 unit when GGP goes up by 0.394 units; PBI goes up by 1 unit when GGP goes up by 0.307 units and PPS goes up by 1 unit when GGP goes up by 0.394 units.

Regression equation for this study is demonstrated in the following:

$$GGP = \beta o + 2.139\ ENK + 2.071\ ENC + 3.597\ OIP + 3.788\ PR + 2.961\ PCE + 4.793\ PPS + 2.565\ PBI + e$$

The results show that the C.R. value for exogenous latent constructs ENK, ENC, OIP, PR, PCE, PCE and PBI is outside the range of ± 1.96 at the level of $p < 0.05$. This indicates that ENK, ENC, OIP, PR, PCE, PCE and PBI in the regression model can significantly predict the endogenous latent construct GGP (ENK = 2.139, $p < 0.05$; ENC = 2.071,$p <$ 0.05: OIP = 3597, $p < 0.0001$; PR = 3.788, $p < 0.0001$; PCE = 2.961, $p < 0.05$; PPS = 4793,

$p < 0.0001$; PBI = 2565, $p < 0.05$). This means ENK, ENC, OIP, PR, PCE, PCE and PBI are predictors of GGP practices. Since all the items are significant, it can be concluded that the convergent validity has been achieved (Awang, 2013). The p value for variance shows that the variance for all contructs is significantly different from zero at the 0.001 level (two-tailed test).

The results of this study are adequate to test the hypothesis. The hypothesis testing for the causal effect of exogenous latent constructs on endogenous latent construct in Table 9 shows that all the exogenous latent constructs in this study namely ENK, ENC, OIP, PR, PCE, PCE and PBI have a positive and significant effect on the endogenous latent construct that is GGP practices ($p < 0.05$) in Malaysia. OIP, PR and PPS are significant at $p < 0.001$, while ENK, ENC, PCE and PBI are significant at $p < 0.05$. Degree of importance of constructs based

Table 8: Regression weights (Group number 1- Default Model)

			Estimate	*S.E.*	*C.R.*	*P*
GGP	<---	PCE	0.279	0.094	2.961	0.003
GGP	<---	OIP	0.251	0.070	3.597	***
GGP	<---	ENC	0.151	0.073	2.071	0.038
GGP	<---	ENK	0.134	0.062	2.139	0.032
GGP	<---	PR	0.394	0.104	3.788	***
GGP	<---	PBI	0.307	0.120	2.565	0.010
GGP	<---	PPS	0.394	0.082	4.793	***
ENK1	<---	ENK	1.000	Reference point		
ENK2	<---	ENK	0.889	0.073	12.186	***
ENK3	<---	ENK	0.957	0.075	12.706	***
ENK4	<---	ENK	0.892	0.073	12.220	***
ENK5	<---	ENK	0.922	0.074	12.520	***
ENK6	<---	ENK	0.882	0.072	12.276	***
PCE5	<---	PCE	1.000	Reference point		
PCE3	<---	PCE	0.942	0.089	10.635	***
PCE2	<---	PCE	1.030	0.093	11.074	***
PCE1	<---	PCE	0.927	0.087	10.673	***
PPS6	<---	PPS	1.000	Reference point		
PPS5	<---	PPS	1.199	0.072	16.766	***
PPS4	<---	PPS	1.075	0.067	16.124	***
PPS3	<---	PPS	1.066	0.064	16.537	***
PPS2	<---	PPS	1.139	0.071	16.099	***
PPS1	<---	PPS	1.198	0.069	17.292	***
ENC1	<---	ENC	1.042	0.092	11.351	***
ENC2	<---	ENC	1.000	Reference point		
PR5	<---	PR	1.000	Reference point		
PR4	<---	PR	1.100	0.092	11.955	***

PR3	<---	PR	1.007	0.088	11.486	***
PR2	<---	PR	1.040	0.091	11.483	***
PR1	<---	PR	1.139	0.094	12.180	***
PBI5	<---	PBI	1.000	Reference point		
PBI4	<---	PBI	1.364	0.136	10.052	***
PBI3	<---	PBI	1.137	0.122	9.322	***
PBI2	<---	PBI	1.244	0.129	9.675	***
PBI1	<---	PBI	1.095	0.114	9.614	***
OIP1	<---	OIP	1.144	0.074	15.361	***
OIP2	<---	OIP	1.000	Reference point		
OIP3	<---	OIP	1.123	0.074	15.082	***
GGP1	<---	GGP	1.000	Reference point		
GGP4	<---	GGP	0.895	0.057	15.824	***
GGP5	<---	GGP	0.825	0.059	14.065	***
GGP7	<---	GGP	0.793	0.057	13.937	***
ENC3	<---	ENC	1.025	0.092	11.182	***
ENC4	<---	ENC	1.031	0.093	11.134	***
ENC5	<---	ENC	1.169	0.097	12.113	***
GGP2	<---	GGP	0.970	0.057	16.963	***
GGP3	<---	GGP	0.946	0.058	16.394	***
PCE4	<---	PCE	1.128	0.095	11.917	***
OIP4	<---	OIP	1.004	0.076	13.217	***
OIP5	<---	OIP	0.990	0.073	13.645	***
PCE6	<---	PCE	1.154	0.095	12.172	***

***indicate a highly significant at <0.001.

Table 9: Result of hypothesis testing

			Estimate	*S.E.*	*C.R.*	*P*	*Result*
GGP	<---	PCE	0.279	0.094	2.961	0.003	Significant at 0.05
GGP	<---	OIP	0.251	0.070	3.597	***	Significant at 0.001
GGP	<---	ENC	0.151	0.073	2.071	0.038	Significant at 0.05
GGP	<---	ENK	0.134	0.062	2.139	0.032	Significant at 0.05
GGP	<---	PR	0.394	0.104	3.788	***	Significant at 0.001
GGP	<---	PBI	0.307	0.120	2.565	0.010	Significant at 0.05
GGP	<---	PPS	0.394	0.082	4.793	***	Significant at 0.001

on standardised regression weights is PR ($b = 0.285$), PPS ($b = 0.255$), PCE ($b = 0.199$), OIP (0192), PBI ($b = 0.169$), ENK ($b = 0.096$) and ENC ($b = 0.091$). The results also show a positive correlation between ENK, ENC, OIP, PR, PCE, PCE and PBI with GGP practices.

DISCUSSION

This study has achieved its objectives and contributes significantly in assisting policy makers to formulate policies and strategies for implementing GGP in Malaysia. This study shows that the proposed model achieves the required level of validity, reliability and fitness with the values of Cronbach's alpha (α) ≥ 0.8; CR ≥ 0.6; AVE ≥ 0.5; Chi square (χ^2); CFI and TFI ≥ 0.90; RMSEA ≤ 0.08 and Chi Square/Degrees of Freedom (Chisq/df) ≤ 5. The results show that ENK; ENC; OIP; PR; PCE; PPS and PBI have a significant and positive impact on the practice of GGP. From the perspective of institutional theory, this study shows that normative, coercive and mimetic pressure influence the actions of an organisation.

The finding is consistent with the findings of Chan (1998), Chan and Lau (2000), Getzner and Grabner-Krauter (2004), Wahid et al. (2011), Schiffman and Kanuk (2010), Haron et al. (2005) and Vining and Ebreo (1990) who found that ENK correlated positively with behaviour. The same effects were reported by Minton and Rose (1997) and Wahid et al. (2011) for ENC; Bjorklund (2011), Eltayeb et al. (2010), Carter and Carter (1998), Carter et al. (1998) and Carter and Jennings (2000) for OIP; Eltayeb et al. (2010), Forman and Jorgensen (2004), Min and Galle (2001) and Preuss (2001) for PR as well as perceived cost effectiveness and benefits of the business; Salam (2008a,b) for percieved availability of products and suppliers; and Wahid et al. (2011), Nik Abdul Rashid (2009), Thorgersen (2002) and Teisl et al. (2002) for PBI. Hines et al. (1987) reported that ENK is the most important predictor in determining an action related to the environment while Dispoto (1977), Diekmann and Preisendorfer (2003), Hines et al. (1987), Kaiser et al. (1999), Kaufmann et al. (2011), Laroche et al. (2001) and Park et al. (1994) found the significant impact of ENK on actions related to the environment. Study by Chan (1996) shows that ENC can be a predictor of green purchasing behaviour. The study by Antil (1984), Barr et al. (2005), Kim and Choi (2005), Lee (2008), Mayer et al. (2012), Milfont et al. (2006), Minton and Rose (1997), Wahid et al. (2011), Roberts and Bacon (1997) and Van Liere and Dunlap (1980) also found that ENC has a significant impact on green purchase behaviour.

In terms of incentives and organisational pressures, this study supports the finding of Eltayeb et al. (2010) who found that consumer pressure on organisations affects the implementation of green purchasing among EMS certified companies in Malaysia. Studies in the field of green purchasing, green supply chain management and purchasing social responsibility conducted by Bjorklund (2011), Carter and Carter (1998), Carter et al. (1998), Carter and Jennings (2000), Hall (2000), Hervani et al. (2005), Preuss (2001), Sarkis (1998), and Zhu and Sarkis (2006) also reported a similar result. In terms of PR, Eltayeb et al. (2010), Min and Galle (2001) and Preuss (2001) found that PR affect green procurement practices. In terms of perceived cost efficiency and business benefits, the finding of this study is in line with the results of Blumberg (1999), Eltayeb et al. (2010), Forman and Jorgensen (2004), Min and Galle (2001), Preuss (2001) and Ravi et al. (2005), which shows that expected business benefits have a significant impact on green procurement.

For perceived products and suppliers availability, the findings are consistent with the findings of Salam (2008a,b) in which he reported that the availability of sustainable products affects the implementation of green purchasing. This study also shows the importance of implementation tools and competency to assist procurers to implement the GGP.

CONCLUSION

This study is important in examining factors influencing GGP in the context of Malaysia, as the factors that influence the GGP practices in one country might be different in another due to differences in demography, culture and socio-economy. At the government level, the findings of this study would assist the government in formulating strategies towards the implementation of GGP in a more systematic and effective manner. At the suppliers' level, the findings would help suppliers to make adaptations in fulfilling the government's requirements. It is expected that the implementation of GGP in Malaysia would benefit the economic, social, and environmental aspects and thus, improve its people's quality of life.

REFERENCES

Adham, K.N. and Siwar, C. (2011) 'Perolehan produk hijau di sektor awam Malaysia: hala tuju, inisiatif dan prospek', *Jurnal Pengurusan Awam*, Vol. 8, No. 1, pp.61–90 (in Malay).

Adham, K.N. and Siwar, C. (2012) 'Transformation of government procurement in Malaysia: direction and initiatives', *Proceeding of the 5th International Public Procurement Conference 2012 (IPPC 2012)*, 17–19 August 2012, Sheraton Seattle Hotel, USA, Part VII Reforms and Transformation of Governance, 1620–1641, Available at: http://woppaa.org/wp-content/uploads/2012/09/PAPER-VII.1-TRANSFORMATION-OF-GOVERNMENT-PROCUREMENT-IN-MALAYSIA.pdf, Accessed on 12 September 2012.

Aerts, W., Cormier, D. and Magnan, M. (2006) 'Intra-industry imitation in corporate environmental reporting: an international perspective', *Journal of Accounting and Public Policy*, Vol. 25, No. 3, pp.1299–1331.

Anbumozhi, V. and Kanda, Y. (2005) 'Greening the production and supply chains in Asia: is there a role for voluntarily initiatives?' *IGES Kansai Research Center Discussion Paper*, KRC-2005, No. 6E.

Antil, J.A. (1984) 'Socially responsible consumers: profile and implications for public policy', *Journal of Macromarketing*, pp.18–39.

Arbuckle, J. and Wothke, W. (1999) *AMOS 4 User's Reference Guide*, Chicago: Smallwaters Corporation.

Arbuckle, J.L. (2007) *AMOS16.0 User's Guide*, Chicago, IL: SPSS Inc.

Awang, Z. (2013) *Structural Equation Modeling using AMOS Graphic*, 2nd Edition, Shah Alam: Universiti Teknologi MARA Publication Centre, UiTM Press.

Bansal, P. and Roth, K. (2000) 'Why companies go green: a model of ecological responsiveness', *Academy of Management Journal*, Vol. 43, No. 4, pp.717–736.

Barr, S., Gilg, A. and Ford, N. (2005) 'Defining the multi-dimensional aspects of household waste management: A study of reported behavior in Devon', *Resources, Conservation and Recycling*, Vol. 45, pp.172–192.

Bartlett, J.E., Kotrlik, J.W. and Higgins, C.C. (2001) 'Organizational research: determining appropriate sample size in survey research', *Information Technology, Learning, and Performance Journal*, Vol. 19, No. 1, pp.43–50.

Bentler, P.M. (1990) 'Comparative fit indexes in structural models', *Psychological Bulletin*, Vol. 107, No. 238–246.

Bentler, P.M. and Bonett, D.G. (1980) 'Significance tests and goodness of fit in the analysis of covariance structures', *Psychological Bulletin*, Vol. 88, pp.588–606.

Bjorklund, M. (2011) 'Influence from the business environment on environmental purchasing - Drivers and hinders of purchasing green transportation services', *Journal of Purchasing and Supply Management*, Vol. 17, pp.11–22.

Blumberg, D.F. (1999) 'Strategic examination of reverse logistics and repair service requirements, needs, market size, and opportunities', *Journal of Business Logistics*, Vol. 20, No. 2, pp.141–159.

Bouwer, M., de Jong, K., Jonk, M., Berman, T., Bersani, R., Lusser, H., Nissinen, A., Parikka, K. and Szuppinger, P. (2005) *Green Public Procurement in Europe 2005 - Status Overview*, The Netherlands: Virage Milieu and Management by, Korte Spaarne 31, 2011 AJ Haarlem, Available at: http://www.ec.europa.eu/environment/gpp/pdf/ report_facts. pdf, Accessed on 7 February 2011.

Brammer, S. and Walker, H. (2011) 'Sustainable procurement in the public sector: An international comparative study', *International Journal of Operations and Production Management*, Vol. 31, No. 4, pp.452–476.

Browne, M.W. and Cudeck, R. (1993) 'Alternative ways of assessing model fit', in K.A. Bollen and J.S. Long (Eds.). *Testing Structural Equation Models*, Beverly Hills, CA: Sage.

Byrne, B.M. (2010) *Structural Equation Modelling with AMOS: Basic Concepts, Applications, and Programming*, 2nd Edition, New York: Taylor and Francis Group.

Cannon, J.P. and Homburg, C. (2001) 'Buyers–supplier relationships and customer firm costs', *Journal of Marketing*, Vol. 65, No. 1, pp.29–43.

Carter, C. (2005) 'Purchasing social responsibility and firm performance: the key mediating roles of organizational learning and supplier performance', *International Journal of Physical Distribution and Logistics Management*, Vol. 35, No. 3, pp.177–194.

Carter, C.R. (2004) 'Purchasing and social responsibility: a replication and extension', *The Journal of Supply Chain Management*, pp.4–16.

Carter, C.R. and Carter, J.R. (1998) 'Interorganizational determinants of environmental purchasing: Initial evidence from the consumer products industries', *Decision Sciences*, Vol. 29, No. 3, pp.659–684.

Carter, C.R. and Jennings, M.M. (2000) *Purchasing's Contribution to the Socially Responsible Management of the Supply Chain*, USA: Center for Advanced Purchasing Studies.

Carter, C.R., Ellram, L.M. and Ready, K.J. (1998) 'Environmental purchasing: benchmarking our German counterparts', *International Journal of Purchasing and Materials Management*, Vol. 34, No. 4, pp.28–38.

Carter, C.R., Kale, R. and Grimm, C.M. (2000) 'Environmental purchasing and firm performance: an empirical investigation', *Transportation Research*, Vol. 36, No. 3, pp.219–228.

Chan, K. (1998) 'Mass communication and pro-environmental behaviour: waste recycling in Hong Kong', *Journal of Environmental Management*, Vol. 52, pp.317–325.

Chan, R.Y.K. (2001) 'Determinants of Chinese consumers' green purchase behavior', *Psychology and Marketing*, Vol. 18, No. 4, pp.389–413.

Chan, R.Y.K. and Lau, L.B.Y. (2000) 'Antecedents of green purchases: a survey in china', *Journal of Consumer Marketing*, Vol. 17, No. 4, pp.338–413.

Chan, T.S. (1996) 'Concerns for environmental issues and consumer purchase preferences: a two-country study', *Journal of International Consumer Marketing*, Vol. 9, No. 1, pp.43–55.

Chase, D. and Smith, T.K. (1992) 'Consumers keen on green but marketers don't deliver', *Advertising Age*, Vol. 63, pp.2–4.

Chen, C.C. (2005) 'Incorporating green purchasing into the frame of ISO 14000', *Journal of Cleaner Production*, Vol. 13, pp.927–933.

Chien, M.K. and Shih, L.H. (2007) 'An empirical study of the implementation of green supply chain management practices in the electrical and electronic industry and their relation to organizational performances', *International Journal Environment Science Technology*, Vol. 4, No. 3, pp.383–394.

Chua, Y.P. (2009) *Kaedah dan Statistik Penyelidikan: Statistik Penyelidikan Lanjutan*, Kuala Lumpur: McGraw Hill. (in Malay).

Clark, G. (2007) 'Evolution of the global sustainable consumption and production policy and the United Nations Environment programme's (UNEP) supporting activities', *Journal of Cleaner Production*, Vol. 15, pp.492–298.

Clemens, B. and Douglas, T.J. (2006) 'Does coercion drive firms to adopt 'voluntary' green initiatives? Relationships among coercion, superior firm resources, and voluntary green initiatives', *Journal of Business Research*, Vol. 59, No. 4, pp.483–491.

Cochran, W.G. (1977) *Sampling Techniques*, 3rd Edition, New York: John Wiley & Sons.

Cooper, R., Frank, G. and Kemp, R. (2000) 'A multinational comparison of key ethical issues, helps and challenges in the purchasing and supply management profession: the key implications for business and the professions', *Journal of Business Ethics*, Vol. 23, No. 1, pp.83–100.

Daft, R.L. (1995) *Organization Theory and Design*, 5th Edition, New York: West Publishing Company.
Diekmann, A. and Preisendorfer, P. (2003) 'Green and greenback. The behavioural effects of environmental attitudes in low-cost and high-cost situations', *Rationality and Society*, Vol. 15, No. 4, pp.441–472.
DiMaggio, P.J. and Powell, W.W. (1983) 'The iron cage revisited: institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, Vol. 48, No. 2, pp.147–160.
Dispoto, R.G. (1977) 'Interrelationships among measures of environmental activity, emotionality and knowledge', *Educational and Psychological Measurement*, Vol. 37, pp.451–459.
Doonan, J., Lanoie, P. and Laplante, B. (2005) 'Analysis determinants of environmental performance in the Canadian pulp and paper industry: an assessment from inside the industry', *Ecology Economics*, Vol. 55, pp.73–84.
Eltayeb, T.K., Suhaiza, Z. and Jayaraman, K. (2010) 'The examination on the drivers for green purchasing adoption among EMS14001 certified companies in Malaysia', *Journal of Manufacturing Technology Management*, Vol. 21, No. 2, pp.206–225.
European Union (EU) (2011) *Buying Green! A Handbook on Environmental Public Procurement*, 2nd Edition, Luxembourg: Publications Office of the European Union.
Faith-Ell, C., Balfors, B. and Folkeson, L. (2006) 'The application of environmental requirements in Swedish road maintenance contracts', *Journal of Cleaner Production*, Vol. 14, pp.163–171.
Forman, M. and Jorgensen, M.S. (2004) 'Organising environmental supply chain management – Experience from a sector with frequent product shifts and complex product chains: the case of the Danish textile sector', *Greener Management International*, Vol. 45, pp.43–62.
Fryxall, G. and Lo, C. (2003) 'The influence on environmental knowledge and values on managerial behaviours on behalf of the environment: An empirical examination of managers in China', *Journal of Business Ethics*, Vol. 46, pp.45–59.
Gelderman, C.J., Ghijsen, P.W. and Brugman, M.J. (2006) 'Public procurement and EU tendering directives – explaining non-compliance', *International Journal of Public Sector Management*, Vol. 19, No. 7, pp.702–714.
Geng, Y. and Doberstein, B. (2008) 'Greening government procurement in developing countries: building capacity in China', *Journal of Environmental Management*, Vol. 88, pp.932–938.
Getzner, M. and Grabner-Krauter, S. (2004) 'Consumer preferences and marketing strategies for green shares. Specifics of the Austrian market', *International Journal of Bank Marketing*, Vol. 4, pp.260–278.
Gonzalez-Padron, T., Hult, G. and Calantone, R. (2008) 'Exploiting innovative opportunities in global purchasing: An assessment of ethical climate and relationship performance', *Industrial Marketing Management*, Vol. 37, pp.69–82.
Greenwood, M. (2001) 'The importance of stakeholders according to business leaders', *Business and Society Review*, Vol. 106, No. 1, pp.29–49.
Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (2006) *Multivariate Data Analysis*, 6th Edition, NJ: Prentice-Hall, Upper Saddle River.
Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010) *Multivariate Data Analysis*, 7th Edition, Upper Saddle River, NJ: Prentice Hall.
Hall, J. (2000) 'Environmental supply chain dynamics', *Journal of Cleaner Production*, Vol. 8, pp.455–471.
Handfield, R.B., Walton, S.V., Seegers, L.K. and Melnyk, S.A. (1997) 'Green chain practices in the furniture industry', *Journal of Operations Management*, Vol. 15, No. 4, pp.293–315.
Haron, S.A., Paim, L. and Yahya, N. (2005) 'Towards sustainable consumption: an examination of environmental knowledge among Malaysians', *International Journal of Consumer Studies*, Vol. 29, No. 5, pp.426–436.
Henriques, I. and Sadorsky, P. (1996) 'The determinants of an environmentally responsive firm: An empirical approach', *Journal of Environmental Economics and Management*, Vol. 30, No. 3, pp.381–395.
Hervani, A.A., Helms, M.M. and Sarkis, J. (2005) 'Performance measurement for green supply chain management', *Benchmarking: An International Journal*, Vol. 12, No. 4, pp.330–353.
Hines, J., Hungerford, H. and Tomera, A. (1987) 'Analysis and syntheses of research on environmental behavior: A meta-analysis', *Journal of Environmental Education*, Vol. 18, No. 2, pp.1–8.
Hirsch, P.M. (1975) 'Organizational effectiveness and the institutional environment', *Administrative Science Quarterly*, Vol. 20, No. 3, pp.327–344.

Ho, L.W.P., Dickinson, N.M. and Chan, G.Y.S. (2010) 'Green procurement in the Asian public sector and the Hong Kong private sector', *Natural Resources Forum*, Vol. 34, pp.24–38.

Hui, I.K., Chan, A.H.S. and Pun, K.F. (2001) 'A study of the environmental management system implementation practices', *Journal of Cleaner Production*, Vol. 9, pp.269–276.

International Green Purchasing Network (IGPN) (2010) *Green Purchasing: The New Growth Frontier - Policies and Programmes to Enhance Green Business Growth in Asia, Europe and the United States*, Japan: International Green Purchasing Network (IGPN).

Joreskog, K. and Sorbom, D. (1989) *LISREL 7: A Guide to the Program and Applications*, 2nd Edition, Chicago: Statistical Package for the Social Sciences.

Kaiser, G.K., Wolfing, S. and Fuhrer, U. (1999) 'Environmental attitude and ecological behavior', *Journal of Environmental Psychology,* Vol. 19, No. 1, pp.1–19.

Kaplan, S. (1991) 'Beyond rationality: clarity-based decision making', Dlm. T. Garling and G. Evans (pnyt.) (Eds.). *Environment, Cognition and Action*, New York: Oxford University Press, hlm., pp.171–190.

Kaufmann, H.R., Panni, M.F. and Orphanidou, Y. (2012) 'Factors affecting consumers green purchasing behavior: an integrated conceptual framework', *Amfiteatru Economic*, Vol. 14, No. 31, pp.51–69.

Kementerian Tenaga, Teknologi Hijau dan Air Malaysia (KeTTHA) (2010) *Dasar Teknologi Hijau Negara*, Putrajaya: Kementerian Tenaga, Teknologi Hijau dan Air Malaysia (in Malay).

Kim, Y. and Choi, S.M. (2005) 'Antecedents of green purchase behavior: An examination of collectivism, environmental concern and PC', *Advances in Consumer Research*, Vol. 32, pp.592–599.

Kline, R.B. (1998) *Principles and Practice of Structural Equation Modeling*, New York: The Guilford Press.

Kumar, B. (2012) *Theory of Planned Behaviour Approach to understand the Purchasing Behaviour for Environmentally Sustainable Products*, Paper W.P. No. 2012-12-08, Indian Institute Of Management Ahmedabad, India, December 2012.

Lambert, D.M. and Cooper, M.C. (2000) 'Issues in supply chain management', *Independent Marketing Management*, Vol. 29, pp.65–83.

Laroche, M., Bergeron, J. and Barbaro-Forleo, G. (2001) 'Targeting consumer who are willing to pay more for environmentally friendly products', *Journal of Consumer Marketing*, Vol. 18, No. 6, pp.503–520.

Lee, K. (2008) 'Opportunities for green marketing: young consumers', *Marketing Intelligence and Planning*, Vol. 26, No. 6, pp.573–586.

Lin, C.Y. (2007) 'Adoption of green supply chain practices in Taiwan's logistics industry', *Journal of International Management Studies*, Vol. 2, No. 2, pp.90–98.

Madu, C.N., Kuei, C. and Madu, I.E. (2002) 'A hierarchic metric approach for integration of green issues in manufacturing: a paper recycling application', *Journal of Environmental Management,* Vol. 64, pp.261–272.

Maignan, I., Hillebrand, B. and McAlister, D. (2002) 'Managing socially-responsible buying: how to integrate noneconomic criteria into the purchasing process', *European Management Journal*, Vol. 20, No. 6, pp.641–648.

Mainieri, T., Barnett, E.G., Unipan, T.R. and Oskamp, S. (1997) 'Green buying: the influence of environmental eoncern on consumer behavior', *Journal of Social Psychology*, Vol. 137, No. 2, pp.189–204.

Maloney, M.P. and Ward, M.P. (1973) 'Ecology: Let's hear from the people: an objective scale for the measurement of ecological attitudes and knowledge', *American Psychologist*, pp.583–586.

Malhotra, N.K. (2004) *Marketing Research: An Applied Orientation,* 4th Edition, New Jersey: Prenticall-Hall.

Marsh, H.W. and Hocevar, D. (1983) 'Confirmatory factor analysis of multitrait-multimethod matrices', *Journal of Educational Measurement*, Vol. 20, pp.231–248.

Martinsons, M.G., Leung, A.L.K. and Loh, C. (1996) 'Technology transfer for sustainable development: environmentalism and entrepreneurship in Hong Kong', *International Journal of Social Economics*, Vol. 23, No. 9, pp.69–96.

Mayer, R., Ryley T. and Gillingwater, D. (2012) 'Passenger perceptions of the green image associated with airlines', *Journal of Transport Geography*, Vol. 22, pp.179–186.

McCrudden, C. (2004) 'Using public procurement to achieve social outcomes', *Natural Resources Forum*, Vol. 28, No. 4, pp.257–267.

Meyer, J., Scott, W. and Strange, D. (1987) 'Centralization, fragmentation, and school district complexity', *Administrative Science Quarterly*, Vol. 32, pp.186–201.

Michelsen, O. and de Boer, L. (2009) 'Green procurement in Norway; a survey of practices at the municipal and county level', *Journal of Environmental Management*, Vol. 91, pp.160–167.

Milfont, T.L., Duckitt, J. and Cameron, L.D. (2006) 'A cross-cultural study of environmental motives concerns and their implications for pro-environmental behaviour', *Environment and Behavior*, Vol. 38, No. 6, pp.745–767.

Min, H. and Galle, W.P. (2001) 'Green purchasing practices of US firms', *International Journal of Operations and Production Management*, Vol. 21, No. 9, pp.1222–1238.

Minton, A.P. and Rose, R.L. (1997) 'The effects of environmental concern on environmentally friendly consumer behavior', *Journal of Business Research*, Vol. 40, pp.37–48.

New, S., Green, K. and Morton, B. (2002) 'An analysis of private versus public sector responses to environmental challenges of the supply chain', *Journal of Public Procurement*, Vol. 2, pp.93–105.

Nik Abdul Rashid, N.R. (2009) 'Awareness of eco-label in Malaysia's green marketing initiative', *International Journal of Business and Management*, Vol. 4, No. 8, pp.132–141.

Nunnally, J.C. (1978) *Psychometric Theory*, 2nd Edition, New York: McGraw-Hill.

O'Brien, C. (1999) 'Sustainable production – A new paradigm for a new millennium', *International Journal of Production Economics*, Vol. 60, No. 61, pp.1–7.

Oliver, C. (1991) 'The antecedents of deinstitutionalization', *Organization Studies*, Vol. 13, No. 4, pp.563–588.

Oskamp, S., Harrington, M.M., Edwards, T.C., Sherwood, D.L., Okuda, S.M. and Swanson, D.C. (1991) 'Factors influencing household recycling behaviour', *Environment and Behavior*, Vol. 23, pp.494–519.

Parikka-Alhola, K. (2008) 'Promoting environmentally sound furniture by green public procurement', *Ecological Economics*, Vol. 68, pp.472–485.

Park, C.W., Mothersbaugh, D.L. and Feick, L. (1994) 'Consumer knowledge assessment', *Journal of Consumer Research*, Vol. 21, pp.71–82.

Peng, Y.S. and Lin, S.S. (2008) 'Local responsiveness pressure, subsidiary resources, green management adoption and subsidiary's performance: evidence from Taiwanese manufactures', *Journal of Business Ethics*, Vol. 79, No. 1, pp.199–212.

Preuss, L. (2001) 'In dirty chains? Purchasing and greener manufacturing', *Journal of Business Ethics*, Vol. 34, No. 3, pp.345–359.

Preuss, L. (2009) 'Addressing sustainable development through public procurement: the case of local government', *Supply Chain Management: An International Journal*, Vol. 14, No. 3, pp.213–223.

Rahbar, E. and Wahid, N.A. (2011) 'Investigation of green marketing tools' effect on consumers' purchase behaviour', *Business Strategy Series*, Vol. 12, No. 2, pp.73–83.

Rao, P. and Holt, D. (2005) 'Do green supply chains lead to competitiveness and economic performance?' *International Journal of Operation Production Management*, Vol. 25, pp.898–916.

Ravi, V., Shankar, R. and Tiwari, M.K. (2005) 'Productivity improvement of a computer hardware supply chain', *International Journal of Productivity and Performance Management*, Vol. 54, No. 4, pp.239–255.

Roberts, J.A. and Bacon, D.R. (1997) 'Ecologically conscious consumer buying', *Journal of Business Research*, Vol. 40, pp.79–89.

Sabri, M.F. and Teoh, Y.Y. (2006) 'Tahap keprihatinan alam sekitar dan amalan kepenggunaan hijau pengguna di Petaling Jaya, Selangor', *Pertanika Journal of Social Science and Humanities*, Vol. 14, No. 2, pp.95–109 (in Malay).

Said, A.M., Ahmadun, F.R., Paim, L.H. and Masud, J. (2003) 'Environmental concerns, knowledge and practices gap among Malaysian teachers', *International Journal of Sustainability Higher Education*, Vol. 4, pp.305–313.

Salam, M.A. (2008a) 'An empirical investigation of the determinants of adoption of green procurement for successful green supply chain management', *Proceedings of the 2008 IEEE ICMT hlm.*, pp.1038–1043.

Salam, M.A. (2008b) 'Green procurement adoption in manufacturing supply chain',. *Proceedings of the 9th Asia Pasific Industrial Engineering and Management Systems Conference (APIEMS 2008), hlm.*, pp.1253–1260.

Sarkar, A. and Mohapatra, P.K.J. (2006) 'Evaluation of supplier capability and performance: A method for supply base reduction', *Journal of Purchasing Supply Management*, Vol. 12, pp.148–163.

Sarkis, J. (1998) 'Theory and methodology evaluating environmentally conscious business practices', *European Journal of Operational Research*, Vol. 107, pp.159–174.

Sarkis, J. and Tamarkin, M. (2005) 'Real options analysis for green trading: the case of greenhouse gases', *Engineering Economics*, Vol. 50, pp.273–294.

Sarkis, J., Zhu, Q. and Lai, K.H. (2010) *An organizational theorethic review of green supply chain management literature. Paper No. 2011-11*, George Perkins Marsh Institute, Clark University, 20 August.

Schiffman, L. and Kanuk, L. (2010) *Consumer Behavior*, 10th Edition, Upper Saddle River, NJ: Prentice-Hall.

Schlegelmilch, B.B., Bohlen, G.M. and Diamantopoulos, A. (1996) 'The link between green purchasing decisions and measures of environmental consciousness', *European Journal of Marketing*, Vol. 30, No. 5, pp.35–55.

Schumacker, R.E. and Lomax, R.G. (2004) A *Beginner's Guide to Structural Equation Modeling*, 2nd Edition, Mahwah, NJ: Lawrence Erlbaum

Scott, W.R. (1992) *Organizations: Rational, Natural and Open Systems*, Englewood Cliffs NJ: Prentice Hall.

Sheth, J.N. and Sharma, A. (1997) 'Supplier relationships', *Industrial Marketing Management*, Vol. 26, pp.91–100.

Sidique, S.F., Lupi, F. and Joshi, S.V. (2010) 'The effects of behavior and attitudes on drop-off recycling activities', *Resources, Conservation and Recycling*, Vol. 54, pp.163–170.

Sinnappan, P. and Abdul R.A. (2011) 'Antecedents of green purchasing behaviour among Malaysian consumers', *International Business Management*, Vol. 5, No. 3, pp.129–139.

Snell, P. (2006) 'Struggle with sustainability', *Supply Management*, 16 November.

Sparks, P. and Shepherd, R. (1992) 'Self-Identity and the theory of planned behavior: Assesing the role of identification with Green Consumerism', *Social Psychology Quarterly*, Vol. 55, No. 4, pp.388–399.

Teisl, M.F., Roe, B. and Hicks, R.L. (2002) 'Can eco-labels tune a market? Evidence from Dolphin Safe Labeling', *Journal of Environmental Economics and Management*, Vol. 43, pp.339–359.

Thomson, J. and Jackson, T. (2007) 'Sustainable procurement in practice: lessons from local government', *Journal of Environmental Planning and Management*, Vol. 50, No. 3, pp.421–444.

Thorgersen, J. (2002) 'Promoting Green Consumer Behavior with Eco-Labels', in Dietz and Stern (Eds.). *New Tools for Environmental Protection: Education, Information and Voluntary Measures* Washington, DC: National Academy Press.

Trepte, P. (2004) *Regulating Procurement: Understanding the ends and means of Public Procurement Regulation*, Oxford: Oxford University Press.

Tsen, C.H., Phang, G., Hasan, H. and Buncha, M.R. (2006) 'Going green: A study of consumers willingness to pay for green products in Kota Kinabalu', *International Journal of Bussines Society*, Vol. 7, pp.40–54.

United Nations Development Programme (UNDP) (2008) *Environmental Procurement*, UNDP Procurement Support Office, Available at: http://www.undp.org/procurement.

Van Liere, K.D. and Dunlap, R.E. (1980) 'The social bases of environmental concern: A review of hypotheses, explanations, and empirical evidence', *Public Opinion Quarterly*, Vol. 44, pp.181–197.

Vazifehdousta, H., Taleghanib, M., Esmaeilpourc, F., Nazaric, K. and Khadangd, M. (2013) 'Purchasing green to become greener: Factors influence consumers' green purchasing behaviour', *Management Science Letters*, Vol. 3, pp.2489–2500.

Verdugo, C.V. (1996) 'A structural model of reuse and recycling in Mexico', *Environment and Behavior*, Vol. 28, pp.664–696.

Vining, J. and Ebreo, A. (1990) 'What makes a recycler? A comparison of recyclers and non-recyclers', *Environment and Behavior*, pp.55–73.

Walker, H. and Brammer, S. (2009) 'Sustainable procurement in the United Kingdom public sector', *Supply Chain Management: An International Journal*, Vol. 14, No. 2, pp.128–137.

Wheaton, B., Muthen, B., Alwin, D.F. and Summer, G.F. (1977) 'Assessing reliability and stability in panel models', in D.R. Heise (Ed.). *Sociological Methodology*, San Francisco: Jossy-Bass.

Yang, W. and Zhang, Y. (2012) 'Research on factors of green purchasing practices of Chinese', *Journal of Business Management and Economics*, Vol. 3, No. 5, pp.222–231.

Yeung, S.P.M. (2004) 'Teaching approaches in Geography and students environmental attitudes', *Environmentalist*, Vol. 24, pp.101–117.

Yoon, J.S. (2002) 'Teacher characteristics as predictors of teacher-student relationship: Stress, negative affect, and self-efficacy', *Social Behavior and Personality*, Vol. 30, pp.485–494.

Zhu, Q. and Sarkis, J. (2006) 'An inter-sectoral comparison of green supply chain management in China: drivers and practices', *Journal of Cleaner Production*, Vol. 14, No. 5, pp.472–486.

Zsidisin, G.A. and Hendrick, T.E. (1998) 'Purchasing's involvement in environmental issues: a multi-country perspective', *Industrial Management and Data Systems*, Vol. 98, No. 7, pp.313–320.

Zsidisin, G.A. and Siferd, S.P. (2001) 'Environmental purchasing: a framework for theory development', *European Journal of Purchasing and Supply Management*, Vol. 7, No. 1.

BIOGRAPHICAL NOTES

Khairul Naim Adham is the Head of Unit (Strategic Planning), National Biodiversity Centre Core Team at the Ministry of Natural Resources and Environment, Malaysia (NRE). He is also a National Expert for the Sustainable Consumption and Production (SCP) Policy Support for Malaysia project (Economic Planning Unit in collaboration with European Union) and Expert Panel for National Occupational Skills Standard (NOSS) Green Technology Compliance, Department of Skill Development and Ministry of Human Resource. He holds a PhD in Environment and Development, Master of Science (Science and Technology Policy Studies), Bachelor of Horticultural Science and Post-graduate Diploma in Public Management.

Chamhuri Siwar is a Professor Emeritus and Principal Research Fellow at the Institute for Environment and Development (LESTARI), National University of Malaysia (UKM). He holds a Bachelor of Economics from the UKM, Master of Agriculture Economics from the University of Leeds, UK and Master of Agriculture and Resources Economics from Iowa State University, USA. His teaching and research interests are in business management, environmental economics, agricultural economics and environmental management.