

THE EXTENT OF GREEN PRACTICES AND THEIR INFLUENCE ON GREEN MANAGEMENT CONTROL SYSTEM

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Abstract—Environmental crises have major negative impacts on environment, social and economy in many countries in the world. The concerns on environmental issues have led people and organizations to adopt sustainability practices specifically green practices. A question arises on the role of Accounting in relating business behaviour towards green practices through its governing, monitoring and regulating mechanisms. Many studies have analysed the green practices and their reporting but very few studies been carried out on how green management control system (GMCS) influenced by the green practices. This paper identifies the extent of green practices and their influence on GMCS in public listed companies in Malaysia. With the study sample of 120 companies, findings show that the green practices are moderate and the GMCS are close to moderate in practice. Green practices have significantly influenced GMCS. This indicates that the public listed companies in Malaysia do involve their management control system in engaging with green issues to establish their concern on the matters.

Index Terms— Sustainability, Green Practices, Green Management Control System.

I. INTRODUCTION

Environmental crises such as air and water pollution, resource scarcity, loss of biodiversity and global warming have major negative impacts on social, environment and economy in many countries in the world. The concerns on environmental issues have led to call for sustainability practices. Environmental demand is one of the “Three pillars” of sustainability which the other two is economic demand and social demand (World Summit United Nations General Assembly, 2005). Environmental demand refers to green practice which means carrying out our activities in ways that do not harm the living creatures and do not deplete our environment, but rather enrich it. The green issues lead to serious questions on the role of people and organizations in society. The link between the behaviour towards green practices and economy, environment and social development may lead to the recognition of the role of Accounting and how it can be integrated into governing, monitoring and regulating business activities (Gray, Bebbington, Collison, Kouhy, Lyon, Reid, 1998; Sumiani, Haslinda, & Lehman, 2007).

Earlier studies indicate that many organizations embrace the environmental concerns by merely reporting their environmental-related activities in their annual reports just to improve corporate image. The actual corporate environmental initiatives relating to corporations’ operations are found to be very minimal (e.g. Gray, 2010; Milne, Kearins & Walton, 2006; Banerjee, 2008; Gond, Palazzo & Basu, 2009; Cho & Patten, 2007; Sumiani, Haslinda & Lehman, 2006; Romlah & Sharifah, 2004; Buniamin, Alrazi & Johari, 2008; ACCA, 2002). Hence, the genuine

practice of green and how it is managed and monitored in organization is questionable. According to the sustainability principles, companies need to integrate social and environmental concerns into their business operations (Commission of the European Communities, 2001, p. 6).

This paper identifies the extent of green practices and their influence on green management control system (GMCS) in public listed companies in Malaysia. With the study sample of 120 companies, findings show that the green practices are moderate and the GMCS are close to moderate in practice. Green practices have significantly influenced GMCS. This indicates that the public listed companies in Malaysia do involve their management control system in engaging with green issues to establish their concern on the matters.

II. LITERATURE REVIEW

A. Adoption of Green Initiatives

Previous studies explain that among the green initiatives adopted are ISO 14001 (Delmas, 2002; Majumdar & Marcus, 2001); green supply chain management includes reducing packaging and waste, assessing vendors on their environmental performance, developing more eco-friendly products and reducing carbon emissions associated with transport of goods (Zhu, Sarkis & Lai, 2013; Walker, Sisto & McBrain, 2008); green logistics practices of truck fleets (Zhang, Thompson, Bao & Jiang, 2014); corporate environmental management (Liu, Liu, Shishime, Yu, Bi & Fujitsuka, 2010); eco-control (Henri & Journeault, 2010); environmental management accounting (EMA) (Jalaludin, Sulaiman &

Ahmad, 2010); energy saving (U.S. EPA, 2006; Maarten, 2008); environmental strategies at the strategic level and within the marketing functional area (Chan, 2010); and environmental attitude (Magrini&Lins, 2007). These show that the adoptions of green initiatives are at the physical practices and at management control system. However, the current study claims that organizations manage their green initiatives at the management control system once they adopt physical green initiatives.

B. Management Control System (MCS)

Taking a broader concept of MCS in the framework by Malmi and Brown (2008), that is based on extensive literature review of the works of Chenhall (2003), Flamholtz,Das & Tsui(1985), Langfield-Smith (1997), Otley (1980), and Simons (1995),amongst others, MCS is defined to include all the devices and systems managers use to ensure that the behaviours and decisions of their employees are consistent with the organisation's objectives and strategies. The term 'package' is employed because in most contemporary organisations there are a number of MCSSs. MCS ensures that overall strategic planning and operative follow-up will work together (IVA, 1995, p. 64.; cf. Nilsson, 1997). Figure 1 shows the MCS package.

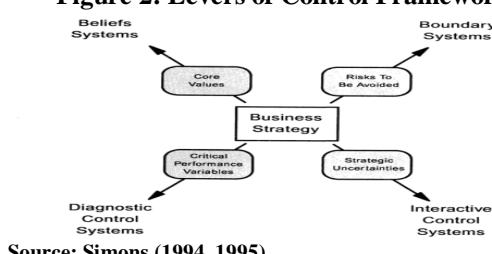
Cultural Controls						
Clans		Values			Symbols	
Planning		Cybernetic Controls				
Long range planning	Action planning	Budgets	Financial Measurement Systems	Non Financial Measurement Systems	Hybrid Measurement Systems	Reward and Compensation
Administrative Controls						
Governance Structure		Organisation Structure			Policies and Procedures	

Source: Malmi& Brown (2008)

C. Levers of Control (LOC)

To reach an understanding of the role of MCS in managing green issuesis by investigating its ways of exercising control according to their relationship to strategy and use by top managers. Simons' (1995) LOC framework is one of the most cited frameworks for understanding LOC. Simons (1995)describes four ways of exercising control which are through belief system, boundary system, diagnostic system and interactive system and simultaneously promoting innovation by management to maintain or alter patterns in organizational activities and behaviour. Figure 2 shows the LOC framework.

Figure 2: Levers of Control Framework



Source: Simons (1994, 1995)

D. Theories and Hypothesis Development

Institutional theory, contingency theory and stakeholder theory explain the adoption of green initiatives. For example, the adoption of green supply chain management (Zhu, Sarkis& Lai, 2013); green logistics practices of truck fleets (Zhang, Thompson, Bao& Jiang, 2014); energy saving (U.S. EPA, 2006; Maarten, 2008); ISO 14001 (Delmas, 2002; Majumdar& Marcus, 2001); corporate environmental management (Liu et al., 2010); eco-control (Henri &Journeault, 2010); EMA(Jalaludin, Sulaiman& Ahmad 2010); environmental strategies at the strategic level and within the marketing functional area (Chan, 2010); and environmental attitude (Magrini&Lins (2007).

The inference made from institutional theory is that the more dominant or powerful a constituent, the greater influence they will have over the organisational operation and MCS (Dimaggio& Powell, 1983; Modell, 2002; Brignall& Modell, 2000; Abernathy & Chua 1996; Oliver, 1991). Institutional theory is an appropriate framework to explain social and environmental responsibility in the context of a developing country because many companies in developing country specifically Malaysia are dependent on the government (Amran & Devi, 2008). Contingency theory however, is a class of behavioural theory that claims no best wayto manage an organization, instead the optimal course of action is contingent upon the internal and external factors. Over the past two decades, there has been a growing interest in understanding the contingent relationship between competitive environments in which firms operate, strategy and MCS and this theory has been the dominant theoretical framework adopted by researchers analysing those relationship (Auzair&Langfield-Smith, 2005; Cadez&Guilding, 2008; Chenhall, 2003; Langfield-Smith, 1997; Simons, 1990). From the stakeholder theory, the model of Mitchell, Agle and Wood(1997)argues that a stakeholder may possess power to impose its will on the organisation. The extent to which a stakeholder possesses power and the sources from which the power is derived (i.e. coercive, utilitarian and normative), and the extent to which they are willing to exert that power, will impact the MCS.

The current study proposes that organizations integrate their green initiatives into MCS once they adopt physical green practices. Therefore, the subsequent hypothesis is built:

H1: Adoption of green initiatives positively influences the green integration into MCS.

In this study, the adoption of green initiatives is interchangeable with green practices, while the green integration into MCS is interchangeable with GMCS.

III. RESEARCH METHODOLOGY

This study is a quantitative studies that conducting questionnaire survey on a population of 921 public

listed companies on Bursa Malaysia. The public listed companies are big companies which are expected to be more sensitive to environmental concerns and are expected to have MCS that are sufficiently developed (Bouwens & Abernethy, 2000). The companies are mandated to produce corporate social responsibility (CSR) reports since 2007 that suggest a high possibility of these companies having adopted some green initiatives. For sample size, this study use simple random method from Bursa Malaysia database. According to Sekaran, (2003) and Roscoe (1975), the proposed rules of thumb for determining sample size where sample size larger than 30 and less than 500 are appropriate for most research. The data is analysed by using partial least square-structural equation modelling (PLS-SEM). Table 1 shows the samples according to their industrial sector. The industrial sector is based on category by Bursa Malaysia.

Table1: Sample

Industrial Sector	Total
Consumer Products	23
Industrial Products	22
Construction	8
Trade and Services	30
Finance	15
Properties	3
Mining	2
Plantation	7
Technology	10
Total Sample	120

IV. RESULTS AND DISCUSSION

A. Descriptive Result

Table 2 shows the green practices (1.GREENADOPT) which consists of (B01-B06) and the GMCS (2.GREENINTER) that consist of (C01-C18). However, GMCS is parceling into four which are (G01-G04).The data use 5 points likert scale which 1=none, 2=little, 3=moderate, 4=some and 5=extensive.

Table 2: Data

		Mean	Level of Practice
B01.Waste Management		3.792	moderate
B02.Recycling		3.950	moderate
B03.Energy Saving		4.008	some
B04.Health-SafetyMeasure		4.075	some
B05.ProcessRedesign		3.558	moderate
B06.Green Supply Chain		3.200	moderate
C01.VisionMission	3.292		moderate
C02.ExchangeKnowledge		3.308	moderate
C03.Green Culture		3.325	moderate
C04.Codes of Conduct		3.117	moderate
C05.External Standards		2.992	little
C06.Internal Report		2.883	little
C07.Audit		2.833	little
C08.CostingReport		2.858	little
C09.Short&Long Plan		3.050	moderate
C10.Physical Target		2.925	little
C11.Financial Budget		2.925	little
C12.Evaluate Performance		2.875	little
C13.RewardSystem		2.600	little
C14.Annual External Report		2.983	little
C15.Formal Review		2.717	little
C16.FormalMeeting		2.717	little
C17.Personal Communication		2.908	little
C18.Revision of plan, budget		2.775	little
G01.sBelief System (C01-C03)		3.308	moderate
G02.sBoundary System (C04-C07)		2.956	little
G03.sDiagnostic System (C08-C14)		2.888	little
G04.sInteractive System (C15-C16)		2.779	little

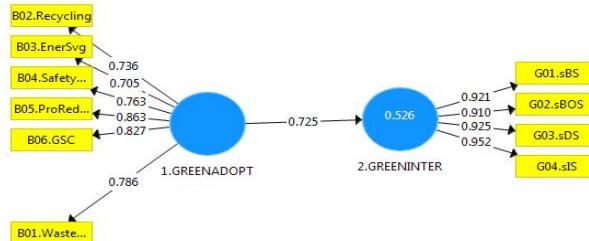
Table 3: Summary of Data

Green Practices	Mean	GMCS	Mean
B01.WasteMgt	3.792	G01.sBS	3.308
B02.Recycling	3.950	G02.sBOS	2.956
B03.EnerSvg	4.008	G03.sDS	2.888
B04.H.SafetyMeas	4.075	G04.sIS	2.779
B05.ProRedesign	3.558		
B06.GSChain	3.200		
Average	3.626	Average	2.983
		Moderate	Close to Moderate

From the results of table 2 and 3 above, the level of green practices by the public listed companies in Malaysia are: waste management is moderate, recycling is moderate, energy saving is some, health-safety measure is some, process redesign is moderate and green supply chain is moderate. Overall, the physical green practice is moderate. For GMCS: Belief System is moderate, Boundary System is little, Diagnostic System is little and Interactive System is little. Overall, the GMCS is little but close to moderate.

B. Result Summary of Measurement Model

This involves the constructs measures to be reliable and valid. Figure 3 shows the model of the study and table 4 shows the result summary.

Figure 3: Model of Study**Table 4:** Result Summary of Measurement model

Latent Variable	Indicator	Loadings	Indicator Reliability (Loadings >= communality)	Composite Reliability	AVE (Sum of Indicator Reliability / No. of Items)	Discriminant Analysis
1.GREENADOP	B01	0.786	>0.708 or >0.70	>0.708 or >0.70	>0.5	
	B02	0.736	0.542			
	B03	0.705	0.500			
	B04	0.763	0.582			
	B05	0.863	0.745			
	B06	0.827	0.684			
2.GREENINTER	G01	0.921	0.848	0.961	0.860	Yes
	G02	0.910	0.828			
	G03	0.925	0.856			
	G04	0.952	0.906			

From the table 4, Internal Consistency is measured by Composite Reliability (CR) which is equivalent to Crobach Alpha. The Composite reliability values should be >0.708 or >0.70 (Hair et al. (2014)). In this study, all indicators have CR >0.708 or >0.70 , hence they have satisfactory internal consistency reliability. Indicator reliability is shown by high outer loadings. Common rule of thumb, outer loadings should be 0.708 or higher. Rationale: squared outer loadings is equivalent to communality (at least 0.5 or 50%). However, item below 0.40 should be eliminated (Hair, Ringle, & Sarstedt, 2011). In this study, all outer loadings >0.708 or >0.70 , hence, the items are members of the constructs. Convergent validity is the extent to which a measure correlates positively with the alternative measures of the same construct. The items share a high proportion of variance. To establish convergent validity, researchers should consider the outer loadings of the indicators and Average Variance Extracted (AVE). The AVE should >0.5 , AVE <0.5 indicates that on average, more error remains in the items than the variance explained by the construct. The results show that AVE for all items >0.5 . Since all items have AVE >0.5 and outer loadings >0.708 or >0.70 , it indicates that the items share a high proportion of variance and a measure correlates positively with the alternative measures of the same construct. Discriminant validity is the extent to which a construct truly distinct from other constructs by empirical standards. In this study, the assessment meets the criteria of FornellLarcker and Cross Loadings (values bigger than others) and also HeterotraitMonotrait Ratio (HTMT)(The value of inter-correlation between construct and construct <0.85 or <0.90). Hence, the constructs are not sharing the same concept and they are discriminant.

C. Result Summary of Structural Model

This involves examining the model's predictive capabilities and the relationships between the constructs. Table 5 shows the result summary of structural model.

Table 5: Result Summary of Structural model

	VIF <5	T Statistics>1 .96 or >1.645	P Values <0.05	Path Coefficient	R ²
GREENADOPT -> GREENINTER	1.000	17.696	0.000	0.725	0.526

The results of table 5 indicate that the VIF <5 , hence no collinearity exist. The path coefficient may be biased if the estimation involves significant levels of collinearity among the predictor constructs. We consider VIF >5 in the predictor constructs as indicative of collinearity that is too high. If collinearity is exceeds these thresholds, we should consider eliminating constructs, merging predictors

into a single construct , or creating higher-order constructs to deal with collinearity problems. The results also indicate that the path is statistically significant using a one-tailed test (T Statistic > 1.645) or a two-tailed test (T Statistic > 1.96) since it has a T Statistic=17.696 and P value=0.000. Looking at the relative importance of the exogenous driver constructs in predicting the dependent construct GREENINTER, we see that GREENADOPT=0.725 is most important to the GREENINTER. The R²=0.526 indicates that the model's predictive accuracy are moderate. Table 6 continues the result summary of structural model.

Table 6: Result Summary of Structural model-Continued

	Path Coefficient	Effect Size-f ²	Predictive Relevance-Q ²
GREENA->GREENIN	0.725	1.110	0.448

The results of table 6 indicate that the GREENADOPT have a large effect in producing the R² for GREENINTER. The f² effect size is a measure of the impact of a specific predictor construct on an endogenous construct. The f² effect size measures the change in the R² value when a specific exogenous construct is omitted from the model. It is used to evaluate whether the omitted predictor construct has a substantive impact on the R² values of the endogenous construct(s). The results indicate that the GREENADOPT=1.110 has a large effect in producing the R² for GREENINTER. Q² values larger than zero for a specific reflective endogenous latent variable indicate the path model's predictive relevance for a particular construct. The table above shows that the Q² value is considerably above zero, thus providing support for the reputation model's predictive relevance for the endogenous construct.

D. Discussion

The public listed companies in Malaysia are the big companies that required in producing CSR reports since the year 2007 which are almost 8 years in time. In average, the companies have been involved in green practices for about 4 to 10 years. This study reveals that in overall, the companies are moderately practicing physical green and minimally but close to moderate applying GMCS in managing green issues. For physical green practices, they implement some on energy saving and health-safety measures in productions but moderate in waste management, recycling, process redesign and green supply chain. As for GMCS, the companies embedded moderately in belief system i.e. green vision and mission are communicated through strategic plan, intranet, booklets, posters or other institutional communication; exchange of knowledge, creation of green awareness and reach an understanding of green issues through trainings, conferences and workshops; and existence of green culture in the organizations. However, the

companies do little but close to moderate in boundary system i.e. establish codes of conduct for green practices; use legal or external standards to monitor achievement of green initiatives; provide regular internal report of progress on green initiatives; and conduct green audits. The companies also do little but close to moderate in diagnostic system i.e. provide regular costing report on green initiatives; establish physical budget or target for green initiatives; establish financial budget for green initiatives; evaluate performance of green initiatives; incorporate criteria for efforts on green initiatives in reward system; and disclose green initiatives in annual external report; except for short and long term plan which moderately implement. Same as interactive system, the companies implement little but close to moderate i.e. frequent formal reviews and debates on green strategies to identify emerging green strategies for enhancement; conduct regular and formal meetings between superiors and subordinates to exchange ideas for green initiatives enhancement; frequent personal communication between superiors and subordinates on implementation of green initiatives; and frequent revision of plans, targets and budgets for green initiatives in response to changes in the external environment.

To date, the green practices and the integration of green into MCS are studied mostly among large and strong environmental commitment companies because they are expected to be more sensitive to environmental concerns and are expected to have MCS that are sufficiently developed (Bouwens & Abernethy, 2000). For comparison, they emphasize not exactly on same angle. For example, Boots, a retailer of health and beauty products; Halcrow, a firm specialised in the provision of planning, design and management services; and The Commercial Group, an independently-owned office services company in the United Kingdom emphasize on diagnostic and interactive systems only (Moon et al., 2011). The study reports that the three companies are making progress towards integration of sustainability into their MCS. Other study by Arjaliès and Mundy (2013) on application of LOC in a group of public listed companies in France reveals that the companies use the LOC but the diagnostic processes are embedded minimally in many companies as they implement a separate system for reporting CSR activities and performances. Not many companies implement operational-level budgets and measures for CSR into their compensation programmes. Mersereau (2012) study on a French insurance company Credit Agricole Assurances, one of the largest financial institutions in Europe, to examine the connection between CSR and management control. The findings show that the communications in regards to CSR are aggressive, widespread, constant and varied. The employees are directly involved in the execution of the CSR strategy. Diagnostic system is done some but not link with the incentive reward system. In other study,

Herzig , Viere and Schaltegger (2012) explored the application of EMA as part of MCS in small and medium enterprises (SMEs) in South-East Asia. Their findings show that EMA tools are used in different ways by different companies. Jalaludin, Sulaiman and Ahmad (2010) also explored the adoption of EMA and the association between EMA and environmental and economic performance of manufacturing companies in Malaysia. The results reveal that the adoption of EMA is low but it has a positive relationship with companies' performance.

Overall, the extent of green integration into MCS is at little to moderate level but it is progressing especially in large and environmental best practice companies. This diversity of approaches shows the concerns of organisations with sustainability issues, but without some common points of reference.

CONCLUSION

Green practices influence GMCS in managing green issues in which green is required to be incorporated into an organization's objectives, strategic plan and organization processes to be genuine in sustainability practices. However, the practice is still at low to moderate level even though in large and strong environmental commitment companies. Among the reasons are: lack of green awareness, hence, need support or incentives from government to enhance the awareness and to improve the activities; less support from staffs due to staffs attitude which reluctant to change; lack of experts or champion to lead the green activities; require lots of efforts and time; less coordination; costly to implement in short term period; and still having limited market for green products.

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