The effects of environmental knowledge and green products awareness on green management and sustainable performance: Evidence from manufacturing sector in UAE

Majdi Khaleeli[a*], Suja Pradeep[a] and Latha Krishnadas[a]

[a]Department of Business Administration – Khawarizmi International College, United Arab Emirates

CHRONICLE	ABSTRACT
	This research intends to figure the antecedents of Green Management and its implementation in manufacturing sector companies in UAE. The study also intends to explore the relationship between the implementation of green management and sustainable performance as measured by complied scale of social, economic and environmental performance. Quantitative research methods are used and the necessary data are collected from 134 companies by using google form survey sent to participants. Statistical Package of Social Sciences (SPSS) Version 22 is used to analyze the data. The findings of this research reveal that managers' environmental knowledge and managers' green product awareness were positively and significantly associated with green management and that green management was also positively and significantly associated with sustainable performance.

1. Introduction

Global warming and climate change are making the major threats to our world today and scholars have conducted several studies that address the eco-system and explored the best practices that companies need to follow to resolve and mitigate these threats (Raharjo, 2018; Berrone et al., 2017; Akturan, 2018, Cankaya & Sezen, 2018). Pollution, poverty, excess use of the available resources has proved to be resulted from the practices of companies that are not aware about the big environmental problems our world is facing (Chaudhary, 2017; Jain, 2016). Raharjo (2018) argued that companies have also negative environmental impacts alongside with their positive performance, and this will lead to a conflict of interest between stockholders and society. Fan et al. (2015) argued that individual consumption has negative impact on the environment. The increasing buying power of consumers lead to increased demand and consumption of products which lead to more deterioration of our environment (Lin et al., 2017; Fan et. al., 2015). Scholars called for more research on environmental issues and sustainability to explore how companies can reduce their negative impacts on our planet that results from their operations (Raharjo, 2018; Fan et. al., 2015). Some other researchers argued that consumer awareness can also play vital role in addressing these issues as they can control their consumption and also buy environmentally friendly products (Wang et al., 2017). Based on this, this research intends to explore the antecedents and enablers of green management, i.e., the management that apply the green practices such as reducing waste, pollution, and protecting the environment and society, it also intends to explore if green management practices are associated positively with company performance. This research intends to explore the antecedents of green management, and whether or not green management practices are associated with sustainability performance of small and medium size companies in UAE.

* Corresponding author.

E-mail address: majdi.khaleeli@khawarizmi.com (M. Khaleeli)

1.1 Green Management

Green management applications are determined by several factors such as the demand of stakeholders, knowledge, available resources, and product uniqueness (Raharjo, 2018). Hoogendoorn et al. (2014) asserted that stakeholders demand for green environmental practices can largely influence companies' strategies when it comes to environmental concerns. Stakeholder includes, but not limited to, investors, customers, suppliers and employees (Buysee & Verbeke, 2003). For instance, employees can push their management to apply and make healthy working environment for them (Hoogendoorn et al., 2014). Furthermore, and due to increased customers awareness of environmental issues (Khaleeli & Jawabri, 2020) they can use their purchasing bower to produce environmentally friendly products for which they are even willing to pay premium price (Nielsen; 2014). Samsung (2008) conceptualized green management as green products, green process, green workplace, green community and green workforce. According to them, green products are environmentally friendly products produced from recyclable materials, green process is the one that does not cause pollution or increase global warming by using renewable sources of energy, green workplace in that a clear anti-waste system is installed, and healthy and safe work environment exist, green community is enabled by providing education on environmental issues and green practices from the company to its society, and finally, green workforce can be achieved by hiring educating and providing training to workers on green practices. In a different view, Peng and Lin (2008) argued that a company can be said to implement green management if it produces green products, uses green research, and applies green marketing.

Many scholars advocate green management as the philosophy and practices that prevail and dominate several functions within the company. This includes, but not limited to green marketing, production, distribution, logistics, and distribution that comply with the best sustainable practices and geared toward reducing the environmental hazards and the waste of resources (Srivastava, 2007; Cankaya & Sezen, 2018; Vanalle et al. 2017; Schmidt et al.,2017). According to Eltayeb et al., (2011) and Cankaya & Sezen (2018), green management can be defined as the practices performed by companies' management to ensure building environmentally friendly practices. It covers different aspects such as human resources, distribution, and operations (Chan et al., 2012; Gao et al., 2009), it also extends to environmental education as Sarkis et al., (2010) defended the environmental education with the company as an important factor in building green management.

Environmental Knowledge and awareness are described as the degree to which individuals are aware of environmental issues and problems, and the extent to which they are supporting the solutions to these problems (Hu et al., 2010; Chaudhary, 2018). According to Vicente-Molina et al. (2013), the environmental knowledge in its two forms, i.e., the objective or actual knowledge, and the subjective or perceived knowledge can shape individuals' attitudes and intention to behave positively toward the environment. Xu et al. (2018) developed what they named as EAPIM model that puts together the environmental awareness and purchase intention and suggested that environmental awareness possibly will affect behavior.

Scholars argued that more research is needed about green products (Wang et al., 2018; Issock et al., 2019). The importance of individual knowledge of green products cannot be underestimated as this will shape consumers preferences and attitudes, and will also help consumers become less sensitive to higher prices associated with being green (Papista et al., 2018). This research proposes that managers who are aware about green products coupled with environmental knowledge are more likely to implement green management practices in their companies.

For the purpose of this research, seven items scale are adapted from Çankaya and Sezen (2018) and 5-points Likert-type scale ranging from 1= Strongly Agree to 5= Strongly Disagree is used. To measure managers' environmental knowledge, four items scale adapted from Issock et al. (2018), and three item scale of measure managers' green products awareness is adapted from Sun and Wang (2019).

Based on the literature review, this research proposes the following hypotheses:

H$_1$: *There is a positive and significant relationship between managers' environmental knowledge and the implementation of green management in manufacturing sector in UAE.*

H$_2$: *There is a positive and significant relationship between managers' green products awareness and the implementation of green management in manufacturing sector in UAE.*

1.2 Sustainability Performance

Sustainability started to dominate the literature during the last year due to increased interest from both academician and practitioners in environmental issues. Several studies have been done to explore the effect of customer consumption and companies' operations on our world as it is believed that mass consumption and inadequate use of resources by manufacturers can lead to global warming, climate change, waste, pollution, fast depletion of resources and this leads to ecological imbalance (Cankaya & Sezen, 2018; Mangla et. al., 2018; Sazvar et. al. 2018). However, green practices can increase the cost of the practicing companies due to extra investment in the short term, with the expectations of higher reward in the future since companies will be able to wisely utilize their resources and reduce their wastes (Akroush et. al., 2018) and the reward can be gained through customers commitment and loyalty as the customer tends to buy from sustainable companies (Chaudhary, 2018; Khaleeli & Jawabri, 2020; Raharjo, 2018). Thus, due to the need to measure the performance of sustainable companies by using different dimensions in measuring the performance trends of sustainable business in long term emerged, scholars

asserted that sustainability performance need to be measured by different indicators and not only the financial ones (Raut et. al., 2019; Cankaya & Sezen, 2018). According to Cankaya and Sezen (2018), sustainable performance can be measured by using three dimensions, namely, environmental performance, economic performance, and social performance. Scholars examined the impact of some green management practices such as supply chain on economic performance of the practicing companies (Younis et al., 2016; Schmidt et al., 2017) and argued that companies can gain economic advantages by implementing green management through increased loyalty and companies' reputation. Some others advocate the effect of green practices on social environment and even argued that social performance is over neglected by researchers (Rajeev et al., 2017) even though social responsibility is believed to positively affect customer satisfaction and also affect the perception of employees, government and other stakeholders about the practicing companies (Cankaya & Sezen, 2018). Cankaya and Sezen (2018) found positive and significant relationship between green management practices and social performance. For the scope of this research, the three dimensions of sustainability performance, i.e., social performance, economic performance and environmental performance were combined as one variable, i.e., sustainable performance. To measure sustainable performance, eleven items have been adapted from Cankaya and Sezen (2018) and five points Likert-type scale ranging from 1 = Strongly Agree to 5 = Strongly Disagree has been used.

Based on the literature review, the following hypotheses are developed:

H$_3$: *There is positive and significant relationship between green management and sustainability performance in manufacturing sector in UAE.*

2. Theoretical Framework

Based on the above literature review and hypotheses developed, the following theoretical framework is proposed in Fig. 1. This research intends also to test the hypothesis as highlighted in this model in UAE manufacturing sector.
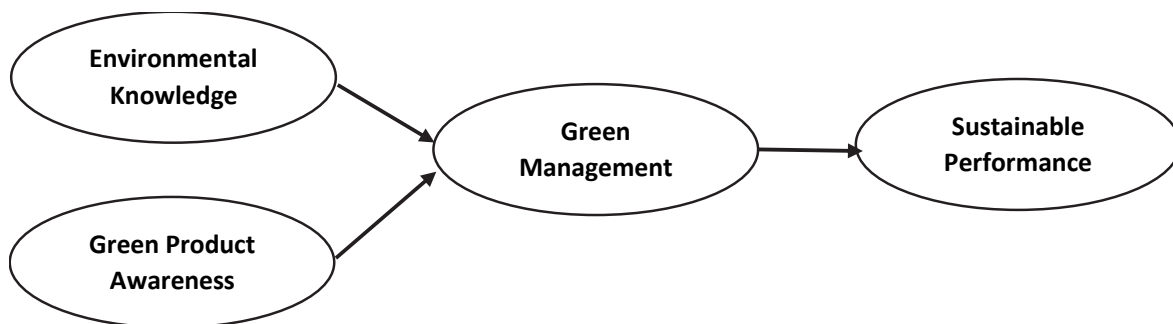

Fig. 1. Research Theoretical Framework.

2.1 Data and Research Methods

This research is empirical in nature as it employs questionnaire for data collection, the respondents of the survey are owners and key administrative managers in United Arab Emirates small and Middle size companies across UAE, the questionnaire used in this research has been adapted from Cankaya and Sezen (2018); Issock et al. (2018) and Sun and Wang (2019) and validated in content as two executives were interviewed online and they were presented with the survey and asked to give their opinions on the questions. If participants of the content validity highlighted a question that is not clear, the researchers re-phrased the item under consideration, this resulted in 5 items of the survey to be re-phrased, and hence a clear and finalized version of the survey became ready-to-use. Google form was used to build the questionnaire, and the link shared with respondents online. As the purpose of this research was to gain insights on environmental knowledge, green products awareness, green management practices, and sustainability performance, hence, the unit of analysis in this survey was the company, and top and middle managers in manufacturing sector in UAE have been asked to participate in the survey. In total, 137 responses were collected, out of which 134 responses were found to be useful and complete and the remaining 3 responses were found to be incomplete in some important items and researchers decided to exclude them from data analysis stage. Statistical Package for Social Sciences (SPSS) Version 22 has been used to analyze the data and to test the research hypothesis.

2.2 Data and Analysis

In order to give the feeling of the respondents, Statistical Package for Social Sciences (SPSS V.22) frequency analysis has been conducted, and the results of this analysis shown in Fig. 2. From the figure, it can be noticed that the overall majority of respondents (69%) are male as 93 male respondents participated in the survey, whereas 41 female participated and male included 29% of the respondents, this gender distribution is expected as the survey targeted managers in the manufacturing sector, when it comes to age, we can see from the figure that the overwhelming majority of respondents (83) were aged between 36 and 50 years (62%) followed by 39 respondents from the age group of above 50 (29%) who represent the status in the manufacturing sector as well. Finally, when it comes to company size, we can notice also that the majority of the

participants (63) working for medium sized company making 47% of the research population, followed by 46 participants from large companies (34%) and 25 respondents from small companies (19%).
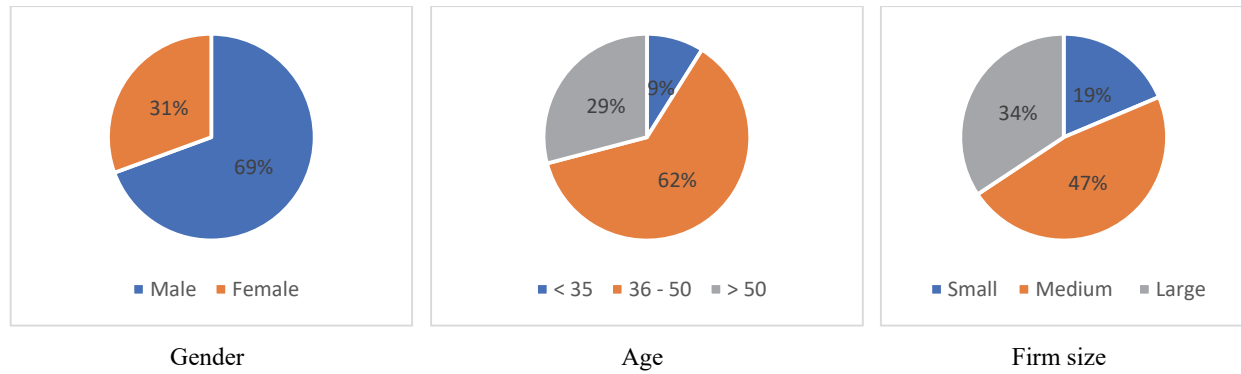

Fig. 2. Demographics of the participants

To test for the reliability of the constructs used in this research, it is important to conduct reliability analysis, and this is done by using Cronbach's Alpha as shown in Table 1 below.

Table 1
Reliability Analysis

Construct	Cronbach's Alpha	N of Items	Construct	Cronbach's Alpha	N of Items
Environmental Knowledge	.782	4	Green Management	.859	7
Green Awareness	.736	3	Sustainable Performance	.823	12

From the above table, it can be concluded that the four scales used to measure the variables of this research are reliable and can be used to test the hypotheses of this research. Ranging from the lowest (0.74) to the highest (0.86), all the constructs said to be reliable as all are above the minimum threshold of (0.70) needed to check for reliability. Descriptive analysis was also conducted to have the feeling of the data collected, and Table 2 shows the average, variance, standard deviation and wight for the research variables.

Table 2
Value of Mean, Variance, and Standard deviation

	N	Minimum	Maximum	Mean	Std. Deviation
Environmental Knowledge	134	1.00	4.00	2.3713	.65303
Green Awareness	134	1.00	4.33	2.5597	.78371
Green Management	134	1.00	4.00	2.3124	.65832
Sustainable Performance	134	1.00	4.33	2.2998	.56631
Valid N (listwise)	134				

According to Table 2, the highest mean of the four variables is (2.56) for green product awareness, with standard deviation of (0.78) which makes it the highest standard deviation in the tested variables, the mean for environmental knowledge is (2.37) with standard deviation of (0.65), whereas the mean of green management is (2.31) with standard deviation of (0.66) and finally, sustainable performance mean was found to be (2.30) with standard deviation of (0.57). Further analysis is needed to test the proposed hypotheses between these variables. Multiple regression analysis was also conducted to test H_1 and H_2, namely, the relationship between managers' environmental knowledge and managers' green products awareness and green management, whereas simple regression analysis was conducted to test H_3 with proposed positive relationship between green management and sustainability performance as follow:

Table 3
Multiple Regression Analysis between managers' environmental knowledge and green product awareness as DV and Green management as ID

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.984	.183		5.369	.000
	Environmental Knowledge	.234	.114	.233	2.057	.042
	Green Product	.302	.095	.359	3.178	.002

a. Dependent Variable: Green Management

The results of multiple regression showed R square (0.31) and adjusted R square (0.30). The results indicate the power of the test which is acceptable at (0.05) significance level, and as portrayed above in Table 3, environmental knowledge is positively (0.23) and significantly (0.04) associated with green management, so H_1 that proposes a positive and significant relationship between environmental Knowledge and green management is accepted, since the relationship is positive and significant. The

table also lends support to our research second hypothesis as positive (0.30) and significant relationship (0.00) between green product awareness and green management, and thus, H2 is also accepted. In order to test H₃ that suggests positive and significant relationship between green management and sustainability performance, simple regression analysis has been conducted and portrayed in Table 4 below.

Table 4
Simple Regression Analysis between green management as ID and sustainability analysis as DV

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.725	.110		6.593	.000
	Green Management	.681	.046	.792	14.896	.000

a. Dependent Variable: sustainability

With R square of (0.627) and adjusted R square of (0.624), which indicates the power of the test, and from Table 4, it can be concluded that green management and sustainable performance are strongly (0.00) and positively (0.68) associated and thus H₃ that proposes a positive and significant relationship between green management and sustainable performance is accepted.

3. Research Findings

Based on the above analysis, the three hypotheses originally proposed in this research were accepted at significance level of (0.05), namely, positive and significant relationship was found between managers environmental awareness and managers' green product awareness as independent variables and green management is dependent variables, the two independent variables found to explain 0.53 of the variances in the dependent variable. This research also lends strong support to the third hypothesis that proposed a positive relationship between green management as independent variable and sustainable performance as it indicated that (0.68) of the variance in the sustainable performance is attributed to green management practices.

4. Conclusions and Recommendations

This research has intended to explore and examine the relationship between managers' environmental knowledge and managers' green product awareness and independent variables on green management practices of manufacturing companies in UAE, it had also intended to measure the relationship between green management and sustainable performance by using a compiled construct of sustainable performance that incorporate the three dimensions of sustainable performance. 134 managers from manufacturing sector in UAE participated in this research and the results have indicated that managers' environmental knowledge and managers' green product awareness were positively and significantly associated with green management. Furthermore, green management was found to be positively and significantly associated with sustainable performance. This research contributes to the body of knowledge in sustainable performance and green managements by providing more insight into the antecedents of green management practices. It also measured green management by using 12 items incorporating the many aspects of green management such as green supply, green operations and green marketing, which also provides support on the link between green management and sustainable performance so managers can be guided accordingly as green management was found to be positively and significantly associated with sustainable performance that incorporate the three dimensions, namely, the economic, environmental, an social performance of the company, that is to say practicing companies found to have positive performance – including the financial one- as they implement green management.

5. Recommendations for Future Research

Future research can build on the findings of this research and can explore the relationships between the variables in different contexts. Researchers are encouraged to explore more antecedents variables that facilitate the implementation of green management other than the two variables examined in this research, namely, managers' environmental knowledge and green products awareness, it will be interesting to see for instance more link between the theory of planned behavior and the variables examined in this research, it will also interesting if researchers examined the impact of green management and sustainable performance by using three different constructs of sustainable performance, i.e., social, environmental, and financial performance. It will also be interesting if further research would be carried out to break down the green management practices into components, thus providing many constructs that can shed more light on green management implementation.

References

Akroush., M., Zuriekat., M., Al Jabali, H. & Asfour, N. (2018). Determinants of purchasing intentions of energy-efficient products: The roles of energy awareness and perceived benefits. *International Journal of Energy Sector Management, 13*(1). https://doi.org/10.1108/ IJESM-05-2018-0009

Akturan, U. (2018). How does greenwashing affect green branding equity and purchase intention? An empirical research. *Marketing Intelligence & Planning, 36*(7), 809-824. DOI: 10.1108/MIP-12-2017-0339

Berrone, P., Fosfuri, A. and Gelabert, L. (2017). Does greenwashing pay off? Understanding the relationship between environmental actions and environmental legitimacy. *Journal of Business Ethics, 144*(2), 363-379.

Çankaya, S. & Sezen, B. (2018). Effects of green supply chain management practices on sustainability performance. *Journal of Manufacturing Technology Management, 30*(1), 98-121. doi.org/10.1108/JMTM-03-2018-0099

Chan, R.Y.K., He, H., Chan, H.K., & Wang, W.Y.C. (2012). Environmental orientation and corporate performance: the mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial Marketing Management, 41*(4), 621-630.

Chaudhary, R. (2018). Green buying behavior in India: an empirical analysis. *Journal of Global Responsibility, 9*(2), 179-192. DOI: 10.1108/JGR-12-2017-0058.

Eltayeb, T.K., Zailani, S., & Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: investigating the outcomes. *Resources, Conservation and Recycling, 55*(5), 495-506.

Fan, J., Wang, S., Wu, Y., Li, J., & Zhao, D. (2015). Buffer effect and price effect of a personal carbon trading scheme. *Energy, 82*(5), 601-610.

Hoogendoorn, S., Oosterbeek, H. & van Praag, M. (2014). The impact of gender diversity on the performance of business teams: evidence from a field experiment. *Management Science, 59*(7), 1514-1528.

Hu, H., Parsa, H., & Self, J. (2010). The dynamics of green restaurant patronage. *Cornell Hospitality Quarterly, 51*(3), 344-362.

Issock, P., Mpinganjira. M. & Lombard, M. (2018). Modelling green customer loyalty and positive word of mouth Can environmental knowledge make the difference in an emerging market?. *International Journal of Emerging Markets, 15*(3), 405-426.

Jain, M. (2016), Not just Delhi: these six Indian cities have an air pollution problem worse than Beijing. Available at: https://scroll.in/article/801365/not-just-delhi-these-indian-cities-have-an-air-pollutionproblem-worse-than-beijing (accessed 2020).

Khaleeli, M., & Jawabri, A. (2020) The effect of environmental awareness on consumers' attitudes and consumers' intention to purchase environmentally friendly products: Evidence from United Arab Emirates. *Management Science Letters, 11*(2), 555-560.

Mangla, K., Luthra, S., Rich, N., Kumar, D., Rana, P., & Dwivedi, K. (2018). Enablers to implement sustainable initiatives in agri-food supply chains. *International Journal of Production Economics, 203*, 379-393.

Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: comparison of university students from emerging and advanced countries. *Journal of Cleaner Production, 61*, 130-138.

Nielsen (2014). It pays to be green: corporate social responsibility meets the bottom line. Nielsen Global Survey.

Peng, Y., & Lin, S. (2008). Local responsiveness pressure, subsidiary resource, green management adoption, and subsidiaries' performance: evidence from Taiwanese manufactures. *Journal of Business Ethics, 79*(1-2), 199-212.

Raharjo, K. (2019). The role of green management in creating sustainability performance on the small and medium enterprises. *Management of Environmental Quality: An International Journal, 30*(3), 557-577. DOI: 10.1108/MEQ-03-2018-0053

Rajeev, A., Pati, R.K., Padhi, S.S., & Govindan, K. (2017). Evolution of sustainability in supply chain management: a literature review. *Journal of Cleaner Production, 162*, 299-314.

Raut, R. D., Luthra, S., Narkhede, B. E., Mangla, S. K., Gardas, B. B., & Priyadarshinee, P. (2019). Examining the performance oriented indicators for implementing green management practices in the Indian agro sector. *Journal of Cleaner Production, 215*, 926-943.

Samsung (2008), available at: www.Samsung.com/AboutSAMSUNG/ELECTRONICS-GLOBAL/SociaICommitm/ (accessed 2020)

Sazvar, Z., Rahmani, M., & Govindan, K., (2018). A sustainable supply chain for organic, conventional agro-food products: the role of demand substitution, climate change and public health. *Journal of Cleaner Production, 194*, 564-583.

Schmidt, C.G., Foerstl, K., & Schaltenbrand, B. (2017). The supply chain position paradox: green practices and firm performance. *Journal of Supply Chain Management, 53*(1), 3-25.

Srivastava, S.K. (2007). Green supply-chain management: a state-of-the-art literature review. *International Journal of Management Reviews, 9*(1), 53-80.

Sun, Y. & Wang, S. (2019). Understanding consumers' intentions to purchase green products in the social media marketing context. *Asia Pacific Journal of Marketing and Logistics, 32*(4), 860-878.

Vanalle, R.M., Ganga, G.M.D., Godinho Filho, M., & Lucato, W.C. (2017). Green supply chain management: an investigation of pressures, practices, and performance within the Brazilian automotive supply chain. *Journal of Cleaner Production, 151*, pp. 250-259.

Wang, S., Li, J., & Zhao, D. (2017). The impact of policy measures on consumer intention to adopt electric vehicles: Evidence from China. *Transportation Research Part A: Policy and Practice, 105*, 14-26.

Xu, L., Prybutok, V. & Blankson, C. (2018). An environmental awareness purchasing intention model. *Industrial Management & Data Systems, 119*(2), 367-381. https://doi.org/10.1108/IMDS-12-2017-0591.

Younis, H., Sundarakani, B., & Vel, P. (2016). The impact of implementing green supply chain management practices on corporate performance. *Competitiveness Review, 26*(3), 216-245.