Journal of Energy Technologies and Policy
ISSN 2224-3232 (Paper) ISSN 2225-0573 (Online)
Vol.7, No.9, 2017

Green and Sustainable Commercial Property Demand in Malaysia and Nigeria

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Abstract
Green building is redefining real estate practices and commercial properties are attracting greater attention of the paradigm shift. Nevertheless, in many countries including Malaysia and Nigeria, green building investment is still beset with uncertainties about the anticipated returns and benefits. The aim of this study is to identify the predictive factors and variables that motivate decisions to demand and invest in green commercial properties, and to apply discriminant analysis technique to assess if there are significant differences in perception between the real estate development team in Malaysia and Nigeria based on the identified variables. The result showed a significant discriminant function separating the two countries based on their perception of the variables. The green building motivation attributes favoured Malaysia. The Wilks' Lambda's *F* test and the standardized discriminant function coefficients, indicated that there are significant differences in perception between the real estate development team in Malaysia and Nigeria as measured by personal and altruistic environmental motivations, corporate conscience responsibility motivations and economic and financial motivations. However, economic and financial motivation variables were found to have showed the most predictive power in accounting for the differences in perception.
Keywords: green building, real estate investment, sustainability, motivations, perceptions.

1.0. Introduction

There is a general opinion among those knowledgeable with environmental sustainability that green building is subject to the forces of demand and supply. Whereas the environmental benefits of green building are becoming less contentious, clients and potential occupants' of green building are more worried of green building that attracts and retains high value tenants, reduce environmental footprint, energy use, and operational cost, enhance employee productivity, and promote collaborative and innovative workplace. On the supply-side, the real estate development team such as developers and investors are more concerned about the key factors that would best deliver high performance building that could attract purchasers and buyers while at the same time guarantee and make profit. On a larger scale, the pressure to shift to green building is because of increasing evidence that the building sector is a major consumer of resources and energy. For instance, the building sector accounts for about 44% of the society's total material use and a large proportion of more than 50% of primary resources (Nelms et al, 2005). In Canada, UK and US for examples, energy consumption by buildings is about 30-50% of the country's total energy demand (Nelms *et al*, 2005).Commercial properties are contributors to this problem. Commercial buildings (offices, retail and industrial) consume close to 20% of the total energy consumption (Kroll, 2011). In Malaysia, commercial buildings alone account for about 32% of total energy use (Suleiman et al, 2012), while energy use in the commercial sector of Nigeria is measured at 20%(Sogo et al, 2014). Green building is an emerging solution to this problem. However, the perception and penetration of the concept of green building, particularly in developing countries is still low.

For example, in a study that measured the performance of countries in green economy, Malaysia and Nigeria were not graded the best performing countries. Countries like Sweden, Norway, Germany, Denmark, Switzerland, Austria, Finland, and Spain ranked best in performance (Dual Citizen LLC, 2014). On ranking by world cities, Singapore, Malaysia bordering city-state, ranked 8, with an average score of 84%, thus placing it in the rank of top 10 green performing cities including Copenhagen, Amsterdam, Stockholm, Vancouver, London, Berlin, New York, Helsinki, and Oslo. However, at the countrywide level, Malaysia ranked 35th with a slightly below average score of 46%(Dual Citizen LLC, 2014).Although, the study did not report the performance of Nigeria, it however stated that the performance of most African countries were poor. In another study of country-by-country performance taking into account of LEED achievement, Malaysia had a total number of 5,785, 244sqm of certified and registered green building projects while Nigeria has 317, 039sqm (US GBC, 2015).

This means that Malaysia and in particular Nigeria are lagging behind in green building investment despite the huge potential market that exist in both countries. Experts have argued that this scenario may have been the consequence of developers and tenants being uncertain of the returns and benefits associated with green building (Nurul and Zainul,2013). Besides, there are fears among clients and the real estate development team and institutional investors when it comes to green building investment. This is because buyer motivations for green building are still based on anecdotal evidences (Eichholtz et al, 2009). Perhaps this is why MIS Asia, (2009)advised

real estate market participants to take a pause, and reflect on the green building market before investing. Nevertheless, as part of the effort to pursue green economy, most countries have passed policies and programmes that specifically target green building. Malaysia has passed National Green Technology Policy, establishedMalaysia Green Building Confederation (MGBC) and the National Green Technology Council to facilitate green building initiatives.

Furthermore, Malaysia has established her own assessment tool known as Green Building Index (GBI) for assessing green design and performance of Malaysian buildings. GBI covers six key areas namely, indoor environment quality, energy efficiency, materials and resources, sustainable site planning and management, water efficiency, and innovation. In addition to GBI, Malaysia allows for two other rating systems: United States Green Building Council's Leadership in Energy and Environment Deign (US LEED), and Singapore's BCA Green Mark. The end product of this achievement is that about 62.5% of green office buildings have been completed and occupied while 12.5% are under construction (Isa et al, 2015). Besides, a total of 402 green commercial buildings have recently applied for certification under the non-residential new construction (NRNC) category and 31 have secured final certification (Green Building Index, 2016).Again, Malaysia has introduced various green tax exemptions, discounts, and investment motivations to nurture green building investment and acceptance among private and public sectors. This includes company tax incentives for businesses providing efficient energy conservation services; and incentives on stamp duty and income tax for real estate constructions that attain GBI Certifications(Aliagha et al, 2013).All the same, Malaysian investors and developers still have the problem of poor incentives. The incentives are not adequate to sustain private and public businesses in green building development. (PwC, 2010).

On the other hand, in 2014 Nigeria registered the Green Building Council of Nigeria (GBCN) with the World Green Building Council (WGBC) on a prospective membership level (WSP, 2014). At the moment, the Nigerian government and professionals in the built environment have not yet made substantial policy on green building rating tools that could be used for offices, retails, multi-unit residential, public and educational building projects in Nigeria. In the interim, Nigeria has allowed the Green Building Council of South Africa (GBCSA) to certify green buildings in Nigeria using the Green Star SA V1 design and rating tools (WSP, 2014). It is known as Green Star SA-Nigeria. Studies have shown that countries that pursue and adopt green building policies, experience greater private-sector participation in green buildings. As Noble (2013)observed government that pursue LEED certification for their buildings, have greater increase in the number of local architects, general contractors, and other construction industry professionals that seek LEED accreditation. This suggests that government policies and programmes have spill over effect and does spur private markets for green building. By extension, the degree to which governments play leadership role, pursue green building policies and programmes could have spill over effects on how real estate developers, architects, contractors, professionals and investors perceive and assess motivational factors of green building. Thus, the more diverse and elaborate green building programmes, policies and incentives are, the more the society and consumers respond positively to green building supply and demand *ceteris paribus*.

The foregoing discussion indicates that Malaysia and Nigeria are obviously at different levels of green building polices, development and implementation. This study is of the opinion that this difference could affect the orientations and perceptions of real estate market participants on various factors that could spur green building. Green building requires demand side and supply side. Potential occupants and consumers determine the demand side while real estate development team largely regulate the supply side. This study focuses on the analysis of the demand side factors for commercial property(retail and office) investment. Existing studies on green building seem to focus on residential green buildings (Christopher, 2007), government and institutional green buildings (Shahamir and Zakara, 2014), Green Infrastructure (Ian, 2010), energy efficiency(Kroll,2011; NgBan and Zainal, 2011), and benefits of green building (Kats et al, 2003; Alev and Baabak, 2010). Studies focusing on green commercial property demand particularly in developing countries such as Malaysia and Nigeria are few. Moreover, demand for green commercial buildings in Malaysia is below average while in Nigeria is very low (Nazirah, 2010; Nduka and Adegboyega, 2014; Nadzirah and Mei, 2015; Nduka and Ogunsamni, 2015).

Thus, this study argues that if green building makes economic sense as acknowledged by many experts, it will be primarily within the domain of green commercial properties, as such, more research focus on empirical evidence of demand factors are required. In the same vein, examination of past studies show that there are dearth of researches on cross-country differences and comparison on green building. It is the contention of this study that such cross-country comparison research will help the countries involved to draw from others' experiences and benchmark themselves. Malaysia and Nigeria are among the fastest developing countries in their regions – Southeast Asia and West Africa respectively. As noted earlier both countries are at different levels of green building polices development and implementation. This study is conceptualised on the notion that such differences in polices and implementation mechanisms could indirectly translate to differences on how real estate market participants perceive and assess prevailing factors affecting demand for commercial green buildings. Based on this logic, the objectives of this study are 1] identify the predictive factors and variables that influence decisions to

demand green or sustainable commercial properties. 2] determine if there are significant differences in perception or a commonality of opinion between real estate developers and investors in Malaysia and Nigeria based on the identified variables, and 3] determine the variables with most predictive power to account for the differences in perception.

2.0 The study Areas – Why Malaysia and Nigeria?

Malaysia and Nigeria are in the same tropical zone. Both countries are in the same latitude characterized by hot and humid climate. Thus, regions like Malaysia and Nigeria will be adopting policies and programmes suitable for green building materials that would help in reducing high temperature. On these bases, they share certain similarities in environmental features, which could have clear implications for green building. Green building design and constructions in both countries are particularly suited for tropical environments. The factors that drive market participants in both countries are comparable. For example, Chequet et al (2013) reported that irrespective of geographical features, one direct benefit of green property demand in any real estate market is energy efficiency and quest for sustainability. Malaysia and Nigeria practice green building and sustainability (Alabi, 2012). As such, studies from Malaysia and Nigeria have shown that factors such as energy efficiency and C02 reduction drive demand for green commercial properties (Isa et al, 2015; Nduka and Ogunsamni, 2015).

On economic and social structure, Malaysia and Nigeria are capitalist countries and erstwhile British colonies. Both countries operate mixed economy giving government participation in the economy. Even though Malaysia and Nigeria are in different regions, both countries operate open property market economy that are globally linked (Bawa, 2013, Usilappan, 2016). There is free entry and free exist in both markets. Moreover, Malaysia and Nigeria are among twenty major emerging economics in the world (Nkkei-Veritas, 2014).They operate a free market where property delivery system is private sector driven. As Bawa (2013) put it, Malaysia and Nigeria have adopted comparative components of private sector dominated housing delivery systems. Cross - regional and state comparative studies indicate that green building investment trend is gradually becoming less localized and limited in one part of geographical region or economic state due to increasing competitive global marketplace occasioned by prevailing concerns on world climate change (McGraw-Hill Construction, 2013). One of the reasons for cross-regional or state studies is knowledge transfer, lesson learning, knowledge sharing and deepening (Bawa, 2013). Therefore, cross-regional comparative analysis of this nature could re-define knowledge in several broad areas of international green investment opportunities and knowledge transfer among developers and investors. At a deeper level, it would allow for benchmarking and a shift from “push” to “pull” factors that could refine institutionalized and localized perception and awareness of green building construction and investment. For example, Nigeria’s low power generation capacity, which has been fluctuating between 2700Mw and 3400Mw in the last three years (2014-2017), suggests that studies in alternative and sustainable energy uses is embarked upon.

3.0 Review of Related Theories and Literature

3.1 Theories Related to Green or Sustainable Building Demand Decisions and Motivations

Two popular theories used to explain the decision to demand and invest in green building are theories of planned behaviour (TPB) and Social Cognitive Theory (SCT). TPB theory is built on the anticipated behavioural control elements to explain for actions that happens little of or beyond individual's power of making choice and decision (Ajzen and Fishbein, 1980; Ajzen, 1991). The protagonists of this theory had contended that personal norms denote the power of normative opinions so also the enthusiasm to fulfil the views. On SCT, the behavioural model explains that motivations, expectations, forethought and prediction could rouse and direct person's act. This can come in the form of natural motive to assuage a particular physiological need (Nurul and Zainul, 2013).As regards to green-building demand, SCT theory holds that before individuals get involved in green project, they must be motivated. That motivation depends on the intention and implications identified through forethought, especially when the concept of green building is an emerging trend (Nurul and Zainul 2013).

Both theories (TPB and SCT) share similarity of opinions that one’s behaviour is influence by opinions, motivation and expectation. This assumption could be linked to the domain of environmental, social and economic factors of green building demand (Kalafatis et al,1999; Nurul and Zainul, 2013). For example, a predicted or the desire to contain greenhouse effect could influence individual decision to demand for green building or show a positive ecological concern and behaviour (Aliagha et al, 2013).Furthermore, individuals anticipating the likely consequences of an impending ecological disaster will set goals and plan courses of action to protect their environment. Altruistic environmental reasons, social gains, and financial maximization are typical motivators (Stern et al, 1999; Aliagha et al, 2013; Nurul and Zainul, 2013). Specifically, Aliagha and Yin Cin (2013) observed that environmental behavioural concerns is based on altruistic beliefs and attributes that promote motivations to protect eco-system and bio-diversity, as well as the quest for energy efficiency and C02 reduction. Its consequences could result to environmental, social and economic benefits (Nurul and Zainul, 2013). Perhaps that is why SCT theorists hypothesize that financial incentives such as tax credits, loans or grants, tax relief, property tax credits, low capital gains tax, and low stamp duties could motivate individuals to invest in green building. Such incentives

offered by the government are effective means of reducing the cost of green building and encouraging the growth of sustainable green building demand and construction (Nurul and Zainul, 2013).

4. Factors Affecting Buyers' Motivation and Perception on the Green or Sustainable Building Demand

4.1 Personal and Altruistic Environmental Motivations

Environmental altruism is acting or helping ecological act to gain internal and self-reward instead of external reward (Baston, 2008). By this definition, environmental risk-averse buyer's concern to be comfortable and avoid impending ecological hazards could base on personal and altruistic motivations. Thus, pro-environmental concern based on altruistic motivation and perception advocates for green buildings that minimize consumption of large resources such as water, energy and materials while improving thermal comfort and acoustic environment(Singh et al, 2010; Roa et al, 2012).In addition, green building that minimizes solid waste and maximizes the safety, health and quality of life of the occupants is perceived as altruistically significant (Stern et al, 1999; Onuoha et al, 2015). Rao et al (2012) found evidence that the quest for thermal comfort and quality acoustic environment influence people's demand for green commercial property. Perhaps this is because most conventional properties by their nature are associated with low productivity of workers and poor acoustic environment, which leave tenants and users irritable and distracted (Miller et al, 2009).Besides, Aliagha et al (2013) hypothesized that a potential property purchaser and occupant considers important the energy use and CO_2 emission of his building especially in this era of cost-consciousness. Thus, any property owner whose building is not energy efficient is likely to face environmental and cost challenges.

Hypothesizing personal and altruistic factors as motivators to green building demand Aliagha and Yin (2013) observed that personal and general altruistic motives are the key factors for energy conservation behaviour. According to the authors, personal norms that lead to pro-environmental action are activated by the belief that the environmental situation may threaten things, the individual values and that the individual can act to reduce the threat. For example, relating this to the study, this study posits that in demand to maintain thermal comfort in private real estate business organization while wearing business suits and neckties, the prevalent attitude and habit of most workers has been to set office air conditioning systems to a temperature as low as 20°C. However, with growing environmental awareness and consciousness office workers are developing pro- environmental beliefs that may be attributed to altruistic or personal moral norms and values. For instance, there are evidences that some office workers may be participating in energy conservation measures not only because it saves energy and money, but because of their altruistic belief that climate change and its effects on man and the environment are real and they can act to reduce these effects (Aliagha and Yin, 2013). Even when some may not believe or understand climate change, they may still feel morally obliged to engage in energy conservation behaviour because their friends and colleagues expect them to do so, or their boss expects them to comply because it is part of the organization's social responsibility and green work style to conserve energy and reduce their carbon footprint.

4.2 Corporate Conscience Responsibility Motivations

Documented evidence suggests that green building investment is a social process of meeting corporate responsibility. There are rising evidence that tenants demand for green real estate is due to enhanced reputation benefits and corporate social responsibility (Kok et al, 2012). Such a move in tenants 'desire for green building could mean that tenants are using the buildings that they occupy to communicate their corporate vision to shareholders and employees (Nurul and Zainul, 2013). The implication is that social factors could rouse the motivation and decision to undertake socially desirable actions such as going green. Therefore, ethical responsibility of caring for the environment and social pressure to meet the needs of communities and organisations could motivate the demand for green building. For example, foremost societies all over the globe admitted that persons want to live in beautiful and contented home environment and abundant green spaces, and closeness to transport and offices (Heerwagen, 2000). As reported by Green-Homes (2013) the cognitive motivating decisions to curb strains on local infrastructures in a community could be regarded as social responsibility. Such motive may be driven by the intention to minimize damage on structures such as landfills, aquatic source, tempest water drains, reclaim and produce green space, transport expansion and repairs for roads (Ian, 2010). Related to this, is user's satisfaction and reduction in absenteeism that improves output of workers and has the ability to attract and retain workers (Isa et al., 2013; Nduka and Ogunsanmi, 2015).

4.3 Economic and Financial Motivations

A common and attractive motivation for green commercial building investment is economic and financial benefits. The intention of any green commercial property investor is to get reasonable rate of returns from his investment. This benefit may not necessarily be in the form of cash but other soft-cost benefits. However, it may be convincible to admit that the initial cost of investing in green commercial property may be higher. This is because various variables such as the cost of building and certification may come into play. However, the initial cost expended are easily recouped within the life cycle operation and upkeep of the building (Nurick et al, 2015). Advocates of this

have justified their assertion on the operating cost reduction of green buildings in water, energy expenditure and improved performance of building tenants (Miller, 2009; Kok, 2012; Nurick et al, 2015). Thus, green building advantages are not only replicated on the cost benefits resulting from energy savings but also on the possible residual value of the property (Popescu et al, 2012). Being aware of this, experts say that green building goes beyond optimizing the life cycle economic performance of the building, to securing of grants and subsides, improvement in employees productivity and satisfaction as well as securing higher rents and increase resale value (Miller et al, 2009; Jim et al, 2013; Nurul and Zainul, 2013; Aliagha et al, 2013). Also Miller and Pogue (2009) had analysed the operating costs, energy impacts, productivity and tenant attitudes from a major real estate portfolio using 154 green buildings and over 700 tenants who have moved into primarily Energy Star-labelled buildings and found that many tenants find such space more productive, and that green buildings do save money on energy costs. Moreover, past literature on green building which mostly focuses on new construction show positive relationship between green commercial building and financial returns. For example, Eichholtz et al (2010) and more recent work by Kok et al (2012) largely found positive effects on market rents and selling prices on certified office buildings in USA. Also, other widely cited scholars (Miller et al, 2009; Fuerst et al, 2009) have mentioned evidence suggesting positive economic and financial related benefits from quicker absorption, higher occupancy rates, lower operating expenses, higher residual values as well as greater occupant productivity in green building investment.

5. Data and method

5.1 Data and Participants

When trying to identify and select individuals or group of individuals that are especially knowledgeable about or experienced with a phenomenon of interest, the key and appropriate sampling procedure often considered by researchers is purposive sampling technique. Our focus of inquiry is to a sample that are knowledgeable and experienced in the subject matter. Purposive sampling technique is a criterion-based sampling used when a researcher's focus of inquiry is to a sample that has a good understanding of the issues concerned. Our major aim of using purposive sampling method is to identify and select the key participants to this study. Participants were selected primarily because they are knowledgeable about the subject matter. Subsequently, we used stratified sampling to select samples for this study. Stratified sampling involves a process of stratification segregation of population nests or for investigation into strata or categories. We opted for stratified sampling in order to ensure adequate and better representation. However, the unit of analysis of this study ought to be buyers, users and occupants of green commercial building. (Piyapong et al, 2011; Mohd et al, 2013). This is ideal and normal.

In any case, what is often ignored and not known is the perception of the real estate development team on the demand side factors. Their opinions are likewise essential as they are regularly in direct contact and negotiations with potential purchasers and buyers. In this manner, they could have expert opinions on the motivating demand factors. Moreover, recent studies have used the opinions of real estate development team such as developers and investors to examine and investigate residential green building investment (Ibrahim et al, 2014; Yee et al, 2015; Elias and Lin, 2015). It is on this reasoning, that we take exception from previous studies, and based the unit of analysis of this study mainly on the perspective of the real estate development team rather than occupants. Thus, our research participants were real estate developers, investors, architects, estate surveyors and valuers, builders, and town planners who are involved and knowledgeable in green building development and investment. They mainly constitute the real estate development team. Given the greater concentration of research participants, Malaysia major urban city Kuala Lumpur was chosen to represent Malaysia while Abuja and Lagos represented Nigeria. The sample frame was drawn from the population of registered real estate development team of 13, 689 for Malaysia and 12,229 for Nigeria. As such, more questionnaires were distributed in Malaysia than Nigeria. Furthermore, the literature revealed that Malaysia has a lead in green building than Nigeria.

A total of 550 sets of questionnaires were distributed among the classes of respondents. In selecting the sample, guidance was taken from Krejcie and Morgan's decision model (1970).This model and research instrument was considered because it provides a generalized scientific guide and table for sample decision. In Malaysia, 400 questionnaires were distributed. Out of this number, 361 were returned. Out of 361 returned, 11 were removed because they were not properly completed. The remaining 350 represented 63.63% of the distributed questionnaires. In Nigeria, 150 questionnaires were distributed. Out of 148 returned, 2 were discarded because of incomplete responses. Thus, remaining 146 indicating 36.37% of the distributed questionnaires. So, in all, the total questionnaires returned from the study areas were 509 while 41 were not returned and 13 were removed. Therefore, the remaining 496 representing 90.18% were used for the analysis of this study. Questionnaires were administered face-to-face to the participants. Several visits were made and reminders sent including phones calls to the respondents. The study introduced incentives to motivate participants respond to the questionnaires. However, participants who had no time to complete the questionnaires either immediately or after the second and third appointments were given self-addressed stamped envelopes or e-mail addresses to return the questionnaires. The certified 496 questionnaires indicated the academic background of the respondents as follows: Malaysia: post-

graduate 22.6%; degree 47.7%, and diploma 29.7%. Nigeria: post-graduate 56.2%; degree 38.3%, and diploma 5.5%. It is evident that the respondents have either university or polytechnic education. On unit of the analysis, Malaysia developers constituted 30.1%; investors 23.6%; architects 18.0%; estate surveyors and valuers 12.3%; builders 12.0% and town planners 4.0%. For Nigeria, developers represented 48.6%; investors 17.1%; architects 9.6%; estate surveyors and valuers 6.2%; builders 4.8% and town planners 2.7%.

5.2 Instrument and measures

The questionnaire was limited to two parts. Part 1 contained general demographic questions of the participants designed to know their background information. While part 2 comprised a set of questions that were intended to shed light on participants' awareness of the green properties and on the perception of factors that could drive green property demand. The distributed questionnaires tapped into their perception of the following measures: personal and altruistic environmental motivation measures: [1]enhanced energy efficiency and CO_2 reduction, [2] improved water efficiency, [3] thermal comfort and quality acoustic environment; [4] reduction of solid waste and minimize site impact. Corporate conscience responsibility motivation measures: [1] users' satisfaction and more control over the environment, [2] minimization of strain on local infrastructure; [3] reduction in absenteeism; [4] boosts creativity, higher morale and lower workforce turnover. Economic and financial motivation measures: [1] optimization of life cycle economic performance; [2] securing grants and subsides; [3] improvement in employees' productivity and satisfaction [4] securing higher rents and increased resale value. Except the questions that dealt on demographic background of the respondents, the questions were measured on interval scale and nominal scale using 5 point Likert scale (I being least important, 2 somewhat important, 3 important, 4 very important and 5 extremely important). The above factors and variables were chosen because they have explanatory relationship with the theory and literature. Both the theory and literature support the factors. Moreover, the factors and variables provide fuller, comprehensive and adequate explanation of the issues that bring to bear on environmental, social and economic relationship with green commercial property. Thus, they have high strength and are comprehensively adequate for this study.

5.3Method

This study involves analysis of differences in perceptions of two group of sample populations Malaysia and Nigeria. As such discriminant analysis was used as the methodical statistic tool for this study. Discriminant analysis is used to study the differences and make comparison between two or more defined group on a set of variables measured at interval scale (Aliagha et al, 2014). It involves a statistical decision rule of maximizing between group variance relative to the within-group variance. This is essential in order to derive a liner combination of two or more discriminating variables that discriminate best between groups (Hair et al,, 1987). The linear grouping is derived from the following equation:

$$Z = {}_1X_1+W_2X_2+W_3X_3\ldots.. +W_{\ n}X_{\ n;}$$

Where Z = the discriminant score W = the discriminant weights, X = the independent discriminant variables.

The beauty of discriminant analysis is that concurrently, two classes of means and standard deviations of groups of populations can be analysed (Aliagha et al, 2014). These classes comprises the total mean score and standard deviation, the group mean score and standard deviations of the sub-classes of the respondents on the same. In using discriminant analysis, a test for equality of group means and developing a predictive model of group membership built on a set of observed discriminating variables could be achieved (Hair et al, 1987). As such, descriptive statistics (total mean and group mean) and inferential statistics, which include F test for Wilks' Lambda, Wilks' Lambda model, standardized canonical discriminant function (SDFC), eigenvalues, canonical correlation, and function at group centroids, were assessed. Variables that make significant differentiation between or among groups were identified through ANOVA *F* test for Wilks' lambda. Each variable's distinctive contribution to discriminant function were assessed using standardized discriminant function coefficients. A low standardized coefficient suggests that the groups did not vary significantly on that variable. The canonical correlation shows the multiple correlations between the predictors and the discriminant function. The structure matrix coefficient displays the correlation between each predictor variable and the discriminant function. Correlations that indicates loadings ≥ 0.3 are considered to have practical significance (Hair et al, 1987; Ndubisi, 2011). An essential criterion for using discriminant analysis is achieving the supposition that the variance-covariance matrices are comparable for the groups. This is usually confirmed by Box's M test of the null hypothesis that the covariance matrices do not vary among groups (Aliagha et al, 2014). Thus the result of this study shows comparable log determinants and variances that are not significantly different (Box's M = 525.815, $F = 14.288$; p value 0.972 is greater than 0.05). Therefore, the hypothesis that groups do not vary is supported implying that it is proper to use discriminant analysis.

6. Results and discussion

Table1 provides the group mean scores and tests of equality of group means statistics used to identify variables and assess the perception of the two countries on motivational demand factors and variables of green commercial

properties. Twelve (12) variables were used to determine their perceptions.

Table 1: Group Mean Differences and Test of Equality of Group Mean of Demand Drivers of Green Commercial Properties (Malaysia and Nigeria).

Variables	Group Mean			Test of equality of group mean			
	Total Mean/ Std	Malaysia Perception Mean / Std	Nigeria Perception Mean / Std	Mean Diff	Wilks' Lambda	F[a]	Sig
Enhanced Energy Efficiency & CO_2 Reduction (EECR)**a**[1]	4.41(1.007)	4.52(0.849)	3.14(1.457)	1.38	0.975	12.875	0.000
Improved Water Efficiency (IWE)**a**[2]	4.10(0.938)	4.13(0.866)	4.03(1.092)	0.01	0.998	1.106	0.294
Thermal comfort & Quality Acoustic Environment (TCQAE)**a**[3]	4.27(0.883)	4.31(0.780)	4.18(1.089)	0.13	0.996	1.932	0.165
Reduced Solid Waste & Minimize Site Impact (RSWMSI)**a**[4]	4.58(0.977)	4.62(0.854)	3.49(1.222)	1.13	0.997	1.661	0.198
User Satisfaction & more Control over the Environment (USMCOE)**b**[1]	4.80(0.999)	4.05(1.153)	3.69(0.909)	0.36	0.974	13.235	0.000
Minimize Strain on Local Infrastructure (MSLI) **b**[2]	4.58(1.061)	4.71(0.994)	3.28(1.155)	1.43	0.967	17.073	0.000
Reduction of Absenteeism (RIA)**b**[3]	4.07(0.950)	4.09(1.107)	3.92(0.873)	0.17	0.993	3.135	0.032
Boots Creativity, higher Moral & lower workforce turn-over (BCHMLWT)**b**[4]	3.95(1.112)	3.69(1.031)	3.50(1.280)	0.19	0.994	3.135	0.043
Optimization of life cycle Economic Performance (OLEP)**c**[1]	4.05(0.951)	4.07(0.883)	4.02(1.098)	0.05	0.999	0.262	0.049
Securing Grants & Subsidies (SGS)**c**[2]	4.07(1.048)	4.28(0.861)	3.58(1.269)	0.7	0.906	51.340	0.000
Improvement in Employee's Productivity & Satisfaction (IEPS)**c**[3]	4.15(1.089)	4.28(0.978)	3.83(1.267)	0.45	0.965	18.051	0.000
Securing Rents & Increased Resale Value (SRIRV)**c**[4]	4.15(1.080)	4.24(1.013)	3.91(1.197)	0.33	0.980	9.902	0.002

a[1] to **a**[4] = Personal and altruistic environmental motivations; **b**[1] to **b**[4] = Corporate conscience responsibility motivations; **c**[1] to **c**[4] = Economic and financial motivations

Table 1 shows that three of the four variables measuring personal and altruistic environmental motivations exhibited weak discriminant power, which suggest there were no significant group mean differences in perception between Malaysia and Nigeria on the variables (IWE, λ 0.998, $F = 1.106$., p >0:05; TCQAE, = λ 0.996, $F = 1.932$., p >0:05; RSWMSI, = λ 0.997, $F = 1.667$., p >0:05). Rather, there was more commonality of opinion than differences between the two groups on the three variables. Though, Malaysia recorded higher group mean values (4.13, 4.31 and 4.62) than Nigeria (4.03, 4.18 and 3.49), the mean differences were too small to make significant difference. On "enhanced energy efficiency andCO_2 reduction (EECR)" there was strong discriminant power and thus, significant group mean difference in perception between Malaysia and Nigeria (λ 0.975, $F = 12.875$, p < 0.05). Largely, although the two countries registered very high total mean on the four variables (all >4), it could be said that personal and altruistic environmental motivations measures, particularly "enhanced energy efficiency and CO_2 reduction'' constitute greater motivating factors for Malaysia than Nigeria. The explanation for this may be because of greater green awareness in Malaysia than Nigeria.

The total mean scores for the four variables measuring corporate conscience responsibility motivations range from 4.8 to 3.9, which overall could be regarded as high. This implies the variables have strong motivational effects on both Nigeria and Malaysia on green building demand. However, a close look at the group means reveals that the four variables exhibited strong discriminant power, which suggests there were significant group mean

differences in perception between the two countries on the variables. (USMCOE, λ 0.974, F = 13.235, p < 0:05; MSLI,λ 0.967, F = 17.073, p < 0.05; RIA, λ 0.993, F = 3.278, p < 0:05; BCHMLWT, λ 0.994, F = 3.135, p < 0:05). Malaysia recorded higher group mean values (4.05, 4.71, 4.09 and 3.69) than Nigeria (3.69, 3.28, 3.92 and 3.50) the group mean differences were large enough to make statistical difference. Corporate responsibility measures constitute greater motivation to commit to green space purchase in Malaysia than Nigeria. Put differently, corporate responsibility measures have strong motivational effects on Malaysia than Nigeria on green commercial building demand. The reason for this may not be farfetched. It is part of the spill over effects. Malaysia has more green building policies and promotional programmes that inherently include instilling corporate social responsibility.

On variables determining economic and financial motivations the two countries displayed high total mean scores on the four variables (all >4), indicating that developers in Malaysia and Nigeria recognise economic and financial motivations as strong factor for green commercial property demand. However, this perception is not balanced as Malaysia has stronger view on the role of economic and financial motivation. Looking at Table 1,there is clear evidence that all the four variables displayed strong discriminant power. This shows that there were significant group mean differences in perception between Malaysia and Nigeria on the variables (OLEP, λ 0.999, F = 0.262, p < 0:05; SGS, λ 0.906, F = 51.340, p < 0.05; IEPS, λ 0.965, F = 18.051, p < 0.05; SRIRV, λ 0.980, F = 9.902, p < 0.05). Malaysia recorded higher group mean values (4.07, 4.28, 4.28 and 4.24) than Nigeria (4.02, 3.58, 3.83 and 3.91), the mean differences were large enough to make significant group difference. Again, the fact that economic and financial motivations have stronger effect on Malaysia than Nigeria is not surprising. Malaysia has provided some green building incentives aimed at promoting demand and supply of green building. The real estate market participants in Malaysia may be more aware of this having known the practical and leveraging implications the incentives make for green space purchase.

6.1 Predicting Discriminant Function for Propensity to Demand Green Commercial Building

One of the objectives of this study is to derive a discriminant function that consist of the variables with greatest predictive power in accounting for differences in perception between the two groups (Malaysia and Nigeria).As such, a stepwise method of enter/remove use for deriving discriminant functions was adopted (Huberty and Barton, 1989).The method was used to specifically select only variables that contribute significantly to discriminant function while at the same predicting group membership. This is achieved by selecting a variable that minimizes the overall Wilks' Lambda at each step. Thus, the 12 variables in table 1 were subjected to stepwise method. As shown in Table 2, 8 out of the 12 variables, in a descending order of degree entered the model as follows: secure grants and subsidies > users' satisfaction and more control over environment > improvement in employee productivity and satisfaction > minimize strain on local infrastructure > optimization of life cycle economic performance> boots creativity, high moral and lower workforce turn-over > reduction in absenteeism, > enhanced energy efficiency and CO_2 reduction.

Table2: Predictive Model for Demand Drivers of Green Commercial Property Investment. Variables entered/removed [a,b,c,d].

		Wilks' Lambda							
						Exact F			
Step	Entered	Statistic	df1	df2	df3	Statistic	df1	df2	Sig
1	Secure grants & Subsidies	0.906	1	1	494	51.340	1	494	0.000
2	Users' satisfaction & more control over environment	0.856	2	1	494	41.544	2	493	0.000
3	Improvement in employee productivity & satisfaction	0.838	3	1	494	31.821	3	492	0.000
4	Minimize strain on local infrastructure	0.823	4	1	494	26.383	4	491	0.000
5	Optimization of life cycle economic performance	0.808	5	1	494	23.251	5	490	0.000
6	Boots creativity, high moral & lower workforce turn-over	0.797	6	1	494	20.774	6	489	0.000
7	Reduction in Absenteeism	0.780	7	1	494	19.622	7	488	0.000
8	Enhanced energy efficiency & Co2 reduction	0.773	8	1	494	17.896	8	487	0.000

Table3: Standardized Canonical Discriminant Function Coefficient and Structure Matrix of Demand Drivers of Green Commercial Property Investment

Standardized Canonical Discriminant Function Coefficient		**Structure Matrix**	
	Function1	Impact Ranking	(Within group Correlation)
Secure grants and Subsidies	0.578	1	0.595
Users' satisfaction & more control of the environment	-588	3	-0.302
Improvement in employee productivity & satisfaction	0.470	2	0.353
Minimize strain on local infrastructure	0.383	4	0.343
Optimization of life cycle economic performance	-0.306	7	0.043
Boots creativity, higher moral & lower turn-over	-0.370	6	-0.147
Reduction in Absenteeism	0.363	5	-0.006
Enhanced energy efficiency and CO_2 reduction	-0.225	8	-0.150

Function at Group Centroids	
Malaysia	0.349
Nigeria	-0.838

Statistics for Model Validation	
Canonical Correlation (CCr)	0.477
(CCr^2)	0.2275
Eigenvalue	0.294[a]
Wilks' Lambda	0.773
Chi – Square (df = 5)	126.282
Classification accuracy (hit ratio)	78.0%
Sig	0.000

In Table 3, the significance of the discriminant function was verified and the variables that have the strongest effect and correlation with the discriminant function were identified. As indicated in the table, a canonical correlation (CCr) of 0.477, was achieved which infers that at a function of 23% (CCr^2), the variance in the group differences were explained. Though when analysing with Wilks' Lambda method(ʌ), the function is treated as significant (ʌ = 0:773, χ^2 (df = 5) = 126.282, p < 0.01).Therefore, this study infers that there is significant discriminant function that evidently distinguishes Malaysia and Nigeria on the bases of their perception of factors that drives green commercial building demand. Displayed in Table 3 also is the standardized discriminant function coefficients (SCDFC) and structure matrix correlation applied to measure each variable's exceptional impact and correlation with the discriminant function.

The variables that have strongest impact and correlation with the discriminant function based on ANOVA (*F*) test, SCDFC, and structure matrix correlation, (within group correlation) include: secures grants and subsidies (ß = 0.578) and within group correlation (ß = 0.595). This is followed by "improvement in employee productivity and satisfaction" (ß = 0:470 and within group correlation (ß = 0.353). Others include: "users satisfaction and more control of the environment" (ß = -0.588) and within group correlation (ß = -0.302), minimization of strain on local infrastructure" (ß = 0:383) and within group correlation (ß =.0.343).Next is "reduction in absenteeism" (ß = 0.363) and within group correlation (ß = -0.006).Following this is the variable "boosts creativity, higher moral and lower workforce turn-over" (ß = -0370) and within group correlation (ß = -0.147); optimization of life cycle economic performance" (ß = -0.306) and within group correlation (ß = 0.043), and finally "enhanced energy efficiency and CO2 reduction" (ß = -0225) and within group correlation (ß = -0.150). The distribution and analysis gives analytical precision of the discriminant function. Thus, the model attained a hit ratio of 78.0 %demonstrating that 78% of the participants from both countries were correctly classified and predicted in terms of their perceptions of the factors that drive green commercial building demand.

7.0 Conclusion

The major objective of this study is to ascertain if there are significant differences between Malaysia and Nigeria on the perception of motivating factors that influence demand for green commercial building, as well as to determine the variables with the most predictive power in accounting for the differences in perception. The results showed that based on total mean alone, the three green building factors: personal and altruistic environmental motivations, economic and financial motivations and corporate conscience responsibility measures have strong motivational effects on both Malaysia and Nigeria concerning green building demand. However, it revealed that overall there is a significant discriminant function that evidently distinguishes and discriminates the two countries

on their perception of factors that drive green building demand. The variables with most predictive power in accounting for these differences in perception were found to be within the measures of economic and financial motivations.

Evidence from the result revealed that the motivation components for commercial green building demand is in favour of Malaysia. For example, the group mean of all the variables used in analysis of study indicates that Malaysia and Nigeria are not at same level of green or sustainable commercial property investment. This ranges from 3.69 to 4.71 for Malaysia and Nigeria 3.14 to 4.18.The mean differences were large enough to make significant group difference. This shows that the factors and the variable have stronger effect on Malaysia than Nigeria. It further goes to show that the real estate market participants in Malaysia have better awareness and perception of the factors affecting green commercial properties and leveraging implications of green purchase than their Nigerian counterparts. Furthermore, the result showed that Malaysia has policies that are more elaborate which have reflected in greater developer's motivation and increasing number of certified green buildings than Nigeria.

Nevertheless, the study has some important implications in the study areas. For instance, the study showed that Malaysia is still below average in green building performance index compared with other best-performing countries like Germany, Denmark, and Sweden etc. Malaysia green incentives and policies are still beset with notable criticisms. This could be apparently because incentives for getting GBI certification are not strongly market driven and adequately enticing to attract consumers and investors especially in the areas of qualifying persons, qualifying costs, standardization of GBI income incentives and stamp duty exclusion and absence of clarity. Again, Malaysia green tax is more pro-supply particularly in the area of green technology investment with little or no process of sensitizing the demand side. This isskewed because demand and supply complements each other. As such, it becomes necessary that Malaysia should improve on her green building incentives and policies to further boost green building demand and investment.

On the part of Nigeria, she has a lot to learn from Malaysia's experience. A key factor that is significant in Malaysia green building initiatives but is lacking in Nigeria as at the moment is policy development and expansion. Nigeria policy development initiatives is still at infant stage and more evolving compared with Malaysia.Elaborate green building policies have been made in Malaysia ranging from GBI policy provisions to green tax incentives relative to Nigeria. Nigeria uses the South Africa Green Star rating tool, this has however not significantly spurred green building investment in Nigeria. For example, the Green Star tool contain and awards lower green building points in the areas of energy efficiency, management and innovation policies compared to Malaysian GBI. The use of Green Star in Nigeria rating should be considered as temporary as its continued use does not demonstrate serious commitment to green building. Learning from the provisions of Malaysian GBI working policy may not be a new thing for Nigeria. For example, the Central Bank of Nigeria CBN between 2010 and 2011 adopted the Malaysian "Cagamas" model to rescue her financial market from total collapse during the global financial crisis of 2007 and 2008 (Olusegun et al, 2015). Through Asset Management Corporation of Nigeria (AMCON) the distress financial institutions were acquired, their capital base re-shored with funds and repackaged for sale to the public. Nigerian government can show leadership in green building by adopting some GBI policies, programs and incentives especially in the area of green technology that isstrong enough to sensitize green building investment. Nigeria needs to develop her rating tools like Malaysia, as the use of South Africa Green Star in the short-term may not sufficiently spur green building investment. Also, efforts should be made by the government to increase the sensitization of stakeholders on green building features and sustainable construction practices.

However, since this study points to cross-regional performance in green building investment as well as fundamental shift from localized information and perception on green property investment drivers, both countries through green technology transfer or green FDI (foreign direct investment) can allow for integrated work across geographical distances and easier information exchange. Through this, environmentally friendly industries technology and practices that directly contribute to environmental progress can be exchanged. Again, more efficient and innovative means to design and construct greenbuildings, as well as the expertise to do so, can be transferred across country borders. By looking to continent of Asia that share similar tropical features with her, Nigerian real estate professionals and policy makers could articulate and formulate less difficult and innovative green building policy systems, and avoid some difficulties and technicalities associated with the developed countries that do not share similar environmental features with her. Having said that, though Malaysia is performing better than Nigeria and has a lot Nigeria can learn from, it is pertinent that Nigeria also look beyond Malaysia for green building policies and programmes. Drawing additional experience from best performing countries and cities in green building such as Singapore will be ideal. This will have practical utility for not only green commercial property consumers, suppliers and investors who are seeking clearer explanations for commitment in green building but also for green building policy makers in Nigeria who are seeking workable strategies to incentivize green building demand.

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