RATIONALISING THE POTENTIAL OF

GREEN OFFICE BUILDING INVESTMENTS IN MALAYSIA

MONA ISA[1], , IBRAHIM SIPAN [2] ,TING KIEN HWA[3]and MEGAT MOHAMED GHAZALI MEGAT A. RAHMAN [4]

[1,2,4] Faculty of Geoinformation and Real Estate, Universiti Teknologi Malaysia (UTM), Skudai, Johor Bahru, Malaysia

[1,3] Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor Darul Ehsan, Malaysia

ABSTRACT

This study was conducted in response to the percieved lack of research carried out in the area of green office building investments in Malaysia. This situation can be attributed to the fact that green office buildings are relatively new, as such evidence on the investment return from these properties are very limited. Many investors have yet to see and realise the benefits and returns on investing in such investments. Due to the issue at hand, 394 questionnaires were distributed to office investors regarding the perception on the importance of return on investment (ROI) for green office buildings, with the aim to rationalise the potential of investing in such investment. The findings reveal that institutional investors, property developers and private individuals perceive the cost saving factor as the most important factor when investing in green office buildings.

Keywords: green office attributes, green office building, return on investment (ROI)

[1] *Email contact: monanuwanda@yahoo.com*

1. INTRODUCTION

Investments in green office buildings have recently attracted the attention of investors because of the potential of these buildings to provide high returns. Thus green development has resulted in a paradigm shift in real estate investments. Several studies have examined the returns and benefits of green office buildings compared with non-green buildings (Eichholtz, Kok, and Quigley, 2009; Fuerst and McAllister, 2010; Harrison and Seiler, 2011; Miller, Spivey, and Florance, 2008). Office buildings accredited with ratings system such as LEED and Energy Star show a positive effect on occupancy rate, rental, market value, lower capitalisation rate and cost savings (Newell, MacFarlane, and Kok, 2011). Various regression models based on existing studies have been established to measure these factors. The present research study takes into consideration the early phase of Malaysia's sustainability efforts and the determination of the importance of the return factors as perceived by investors and of the influential factors such as green attributes and risks that affect returns. The results of this study are crucial in the understanding of the overall perception towards investments in green office buildings as a new investment option. The confidence of investors in this new form of investment can be assessed through their perception of such investments.

Theoretically, investors' expected returns on investments (ROIs) for green office buildings are similar to that for conventional buildings, but these returns differ in some ways. According to the triple bottom line perspective, the scope of ROIs for green office buildings includes monetary elements such as financial returns and non-monetary elements such as social and environmental benefits (Lutzkendorf and Lorenz, 2005). The concept of returns brings a new dimension to social benefits and environmental benefits. However, investors are more interested in financial returns determined by yield, income/rental and capital appreciation than in non-monetary returns, which bring long-term benefits to the improvement of investments. Another significant difference between green and non-green office buildings is the cost saving in building expenses, including energy, water and waste management, and maintenance expenses. Financial incentives contribute to cost savings because of the benefits of being green. Green office buildings apply sustainable techniques that help reduce operating costs, thus increasing the net income of such buildings. By contrast, conventional buildings normally incur high costs, particularly in energy consumption, and thus burden building owners. High building expenses affect ROIs by reducing net income. Risks and building factors such as building design and architecture, facilities and services, types of tenants and management efficiency also affect ROIs. These are the common factors that affect the ROIs for both green and non-green office buildings.

Along with the heightened awareness of green real estate investments is the growing interest in obtaining feedback from stakeholders using questionnaires. In the present study, we gather such feedback from office building owners and single tenants within the Federal Territory of Kuala Lumpur (FTKL) using a questionnaire survey. The results of this study identify the factors that influence investors' perceptions of ROIs for green office buildings. These factors include green attributes, risks, and building factors. Kuala Lumpur is selected as a case study reference for Malaysia, it being the capital city and with a conurbation of the country's landmark office buildings, a juxtaposition of the conventional and the green.

2. DRIVERS AND BARRIERS IN GREEN REAL ESTATE INVESTMENT

There have been a number of studies on the drivers and barriers in green real estate investment (Addae-Dapaah and Chieh, 2011; Bond and Perrett, 2012; Ellison, Sayce, and Parnel, 2007; Falkenbach, Lindholm, and Schleich, 2010; Morri and Soffietti, 2013).

Falkenbach et al. (2010) grouped the drivers into three main categories and empirical studies have concluded that the advantages in green real estate investment property are more focused on corporate drivers in developed countries such as the United States, the United Kingdom, Europe, and Australia. Further evidence on rents and values in other markets, and green certification types, are important in providing a perspective of the variations between countries.

Ellison et al. (2007) classified the green real estate investment in the United Kingdom as being driven by fiscal measures that include legislation and regulation, and market factors. The market transformation towards green real estate investment will only be realised sooner in the future, if an index of the performance of existing buildings, correlating financial return and sustainability, is made much earlier than expected and more easily available.

Bond and Perrett (2012) ranked the drivers that lead green real estate development in New Zealand from 1 to 10, with the highest rank being tenant satisfaction and productivity, followed by superior building performance, rising energy costs, competitive advantage, lower lifecycle costs, industry rating system (Green Star), government policy, building code and education in awareness, and the availability of green products. The advantages of investing in green buildings with the highest rank are occupancy rate, increased property value, high rental, marketing potential, better indoor air quality, and decreased obsolescence.

Morri and Soffietti (2013) found that higher green premium in green building investment in Italy are due to factors such as cost saving, high occupancy rate, cap rate reduction, and green labelling, while high price premium is due to additional costs involved in the investment. The study showed that green practices are mainly concentrated on office and commercial buildings in high density urban areas due to the fact that green buildings are energy saving and have high market demand.

Addae-Dapaah et al. (2009) conducted a survey study of 400 commercial real estate users in Singapore, on the perception of the benefits of green buildings and what were the factors that tend to influence decisions to either occupy or invest in them. It was found that the respondents were aware of and appreciate the benefits of green buildings, but they were not yet ready to occupy or invest in them as they were more concerned about monetary aspects and financial returns. However, they would be willing to invest in green buildings if it was proven they could reduce costs and command higher property values. This shows that green building is a future investment option, provided a better return higher than that of the ordinary buildings is produced.

Another survey study on property developers and investors in New Zealand was carried out to gauge their perception of sustainable buildings and actions associated with their own commercial portfolios, as well as the impact upon sustainability. The purpose of the study was to examine the relationship between the sustainability element and the market value of an office building.

Results of the study showed that green buildings will be an important component of property portfolios in the future. The researchers also suggested that a more detailed study should be conducted since the property industry has yet to identify the added value of sustainable buildings, and has not integrated this into the evaluation process (Myers, Reed, and Robinson, 2008).

A further study of 20 investors was carried out in the United Kingdom, which included institutional investors, property investment consultancy companies and property companies. The aim was to understand their perception of the significance and relevance of sustainable criteria, including annual energy efficiency, climate control, waste management, water management, pollution, physical adaptability of the space, and accessibility. The result of the study confirmed the importance of addressing sustainability within the commercial property stock, especially on the issues of annual climate control and accessibility by car (Ellison et al., 2007).

A similar survey research was undertaken by Sayce et al. (2007) in the United Kingdom involving 240 institutional investors, valuation surveyors, property developers and financial institutions to identify whether factors including green incentives could have a direct impact on rental value and yield. It was found that sustainable building investment is subject to risk mitigation and there was no evidence of return on investment.

Another survey study carried out by Myers et al. (2008), involving property developers and investors in New Zealand, investigated their perception of sustainable buildings, their actions with regard to their own commercial portfolios, as well as the impact upon sustainability. The relationship between sustainability and the market value of an office building was also examined. The findings of the study indicated that green buildings would be an important property portfolio component in the future. The researchers also suggested that a more detailed study should be made as the industry has yet to identify and assess the added value of sustainable buildings, and also such an assessment has yet to be integrated into the process of evaluation.

Studies were also conducted by Issa et al. (2010) for Canadian specialists comprising 1,200 LEED professionals on their awareness of and confidence in research work assessing the cost premiums, long term cost benefits, and health and productivity benefits of green buildings. The statistical analyses using t-test and mixed-model Anova test showed that the respondents were still unsure about the results of the research conducted in the field of green buildings, especially the costs and benefits of green buildings. They also argued that the decision to go green was totally dependent

on the owners of the building. Nevertheless, they concurred that green buildings could reduce energy cost which is the main expenditure in most office buildings. In Malaysia, research has yet to direct the focus on investors' interest in green office buildings.

Semi-structured, in-depth interviews were conducted with 7 residents and their neighbours in a case-study building undergoing green refurbishment in Melbourne, Australia. It was found that commercial property tenants were keen supporters of the concept of sustainability. Tenants were interested and willing to engage in discussions about sustainability initiatives but the process, cost, and benefits had to be more explicit (Miller and Buys, 2008).

The major barriers to green investment in real estate were discussed by Zhang, Platten, and Shen (2011); Issa, Rankin, & Christian (2010); Choi (2009). Their impression was that one of the reasons why investors tend to refrain from investing in green office buildings was the high initial cost of construction. Choi (2009) explained that the high cost is due to the knowledge gap in green development quantification, and the lack of communication. Hamidi (2010) pointed out, that the high cost of construction for green offices and commercial buildings can be attributed to the lack of green expertise to initiate green design strategy from the early stages of building design and planning. Yoke (2011) found that there is no enforcement in applying green standards in green building construction in Malaysia, and this could contribute to a sluggish transition to green developments. To aggravate matters, the slow recovery of long-term cost saving hinders the progression of green building development (Issa et al., 2010). If construction cost is reduced and the benefits of applying green concepts are scientifically proven, then the perception of investors can be improved (Ellison et al., 2007).

Two important factors that affect the cost of green office and commercial buildings in Malaysia are:

a) the coordination and experience of the project consultants team; and

b) the early adoption and implementation of a green strategy in the building design and planning stages (Hamidi, 2010).

Investment in green office buildings can be expected to increase, if the construction cost could be reduced and the benefits be increased. Likewise, for existing green office buildings, investors prefer to receive capital appreciation or rental growth and have low maintenance costs (Sayce et al., 2007). The drivers influencing demand and supply of green buildings are still being developed and further research is required on the beneficial characteristics of these buildings (Lutzkendorf and Lorenz, 2007). A comprehensive effort should be made through raising public awareness, and by government agencies in providing green incentives and regulatory policies to ensure a steadily increasing demand, improved functionality and quality of green buildings.

2. RESEARCH METHODOLOGY AND METHODS

To assess the status of green office building investments in Malaysia, feedback was obtained from office investors that own and rent office buildings in the Federal Territory of Kuala Lumpur using a questionnaire survey. Prospective respondents are stakeholders of the office building, or a representative of the owner, and they should hold at least a managerial position in the organisation. The profile of the respondents include gender, age, highest tertiary qualification, positions held in the organisation, and years of experience. As all respondents hold high managerial positions within their respective organisations, their opinions can be considered strong enough and noteworthy for this study to determine the expected ROIs of organisation and the various factors influencing such returns.

This study employed the questionnaire method which is an inexpensive and efficient way to collect data that cover a wide geographical area (Neuman, 2011). The questionnaire consisted of 44 items that represented the various factors related to green office building investments. The rating of these items by the respondents were in terms of their 'degrees of importance'. The questionnaire comprised two parts. The first part evaluated the factors considered important by investors when investing in green office buildings. The second part evaluated the factors that significantly influence ROIs for green office buildings (see Appendices 1 to 3). The questionnaire survey is similar to those carried out in Singapore (Addae-Dapaah et al., 2009), Italy (Morri and Soffietti, 2013), the United Kingdom (Sayce et al., 2007), and New Zealand (Bond and Perrett, 2012). The length of the questionnaire and the questionnaire items were redesigned to suit local conditions and the assessment of green office buildings in Malaysia. A five-point Likert scale was employed for the questionnaire.

The respondents that made up the study sample included institutional stakeholders, private individuals, and property investors cum developers who own and rent office buildings within the Federal Territory of Kuala Lumpur (FTKL). Since past studies had focused mainly only on institutional investors, this research has included property developers and private investors as part of the sample since both types of investors also own office buildings for investment.

The sampling size was based on the total population of office buildings. As the capital city of Malaysia, Kuala Lumpur has the largest population and the highest concentration of office buildings in the country. According to the National Property Information Centre (NAPIC), the total number of office buildings in the FTKL in 2010 was 384. This number reached 394 in the first quarter of 2013. The gross floor space of these buildings totalled approximately 81,159,700 sq. ft., mostly located in the Kuala Lumpur City Centre/Golden Triangle, the Central Business District, and the out-of-town locations. Kuala Lumpur is also the centre of tertiary services and businesses in Malaysia.

3. RESULTS AND DISCUSSIONS

3.1 Descriptive Statistics

The covariance matrix method is used to calculate the descriptive function so that all variables could be included in the analysis. The composite scores of the variables are then computed by taking the means of the scores of the original measurement items. Table 1 presents the means, standard deviations and standard errors of the variables.

Table 1: Results of the descriptive statistics

Variable	Statistic		Mean	Std. Deviation	Std. Error of Mean
	Min	Max	(M)	(SD)	(SEM)
Financial Returns	2.00	5.00	3.75	0.51	0.05
Cost Savings	2.67	5.00	4.05	0.48	0.05
Financial Incentives	1.75	5.00	3.66	0.57	0.06
Social Benefits	2.40	5.00	3.59	0.60	0.06
Environmental Benefits	2.00	5.00	3.52	0.78	0.08
Risks	2.00	5.00	3.52	0.61	0.06
Building Factors	2.33	4.83	3.77	0.45	0.04
Energy Efficiency	3.00	5.00	4.08	0.39	0.04
Water Efficiency	2.00	5.00	3.72	0.64	0.06
Indoor Environmental Quality	2.00	5.00	3.97	0.54	0.05
Sustainable Site Planning and Management	2.25	5.00	3.72	0.52	0.05
Materials and Resources	2.00	4.67	3.64	0.56	0.05
Innovation	2.00	5.00	3.76	0.58	0.06

The mean is applied as a measure of central tendency. As shown in Table 1, all variables are above their midpoint level (3). The highest mean rating belongs to "Energy Efficiency" (M = 4.08). This is closely followed by "Cost Savings" (M = 4.05). The lowest mean rating belongs to "Environmental Benefits" and "Risks," both of which show a mean value of 3.52. The standard deviation is applied as a dispersion measure to indicate the degree to which each variable disperses from the variable mean. The individual values of "Environmental Benefits" deviate the most from its mean (SD = 0.78), a phenomenon indicating that the variation in the responses of the survey participants was highest for this variable. "Energy Efficiency" shows the lowest deviation from the mean with a standard deviation of 0.39. Finally, the standard error is applied as the other dispersion measure to indicate the degree to which each variable mean deviates from its relative population mean. The mean of "Environmental Benefits" deviates the most from its population mean at SEM = 0.08, whereas the means of "Building Factors" and "Energy Efficiency" deviate the least from the population mean at SEM = 0.04.

3.2 Respondents' Background

This section makes a further investigation into the respondents' background, taking into consideration types of investor, general opinion on green office buildings, office building ownership and building types, level of participation in green real estate investment, current plan in green office building portfolio, identification of a green office building investment portfolio, and the level of success in such investments.

3.3.1 Types of investor

Table 2: Types of investor

Group	Frequency (No.)	Percentage (%)	
Institutional	51	48.1	
Private individuals	13	12.3	
Property developers / company	42	39.6	
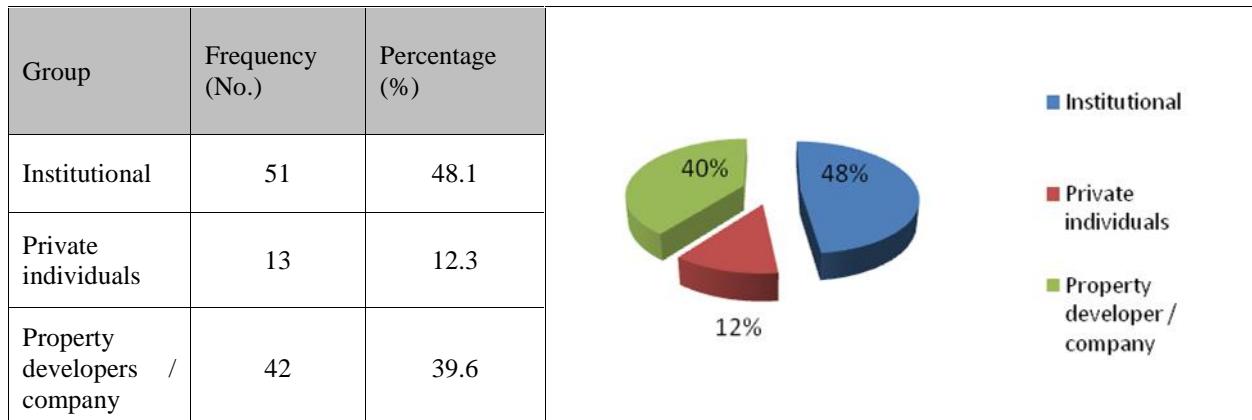
From Table 2, the majority of organisations that own office buildings in the Federal Territory of Kuala Lumpur are institutional investors, representing 48% of the ownership. They are financial institutions, insurance companies, building societies, investment trusts or fund management companies, pension funds and government agencies. Property developers account for 39.6% of investors, and private individuals represent 12.3%. The finding that institutional investors have the greatest involvement in office investment in Kuala Lumpur is similar to the findings by Parker (2000), Huyghebaert and Hulle (2004), Davis (2005), Nielson (2005), and Nappi-Choulet (2006) in that these researchers found that institutional investors make up the largest group of investors in many countries.

3.3.2   General opinion on green office buildings

Table 3: Perception of green office buildings in general

	N	Mean		Standard Deviation (S.D)
	Statistic	Statistic	SEM	
1. Environmentally friendly	106	4.142	0.05	0.467
2. Energy saving	106	4.094	0.05	0.489
3. Cost saving	106	3.991	0.06	0.625
4.Better working environment	106	3.953	0.06	0.575
5. Better image	106	3.868	0.06	0.663
6. Produce better rental	106	3.736	0.06	0.590
7. Generate better yield	106	3.717	0.06	0.565
8. Better marketability	106	3.708	0.06	0.601
9. Attract prestige tenants	106	3.642	0.07	0.665
10. High occupancy rate	106	3.547	0.06	0.649
11. Better access to public transport	106	3.500	0.08	0.831
12.Low building maintenance	106	3.491	0.08	0.772
13. Will invest in a green office building	106	3.274	0.09	0.879

Table 3 lists the 13 variables. From these 13 variables, it is observed that the general perception of the respondents was that green office buildings are environmentally-friendly (M = 4.142), energy saving (M = 4.094), and cost saving (M = 3.991). Green office buildings are also perceived as having a better working environment (M = 3.953), a better image (M = 3.868), produce better rental (M = 3.736), generate better yield (M = 3.736), and have better marketability (M = 3.708). Nonetheless, respondents are generally reluctant to invest in green office buildings, as indicated by the mean score for this variable which is the lowest (M = 3.274). From this finding, it is clear that the respondents generally perceive green buildings as synonymous with environmentally-friendly buildings. The terms *sustainable*, *green*, and *environmentally-friendly* are terms in common that reflect the interpretation that an office building is green. The term *green* refers to a concept for buildings in the residential, commercial and industrial sectors, and such buildings are frequently referred to as being environmentally-friendly.

This research indicates that, from the investors' perspective in Malaysia, green office buildings are perceived as energy cost saving. The significant difference between green and non-green office building investments is the lower energy consumption which contributes to energy cost savings.

3.3.3   Office building ownership and type of building owned

Table 4: Frequency of office building ownership and type

Owning an office building			Type of owned office building			Descriptive statistics of owned office buildings			
Group	Frequency	%	Group	Frequency	%	Group	Mean	Std. dev.	Sum
Owner	88	83.0	Non-green	72	67.9	Non-green	10.427	39.633	855
			Green	7	6.6				
			Both	9	8.5	Green	1.563	1.031	25
			Missing	18	17				
Tenant	18	17.0	X	X	X	X	X	X	X

As in Table 4, most organisations (88) are building owners accounting for 83%. Of these, there are 72 (67.9%) non-green structures, 7 (6.6%) are green-certified, and 9 (8.5%) respondents own both green and non-green office buildings. By contrast, only 18 or 17% of the organisations rent their buildings. About 67.9% of the organisations own non-green buildings whereas 6.6% own green office buildings, and 8.5% own both green and non-green buildings. An illustration of the findings is shown in Diagram 1.
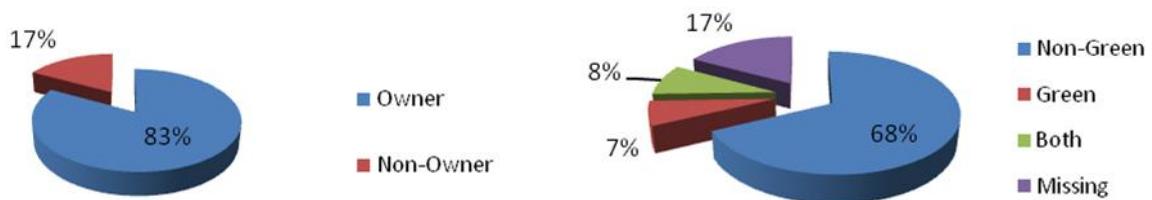

Diagram 1: Frequency of owning office buildings and type

3.3.4 Level of participation in green office building investments

Table 5: Frequency of level of participation

Group	Frequency (No.)	Percentage (%)
None at all	9	8.5
Knowledge	30	28.3
Awareness	41	38.7
Readiness	10	9.4
Practice	16	15.1

Table 5 shows that the organisations have a high level of awareness (38.7%) of the concept of green office investment, claim to be knowledgeable (28.3%), and are active in practice (15.1%). This result confirms that the respondents are well aware of the green benefits, but they still do not have much intention to implement green building investment, as only 15.1% of the stakeholders practised green real estate portfolio development at the time of this study. Nearly 10% of the respondents are ready to invest or to implement green strategies. These findings are consistent with the current number of green office buildings in Kuala Lumpur, described in Table 7 – Frequency of office building ownership and type.

3.3.5   Green office building investment portfolios

Table 6: Frequency of current plans to achieve a green property portfolio

| Group	Frequency (No.)	Percentage (%)	
No plan at the moment	84	80	
Purpose new green	8	7.6	
Future upgrading	8	7.6	
Retrofitting and green adaptation	5	4.8	
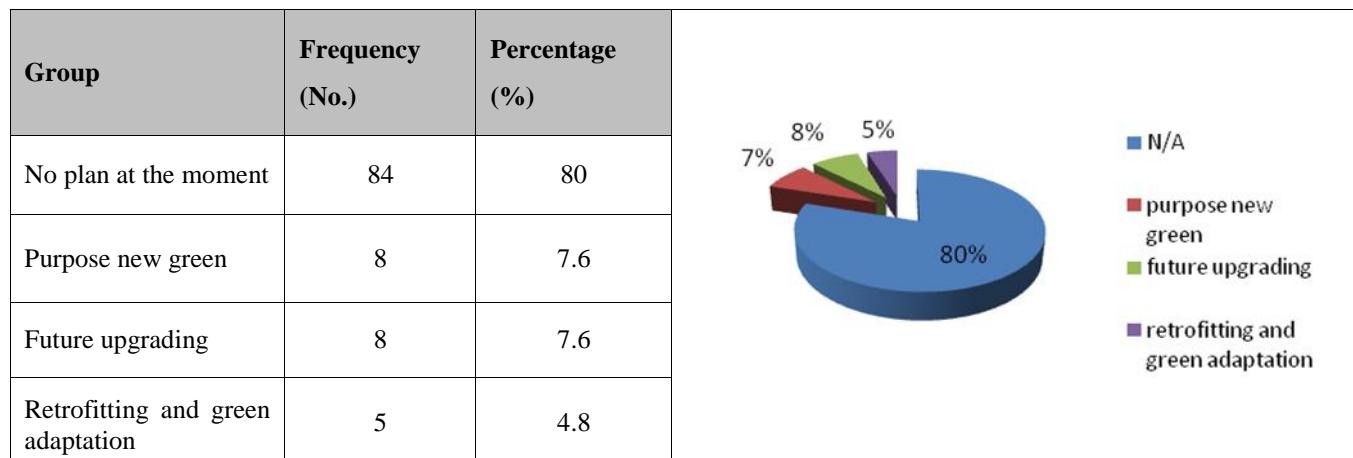
Missing = 1 of 106

Table 6 shows that 80% or 84 organisations do not have any immediate plans yet to convert their buildings to green standards, or to build new green office buildings. However, it is encouraging to note that about 20% of the organisations are considering upgrading plans in the future, which will include purpose new green, future upgrading, and green retrofitting and adaptation.

3.3.6 Location of green office buildings in KLFT

Table 7: Frequency of green office building location

Group	Frequency (No.)	Percentage (%)	
Golden Triangle	8	7.5	
Central Business District	2	1.9	
City Centre	3	2.8	
Suburban KL	3	2.8	
Other	0	0	
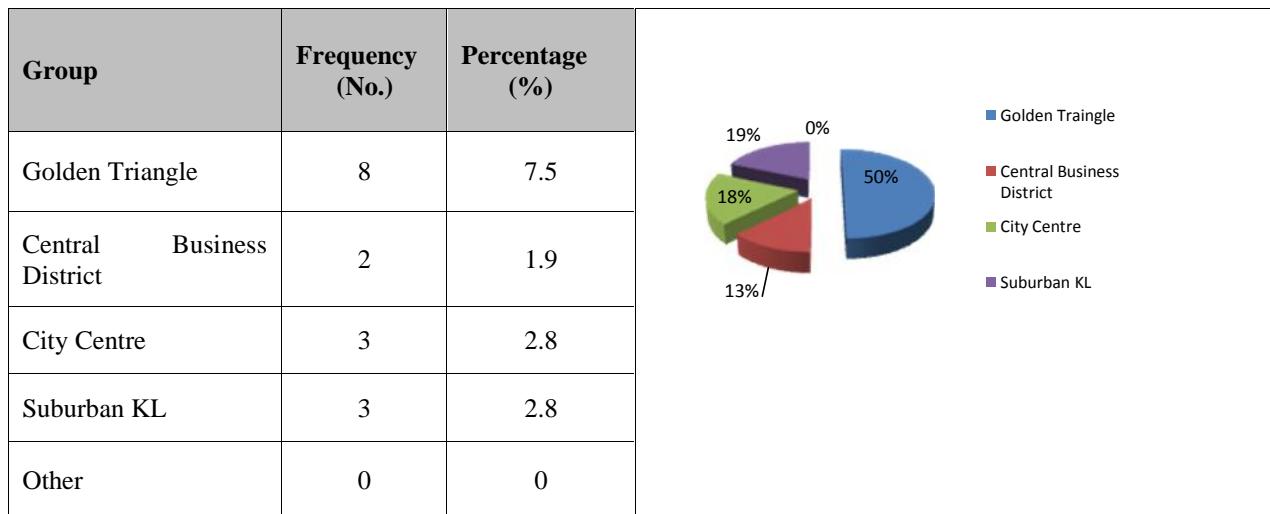
The majority of green office structures are concentrated in the Golden Triangle, where there are eight buildings. There are three each in the City Centre and Suburban KL areas, while the remaining two are located in the Central Business District, as indicated by Table 7. The survey shows that ten buildings have been completed and are occupied, four are newly completed, and two more buildings are still under construction. This is described in Table 8 – Frequency of building status. National Property Information Centre (NAPIC) indicated that in 2013 there were 89 office buildings located in the Golden Triangle, compared to 132 in the City Centre and 95 in the Central Business District. It is found that most of the prestige office developments of Grade A buildings are located in the Golden Triangle, and these include green buildings. This survey confirms that the green office buildings in Kuala Lumpur are concentrated in the prestige location known as the Golden Triangle.

3.3.7 Green office building's construction status and purposes

Table 8: Frequency of building status

Group	Frequency (No.)	Percentage (%)	
Under construction	2	12.5	
Newly completed	4	25.0	
Completed with occupation	10	62.5	
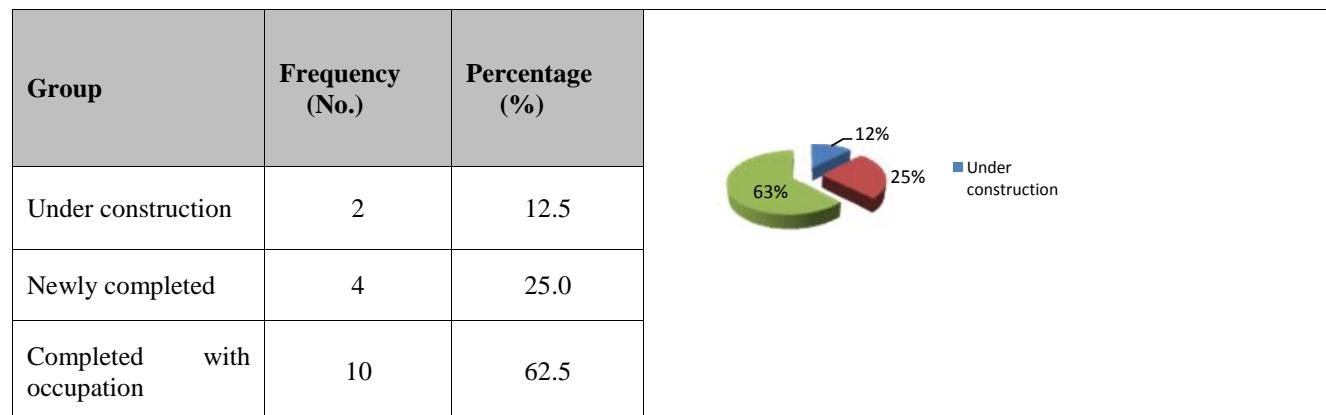
Missing = 72 of 88

Table 9: Frequency of purpose of constructing a green office building

Group	Frequency (No.)	Percentage (%)
Investment	8	7.5
Owner occupation	3	2.8
Both of the above	5	4.7
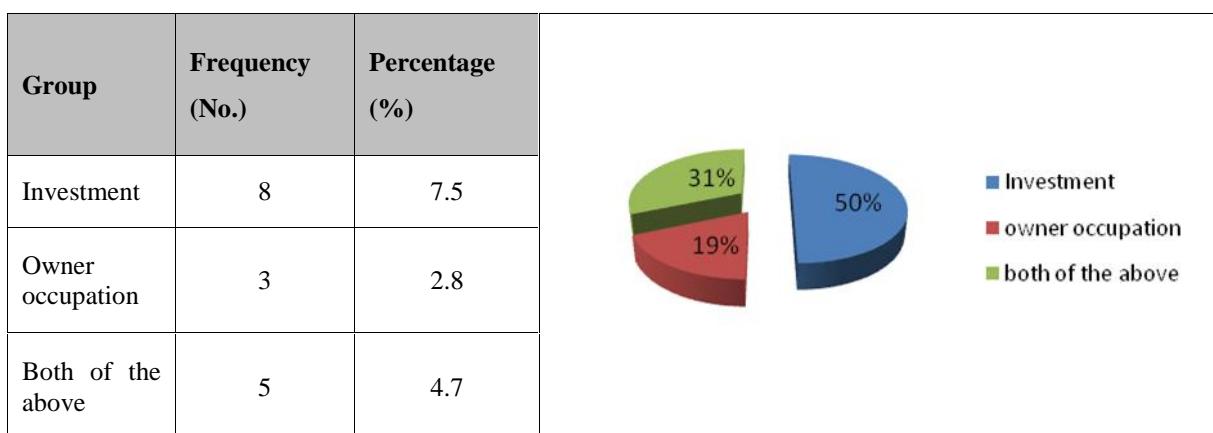
Most organisations (nearly 8%) own office buildings for investment purposes, about 3% own buildings for their own occupation, and close to 5% own the properties for both investment and own occupation. This finding is similar to (Nielson, 2008; Parker, 2000) who described institutional investors as large entities with considerable capital to invest in real assets for long-term investment purposes, including office buildings.

3.3.8 Green office building investments' level of success

Table 10: Frequency of general overview on level of success

Group	Frequency (No.)	Percentage (%)
Not successful	2	12.5
Averagely successful	5	31.3
Successful	8	50.0
Very successful	1	6.3

In the observation of the level of success of green office building investments, Table 10 shows that an average of 50% of building owners find green office building investment successful, 6.3% considers it highly successful, 31.3% thinks it averagely successful, and 12.5% believe the investment is not successful. Interviews were conducted with the respective respondents who were then asked why they perceived the green investment was unsuccessful. Feedback from these interviews revealed the reasons being the lack of green incentives, and inconsistency in the current green policies, thus causing some negative aspects and difficulty in sustaining the building. For example, a green office building has proven there is a great improvement in electricity saving. However, this advantage is not compatible with the minimum energy consumption requirement for commercial buildings by Tenaga National Berhad (TNB). TNB will impose a financial penalty on any office building that does not consume more than the minimum amount of electricity in the first six months of operation. This, of course, conflicts with the purpose of adopting green energy saving in a building. One of the green incentives and advantages available in Malaysia is the eligibility to apply for tax and stamp duty exemptions for GBI-certified green buildings. Currently, the GBI is also proposing that local authorities lower the assessment rates of GBI-certified buildings, using the rationale that green buildings reduce waste production, besides having lower energy and water consumption. Another disadvantage is the cost of materials for green construction as this market sector is currently more expensive than the conventional, which has been mentioned by Choi (2009).

The GBI has created an initiative to provide Malaysian suppliers information in their directory that supports more competitive green material pricing levels. On further investigation, it is clear that the respondents who do not believe in the success of green investment have several reasons, including that of failure to meet the break-even of the capital investment, as the building was relatively still new and not operating to full capacity, and that currently, there are not enough green incentives being given.

3.4 Perception of investors on the importance of ROI sources for green office building investments

Table 11: Mean score analysis of the perception of investors on the ROI sources for green office building investments

Return factors/ROI sources	Mean	SD
1. CS_1 Energy efficiency	4.132	0.536
2. CS_2 Water & waste efficiency	4.038	0.584
3. CS_3 Operations & maintenance	3.991	0.640
4. FR_1 Capital appreciation	3.915	0.604
5. SB_5 Productivity	3.811	0.678
6. FI_3 Green incentives	3.802	0.668
7. SB_4 Satisfaction from occupation	3.764	0.711
8. FR_2 Rental income	3.755	0.728
9. FR_3 Occupancy rate	3.736	0.721
10. FI_2 Green tax assessment benefits	3.726	0.670
11. FR_4 Yield	3.613	0.626
12. SB_3 Branding	3.557	0.806
13. EB_2 Minimise pollution	3.5472	0.794
14. SB_2 Image	3.519	0.842
15. EB_1 To sustain the environment	3.500	0.907
16. FI_1 Insurance premium	3.462	0.771
17. SB_1 Corporate social responsibility	3.293	0.828

In Table 11, the perception of respondents is that financial return which is defined as higher capital appreciation, claimed the fourth highest return expectation when investing in green office buildings (M = 3.9906). This was followed by social benefits which refer to higher productivity due to better indoor air quality, natural lighting, and a user-friendly layout and design (M = 3.8113). The environmental benefits ranked in Table 7 include minimised pollution (M = 3.5472) and sustaining the environment, whereby buildings emit less carbon dioxide into the environment (M = 3.5000). Of interest to note, they scored low for the expected return, at positions 13 and 15 respectively, out of the 17 variables. The lowest expected return perceived by the investors is their corporate social responsibility towards sustainability and the environment, with the mean score of M = 3.2925. Malaysian investors are seemingly more concerned about building expenses due to several factors identified such as energy efficiency, including an increase in energy costs every year, high building operating expenses especially electricity usage, office equipment, lifts, and air conditioning systems.

3.6 Perception of investors on the importance of green office attributes affecting ROI

Table 12: Mean score analysis of the perception of investors on green attributes affecting ROI for green office buildings

No	Item	Mean Score	SD
1.	EE_5 Efficient energy performance	4.1415	0.52443
2.	EE_4 Efficient cooling system	4.1321	0.45931
3.	EE_1 Renewable energy	4.1038	0.56786
4.	EE_3 Lighting	4.0660	0.44226
5.	EQ_4 Health & safety	4.0000	0.41096
6.	EQ_1 Air quality	3.9906	0.62481
7.	EQ_3 Lighting, visuals & acoustics	3.9906	0.60938
8.	EE_2 Electrical sub-metering	3.9434	0.65944
9.	EQ_2 Thermal comfort	3.9434	0.58277
10.	SM_4 Building design	3.9434	0.58277
11.	IN_1 Innovation	3.9340	0.65128
12.	MR_2 Waste management	3.7925	0.62818
13.	WE_2 High tech appliances & fittings	3.7642	0.66978
14.	SPM_3 Accessibility	3.7547	0.67346
15.	MR_2 Green products	3.7075	0.66141
16.	WE_1 Rain conservation	3.6698	0.75241
17.	SM_2 Construction management	3.6321	0.73453
18.	IN_2_Green accreditation	3.5849	0.71538
19.	SM_1 Site planning	3.5566	0.73134
20.	MR_1 Reused & recycled materials	3.4340	0.76866

From Table 12, the study reveals that efficient energy performance with an efficient cooling system and use of renewable energy, are perceived as very important factors affecting the ROI (M = 4.1415 to M = 4.0660), followed by indoor air quality attributes. This finding shows that green accreditation (M = 3.5849), site planning (M = 3.5566), and reused and recycled materials (M = 3.4340) are perceived as the least important factors that affect the return for green office building investment. These perceptions show that energy efficiency is the most important factor to determine a higher return from green office building investment. This study has resulted in similarities with previous studies, showing that energy efficiency attributes distinguish green office buildings from conventional buildings.

The three attributes of green accreditation, site planning, and reused and recycled materials scored the lowest mean scores (M = 3.4340 to 3.5849), indicating that investors perceive that green accreditation is not an important attribute, in achieving a better ROI. This is contradictory to most previous studies which conclude that green accreditation has a significant effect on the return, especially for rental value, branding, and market value. This survey result is not surprising, however, because the lack of best practices among the property investors (M = 4.208) and the lack of property performance data on green buildings (M = 3.774) may have influenced the opinions of investors that green accreditation is not an important attribute as shown in Table 19. Furthermore, this result can be linked to the knowledge of the investors on green concepts, which recorded that the majority of investors have an awareness level at 38.7%, but only 16 respondents out of the 106, about 15%, are currently investing in green office buildings.

Table 13: Descriptive statistics on the barriers in green office building investments

	N	Mean		S.D
	Statistic	Statistic	Std. error	
1. Lack of best practices among property investors	106	4.208	0.40	3.949
2. Higher capital required to invest in green office buildings	106	3.981	0.07	0.704
3. Lack of property performance data on green buildings	106	3.774	0.07	0.666
4. No legal requirement to invest in green office buildings	106	3.745	0.07	0.704
5. Not enough public sector encouragement	106	3.726	0.07	0.750
6. Insufficient tenant demand	106	3.679	0.07	0.684
7. Insufficient green buildings to invest in	106	3.623	0.07	0.683
8. Lack of knowledge/expertise in GB investment	106	3.594	0.08	0.791
9. Absence of clear financial benefits	106	3.5472	0.08	0.794
10. Onerous procedures to comply with green certification requirements	106	3.2642	0.07	0.721
11. Unsure of benefits and return from the investment	106	2.9717	0.09	0.971
12. Do not see the necessity to invest in green office buildings	106	2.7547	0.09	1.003
13. No faith in green	106	2.5283	0.08	0.875

At the time of this study, the lack of best practices among property investors was perceived as the main barrier to green office building investment. Malaysia is still considered a newcomer in the drive towards sustainability, and the number of green office buildings is still limited, as shown in earlier findings.

Five office buildings have obtained final certification whereas the rest are still undergoing the certification process, or are under construction (Green Building Index Malaysia, 2011). The high level of capital required to invest in green office buildings is one of the factors that slows down the sustainability movement. This factor is also one of the main barriers faced by other countries around the world. An inquiry was posed to the National Property Information Centre (NAPIC) in July 2013 concerning the lack of performance data on green office buildings. The inquiry resulted in NAPIC confirming that initiatives concerning the green movement in real estate have taken place, with the provision of an overview of the green market in the Property Market Report, and it has indicated its intention to allocate resources that would address the needs of the green property market in Malaysia in the near future. Such positive response is good news for all property investors who currently have doubts about the financial performance of green office building investment. The NAPIC findings will complement data from the GBI which provides general information on the total number of green buildings in Malaysia.

4.0 CONCLUSIONS

This paper presents the findings of an exploratory study on the rationalisation of green office building investments in Malaysia. The respondents comprise 106 organisations that currently own and rent office buildings in Kuala Lumpur. This study is expected to fill the void still remaining even after similar findings in Malaysia, in the context of the advantages of green office investment compared to conventional investment. Supported by this study, it is hoped that a transition of investments from conventional to green buildings is envisaged to be much smoother, more rapid and more acceptable by the business community as a whole. Likewise, the study can help to contribute evidence to the growing body of research on green office building investments in Malaysia. Further research to determine the real return of green office buildings could be conducted in the near future, based on the availability of green office samples in the market. This could contribute to a more precise understanding of the expected return from the Malaysian business perspective. With increasing numbers of green office buildings expected to receive green accreditation, the conclusive findings of this study can be further examined to establish factors affecting the return for green office buildings. Then only at some point in time will the rationalisation of the potential of green office building investments in Malaysia be enabled and be completely embraced to achieve total realisation of the green investment portfolio by the majority of the Malaysian investors.

Acknowledgement

REFERENCES

Addae-Dapaah, K., & Chieh, S. J. (2011). Green Mark Certification: Does the market understand. *The Journal of Sustainable Real Estate, 3*(1), 91-115.

Addae-Dapaah, K., Hiang, L. K., & Sharon, N. Y. S. (2009). Sustainability of sustainable real property development. *The Journal of Sustainable Real Estate, 1*, 204-225.

Bond, S., & Perrett, G. (2012). The Key Drivers and Barriers To the Sustainable Development of Commercial Property in New Zealand. *The Journal of Sustainable Real Estate, 4*(1), 49-75.

Choi, C. (2009). Removing Market Barriers to Green development: Principles and Action Projects to Promote Widespread Adoption of Green Development Practices. *The Journal of Sustainable Real Estate*, 1(1), 107-138

Davis, E. P. (2005). *The Role of Pension Funds as Institutional Investors in Emerging Markets.* .Paper presented at the Korean Development Institute Conference - Population Aging in Korea: Economic Impacts and Policy Issues, Korea. http://m.kdi.re.kr/data/download/attach/7798_4_3.pdf. Acessed 23/2/2013.

Eichholtz, P., Kok, N., & Quigley, J. M. (2009). Doing Well By Doing Good? Green Office Buildings. *American Economics Reviews, 100*(5), 2492-2509.

Ellison, L., Sayce, S., & Parnel, P. (2007). Assessing sustainability in the existing commercial property stock: Establishing sustainability criteria relevant for the commercial property investment sector. *Journal of Property Management, 25*(3), 287-304. doi: 10.1108/02637470710753648.

Falkenbach, H., Lindholm, A.-L., & Schleich, H. (2010). Environmental sustainability : drivers for the real estate investor. *Journal of real estate literature, 18*(2), 201-223.

Fuerst, F., & McAllister, P. (2010). An Investigation of the Effect of Eco-Labeling on Office Occupancy Rates. *The Journal of Sustainable Real Estate, 1*(1), 49-64.

Green Building Index Malaysia. (2011). Green Building Index Criteria, http://www.greenbuildingindex.org.

Hamidi, B. (2010). *A Green Cost Allocation Model for Office and Commercial Buildings in Malaysia.* (Msc Thesis in Construction Management), Universiti Teknologi Malaysia, Johor Bahru.

Harrison, D., & Seiler, M. (2011). The political economy of green office buildings. *Journal of Property Investment & Finance, 29*(4/5), 551 - 565. doi: http://dx.doi.org/10.1108/14635781111150394

Huyghebaert, N., & Hulle, C. V. (2004). The Role of Institutional Investors in Corporate Finance. *Tijdschrift voor Economie en Management, XLIX:4*, 689-726.

Issa, M. H., Rankin, J. H., & Christian, A. J. (2010). Canadian practitioners' perception of research work investigating the cost premiums, long term costs and health and productivity benefits of green buildings. *Building and Environment, 45*(7), 1698-1711.

Lutzkendorf, T., & Lorenz, D. (2005). Sustainable Property Investment: valuing sustainable buildings through property performance assessment. *Building Research & Information, 33*(3), 212-234.

Lutzkendorf, T., & Lorenz, D. (2007). Integrating Sustainability into Property Risks Assesments for Market Transformation. *Building Research and Information, 35*(6), 644-661.

Miller, E., & Buys, L. (2008). Retrofitting Commercial Office Buildings for Sustainability: Tenants' Perspective. *Journal of Property Investment and Finance, 26*(6), 552-561. doi: http://dx.doi.org/10.1108/14635780810908398.

Miller, N., Spivey, J., & Florance, A. (2008). Does Green Pay Off? *Journal of Real Estate Portfolio Management, 14*(4), 385-400.

Morri, G., & Soffietti, F. (2013). Green building sustainability and market premiums in Italy. *Journal Of European Real Estate Research, 6*(3), 303-332.

Myers, G., Reed, R., & Robinson, J. (2008). *Investor Perception of the business case for sustainable office buildings: evidence from New Zealand.* Paper presented at the 14th Annual Pacific Rim Real Estate Society Conference 2008, Kuala Lumpur.

Myers, G., Reed, R., & Robinson, J. (2008). Sustainable Property-The Future of the New Zealand. *Pacific Rim Property Research Journal, 14*(3), 298-321.

Nappi-Choulet, I. (2006). The Role and Behaviour of Commercial Property Investors and Developers in French Urban Regeneration: The Experience of the Paris Region. *Journal of Urban Studies, 43*(9), 1511-1535.

Neuman, W. L. (2011). *Social Research Methods*: Pearson.

Newell, G., MacFarlane, J., & Kok, N. (2011). Building Better Returns: A Study of the Financial Performance of Green Office Buildings in Australia. Report for the Australian PropertyInstitute and the Property Funds Association of Australia.

Nielson, K. M. (2008). Institutional Investors and Private Equity. *Review Of Finance, 18*(1), 185-219. doi: 10.1093/rof/rfm009

Parker, D. (2000). *An Institutional Perspective On Property Research*. Paper presented at the 6th Annual Pacific Real Estate Society Conference, University of Technology, Sydney, Australia. http://davidparkercomau.melbourneitwebsites.com/files/2000prresconf.pdf. Acessed on 23/2/2013.

Sayce, S., Ellison, L., & Parnell, P. (2007). Understanding investment drivers for UK sustainable property. *Building Research & Information, 35*(6), 629-643.

Yoke, N. W. (2011). *Perception of life cycle costing in Malaysia green building.* (Master Degree Thesis in Contruction Management), Universiti Teknologi Malaysia., Johor Bahru.

Zhang, X., Platten, A., & Shen, L. (2011). Green property development practice in China: Costs and barriers. *Building and Environment, 46* 2153-2160. doi: doi:10.1016/j.buildenv.2011.04.031

Appendix 1

Return On Investment (ROI) From Green Office Buildings

Construct	Item	Operationalisation of Variables	Measurement Scales
Financial Return (DV)			
Financial (Return)(FR)	FR_1:Capital appreciation	Higher capital appreciation	
	FR_2:Rental income	Higher rental with high potential in rental growth	
	FR_3:Occupancy rate	High occupancy rate; due to being green	
	FR_4:Yield	Lower yield - as a reflection of high market value (higher in value)	
Cost saving (CS)	CS_1:Energy efficiency	Reduce energy usage of the building, due to applications, such as renewable energy, sub-metering, efficient energy performance, natural lighting	Five-point scale with anchors from Very Not Important to Very Important
	CS_2:Water and waste efficiency	Application of appliances & fittings that reduce water usage, rainwater harvesting for landscape and cleaning usage	
	CS_3:Operations and maintenance	Reduce costs in outgoings and repairs, low maintenance costs, due to the application of re-usable and recyclable materials, green products, less obsolescence and longer life building facilities	
Financial incentives (FI)	FI_1:Insurance premiums	Low insurance premiums, due to low environmental risk	
	FI_2:Green tax and assessment benefits	Reductions in assessment rate and on income tax for rental income imposed by LHDN	
	FI_3:Green incentives	Green incentives, such as green grants and lower interest rates awarded to green projects registered under KeTTHA	
Social Benefits (DV)			
Social benefits (SB)	SB_1: Corporate Social Responsibility	CSR of investors or organizations towards sustainability and the environment	
	SB_2:Image	Better image or reputation for being green	
	SB_3: Branding	Green certification, such as platinum, gold, or silver ratings for marketability	
	SB_4:Satisfaction from occupation	Satisfaction from tenants and occupiers, due to better working environments, improved air quality, natural lighting, with designs that are adjustable to the user's needs	
	SB_5:Productivity	High productivity, due to better indoor air quality, natural lighting, user friendly layouts and designs	
Environmental Benefits (DV)			
Environmental benefits (EB)	EB_1:To sustain the environment	Buildings emit less CO^2 into the environment	
	EB_2: Minimise pollution	Reduce waste pollution, such as solid and liquid wastes	

Appendix 2

Factors Influencing Investment Return

Construct	Item	Operationalisation of Variables	Measurement Scales
Risk (RS) (IV)	RS_1:Economic and political risk	Risks, such as Gross Domestic Product (GDP), inflation rate, and political stability	Five-point scale with anchors from Very Not Important to Very Important
	RS_2:Government policies	Government interventions, such as fiscal and financial policies towards green developments	
	RS_3:Surrounding competitors	Similar office buildings located within the vicinity	
	RS_4:Physical risk	Natural disasters, such as floods, tsunamis, and landslides	
Building factors(BF) (IV)	BF_1:Location	Selection of site; whether located within the Central Business District (CBD), Golden Triangle area, or within the city or sub-urban areas	
	BF_2:Building grade	Grade of office building, such as Grade A or B office building for high rental	
	BF_3:Building materials and cost of construction	The green material's usage and the costs of construction for future maintenance reduction	
	BF_4:Type of tenants	Tenant's portfolio (i.e., single or multiple tenants) for rental security	
	BF_5:Property management team	Whether in-house or outsourced management team managing the building for return efficiency	
	BF_6:Building design and architecture	Design, in terms of layout, accessibility, interior, and exterior of the building for better return	
	BF_7:Building facilities and services	The functionality of facilities and building services to minimise operation costs	

Appendix 3

Green office attributes influencing investment return

Construct	Item	Operationalisation of Variables	Measurement Scales
		Green Office Building Attributes (IV)	
Energy Efficiency (EE)	EE_1:Renewable energy	The use of renewable energy to reduce energy consumption	
	EE_2:Electrical sub-metering	The application of electrical sub-metering to reduce energy use	
	EE_3:Lighting	Day lighting (natural or artificial lighting) to reduce energy use	
	EE_4:Efficient cooling system	Air-conditioning consumption reduction, due to better design, natural air circulation by having a good layout, space within the building	Five-point scale with anchors from Very not important to Very Important
Water Efficiency (WE)	WE_1:Rain conservation	Application of rain-water harvesting in the building to reduce water consumption	
	WE_2:High tech appliances and fittings	Appliances and fittings for the reduction of water usage in toilets, urinals, waste fittings and cleaning	
Indoor Environmental Quality (EQ)	IEQ_1:Air quality	Indoor air quality for users' satisfaction	
	IEQ_2:Thermal comfort	Humidity and temperature control for user comforts	
	IEQ_3: Lighting, visuals and acoustics	Visual comfort, lighting and noise controls for user comforts	
	IEQ_4:Health and safety	Better air quality and ventilation for high productivity and a healthier environment	
Sustainable site planning and management (SM)	SPM_1:Site planning	Low impact site construction, infrastructure to minimise environmental pollutions	
	SPM_2:Construction management	Health and safety of the site, construction area, workers and infrastructure efficiency to reduce construction risks	
	SPM_3:Accessibility	The building's accessibility to public transportation and amenities for users' convenience	
	SPM_4:Building design	Allocation of space, layout, exterior and interior design for a better building functionality	
Materials and resources (MR)	MR_1:Reused and recycled material	The application of recycled materials in construction and building materials to reduce construction costs	
	MR_2:Waste management	Waste management strategies to provide a healthier environment	
	MR_3:Green products	The use of green products in building materials and construction for low maintenance costs	
Innovation (IN)	IN_1:Innovation	Green design that maximises the environment and natural resources; in order to achieve better performance in energy efficiency, water efficiency and functionality of technology employed within the building	
	IN_2:Green accreditation	Green accreditation such as Platinum, Gold, Silver, Certified for better building value	