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The Impact of Green Premium on the Development of Green-labeled Offices in the U.K.

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Abstract The perceived wisdom in many studies is that the establishment of a premium value is an essential prerequisite for the promotion of green buildings. This green premium is then a driver of the development of new green buildings, as well as an agent of the green transformation of the existing non-labeled properties. In this study, green premium is assessed as a potential driver of labeled office property development. Thirty-two commercial real estate professionals, working for organizations that are involved in the development, sale, letting or management of green offices, were interviewed across four cities in the United Kingdom: London, Manchester, Birmingham, and Edinburgh. The results reveal that after 15 years of an active development of green offices, the existence of a green rent premium remains elusive. Similarly, no evidence was found of a willingness to pay more to occupy green-labeled offices. The results suggest that a green premium cannot be simply seen in terms of a headline rent but more widely by reference to future income streams. Consequently, we propose a ''green letting premium'' as the primary motivation for the development of green offices. Our study contributes significantly to how green premium is defined, understood, and valued globally.

Keywords green office development; green premium; greening process; local office market; U.K.

Commercial offices are recognized globally as the workplace for service-sector employees and the base for the large proportion of economic activities in cities (Jancey et al., 2016). As a result, office buildings constitute a significant source of the carbon footprint emanating not only from construction, usage, and demolition of the physical structures but also from the way users of such buildings commute (Jones, 2013: Luo, Yang, and Liu, 2016). The overwhelming contribution of offices to environmental concerns continues to make them a key target on the global green agenda and in response, many environmental certification schemes have been introduced to ensure buildings are built to certain predefined green standards (Yudelson, 2010; Roderick, McEwan, Wheatley, and Alonso, 2009; Seinre, Kurnitski, and Voll, 2014; Nurick et al., 2015). Although not often expressly stated, it can be argued that the ultimate essence of establishing the certification schemes is to create a market premium for labeled buildings and

speed up the rate of their adoption by the relevant stakeholders (Reed, Bilos, and Wilkinson, 2009; Malkani and Starik, 2013).

Indeed, many researchers have concluded that there is a premium for green-labeled buildings both in terms of rent and sales price (e.g., Dermisi, 2009; Wiley, Benefield, and Johnson, 2010; Das, Tidwell, and Ziobrowski, 2011; Gripne, Martel, and Lewandowski, 2012; Chegut, Eichholtz, and Kok, 2014; Das and Wiley, 2014; Fuerst and van de Wetering, 2015). In accordance with the workings and dynamics of the real estate market (see DiPasquale and Wheaton, 1992; Ball, Lizieri, and MacGregor, 1998; Dunse, Leishman, and Watkins, 2002; Roxana and Vasile, 2012; Jones, 2013), the existence of a green premium could potentially drive the investment and development of new green-labeled buildings, as well as the green-refurbishment of the existing uncertified buildings.

In a recent analysis of the growth of the green office market in the United Kingdom, Oyedokun, Jones, and Dunse (2015) found that the green office stock is composed of not only newly built but also of refurbished buildings that obtained green certification after undergoing extensive refurbishment. This implies that city office markets have started to undergo a greening process through both new development and green refurbishment of the existing stock. However, it is not clear whether investors' expectation of a green premium is crucial for this rapid market transition. In this study, therefore, we address the following question: Is the current office property greening process in the U.K. a consequence of an expectation of a green premium? We examine this question using qualitative evidence from four cities in the U.K.: London, Manchester, Birmingham, and Edinburgh.

The premise of the study is that the greening process is best envisaged within the operation of local office markets. This greening process is analyzed within a framework of ''green steps'' using data obtained through semi-structured one-to-one interviews and content analysis of relevant documents. Thirty-two commercial real estate professionals, working for organizations that are involved in the development, sale, letting or management of green offices, were interviewed across the four cities.

In the context of this study, green offices are taken as those that have been certified by the Building Research Establishment Environmental Assessment Method (BREEAM), which was established in 1990 as the world's first green building certification scheme. BREEAM is a voluntary rating tool, which makes it the most appropriate indicator of the market embrace of green buildings when compared to mandatory certification schemes like the Energy Performance Certificates (EPCs) and the Display Energy Certificates (Rashid, Spreckelmeyer, and Angrisano, 2012; Fuerst and van de Wetering, 2015; van der Heijden, 2015). A BREEAM rating encompasses a range of sustainability dimensions, such as energy efficiency, health and well-being, water, waste, materials, transport, land use and ecology, and management (BRE, 2012; Schweber, 2013). The label is the accepted green building standard within the commercial property sector in the U.K. The equivalent accreditation system to BREEAM in the United States is the Leadership in Energy and Environmental Design (LEED) (Lee and Burnett, 2008; Roderick, McEwan, Wheatley, and Alonso, 2009).

In terms of structure, the paper begins with a discussion of the underlying nature of the office greening process, followed by a detailed explanation of the research approach adopted. We then consider the evidence on the dynamics of the office market greening process in a series of linked sections including the green premium and its valuation, the existence of a green office submarket, drivers of green office investment, and local insights from three of the four case study cities. In the conclusion, we assess the relative power of the green premium and other influences identified during data collection.

The Greening Process

One potential route to the greening of the office stock is the existence of a green premium (Sayce, Ellison, and Parnell, 2007). Based on real estate economic fundamentals, a premium value for green-labeled offices at the local level should lead to the new development of these types of buildings if land is available (Ball, Lizieri, and MacGregor, 1998; Ke and White, 2009). This would occur through the price mechanism in that increased rents and capital values could make green developments profitable (DiPasquale and Wheaton, 1992). If the green premium is sufficiently high enough, it could stimulate the viable development of new offices and refurbishment of the existing stock of office buildings. However, in addition to the greening impact of the existence of a green premium, the internal dynamics of a local office market are likely to be more complex than can be predicted in the context of the traditional economic theories (Stevenson, 2007; Dunse, Jones, and White, 2010; Das, Tidwell, and Ziobrowsk, 2011). Central to this is the pace of green building supply, which is likely to constitute a major influence on the demand for a green office or the premium that comes with it (Chegut, Eichholtz, and Kok, 2014).

It is possible that a green building is an essential feature for certain firms and that other offices might be rejected in favor of the labeled office units (Eichholtz, Kok, and Quigley, 2010). If there is sufficient inelastic demand of this nature, then this would create a green submarket with an associated premium if there is insufficient supply (Day, 2003; Wu and Sharma, 2012). But in practice, choosing a new office involves normally considering a range of substitute properties in which the choice balances a range of attributes, such as rent, location, and size, with green features (Nappi-Choulet and Decamps, 2013; Sanderson and Edwards, 2014). The tenant's choice is likely to involve a trade-off between the ''positive'' and the ''negative'' characteristics of the different offices (Levy and Peterson, 2013).

A similar issue is raised in the greening of the existing office stock. Leishman, Orr, and Pellegrini-Masini (2012) examined the acceptability to occupiers of carbon emission reducing adaptations to offices. They employed a form of stated preference modeling conjoint analysis that presented hypothetical choices on office characteristics in terms of layout, rent, building/IT systems, and location to respondents. The survey comprised 150 executives in the U.K. who were making decisions about the choice of premises. The authors find that energy-efficient building adaptations that severely restrict the functionality of office space are unlikely to be taken up. Their findings suggest that a certain degree of restriction

on office functionality is possible but would have to be compensated for by either an improved green profile or a lower rent. There are, therefore, possible barriers to a premium for green buildings, especially to adapting existing offices (Miller and Buys, 2008). Although sustainability seems to be gaining increasing importance on the priority list of corporate organizations (Zieba, Belniak, and Gluszak, 2013; Robinson, Simons, Lee, and Kern, 2016), it is useful to examine the dynamics of the greening of the office market.

At the beginning of the process, the greenness of offices is a secondary demand characteristic subservient to location and the suitability/functionality of space (Jones, 2013). If and when the benefits of green offices to tenants become widely accepted, and such offices become the norm, then there could be a negative impact on the values of non-green stock. From this perspective, rather than a green premium, there is a non-green discount rent (Runde and Thoyre, 2010). However, this phenomenon would not happen overnight and probably would take some years as the take up will be constrained by new supply. But looking into the future also, there may be a threshold or tipping point in terms of the additional/adapted green office stock at which it becomes unacceptable to have additional supply (Chegut, Eichholtz, and Kok, 2014).

As a result, one of the implications of greening the office stock is that eventually existing non-green offices can become unattractive to tenants and their rents depreciate in relative terms. At this point, these offices will become obsolete, and require refurbishment or complete redevelopment (Miller, Spivey, and Florance, 2008; Rodi, Hwa, Said, and Mahamood, 2015). ‘‘Green obsolescence’’ in this way stems from the internal dynamics of local markets. Indeed, Dunse and Jones (2005) have already demonstrated that the rate of obsolescence more generally can vary between local markets. This process can be seen as a combination of functional, aesthetic, legal, social, physical, and environmental obsolescence (Crosby, Devaney, and Law, 2012). The process also implies that a decrease in demand in one sector of the office market (the obsolete non-labeled stock) can potentially lead to an increase in demand for another sector (the newly-formed, preferred green offices) (Roxana and Vaile, 2012; Jones, 2013).

The foregoing is an end or a near end state to the greening process but at present in most localities, non-labeled offices constitute the larger proportion of the market (Oyedokun, Jones, and Dunse, 2015). An interim stage is the establishment of a green submarket whereby a sufficient number of occupiers require a green-labeled building so that there is an identifiable sector of the local market. This could lead to a rent premium if there is excess demand. Invariably, the emergence of a new green submarket implies that the existing submarket structure must undergo a transition, resulting in its expansion, shrinkage, upgrade or destruction (Jones, 2013). This process has a close link with the concept of ‘‘creative destruction,’’ which relates to the emergence, disappearance, and reconfiguration of the various sectors of a market or economy (Roxana and Vasile, 2012). The process would see the submarket grow to engulf the whole market as acceptance and requirement for green offices become the dominant perspective.

However, the dynamics of change within real estate markets can be slow and not simply determined by such a simple price mechanism. The real estate market is

very imperfect (Keogh and D'Arcy, 1999). The development of green offices like any other property (sub)sector can be influenced by prevailing lease structures, the state of the local property market, the local urban morphology restricting development, planning and conservation regulations, and (expectations about) the local economy (Cheshire, Leunig, Nathan, and Overman, 2012; Jones, 2013; Fuerst, Kontokosta, and McAllister, 2014; Lambiri and Rovolis, 2014). In addition, even if there is a widely-accepted demand for more green offices, there are time lags to any development response, and the supply process can be negatively distorted by national economic downturns. All these are indirect barriers to building development and potential inhibitors for the office stock greening process.

One further complexity is also worth noting. The demonstration of corporate social responsibility can be a strong motivation for occupying green offices, particularly by large multi-national companies (Eichholtz, Kok, and Quigley, 2010; Jones, 2013). But while such demand is likely to be independent of the dynamics of the greening of local office markets, it will almost certainly have spatial concentrations, particularly in major cities. These agglomerations may, therefore, give a misconception of the existence of a green office market, although it is possible they could have a demonstration effect.

One green driver is the obsolescence threat from the national green policy agenda whereby the government will ultimately enforce stricter regulations, as evidenced firstly by the introduction of EPCs by the European Union in 2008 (Sayce, Ellison, and Parnell, 2007; Falkenbach, Lindholm, and Schleich, 2010). Indeed, national legislation introduced in 2011 in the U.K. means that buildings within the lowest two EPC bands, F and G, will not be lettable after 2018, and hence obsolete (GVA, 2014). Greener national building regulations and new technologies could also shape green building development.

Furthermore, the role of national and local planning policies can influence the greening process in a number of ways (Cheshire, Leunig, Nathan, and Overman, 2012). Local planning and conservation policies may significantly constrain new development and by implication the green office stock. In these circumstances, any greening would be predominantly restricted to the modification of existing stock with the difficulties noted above. On the other hand, in the U.K., where planning permission is required for new development, the local authority could insist on new buildings having green credentials either in terms of location relative to nearby public transport routes or physical structures (BSRIA, 2012). But these policies are likely to be most effective during periods of high demand and capital values.

The role of the property boom in the first decade of this century in the U.K. exemplified the significance of national factors as it provided a springboard for the expansion of green offices, but there was a differential impact between cities. By the beginning of 2015, green office space is almost 30% in London, just over a fifth of the market in Manchester and Leeds, and approaching a fifth in Bristol and Edinburgh city centers (Oyedokun, Jones, and Dunse, 2015). There are clearly important local market factors at work.

Our supposition, therefore, is that the office greening or non-greening process has a local dimension. As noted above, there are a number of potential elements to this process, and there are the complexities of the perpetual interaction between investment and the occupier markets. The existence of a green premium has the potential to stimulate the development of labeled buildings, as well as the green transformation of the existing non-labeled properties. But its existence is disputed and it is not the only prospective driver for green buildings. The barriers to the greening process identified above are also considered. In the analysis, we examine the experience of four cities, initially focusing on the role of the green premium.

Methods and Procedure

Given the nature of our study and the research question, a case study approach has been adopted. Using a multiple case design, this approach allows for both the intra- and cross-case analyses of the green premium in selected cities. Based on data obtained from the CoStar database in 2015, London, Manchester, Birmingham, and Edinburgh were selected as cases for the investigation being the greenest markets in terms of the presence of BREEAM-labeled office buildings. The selection of these four cities is also useful because the CoStar data referred to earlier reveal a remarkable variation in the pattern of growth of the green offices across the cases with London at the top of the table.

We examine the greening process after approximately 15 years of active development of green offices in the U.K. Our focus is on the role of the green premium within the differential local dynamics of local office markets. It provides the platform to test whether a green premium is a significant driver of the development of green-labeled offices. Similarly, the use of the case study approach enables an assessment of other local factors in this process.

The study is based primarily on qualitative data obtained through in-depth interviews with commercial real estate professionals in the selected cities. To ensure the credibility of the research, professionals were interviewed only if they were personally involved (through their company) in the letting or management of at least one green office building, or worked for a company listed among the top-ten biggest firms in office acquisitions and sales in the CoStar database at the time of data collection. We found that London and Edinburgh have 19 companies each from which interviewees could be selected, while Manchester and Birmingham have 15 and 12 organizations respectively (Exhibit 1).

Sampling was based on the principle of ‘‘saturation,’’ which finds there is a point at which additional interviews no longer lead to new information (Charmaz, 2006; Mason, 2010; Bonde, 2013). Guest, Bunce, and Johnson (2006) note that saturation tends to occur from the first six interviews up to a maximum of twelve. In this study 10 professionals were interviewed in London, 8 in Edinburgh, and 7 in each of Manchester and Birmingham (Exhibit 1). The sample sizes adopted, therefore, align with existing qualitative studies (see Kientzel and Kok, 2011).

In terms of position in their respective firms, the interviewees are generally among the high-ranked members of staff, including senior directors, directors, associate

Exhibit 1 | Sample Distribution of the Interviewees

Location	# of Organizations with Potential Interviewees	# of Interviewees at Saturation
London	19	10
Edinburgh	19	8
Manchester	15	7
Birmingham	12	7

directors, partners, and unit managers. In terms of functions, they undertook various responsibilities for and on behalf of developers, investors, and occupiers. These included acting as development and leasing advisors, representing occupiers in office leasing, and undertaking appraisals of real estate for various purposes. These professionals can be viewed as the ''custodians'' of the office market, understanding the dynamics of green office development, demand, and changes in occupier requirement and willingness-to-pay (RICS, 2010). On average, each of the interviewees has accumulated 10 years of experience of working in their respective city office market. With this background, the interviewees are the most suitable source of information for the study.

Prior to the interviews, a snapshot analysis of the green office sector of the respective city was sent to each respondent (Exhibit 2). In view of the multiple ways in which a green building is understood, the snapshot analysis was meant to provide uniform understanding of what constitutes a green office among the study participants. The in-depth semi-structured interviews were conducted in the offices of the interviewees and were recorded using a voice recorder (see Exhibit 3 for the topic guide). The manual note-taking method was also used to record interesting responses or those that need further probing. Each interview session was about 50 minutes. After manually transcribing the recorded interviews, the transcripts were imported into the NVivo Software for a thematic analysis (Vohra, 2014). Thematic analysis is a form of pattern recognition within the data, where identified themes become the categories for analysis (Fereday and Muir-Cochrane, 2006). Replication logic, which involves repeating the same data collection and analysis across cases, was strictly applied so that each case city can stand as an analytic unit (Eisenhardt and Graebner, 2007; Yin, 2013).

Results and Discussion

The Green Premium and its Valuation

Our focus to assess a green premium as a possible driver of the development of green office buildings in the U.K. Therefore, the initial interview questions were targeted at establishing whether there is a premium for green offices and issues around how it is assessed in real estate valuation. There was a ''consensus'' in the

Exhibit 2 | The London "Green?" Office Market

The London "Green?" Office Market

Executive Summary

Globally, commercial buildings are target of various policies aimed at achieving sustainability in terms of energy efficiency and low carbon emissions. This sustainability agenda has given rise to growth of 'green' building sector in major cities of most developed countries. While the initial adoption of 'green' building was slow in the United Kingdom, there are evidences that the process has accelerated in the last decade. However, detailed information is not available on the development. This analysis therefore presents the growth of 'green' office submarket in London between 1990 and 2014 using Building Research Establishment Environmental Assessment Method (BREEAM) as the measurement benchmark. The analysis is based on data obtained from CoStar database in March 2015. Attempt is also made to assess the performance of the sector using rent, vacancy rate, month on market and yield as indices.

Key Findings

- There are 433 'green' office buildings in the UK out of which 120 buildings, which translate to 20,651,081 ft^2 are located in London.
- In terms of lettable floor space, London 'green' offices constitute 50.3% of the UK 'green' office stock.
- Also, based on lettable floor space, 'green' offices constitute approximately 21.76% of London office stock.
- Over the period, the growth trend of 'green' offices in London has been very regular making it unique among other UK cities.
- The largest volume of stock additions was recorded in 2014.
- 'Green' offices enjoy a higher rental rate than 'non-green' stock though their rental performance is dependent on location.
- On the other hand, 'green' offices tend to have a higher vacancy rate than market average.

Tables and Charts

Table 1: Share of London 'green' office in the UK

Location	Count	% of UK 'green' offices	'Green' lettable space (ft^2)	% of UK 'green' space
London	120	27.71	20,651,081	50.34
UK	433	-	41,022,397	-

Table 2: Share of 'green' offices in London office market

Category	Count	%	Lettable space (ft^2)	%
'Green' stock	120	5.91	20,651,081	21.76
Market	2,030	-	94,910,022	-

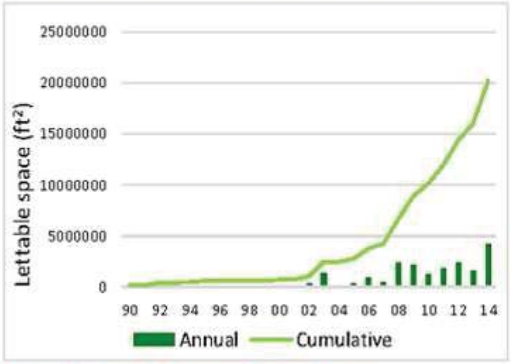

Figure 1: Growth of 'green' office sector

Table 3: Comparative performance analysis

Parameter		London		
		'Green'	'Non-green'	Market
Rent (£)	Current per ft^2	55.47	36.41	41.32
	5-Year Average	49.80	32.15	36.87
Vacancy rate (%)	Current	24.7	16.7	18.5
	5-Year Average	26.8	12.4	15.1
Month on market	Current	7.8	8.9	8.9
	5-Year Average	12.5	13.3	13.3
Yield (%)	Current	5.2	5.2	5.2
	5-Year Average	5.8	6.1	6.1

Exhibit 2 | (continued)
The London "Green?" Office Market

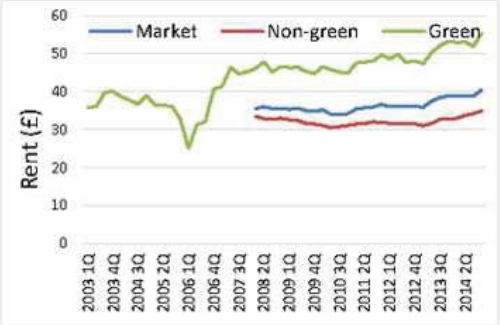

Figure 2: Trend in rental rate

Figure 3: Trend in vacancy rate

Implications

This analysis presents the growth and performance of 'green' offices in London over the period 1990-2014. Using a voluntary green certification (BREEAM) as the assessment benchmark, the analysis shows that while there has been increase in 'green' office stock in the city's office market, 'green' offices still constitute a minor segment. Also, the analysis reveals that the growth has been inconsistent which makes future growth prediction difficult. The current state of 'green' office sector which can be likened to the development of market for a 'new product' can be said to be in the 'introduction stage'.

The analysis further shows that 'green' offices enjoy a higher average rental rate which agrees with most findings that sustainable buildings can attract a value premium. Questions have often been raised as to the authenticity of such claims on the grounds that location and building quality (and not necessarily green certification) are the major determinants of value. This analysis reveals the impact of central location on rental rate as 'green' offices in the Central London achieved higher rental rates than those located in Outer London (A detailed report is available). While 'green' offices enjoy a higher rental rate than the 'non-green' regardless of location, this performance may be undermined by their higher vacancy rate. This analysis has implications for further investigation as highlighted below.

- **Reliability and acceptance of green labels**

Green labels are important ingredients for the development of market for green buildings as they establish consistent guidelines that can be universally understood and adopted by the market participants. This no doubt would help to (1) facilitate standardization and (2) simplify 'product' development. This is however only achievable when market participants perceive green labels as reliable. Further investigation is therefore necessary to ascertain whether the operational green label is acceptable to market participants as good mark of quality for a 'new product'.

- **Investors' willingness to take risk**

Similar to any new product, 'green' offices tend to be affected by certain initial risk in terms of financial performance. This may render investment in them unattractive especially to the risk-averters until market matures and uncertainty is drastically reduced. Although the growth of the sector points to the fact that there is supply of 'green' offices, further investigation is needed to ascertain whether the investors are prepared to bear the initial risk associated with such a 'new product' until a mature market is developed. Unless the investors are ready to bear this initial risk, the 'green' office growth could suffer a great setback. It is necessary that the existing 'suppliers' sustain the tempo and continue to bear the initial investment return short-fall.

- **Occupiers' attitude to occupy 'green'**

As a corollary to the supply of 'green' offices, a sustainable market cannot emerge unless 'demanders' have positive attitudes towards occupying such buildings. The high rate of vacancy in the 'green' office sector as shown in the analysis needs to be properly investigated. Occupiers' attitudinal dispositions to 'green' office buildings and their impact on renting decisions must be evaluated.

Ultimately, for the development of a virile market for 'green' offices, there must be unanimous acceptance by both the investment and occupier markets. Furthermore, beyond general acceptance by market stakeholders, 'green' offices must grow to become a prime sector in the city office market. Unless a prime 'green' office submarket emerges, which has the potential to render the existing stock obsolete and engender extensive refurbishment or redevelopment, the agenda for a sustainable city may be unrealizable.

Exhibit 3 | Green Premium and Impact on Property Development

Topic Guide for Real Estate Professionals

Section A: Introduction [for interviewer's use]

- Explain the study's aim
- Explain criteria for choosing the interviewees
- Assure interviewees that research ethics would be strictly followed
- Ask for permission before recording the interviews
- Ask if there are questions before proceeding to the interview proper

Section B: Background

1. If you would like, can I start by asking a bit about you?
2. [For landlord representatives] Your company manages a [some] BREEAM certified office building(s) in this city and you are the landlord(s)'s representative [as obtained from CoStar database]. How would you describe your specific functions in this regard?

Section C: Market acceptance of 'green' labels

3. I refer to the 'snapshot' analysis I sent to you which shows how 'green' [BREEAM certified] offices have grown within the wider city office property market.
   - Would you describe this as a signal of the evolution of a 'green' office submarket?
   - BREEAM and EPC are the main operational 'green' credentials in the UK.
   - How would you describe the current state of market acceptance of these labels – dispositions in the investors and occupiers?

Section D: Who occupies green buildings?

4. One of the criteria to determine the significance of green office sector is the existence and identification of willing "demanders."
   - Would you say that 'green' office occupiers have now formed a distinct group that can be identified?
   - Do they now constitute a 'consumer-based' market segment?
   - How would you describe the nature of firms with high affinity to occupy 'green' buildings? Can you mention their significant attributes?

Section E: Link between property value and green credentials

5. There are claims that green buildings command a certain rental premium over conventional buildings. Also, looking at the analysis I sent to you, it appears that 'green' buildings truly command higher rent [asking rent though] than non-certified buildings.
   - How will you rate the rental performance of 'green' offices?
   - No doubt there are so many factors that determine rent [*location, accessibility, transport, building quality, facilities, etc], how will rate the impact of green credentials on 'green' office property value?*
   - *It has been advocated that sustainability should be factored into the valuation process, what's your take on this given the current* state of the market?
6. But looking at the analysis again, it appears 'green' buildings generally have higher vacancy rates and 'months on the market', is there any explanation why this should be so?
7. With respect to the building(s) for which you're landlord's representative, would you say that they are enjoying 'above market average' rent?
   - With your personal experience as landlord's representative, what are specific benefits that accrue from green credentials to the investors?

Section E: Impact of green office sector and premium

8. The presence of 'green' buildings can lead to obsolescence for proximate conventional buildings, how will you comment on this given the current market situation?
9. Have we begun to see the impact of 'green' offices in terms of retrofitting, conversion, redevelopment, etc. of existing stock?
10. [If applicable] CoStar database shows that the BREEAM office buildings in your management portfolio achieved certification after being constructed. Was green certification / sustainability the primary motivating factor?
    - And after the whole process, has there been evidence of "better life" for the property? [Increased rent, satisfaction for the occupiers, lower operational costs, etc.]

responses of the professionals, which it is difficult to categorically say there is a premium for green buildings (in 2015). One interviewee in a provincial city said, ''… regrettably no is the answer and I think that's rather a shame, but there is no evidence that a green building commands a higher rent than a non-green. If you have two buildings that are identical in every way, same location, same size and specification, and one of them theoretically is BREEAM Excellent and the other isn't, there is no evidence today that the occupiers would pay more to occupy it or that an investor would pay more to acquire it.'' Another said, ''I hope it happens. Green agenda is rising on occupiers' agenda and development market is responding to it certainly more than it was 10 years ago, but it won't be in the next decade, there's a lot of market maturing that must occur for that to happen'' (Senior Director, Birmingham).

Sharing a similar view, one interviewee in Manchester noted: ''… there's no separate submarket for green offices and there's no green premium. It is government that is driving green buildings'' (Director Office Agency, Manchester).

Another interviewee from central London also stated that, ''… occupiers would expect to get a BREEAM Excellent rating, but what I'm saying is, they won't pay more to get it because they expect it as a normal thing. If it's a new development and is not BREEAM Excellent, the case would be, why not, rather than we're going to pay more because it has got it'' (Director, London).

As can be inferred from the evidence, the interviewees acknowledge that green buildings should enjoy a certain rental premium over the uncertified stock, but they also agreed that the available market evidence to support the existence of a green premium was still largely unconvincing in these cities. This finding is at variance with many international studies that have estimated a premium for green buildings (McAllister, 2009; Wiley, Benefield, and Johnson, 2010; Kok and Jennen, 2012; Heinzle et al., 2013; Lagerkvist, 2013; Chegut, Eichholtz, and Kok, 2014; Fuerst and van de Wetering, 2015). The answer lies partly in local market differences but also in the valuation methods and procedures that valuers in the U.K. are required to follow by their professional organization, RICS. The negative finding is in consonance with Sayce (2018), who notes that valuers have not fully realized the need to incorporate green building features eco-labeling into valuation. Corroborating, Warren-Myers (2018) also notes that the lack of relevant financial correlations between sustainability and economic return constitutes a major factor inhibiting the valuers from being able to accurately reflect the impact of sustainability on property values.

To support their opinion, the real estate consultants gave some justifications why they felt the existence of a green premium was still questionable. These are summarized and discussed in the following sub-sections.

Relative Scarcity of Green Offices

One of the reasons that were often mentioned during the interviews related to the relative scarcity of green offices. With the exception of London, which has about 120 green offices, other cities within the U.K. typically have less than 30 labeled

Exhibit 4 | Responses from London on Scarcity of Green Offices

Interview Responses
"I think with the submarkets where I work [City of London, Canary Wharf and Southbank], there's sufficient choice of buildings that offer such [green] aspects that I don't think it [green premium] becomes relevant. If you're in a location with only one building with a very green standard and others with poorer standard, yes occupiers might focus on only that building. Where I work, all the buildings have those credentials, so competition isn't the case, corporate occupiers would expect buildings to achieve those high standards anyway" (Director, London).
"In the City of London, buildings tend to be BREEAM Excellent or Very Good. That is the standard really, as landlords would strive most of the time to create a BREEAM Excellent building. They believe it's a marketing tool to attract occupiers though green credential is really not high on the occupiers' preference list" (Director, City Agency, London).

buildings according to our data. From the perspective of the interviewees, there were not enough green buildings in the market upon which reliable valuations could be based in order to confidently justify the existence of a green premium. Explicitly their views from provincial cities were: ''There's not enough of them yet to say yes. I think there are only two BREEAM Excellent buildings in central Edinburgh. There's not enough in the market yet to make people differentiate'' (Business Unit Manager, Edinburgh). And ''In general terms, there is relatively limited transactional evidence to support a green premium'' (Senior Surveyor, Birmingham).

These responses suggest that the available market data required for credible valuations regarding a green premium is still largely insufficient, even in provincial cities. The green office property sectors in most cities within the U.K. can be said to be at their emergent state, while some markets are yet to have any green building (Oyedokun, Jones, and Dunse, 2015; Janda et al., 2016;). Therefore, and as repeatedly echoed by the interviewees, the inevitable paucity of transaction-based data associated with the nascent nature of the sector, raises significant concerns about the validity of the existence of a green premium. There is a local dimension to the green office market development and data availability tends to differ across markets.

In London, the position of the interviewees regarding the scarcity of green-labeled offices seemed to be different, but the same valuation problem also exists. The two responses in Exhibit 4 suggest that the London office market has a significant concentration of green-labeled offices, at least in key submarkets.

These responses seem to indicate that the London office market might have been saturated with green offices as has also been suggested by Chegut, Eichholtz, and Kok (2013). But with the relatively small population of such buildings as stated earlier (120 buildings in total) and infrequent transactions in terms of lease and sale, it is clear that valuing a green premium using a market comparison approach will be highly difficult if not totally impossible (Matisoff, Noonan, and Flowers,

2016). In either of these two instances, the use of estimated data to replace a large pool of missing information tends to be the solution but with additional ramifications for the credibility of valuation and existence of a green premium (McAllister, 2012; Jones, 2013).

Green Offices are the Newest

Another valuation-related factor that challenges the existence of a green premium as gleaned from the interview responses, is that the majority of green offices are new buildings built to modern specifications. One interviewee noted as follows: ''Other things being equal, BREEAM-certified versus non-BREEAM, with everything else the same, size, rent, location, etc., they (occupiers) might go for BREEAM Excellent but that never happens because all the new buildings are BREEAM Excellent, so it's like a level playing field'' (Director Office Agency, Manchester). Another said, ''It is also true that new buildings command the highest rents. Therefore, it appears that green buildings give a better return, whereas, the reality is simply that they are the newest buildings'' (Director, Manchester).

Since there is a strong positive correlation between the age and the condition of a building, green buildings, other things being equal, tend to be more functional and aesthetically appealing than older buildings, which are mostly non-labeled (Chegut, Eichholtz, and Kok, 2014). Indeed, in terms of specification, green office buildings tend to incorporate state-of-the-art technologies, as required in contemporary office buildings and in most cases distinct from the uncertified stock (Matisoff, Noonan, and Flowers, 2016; Robinson and Sanderford, 2016). Fuerst and van de Wetering (2015, p. 205) note that ''there may be a difference in design specifications between BREEAM-rated buildings and non-BREEAM buildings with similar higher standards.'' With very few comparable buildings in the markets as is the case with most of the U.K. cities, the basis for valuation is usually absent, which implies that the estimations of a green premium tend to be by comparing new buildings with old. Although age, modernity, and other similar variables can be controlled for as usual in most hedonic pricing studies, such a process cannot compare with using ideal comparable properties (Muldavin, 2008; Shapiro, Mackmin, and Sams, 2012).

So far, the analysis of the responses has centered on why the interviewees felt the existence of a green premium was still elusive. But beyond this argument, there are other conclusions that could be drawn from the responses analyzed in this section which are relevant to the (in)existence of green office submarkets, as discussed in the next sub-section.

Existence of a Green Office Submarket

While there were not enough green offices in the rest of the case study cities, the responses from London, two of which are in Exhibit 4, suggest that there is sufficient choice of green offices. In fact, they claim that green offices have become a norm rather than the exception in the market and that BREEAM Excellent is now the standard for defining a modern building. This is an indication

of the existence of a submarket for green offices in London, at least in terms of building units and total floor space (Wu and Sharma, 2012). But in the context of property submarket analysis, the potential existence of a green office submarket in London is greatly challenged by the elusiveness of a green premium. While the average price of properties in a submarket should be distinct from the rest of the market (Chen and Hao, 2010), this appears not to be the case as no difference between the rental rates of green-labeled and non-labeled offices of similar qualities is consistently referred to in the quotes noted above.

The responses (Exhibit 4) suggest further that green offices may enjoy a certain rental premium when there are not many of such buildings in the market. For instance, one green building amidst many uncertified ones within the same location may enjoy a certain premium as it tends to be accepted as a ''benchmark'' property (Fuerst and van de Wetering, 2015). This view is also shared by Wiley, Benefield, and Johnson (2010), who note that if a market is not saturated with green buildings, available space might let in a segmented market characterized by excess demand, which might enable green buildings to command premium rents. However, as green offices lose their vintage status, due to increasing supply, green premium becomes very insignificant (Chegut, Eichholtz, and Kok., 2014; Fuerst and van de Wetering, 2015).

Drawing from this evidence, it is clear that should there be any rental premium at all, it is highly dependent on the number of green buildings in a given locality at a particular point in time. Likewise, among the labeled buildings, a building in the top-most rating (say BREEAM Outstanding) among others with a lower rating, tends to enjoy a certain premium. Thus, when green buildings are very rare in the market, there is the possibility of them commanding a certain premium, but as time passes and their numbers increase, the premium gradually dissipates. Whereas it is also difficult for a submarket to exist with too few buildings and irregular supply, the chance of occurrence and magnitude of a green premium increase when green buildings are very few.

So far, it has been argued that a green office submarket potentially exists in London in terms of building units and floor space. Another way of proving the existence of a submarket is to use occupier preference. Using this criterion, there is no evidence of the presence of a large pool of green occupiers in the four cities. Responding to the question on the number of potential green office occupiers in the market, one interviewee said: ''… it's very very low. I won't like to guess, below 10% … it's just not on people's radar.'' And ''I can't recall a corporate making a decision solely based on the BREEAM rating of building or it having a big impact on their decision making'' (Director Office Agency, Manchester).

This response is an indication of the sparsity of potential occupiers who are willing to take up nothing but green buildings. However, there was a general feeling among the interviewees that green-labeled buildings might let to a community of occupiers who have a high consideration for environmental sustainability as part of their corporate social responsibility (CSR) agenda. However, such occupiers are very insignificant, as they tend to be very large corporate organizations only. The relatively low number of green office occupiers constitutes a major reason

for the lack of a green premium and invariably, green office submarkets especially as ''tenants are not willing to pay for energy efficiency'' (Gabe and Rehm, 2014).

There is also an indication of the green-building label not constituting a major factor in the renting decisions of occupiers. The responses received suggest that very few corporate occupiers that might be keen on taking up green-labeled buildings, might not readily be willing to pay any significant premium for green offices depending on their space requirement and bargaining power at the time of negotiation. This has also been suggested by Gabe and Rehm (2014). It is, therefore, very difficult to conclude that a green premium truly exists when rents paid are not conspicuously linked to green building labeling. Although there is evidence of willingness-to-pay (Robinson, Simons, Lee, and Kern, 2016), it tends to vary with market and most office markets in the U.K. might not have a significant number of willing green occupiers. Indeed, the evaluation of the impact of green-labeling on office rents, as well as its significance remains very complex. In line with this view, Fuerst and van de Wetering (2015, p. 205) conclude that the green premium reported in their study ''may not be fully attributable to certification alone.'' This might not be unconnected with ''the ambiguity of certifications that distill the many dimensions of green buildings into a single numeric score or tiered levels'' that are often difficult for the market to comprehend (Matisoff, Noonan, and Flowers, 2016).

As can be concluded based on the evidence discussed in this section, the case study cities have not started to witness the beginnings of a green office submarket. This is especially more valid for Manchester, Birmingham, and Edinburgh, which still have very few office buildings and a relatively small size of green office occupiers. A green office submarket probably exists in London given that about 22% of the city's total space is green, but this proposition is also easily undermined by the uncertain nature of the green premium.

Drivers of Green Office Development

The logic of the green premium as a driver of change is that developers and investors will be ready to invest in green buildings as they can obtain higher rents, which are sufficient to justify their investment. However, the interview responses analyzed so far suggest that the existence of a green premium remains elusive, which invalidates this proposition. The decisions to invest in green offices are, therefore, not profoundly linked to a green premium, which from all indications remains largely uncertain, irregular, and isolated (Robinson and McAllister, 2015). The cost of developing new green buildings is still a major concern, but according to the interviewees, green retrofitting is even more unattractive due to the substantial cost associated with it. One interviewee said: ''… it is quite expensive to achieve a (BREEAM) standard with older buildings and there's no additional rent or premium for second-hand buildings even with good green ratings. And ''It was because the property needed comprehensive refurbishment and not necessarily because of the quest to achieve BREEAM, although while trying to achieve the primary goal, BREEAM became part of it'' (Director, Edinburgh).

As can be inferred from the response, the extensive green office development and refurbishment since the millennium seem to point to alternative explanations,

rather than the investors' expectation of a green premium. This is especially true given the ongoing debate about the cost implications of green buildings. Indeed, some building projects have ended in negative net value in what might not be unconnected with the bid to achieve green standards (Brotman, 2014). With the unclear impact of the green premium on green office development activities, the interviewees highlighted a number of factors driving the development of green offices in the cities. In the words of one of the interviewees, "… there's the belief that the higher the rating, the more quickly the building would let. And at the top end of the market, developers would normally build to these minimum standards so as to capture all potential occupiers" (Director, Edinburgh).

As gleaned from their views, a significant driver of green office development relates to the belief of developers and investors that, by building to green standards, they are likely to let their buildings quickly, thereby reducing time on the market and invariably, the cost associated with a void period. In addition, labeled buildings seem to be the strategy to capture a wide range of occupiers, especially at the upper end of the market. Thus, the desire to meet the requirement of the majority of occupiers is paramount in the development agendas of developers and investors.

Furthermore, the interview responses suggest that there is a growing perception among the investors that green offices offer certain occupancy benefits. As expressed by one interviewee, "whilst the BREEAM rating is relevant to investors, in our experience, this is more due to the perceived occupational benefits, such as lower running costs and the perception that this is more attractive to occupiers" (Senior Surveyor, Birmingham).

The benefits of green buildings are well-documented in the literature (e.g., Newsham, Mancini, and Birt, 2009; Singh, Syal, Korkmaz, and Grady, 2011; Nieuwenhuis, Knight, Postmes, and Haslam, 2014) and based on this response, they seem to be influencing investment decisions in all the four case cities. Potentially, occupancy benefits make green offices more attractive to occupiers. When that becomes apparent in the market, the supply side will undoubtedly respond even when occupiers might not be prepared to pay any premium.

The desire to protect investments against possible future risks is also identified as a driver of green office development. As expressed by the interviewees: "If you don't get a good rating for a new build, it would work against you. Whether the rent, speed of letting, future proofing … people are protecting themselves against what might come" (Director, Edinburgh). And "For developers, the reasons are that they want the badge to get the occupiers and also to future-proof it which is a means of delivering the building for the occupiers to receive at lower running cost" (Senior Director, Birmingham).

As can be inferred from the responses, green offices are desirable not only to ensure appreciation of investment but also that such buildings can readily adapt to possible future changes in sustainability legislation and standards. To achieve this, buildings must incorporate the best possible technologies, while also catering for the expected requirements of the occupiers (Lizieri, 2003; Ellison, Sayce, and

Smith, 2007). Their designs, specifications, and facilities have to reflect a high degree of modernity, and they must also be flexible so as to accommodate any future changes as needs arise. As can be observed in the following response, developing to green standards is one way to future-proof investments against sustainability obsolescence, but that again will be within the limits of profitability metrics. ''The more you spend the less the profit, so people won't spend more if it won't help them. It will change over time because legislation would help push all of that'' (Business Unit Manager, Edinburgh).

Based on these responses, there is a revealed level of uncertainty among the developers and investors with respect to policies that might be introduced or the changes that might be made to the existing legislations, which may potentially affect their investment. While the policy on EPC is expected to remain even as compliance continues to increase, there is also the fear that further policies may be introduced. Indeed, some form of guidelines that promote the adoption of BREEAM for new office developments and refurbishments are already in force in some localities (BSRIA, 2012).

It is not only the developers/investors who are concerned about future financial proofing, funders also desire to have their money well-secured and able to generate a good return on their investment in the form of interest. The development of large office blocks requires huge amounts of capital and this alone makes them very risky. As a result, the perceived good and regular flow of income, as well as the potential capital value appreciation that green buildings possess due to their modernity, high technology specifications, and legislation compliance, form a strong attraction for the financiers. According to one interviewee: ''… specifying certain green rating can help secure development finance and especially if you're selling to institutional investors, you want to specify high BREEAM/EPC ratings'' (Director, Edinburgh).

However, green-labeling alone is not enough for securing finance for development proposals (Ellison, Sayce, and Smith, 2007). Instead, it is the perception of the financiers about the viability of projects that will determine their commitments regardless of the green status of developments. As expressed by some of the interviewees, proposing a green building is not an automatic qualification to access finance. This is because funders are predominantly concerned with what happens to their money (Jones, Dunse, Livingstone, and Cutsforth, 2017), and not whether a project is green or not.

There is also the suggestion of some building owners desirous of portraying themselves as being green would rather just develop green buildings, not because they anticipate any unusual rent margin. One interviewee from London said that development of green offices ''… is being driven at the higher end of the market by some end users and some landlords seeking to present their green credentials'' (Partner, London). Another interviewee from Manchester noted that ''the office market is entirely commercially driven, and therefore anything which gives a competitive advantage will be utilised'' (Director, Manchester).

Based on the evidence discussed in this section, it is almost certain that failure to achieve a good green rating, especially for a new build, might work against the

realization of investment financial objectives. Also, the responses seem to suggest that green buildings can be more financially viable than the non-labeled especially in the long run, due to quicker letting and lower running costs. All of these benefits seem to indicate that a green premium might have been included in the achieved rents of green offices. This, however, is unlikely to be the case when put in the context of the earlier discussion on the green premium and its valuation, as well as lack of a strong relationship between green certification and rents of green offices.

Instead of the overall green certification status, building-specific attributes (e.g., location, building image, and general accessibility) as well as affordability, seem to be more important to the occupiers, and each building attribute ranks differently on the priority list of occupiers (Simons, Robinson, and Lee, 2014; Robinson, Simons, Lee, and Kern, 2016). It should be mentioned that a green premium can be realized through lower operating costs, reduced void periods, protection against obsolescence, and higher occupancy rates, and not just in the form of higher headline rents (Fuerst, Kontokosta, and McAllister, 2014; Matisoff, Noonan, and Flowers, 2016). Indeed, the interview responses analyzed in this section highlight the benefits that could have formed the basis of argument in support of the existence of a green premium. However, this is largely undermined by the fact that there are office buildings without green badges and yet command similar rents as the labeled (Robinson and Sanderford, 2016). The actual premium derivable from green labeling, as opposed to the benefits that accrue from other building features, remains very indistinct. The paradox is, most of the green building features are usually factored into the green certification (Reed, Bilos, and Wilkinson, 2009).

As can be concluded based on the responses analyzed in this section, the development of green-labeled offices as experienced in the U.K. to date, is not necessarily the result of any anticipated green premium. Rather, it is largely in response to potential future legislation risks.

Local Market Influences

An attempt has been made in the preceding section to present the drivers of green office development based on evidence across the four case study cities. However, the responses also showed that there are some drivers that are for one reason or the other, more pronounced in some markets than the others. This agrees with the premise of the study that the supply and the eventual greening of office buildings tend to be driven by local market influences. These drivers are discussed in this section employing intra-case analysis of local green office markets in three of the case study cities.

CSR Agenda and Occupier Specification Requirements (London)

As previously noted, the London office market is ahead of other U.K. cities with the presence of about 120 labeled offices at the end of 2014. Such buildings represented about 50% of the national office stock, making the city market the

greenest in the U.K. in terms of building units and floor space (Oyedokun, Jones, and Dunse, 2015). As gleaned from the interviews, the scale relates to the city's role as a global financial center and home for key branches (or headquarters) of many international organizations, most of which have standards of corporate strategy that align with environmental sustainability. In the words of an interviewee: "I think for companies like PWC, KPMG, and similar large corporates, the green credential aspect of a building is important. Their CSRs are such that they operate on a sustainable basis as much as possible" (Director, London).

As can be inferred from this response, the demand requirement for labeled buildings tends to be high in cities with a preponderance of environmental conscious organizations. It has been reported that many of these large international corporate businesses see occupying signature (often green) buildings as a means of promoting their identity (Eichholtz, Kok, and Quigley, 2010; Levy and Peterson, 2013). As part of a CSR agenda as well, some organizations might be looking to green buildings in accordance with the dictates of their shareholders (O'Mara and Bates, 2012). All these factors can work together to motivate green office development. However, the state of the market will likely determine how much importance is attached to green building certification. As one interviewee expressed: "… a market with very few conscientious green office occupiers as revealed in previous analyses, the bargaining position of the occupiers during negotiations can also determine whether a green premium would be included in office rents. The presence of occupiers with a CSR strategy that promotes lease of green offices might not necessarily result to a green rent premium, but it can certainly be capitalized upon by the investors to capture a wider range of occupiers in the market."

In fact, there is evidence non-indigenous companies might be influencing the market using CSR policies that are well-linked to operations in their respective countries of origin. One interviewee noted that "more developers are now going for LEED due to the influx of American investors into the UK" (Director, London). This might be partly due to LEED being the dominant green building certification for the U.S. or an attempt to demonstrate the same degree of corporate-level commitment to environmental sustainability.

Notwithstanding, it should be mentioned that the impact of CSR and occupier specification requirements might not be limited to London alone. Sustainability is a global concept and global cities such as London should be at the forefront of the green agenda in terms of the demand and supply of green offices (Kok and Holtermans, 2014). However, while provincial cities like Manchester, Birmingham, and Edinburgh may have also been influenced by the wave of globalization, it is to a lesser extent compared to London. This is because the focus of the market stakeholders is most likely to shift to the regional cities whenever there is a need to develop, buy or lease outside London.

Local Planning Requirements (Manchester and Edinburgh)

The provisions of local development planning constitute a significant influence in both Manchester and Edinburgh, although for different reasons. According to the

consultants interviewed in Manchester, a dominant influence on green office development since 2012 has been the planning policy of the city's council. One interviewee expressed that "virtually all new buildings are obliged by planning regulations" (Director, Manchester) while another said that the provision is more applicable to city-center developments. "The Manchester City Council, through the planning guidance for the city center, requires that new office buildings have to be wherever possible at BREEAM Excellent" (Director Office Agency, Manchester).

Manchester's Local Development Framework is a document that contains detailed provisions regarding the development and extensive refurbishment of commercial office buildings, especially within the zone designated as the city center. To be specific, policy DM1 of the framework states that: "… subject to scheme viability, developers will be required to demonstrate that new development incorporates sustainable construction techniques as follows (in terms of energy targets this policy should be read alongside policy EN6 and the higher target will apply)." For example, "(b) For new commercial developments to demonstrate best practice, which will include the application of the BREEAM (Building Research Establishment Environmental Assessment Method) standards" (Manchester City Council, 2012; pp. 216–17).

As suggested by the interviewees, the developers might have accepted green buildings, but "through gritted teeth rather than they wanted it" (Director Office Agency, Manchester). It appears these planning regulations may define the nature of new development but not the pace of development. They may have worked in the short term but when the market is weak, and development is "financially challenged," there will be a conflict between the policy and the promotion of local economic development (Cheshire, Leunig, Nathan, and Overman, 2012; Sayce, Ellison, and Parnell, 2007). There may even be the need to provide financial incentives to developers and investors to sustain green building development in the event of a waning profitability in the long run (Brotman, 2014). Based on this evidence, only time would tell what would be the consequence of employing regulatory measures in driving the adoption of voluntary green labels in the commercial property market. Mandating new buildings to obtain a voluntary green label was reported to have a significant positive effect on market penetration in the U.S. (Fuerst, Kontokosta, and McAllister, 2014).

In Edinburgh, the quest to preserve the heritage values of the city was amplified by the interviewees as a factor impeding the greening of the commercial office stock. The city is one of the most sought-after destinations for tourists with many centrally-located buildings designated as UNESCO's world heritage sites (Parlett, Fletcher, and Cooper, 1995). The city is guided by numerous environmental and planning policies that promote the preservation of heritage values (The Scottish Government, 2010). According to the responses received, owners of affected buildings are unable to carry out redevelopment or extensive refurbishment that can affect the heritage features for which the buildings have been recognized. One interviewee noted that Edinburgh "… is a difficult city to develop or refurbish older buildings, but on the other hand, people come to live in the city because it's a beautiful city, nice to live" (Director, Edinburgh). In addition, another

interviewee said that "… to really achieve high ratings on these (BREEAM) standards, you have to redevelop, but you can't knock down these buildings because they are world heritage sites" (Partner, Edinburgh).

The case of an old office building was highlighted by one of the interviewees: "We actually had restrictions on that building. It was listed (for conservation purposes), and we sought to make it as environmentally sustainable as possible … and (achieve) green credential as high as possible, but there are limits to what you could do … the windows are listed, so you can't replace the glass, so we simply did the best we could" (Partner, Edinburgh).

The interviewee's response suggests that, while more effort would have been made to refurbish the building to the desired taste, the fact that the building is historical constituted a major hindrance to its refurbishment. Some of the interviewees also expressed disappointment that it is almost impossible for a refurbished building to achieve a high rating specifically, BREEAM Excellent, even while such buildings actually satisfy some core tenets of sustainability, such as long lifespan, reuse, and recycling. But there are also questions regarding the technical aspects of these refurbishment projects, particularly pertaining to whether historic buildings can be retrofitted optimally, to make them as sustainable and energy efficient as modern buildings (Miller and Buys, 2008). BREEAM Refurbished has been introduced for refurbished buildings, but it is not yet popular in the market.

The overall implications of the planning provisions to preserve the heritage values of commercial buildings in Edinburgh are that the green transformation (defined as achieving good green labeling) of the city's office sector is likely to be slow and inconsistent, to a large extent, with the price mechanism. In addition, new developments will be forced to the city fringe due to a constraint on land supply. Again, planning regulations concerning heritage preservation may be influencing the office stock greening process, but in the context of this study, it is more pronounced in Edinburgh.

Conclusion

This study examined the impact of a green premium as a potential driver of green office property development. It employed a case study approach, presenting qualitative evidence from four cities in the U.K. with significant concentrations of green offices, built since the turn of the century. While most previous research on the green premium has taken the form of outcomes using hedonic regression models in which the value of greenness is estimated by controlling for building-specific characteristics, a qualitative approach has been adopted in this study, which enables a focus on the process of change. This makes the study unique in terms of methodology, being one of the very few studies to use the approach. Another uniqueness of the study relates to the use of multiple case design so that inferences could be drawn from more than one case.

The results show that despite significant green office development, the existence of a green rent premium remains elusive in the case study cities. This is partly

due to the nature of the valuation process in the U.K. As deduced from the analysis, most of the green buildings are new and tend to be distinctive in the local markets, which makes green premium estimations very difficult. The evidence suggests that if there is a rent premium at all for green buildings, it would mostly be because such buildings enjoy certain advantages, such as being trophy properties, newly built or built to modern specifications.

Furthermore, while the number of green offices is increasing, no evidence is found that a green office submarket exists in the cities examined. The market view from respondents is that only a few potential users would take up no building other than green-labeled. The uncertain nature of the green premium and a green office submarket contrasts to a large extent with the number of green buildings having increased substantially in the first 15 years of this century in the U.K.

The motivation for green office development appears not to have come from any anticipated rental or capital value premium on these offices, but majorly from the belief that these properties have the potential to attract quality tenants. While there is clearly support that sustainability is strongly relevant to corporate agendas, there is no convincing evidence that green offices are rented purely because they are green-labeled. While occupiers might like to occupy green offices, such a decision is influenced by the wider set of attributes of an office. Nevertheless, there is a general belief by agents that a green label is important but these views can be characterized as a ''green letting premium'' rather than a ''green rent premium.'' While it is a subtle difference, it is important to developers, financiers, and investors in driving green office development as it takes a forward-looking anticipatory perspective in which a green label is perceived as essentially acting as a guarantee of future income streams and ultimately lower yields/higher capitalization rates.

As found consistently in this study, factors such as occupiers' requirements for modern buildings and the desire of investors to future-proof investment against possible sustainability obsolescence seem to be better explanations for the development of the green-labeled offices in the U.K. The potential long-term risk of obsolescence resulting from government policy that has promoted a green agenda with the likelihood that increased green building standards will be required in the future has been a significant driver of green office development. This factor, in particular, seemed to have exercised the minds of investors and perhaps banks providing development finance.

The role of CSR as a strong motivation for green buildings is more pronounced in London, the location of half of the U.K. green office stock. As found in this study, the adoption of green offices in London is strongly influenced by its role as a global financial center and home to image-conscious major financial institutions. This is in accordance with the current prevalence of green buildings in most of the global cities (Kok and Holtermans, 2014). The presence of organizations with sustainability policies has helped to raise the awareness and demand for green offices. However, the impact of this demand as a demonstration effect on the rest of the London market is limited.

The impact of local planning is highlighted in the provincial cities. In Manchester, the local planning authority stipulates a requirement for BREEAM Excellent status for all new developments and major refurbishments, especially at the city core. While this seems to be yielding the desired results, it is not yet clear what would be the consequences for the viability of office development, especially in market downturns. In the same vein, the planning provisions on the preservation of buildings with heritage values are affecting the pace of the greening process in Edinburgh. For this particular market, the rate and degree of refurbishment, in particular, is highly restricted and has encouraged newly built labeled buildings outside the city center.

Overall, the fundamental drivers of green offices are not strongly linked to the existence of a local market green premium but are to a large extent motivated by legislation that is promoting a green agenda and anticipated demand for high specification offices. Given the nature of this demand is linked to a city's economy, the process will always have a local dimension. The message of the study is that green-labeling is important to both the investors and the financial institutions providing development finance as a means of insuring against potential functional obsolescence caused by central governments' continuing commitment to the green agenda. The findings can be embodied as a green letting premium rather than a green rent premium that is driving development. Local planning policies and urban morphology can also have an impact on the greening dynamic in terms of setting local standards and the pace of development.

The findings point to the need to re-evaluate existing knowledge on the nature of a green premium in order to derive more objective and realistic conclusions that can help enhance market acceptance and investment in green-labeled buildings. The use of hedonic pricing models and stated willingness-to-pay for green features has been promoted, but their success is still limited to submarkets with sufficient market evidence. These research approaches focus only on estimating outcomes rather than the process of the adoption of green buildings. This study by examining underlying market sentiment suggests that a green premium cannot be simply seen in terms of a headline rent but more widely by reference to future income streams.

Qualitative research has some limitations, but the evidence derived in this study is broadly consistent across respondents in different firms and in individual cities and across cities. While the findings here cannot necessarily be generalized to represent the experience of any other office markets within or outside the U.K., the study has global implications for how a green premium is defined, understood, and valued. The use of a qualitative research approach in understanding a concept that is traditionally assessed using quantitative research methods is one of the strengths of the study. The concept of a green letting premium needs to be assessed by further research in cities beyond the U.K. By replicating the study in the U.S. and other countries where a green premium message has become a norm, the international understanding of the existence and impact of a green premium would be enhanced.

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