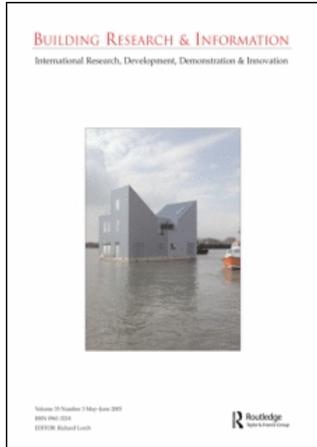


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Responsible property investment criteria developed using the Delphi Method

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Responsible property investment criteria developed using the Delphi Method

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This paper helps define responsible property investing (RPI) by using the Delphi Method to prioritize criteria for the evaluation of property investments. An international panel from the real estate and social investing sectors evaluated 66 criteria in terms of materiality to investors and importance to the public interest. A moderate to strong level of consensus was achieved. Criteria were ranked in terms of their materiality for financial performance and their importance to the public interest. Top ranked criteria were energy efficiency and conservation, high level of public transport services, transit-oriented development, daylight and natural ventilation, and contributes to higher density, mixed-use walkable places. There were few to no significant differences among the panellists by industry, gender or nationality. Factor analysis uncovered ten dimensions underlying the criteria. Based on this analysis, the panel would emphasize the creation of less automobile-dependent and more energy-efficient cities where worker well-being and urban revitalization are priorities. Leadership in Energy and Environmental Design (LEED) green building rating tools were compared with the results and found to be much stronger on environmental criteria than social concerns. The results can guide RPI portfolio audits, database development, third-party assessments of property companies, strategic consulting, the development of corporate reporting standards, RPI certification procedures, updated green building assessment tools, and cost–benefit studies to help guide asset managers.

Keywords: corporate social responsibility, ethical behaviour, green buildings, investment criteria, property portfolios, public interest, responsible property investment

Cet article aide à définir l'Investissement Immobilier Responsable (RPI) en utilisant la méthode Delphi pour classer par ordre de priorité des critères pour l'évaluation des investissements immobiliers. Un groupe international composé de représentants des secteurs de l'immobilier et de l'investissement social a évalué 66 critères en termes d'importance relative pour les performances financières et d'importance pour l'intérêt public. Un niveau de consensus moyen à fort s'est dégagé. Les critères ont été classés en termes d'importance pour les performances financières et d'importance pour l'intérêt public. Les critères prioritaires étaient l'efficacité énergétique et la conservation, un haut niveau de transports publics, des développements axés sur les transits, la lumière du jour et la ventilation naturelle ainsi que la contribution à des lieux piétonniers à forte densité et à usages mixtes. Il n'y avait peu ou pas de différences significatives entre les membres du groupe répartis par industrie, sexe ou nationalité. L'analyse des facteurs a mis à jour dix dimensions sous-jacentes des critères. Sur la base de cette analyse, le groupe insiste sur la création de villes dépendant moins de la voiture et plus efficaces en énergie où les priorités sont le bien-être des travailleurs et la revitalisation urbaine. Les outils de classement des bâtiments écologiques du système LEED (Leadership in Energy and Environmental Design) ont été comparés aux résultats et se sont révélés beaucoup plus utiles pour les critères environnementaux que pour les préoccupations sociales. Les résultats peuvent guider les audits de portefeuilles RPI, le développement de bases de données, l'évaluation d'entreprises immobilières par des tiers, la consultance stratégique, le développement de normes de reporting institutionnel, les procédures de certification RPI, les outils d'évaluation de bâtiments écologiques actualisés et des analyses coûts-avantages pour aider les gestionnaires d'actifs.

Mots clés: responsabilité sociale de l'entreprise, comportement éthique, bâtiments écologiques, critères d'investissement, portefeuilles de biens, intérêt public, investissement immobilier responsable

Introduction

Responsible property investing

Institutional property investors own a significant share of the world's building stock. These investors include developers, real estate lessors, pension and investment funds, portfolio managers, and real estate investment trusts. In the US they own about 20% of the total value of all commercial buildings and about 9% of the value of all fixed residential structures (Bureau of Economic Analysis (BEA), 2007).

Property investing can be very profitable. For example, total returns from 1975 to 2005 for US real estate investment trusts exceeded all the leading security benchmarks according to the National Association of Real Estate Investment Trusts (2007). However, while properties may earn healthy financial returns for their investors, they can also be associated with a variety of social and environmental problems. For example, 54% of all global CO₂ emissions from the use of fossil fuels in 1995 were produced by residential and commercial buildings and the transportation between them (Intergovernmental Panel on Climate Change, 2001); 18% of all fatalities in US private industry are in building construction, related trades and real estate (US Bureau of Labor Statistics, 2005); the US loses 1.5 million acres of farmland annually to urbanization (American Farmland Trust, 2007); and 2 million occupied housing units have severe physical problems such as no hot or cold water, flush toilets, or electricity (US Census Bureau, 2000).

As property owners and debtors, real estate investors can influence how these and other property-related issues are addressed. They can purchase and promote new buildings that are located and designed to create fewer negative and more positive impacts. And they can address issues through how they manage and refurbish their existing portfolios.

Not only is it in the public interest for property investors to better manage the social and environmental consequences of their industry, it is in their own interest as well. Social and environmental problems can represent very real business threats and opportunities. For example, unsafe properties can be major liabilities for their owners. Overall, social and environmental issues can create a variety of financial problems for building owners because of the risks, liabilities and expenses they can create.

A new property investment paradigm is emerging that is designed to give greater consideration to such issues in the property investment process (Pivo, 2005; Hermes Real Estate, 2006). It is called responsible property investing (RPI) and the *Wall Street Journal* has referred to it as 'real estate's latest movement' (Haughney, 2006). In short, RPI means making and managing property investments in ways that go

beyond compliance with minimum legal requirements in order to better manage social and environmental issues. The goal is to help solve societal and ecological problems while also managing their associated business risks and opportunities.

RPI is not philanthropy or altruism. It seeks strategies that are consistent with investor goals and fiduciary responsibilities. While it shares a commitment to the public interest with other progressive architecture, planning, and development movements, it is unique in its focus on design and management practices that can produce acceptable financial returns.

RPI has its roots in corporate social responsibility and socially responsible investing. Corporate social responsibility (CSR) means:

private firms doing more than they are required to do under applicable laws and regulations governing the environment, worker safety and health, and investments in the communities in which they operate.

(Portney, 2005, p. 108)

Garriga and Mele (2004) review the CSR literature and conclude that it is motivated by four main concerns: producing profits, using business power in a reasonable way, integrating social demands, and contributing to a good society through ethical behaviour. According to KPMG (2005), 52% of the 250 largest companies in the Fortune 500 issued CSR reports in 2005. In many respects, RPI is CSR for the property sector.

Socially responsible investing (SRI) refers to giving consideration to both financial and ethical issues when making financial investments. It is, in part, CSR as applied in the investment sector, but it also pertains to private, non-profit and other non-corporate investment decisions. Mansley (2000, p. 171) predicted several years ago that property would join the main debate on socially responsible investing because it is 'at the frontline of many social and environmental debates today'. According to one of the SRI industry leaders (Schueth, 2003), SRI investors are motivated by a desire to put their money to work in ways that align with their values and a desire to encourage improvements in the quality of life. SRI uses screening to include or exclude companies based on environmental criteria, shareholder advocacy to engage in dialogue with companies on issues of concern, and community investing to provide capital to people in low-income, at risk communities (Schueth, 2003). As of 2005, nearly 10% of all funds under professional investment management in the US were involved with socially responsible investing, and the trend is growing in Europe, Asia and Canada as well (Social Investment Forum, 2006).

Recently, The Principles for Responsible Investment were developed by the UN Global Compact and UN Environment Programme Finance Initiative (PRI, 2006) to provide institutional investors with a framework for considering social, environmental, and corporate governance issues in their decision-making. To date there have been over 180 institutional signatories to the Principles, representing over US\$8 trillion in assets under management. During their development, Pivo and McNamara (2005) prepared a brief on how the Principles could apply to property investing through the process of RPI. At the time, the idea that social responsibility could apply to property investing was not entirely new. Mansley (2000) had already recommended it in 2000 and it had been previously explored by McNamara (2000) and Newell and Acheampong (2002). Subsequently, it has been examined by Lutzkendorf and Lorenz (2005), Boyd (2005a) and Pivo (2005). Nevertheless, Pivo and McNamara's brief increased awareness of the property issue among PRI signatories, many of which have large real estate portfolios on the order of US\$5 billion to US\$50 billion, and sparked the creation of the Property Working Group within the United Nations Environment Programme Finance Initiative (UNEPFI). Some of the world's leading property investment organizations are founding members, including PRUPIM, Caisse des Depots, AXA Real Estate Investment Managers France, Hermes Investment Management, Morley Fund Management, F&C Property Asset Management, and WestLB AG. The group's first objective is to create a set of briefs illustrating the financial feasibility of responsible property investing (UNEPFI, 2007).

Meanwhile, in the US interest has been growing within the US\$2.3 trillion SRI industry (Social Investment Forum, 2006) in property as an asset class. It was the focus of break-out sessions during the 2005 and 2006 SRI industry conferences, and the subject of articles on leading SRI websites (Baue, 2005a, b). This brought about the creation of the Responsible Property Investment Project (RPIP), a cooperative effort of the Institute for Responsible Investment at Boston College and the University of Arizona. Somewhat similar to the UNEPFI initiative, the RPIP includes a working group composed of leading North American real estate investors, asset managers, and SRI companies. So far the RPIP has focused on conducting research on RPI in North America and organizing conferences that allow SRI and real estate industry leaders to discuss the future of responsible property investing (Wood and Pivo, 2006).

A commitment to RPI by the SRI industry could have a major impact on the real estate industry. If 10–20% of the US\$2.3 trillion in SRI funds were invested in RPI, which is the allocation to real estate commonly recommended for investment portfolios (Waggle and

Johnson, 2004), it would equal 50–100% of the entire 2006 US REIT industry market capitalization (National Association of Real Estate Investment Trusts, 2007).

A key recommendation that emerged from the first RPIP conference was that criteria should be developed to help investors define and identify responsible property investments and they should be ranked both in terms of their materiality to investors and their importance to the public interest (Wood and Pivo, 2006). A similar call has been heard in the UK over the past few years, partly in response to the complexity and inconsistency of surveys being received by property companies requesting information on their social and environmental policies and programmes (Barrett, 2003; Ritblat, 2003; *Estates Gazette*, 2006).

Materiality and the public interest are distinct dimensions. Materiality refers to facts about an investment that are important to investors when making investment decisions (Hall, 2004). The energy efficiency of a property portfolio, for instance, is material because energy prices or regulations can affect financial returns. Public interest, on the other hand, pertains to ethical issues and externalities relevant to the general welfare. The energy efficiency of a property portfolio is in the public interest because it affects air pollution and global warming, which raises broader ethical, social, and environmental issues important to all members of society. Materiality and the public interest correspond to the threats and opportunities that social and environmental issues represent for business profits, on the one hand, and societal well-being, on the other hand, and both considerations are important to responsible investors. Thus, for separate reasons any potential criteria for RPI should be evaluated for their importance to both materiality and the public interest.

The Delphi Method

This paper responds to these calls for RPI criteria. It reports findings from a systematic effort to prioritize RPI criteria, considering both their materiality and significance for the public interest.

The creation of such metrics is a complex task that touches on both the facts and values associated with a variety of issues and topics. It could be approached through a scientific survey of professionals or the population at large, but that would not allow for the kind of interactive group process that can blend stakeholder interests and forge the consensus of opinion needed for a widely accepted rating system. Thus, for this project an approach was taken that could facilitate group interaction and decision-making.

The approach that was chosen is known as the Delphi Method. According to Fischer (1978, p. 64):

Delphi is a method of gathering and refining the opinions of experts in order to obtain consensus.

It replaces direct debate because in face-to-face discussions involving opinion there are biasing effects such as the influence of dominant individuals and pressure for conformity.

Delphi has been used since the early 1950s when it was developed at the RAND Corporation. The most recognized book on the subject is by Linstone and Turoff (1975). Other useful reviews include Fischer (1978), Schmidt (1997), Okoli and Pawloski (2004), and Keeney *et al.* (2006). Basically, it is a structured group interaction that proceeds through ‘rounds’ of opinion collection and feedback. Each round is composed of a written survey followed by feedback to the respondents of the statistical scores for each survey question. After each round the respondents are surveyed again to determine whether their opinions have shifted after seeing the statistical results from the prior round(s). As a result of the process there is typically a convergence of opinion. Usually, after three or four rounds the convergence ends and a stabilized group opinion emerges. This group opinion may reflect agreement, disagreement or some of each.

In contrast to a traditional survey, which would use a random sample to estimate the views held by separate individuals in a target population, the Delphi Method uses interactions by a panel with relevant expertise to arrive at a consensus group response to difficult questions. The results are not designed to represent a statistical sampling of a larger population. However, the validity of generalizing the results to a larger population, that is, the extent to which non-participants would produce similar results, can be tested in subsequent studies by repeating the Delphi process with different panel members or by using different methods, such as traditional surveys, interviews or other techniques.

Research methods

Survey process

The survey for this study was conducted in three rounds. In the first round, 92 individuals were invited to participate and 51 (55%) accepted the invitation (see Panel composition, below). Those who participated in the first and second rounds were asked to participate in the next round. Forty-nine agreed to go on to the second round and 43 agreed to go on to the third round.

For the first round, prospective panellists were contacted by e-mail and sent an invitation to participate, an explanation of the study process and a hyperlink to the survey instrument, which could be completed on-line. Reminders were sent to those who did not respond approximately one and two weeks after the initial invitation. Invitations to the second round were sent by e-mail one month after the start of Round 1. The panel’s median responses and frequency tables from Round 1 were included. Reminders to participate were sent at two- and three-week intervals. Invitations to the third round were e-mailed about two months into the study along with median responses and frequency tables from Round 2. Reminders followed two and four weeks later.

Panel composition

The best number of Delphi panellists has not been determined. It generally depends on the number needed to have a representative pooling of views and is commonly thought to be ten to 50 members in the final round of the process (Ndour *et al.*, 1992). According to Keeney *et al.* (2006, p. 208), ‘there is no universally agreed criteria for the selection of experts’ and:

no magic formula to help researchers decide on who are the experts and how many there should be (p. 209).

They point out, however, that:

working on the principle that experts must have knowledge of the subject area, participants cannot be selected randomly (p. 208).

Ndour *et al.* (1992) concur and point out that the reliability and validity of the method requires the panel members to be knowledgeable about the subject and represent many different points of view.

In the present study, the question of who is expert is complicated by the nature of the questions being discussed. The study touches on a wide variety of economic, social, and environmental subjects and concerns both facts and values pertaining to real estate, buildings, cities, and socially responsible investing. Ultimately, it was thought that the success of the exercise would depend on achieving agreement among people who could bring both a general knowledge of the issues and represent a broad range of values and priorities. Therefore, a demographically diverse group of panellists was sought from a variety of relevant backgrounds, such as real estate, social investing, community development, environmental planning, etc., with considerable professional experience and an interest in RPI.

Since there is no directory for RPI experts, the panel was selected from lists of individuals who had either attended a session on RPI at the 2005 SRI in the Rockies Conference, attended a two-day conference on the topic co-hosted in 2006 by the University of Arizona and Boston College, or enrolled in the Responsible Property Investing ListServ hosted by the University of Arizona. As already noted, the selection criteria prevent random sampling from the lists. Participants were therefore purposively selected to represent a high level of expertise, a variety of relevant occupational backgrounds, and some degree of diversity in gender, ethnicity, and nationality.

The final panel of participants included members with professional backgrounds in real estate (40%), socially responsible investing (35%), engineering and design (8%), and academia (17%). Most were US residents (88%), but others came from outside the US, including Canada (2%), the UK (6%), Germany (2%), and Australia (2%). Their level of accomplishment was judged in terms of their educational level, years of experience and organizational status. A total of 75% held Master's, professional or doctoral degrees; they averaged 22 years of professional experience; and most held senior positions in their organizations with titles such as President, Vice-President, Chairman, Director, Chief Operating Officer, Chief Financial Officer, and Professor. The group was gender-balanced, though less racially diverse than the general population.

Since the panellists were not selected by random sampling, potential selection biases were addressed by collecting information on various demographic characteristics of the panel and checking to see if they influenced their responses to the surveys. As will be shown below (see Ratings by subgroups), the findings were broken down in a variety of ways and demographic factors were not found to have a significant impact on the final results. Therefore, it is unlikely that any demographic biases that might be reflected in the panel composition had a significant effect on the final outcome.

Survey instrument

The survey asked all panellists to rate a list of criteria both in terms of their importance to materiality and the public interest. Ratings were performed on a scale of 1 to 5, with 1 being least and 5 being most important. The criteria to be rated were largely drawn from existing sources on sustainability or social responsibility in property including Mansley (2000), Sayce and Ellison (2003a, b), Sayce *et al.* (2004), St. Lawrence (2004), Kimmet and Boyd (2004), Upstream (2004), Boyd (2005a, b), Boyd and Kimmet (2005), Pivo and McNamara (2005), the Sustainable Property Appraisal Project (2005), and Hermes Real Estate (2006). The criteria touched on a variety of topics that could

affect the social or environmental performance of a property investor's portfolio including location (e.g. central location), public facilities and services (e.g. parks and open space nearby), design and engineering (e.g. water conservation technology), development processes (e.g. solicitation of community input), operations and maintenance (e.g. energy efficiency), removal (e.g. recycling of demolition waste), occupant behaviour (e.g. recycling) and owner behaviour (e.g. disclosure and reporting of social and environmental performance). Within this framework most of the criteria can be affected by more than one of these processes, underscoring the complexity of implementing responsible property investing. For example, the water efficiency of a property or portfolio can depend on public services (e.g. whether a property is served by a reclaimed water system), design and engineering (e.g. fixture and landscape selections), operations and maintenance (e.g. leak and irrigation management), and occupant behaviour (e.g. turning off facets and reporting leaks).

In Round 1 the panel was asked to rate 54 criteria. They were also invited to suggest additional criteria for subsequent rounds. This resulted in a total of 66 criteria for Rounds 2 and 3.

As described above, for Rounds 2 and 3 the panellists were given the median results and a frequency distribution for responses from the prior round. They were asked to keep these scores in mind, since the goal was to work toward consensus, and to give the median group score if they wished to agree with the group as a whole. They were also invited to disagree if they so desired.

Results

Level of consensus achieved

Table 1 gives the level of consensus achieved as measured by Kendall's Coefficient of Concordance (Kendall's *W*) and the related interpretation of the scores as suggested by Schmidt (1997). Kendall's *W* is a non-parametric statistic and, as such, only measures the level of agreement within the panel. It is not intended to estimate the level of consensus in the larger population outside of the Delphi panel. As mentioned above, that is not the purpose of a Delphi process. Consequently, parametric statistics, such as confidence intervals or significance levels, are not provided. They are only appropriate when making estimates about a larger population using a random sample research design.

A low level of agreement was found in Round 1 with higher levels of agreement achieved in each of the subsequent rounds. By the final round a moderate-to-strong level of agreement was achieved. In each

Table 1 Level of agreement achieved

Round	Kendall's <i>W</i> for materiality	Kendall's <i>W</i> for the public interest	Interpretation	Confidence in ratings
1	0.33	0.28	Weak agreement	Low
2	0.47	0.39	Weak to moderate agreement	Low to fair
3	0.60	0.55	Moderate to strong agreement	Fair to high

round there was greater agreement on the materiality of the criteria than on their importance for the public interest, though the difference fell to 9% by the final round.

The increment for improvement in Kendall's *W* was as high or higher for Rounds 2 and 3 as for Rounds 1 and 2, so it is likely that a stronger consensus would have been achieved with more rounds. However, the process was ended after Round 3 because of attrition from the panel between Rounds 2 and 3 (14%), the time burden on the panellists, and the expectation that more rounds would not significantly alter the rankings. The effect on the final results from panellists dropping out is discussed in the following section.

Ratings overall

The results achieved after Round 3 are summarized in Table 2. Each criterion is given in column 5, just as it was presented to the panellists in the survey. The mean ratings given by the panel for the materiality and public interest of each criterion are given in columns 6 and 7. The mean of these two scores is given in column 9. Since both dimensions are viewed as relevant to the overall importance of each criterion, the criteria are ranked in column 1 according to this mean of materiality and public interest (column 9). Quartile scores are given in column 2, also based on the mean of materiality and public interest. Rankings based on materiality and public interest alone are given in columns 3 and 4, respectively. Column 8 gives the difference between these rankings, which is discussed below. Column 10 gives the increment between each item in column 9 and the next higher score, which also is discussed below. Grand means for each column appear in the last row of the table.

According to the panel the five most important criteria for judging RPI, considering both their importance for materiality and the public interest, are energy efficiency and conservation, high level of public transport services, central location, transit-oriented development, and water conservation and recycling.

There are 16 criteria in the top quartile. Five of these are primarily environmental issues (energy and water conservation, alternative energy, flexibility, and recycling), three are primarily social issues (worker

productivity, absenteeism/illness, and aesthetics), and eight are related to both considerations (transport services, central location, transit-oriented development, daylight and ventilation, contributions to walkable places, regulatory compliance, urban revitalization, and open space and plazas).

Fifty-five of the criteria received a combined score (the average of mean materiality and public interest ratings) of 3.0 or greater. This indicates that a large number of the criteria were viewed as relatively important by the panel.

An analysis of the increments in column 9 identified certain break points in the rankings. Overall, the average increment was 0.04. Increments considerably larger than this occurred after the first, fourth, fifth, 15th, 45th and 48th criteria. Using these breakpoints to place the criteria in tiers, there was a top tier group composed of a single criterion – energy efficiency and conservation – a second tier composed of public transportation and centrality, and additional groups broken at the larger increments.

The ratings given in Round 2 by the seven panellists who dropped out were compared with those who did not drop out to determine whether their staying would have had a significant effect on the final outcomes. For 59 (90%) of the criteria, the ratings given by those who dropped were very similar to the ratings given by those who remained, indicating that the loss of panellists had little effect on the overall scores and final rankings for most of the criteria. For seven criteria (10%), however, the scores given by those who left were rather different from those who stayed. In these cases the final rankings were computed with and without their scores from Round 2. The rank of one criterion would have been lowered by 1 (high level of public transport services) and the rank of another would have been lowered by 2 (minimizes building related absenteeism and illness). The rank of a third criterion would have been raised by 2 (use of ozone-depleting chemicals) and the rank of a fourth would have been raised by 6 (not built on prime farmland). Retaining those who left, however, would not have affected the top-ranked criterion or the criteria included in the top ten or 20. In sum, the loss of panellists had only a small effect on the final rankings and almost no affect on the highest ones.

Table 2 Results, Round 3

(1) Rank per (9)	(2) Quartile per (9)	(3) Rank per (6)	(4) Rank per (7)	(5) Criteria	Ratings		Analyses		
					(6) Materiality	(7) Public interest	(8) Difference	(9) Mean	(10) Increment
1	4	2	1	Energy efficiency and conservation	4.56	5.00	-0.44	4.78	
2	4	3	2	High level of public transport services	4.14	4.93	-0.79	4.53	0.25
3	4	1	18	Central location	4.91	4.09	0.82	4.50	0.03
4	4	4	5	Transit-oriented development	4.09	4.84	-0.75	4.47	0.03
5	4	12	4	Water conservation and recycling	3.67	4.86	-1.19	4.27	0.20
6	4	7	10	Daylight and natural ventilation	3.95	4.35	-0.40	4.15	0.12
7	4	9	9	Contributes to higher density, mixed-use walkable places	3.86	4.37	-0.51	4.12	0.03
8	4	5	16	Regulatory compliance	4.07	4.12	-0.05	4.09	0.03
9	4	10	11	Benefits urban revitalization	3.84	4.28	-0.44	4.06	0.03
10	4	6	19	Flexibility to adapt to changing uses over time	4.00	4.07	-0.07	4.03	0.03
11	4	8	21	Occupant worker productivity	3.88	4.02	-0.14	3.95	0.08
12	4	12	18	Minimizes building-related absenteeism and illness	3.67	4.09	-0.42	3.88	0.07
13	4	10	25	Aesthetics, contextual fit, visual blending, and quality public realm	3.84	3.91	-0.07	3.87	0.01
14	4	22	6	Alternative energy sources used	2.91	4.79	-1.88	3.85	0.02
15	4	13	13	Open space, parks or plazas nearby	3.28	4.19	-0.91	3.73	0.12
16	4	16	10	Recycling, waste reduction, recycled materials	3.09	4.35	-1.26	3.72	0.01
17	3	13	17	US Environmental Protection Agency Partnerships: Energy Star, Best Workplaces for Commuters, Waste Wise or Combined Heat and Power programmes	3.28	4.10	-0.82	3.69	0.03
17	3	32	3	Low contributions to global warming	2.50	4.88	-2.38	3.69	0.03
18	3	14	18	Catalyses positive suburban and peripheral development or redevelopment	3.16	4.09	-0.93	3.63	0.06
19	3	15	21	Green building certification (LEED, BREEAM, etc.)	3.12	4.02	-0.9	3.57	0.06
19	3	21	12	Sustainability of building materials	2.93	4.21	-1.28	3.57	0.06
20	3	17	21	Sense of community, sense of place throughout the building	3.07	4.02	-0.95	3.55	0.02
21	3	17	22	Childcare onsite or close by	3.07	4.00	-0.93	3.53	0.02
21	3	19	18	Accommodations for the disabled	2.98	4.09	-1.11	3.53	0.02
22	3	30	8	Protects or provides wildlife habitat	2.63	4.42	-1.79	3.52	0.01
23	3	15	25	Amenities close by for working parents (access to food/prepared meals, laundry, errands, etc.)	3.12	3.91	-0.79	3.51	0.01
23	3	21	18	Brownfield and infill development	2.93	4.09	-1.16	3.51	0.01
24	3	11	36	Property and visitor security	3.79	3.19	0.60	3.49	0.02
24	3	18	23	Engaged in community relations and development	3.00	3.98	-0.98	3.49	0.02
25	3	23	16	Disclosure and reporting of social and environmental performance	2.84	4.12	-1.28	3.48	0.01
26	3	21	24	Stakeholder and community engagement	2.93	3.95	-1.02	3.44	0.04
27	3	21	25	Solicits community input during all stages of development	2.93	3.91	-0.98	3.42	0.02
27	3	23	22	Affordable housing considerations (for housing) or access for low-income owners or minority-owned businesses for commercial property	2.83	4.00	-1.17	3.42	0.02
28	2	23	24	Tree planting and protection	2.84	3.95	-1.11	3.40	0.02
29	2	26	20	Buffering for wetlands and riparian areas	2.72	4.05	-1.33	3.38	0.02
30	2	24	27	Engagement on issues with suppliers	2.81	3.86	-1.05	3.34	0.04
30	2	26	24	Fair labour practices for construction and service workers	2.72	3.95	-1.23	3.34	0.04
30	2	40	7	Use of ozone-depleting chemicals avoided	2.00	4.67	-2.67	3.34	0.04
31	2	25	28	Minimum negative impacts on local traffic, schools, and other infrastructure/services	2.79	3.84	-1.05	3.31	0.03
32	2	27	28	No involuntary displacement of homes and business	2.70	3.84	-1.14	3.27	0.04
33	2	28	28	Considerate construction practices	2.67	3.84	-1.17	3.26	0.01
33	2	30	26	Historic and landmark preservation	2.63	3.88	-1.25	3.26	0.01
34	2	30	26	Native landscaping	2.63	3.88	-1.25	3.25	0.01
35	2	25	31	Use of union construction and service workers	2.77	3.65	-0.88	3.21	0.04
36	2	34	14	Reduced runoff and nutrient/ pesticide discharge from buildings and landscaping	2.19	4.16	-1.97	3.17	0.04
37	2	29	32	Protects ridge lines, view sheds	2.65	3.63	-0.98	3.14	0.03
38	2	36	15	Environmental restoration projects	2.09	4.14	-2.05	3.12	0.02

(Table continued)

Table 2 Continued

(1) Rank per (9)	(2) Quartile per (9)	(3) Rank per (6)	(4) Rank per (7)	(5) Criteria	Ratings		Analyses		
					(6) Materiality	(7) Public interest	(8) Difference	(9) Mean	(10) Increment
39	2	22	35	Low risk of injuries to workers and visitors	2.91	3.26	-0.35	3.08	0.04
40	2	18	37	Low risk from natural hazards	3.00	3.14	-0.14	3.07	0.01
41	1	35	24	Use of locally sourced materials	2.16	3.95	-1.79	3.06	0.01
42	1	40	19	Not built on prime farmland	2.00	4.07	-2.07	3.03	0.03
43	1	20	38	Gyms and showers	2.95	3.09	-0.14	3.02	0.01
44	1	34	28	Local and low-income hiring and training	2.19	3.84	-1.65	3.01	0.01
44	1	40	21	Carpooling services	2.00	4.02	-2.02	3.01	0.01
45	1	34	29	Managed to promote multiracial respect and participation	2.19	3.81	-1.62	3.00	0.01
46	1	37	30	Bicycle trails and facilities	2.07	3.79	-1.72	2.93	0.07
47	1	33	33	No undue influence by owners in local planning and zoning	2.26	3.37	-1.11	2.81	0.12
48	1	31	42	Insurance for property visitors	2.60	2.91	-0.31	2.76	0.05
49	1	38	34	Respect for indigenous people's rights, beliefs and traditions	2.05	3.35	-1.3	2.70	0.06
50	1	38	39	No 'pariah' tenants (e.g. tobacco or firearms-makers)	2.05	3.00	-0.95	2.52	0.18
51	1	38	42	Public art	2.05	2.91	-0.86	2.48	0.04
52	1	41	40	Evacuation and first aid training	1.95	2.98	-1.03	2.47	0.01
53	1	39	43	Access to first aid equipment	2.02	2.88	-0.86	2.45	0.02
54	1	40	43	Health and safety signage	2.00	2.88	-0.88	2.44	0.01
55	1	42	41	Philanthropic endeavours and volunteering by owners and employees	1.88	2.95	-1.07	2.42	0.02
56	1	41	44	Social Responsibility credentials of the property mortgagee	1.95	2.86	-0.91	2.41	0.01
				Grand means	2.90	3.90	-0.93	3.40	0.04

Ratings by subgroups

Cross-tabulations were used to determine whether there were differences in the final ratings given by panellists from different economic sectors (SRI, real estate, consulting, or academic), genders, or nationalities. Differences were looked for in four different ways. Subgroups were examined for differences in their number one criteria, subgroups were examined for differences in their top ten criteria, ratings were examined for criteria associated with special issues, and large differences between groups were identified. Overall, very few differences were found. The results are summarized in Table 3.

There were almost no differences among the subgroups in their selection of top ranked criteria. Energy efficiency and conservation was the number one criteria for every one of the subgroups and the top ten criteria for every subgroup had at least nine items in common with the top ten for the panel as a whole.

Certain criteria were examined to see if a particular subgroup rated them differently than others because of special concerns that might be linked to the subgroup. Members of the real estate industry, for example, were checked to see if they put much more emphasis on central location but they did not. Members of the SRI industry were checked to see if they put more emphasis on disclosure and reporting, but they did not. Small or

no differences were also found between males and females on their views about childcare, security, and amenities for working parents. And small or no differences were found between US and non-US panellists on their views about global warming, public transport, and historic preservation.

Finally, any criteria were noted if a subgroup rated them at least 0.5 (10%) higher or lower than the panel as a whole. None of these differences was found by industry or gender. However, the non-US panellists did rate several criteria 0.6–0.8 (12–16%) lower than their US counterparts. There does not appear to be anything common to these seven criteria, however (they are listed in Table 3), so the differences are probably not systematically linked to the panellist's non-US status.

What is most remarkable about these differences is how few of them there are. It should be noted, however, that the Delphi process is designed to encourage agreement. More differences may well have existed before the process itself.

Relationships between dimensions

The average materiality rating for all the criteria was 2.9 while the average public interest rating was 3.9. This indicates that the panel generally viewed the 66

Table 3 Summary of cross-tabulations

Subgroups	No. 1 criteria	Comparison with overall top ten criteria	Special subgroup issues	Other differences in ratings ≥ 0.5
By industry				
Real Estate	Energy	Dropped none Added none	4.6 for central versus 4.5 over all	None
SRI	Energy	Dropped urban revitalization Added alternative energy sources	3.7 for disclosure versus 3.5 over all	
Academics	Energy	Dropped urban revitalization Added positive suburban development		
Consultants	Energy	Dropped water conservation Added tree planting and protection		
By gender				
Male	Energy	Dropped none Added none		
Female	Energy	Dropped none Added none	3.5 for childcare, 3.6 by males 3.5 for security, 3.5 by males 3.6 for mums' amenities, 3.5 by males	None
By nation				
US	Energy	Dropped none Added none		
Not US	Energy	Dropped dense mixed walkable places Added aesthetics/ public realm	3.8 for global warming versus 3.7 by US 3.5 for public transport versus 3.5 by US 3.1 for historic preservation versus 3.3 by US	Gave ratings 0.6–0.8 lower to carpooling, community input, local hiring, alternative energy, fair labour, and community relations

criteria as more important to the public interest than to materiality.

The rankings for criteria with a large difference between their materiality and public interest ratings can change significantly if their ranks are determined based on materiality or public interest alone. Columns 3 and 4 of Table 2 give these rankings.

Using materiality alone, the five criteria that improved in ranking the most were gyms and showers (+22), low risk of natural hazards (+21), insurance for property visitors (+16), low risk of injury to workers and visitors (+16), and property and visitor security (+13). Those that got substantially demoted were low contributions to global warming (–15), and use of ozone-depleting chemicals (–11). This shows how the safety criteria were seen more as financial issues than public interest ones, while the reverse was true for environmental concerns.

When only the public interest was used to rank the criteria, the five criteria that improved in ranking the most were use of ozone-depleting chemicals (+22), not on prime farmland (+22), environmental restoration projects (+22), carpooling services (+22), and reduced runoff and nutrient/pesticide discharge (+22). Those substantially demoted included central location

(–15), aesthetics, contextual fit, visual blending, and quality public realm (–12), property and visitor security (–12), and occupant worker productivity (–10). Here again, it can be seen how certain environmental criteria were viewed more as public interest issues than material ones while various other concerns were viewed as more important to materiality than the public interest.

In general, the decision whether to rank criteria in terms of materiality, the public interest or a combination of the two affected the final rankings. Nevertheless, five criteria ranked in the top ten regardless of which ranking system was used: energy efficiency and conservation, high level of public transport services, transit-oriented development, daylight and natural ventilation, and contributes to higher density, mixed-use walkable places.

Relationship to processes in practice

In order to evaluate the importance of property location, building design, property management, and other aspects of the overall investment process for social and environmental outcomes, a matrix was prepared showing the criteria that, in the view of the author, are affected by various property ownership and management processes (Table 4). At the bottom of Table 4 the

Table 4 Criteria versus elements of practice

Rank	Criteria	Location	Public services	Site/building design and engineering	Development	Operations & Maintenance	Removal	Occupant behaviour	Owner behaviour
1	Energy efficiency and conservation		x	x	x	x	x	x	
2	High level of public transport services		x			x			
3	Central location	x							
4	Transit-oriented development	x	x	x					
5	Water conservation and recycling		x	x		x		x	
6	Daylight and natural ventilation			x					
7	Contributes to higher density, mixed-use walkable places	x		x		x			
8	Regulatory compliance			x	x	x	x	x	
9	Benefits urban revitalization	x		x		x	x	x	
10	Flexibility to adapt to changing uses over time			x		x			
11	Occupant worker productivity			x		x		x	
12	Minimizes building-related absenteeism and illness	x		x		x		x	
13	Aesthetics, contextual fit, visual blending, and quality public realm			x					
14	Alternative energy sources used		x	x		x			
15	Open space, parks or plazas nearby		x	x					
16	Recycling, waste reduction, recycled materials			x	x	x	x	x	
17	US Environmental Protection Agency Partnerships: Energy Star, Best Workplaces for Commuters, Waste Wise or Combined Heat and Power programmes			x		x			x
17	Low contributions to global warming	x		x	x	x	x	x	
18	Catalyses positive suburban and peripheral development or redevelopment	x		x		x			
19	Green building certification (LEED, BREEAM, etc.)	x		x	x	x			x
19	Sustainability of building materials			x	x	x			
20	Sense of community, sense of place throughout the building			x		x		x	
21	Childcare onsite or close by	x	x	x		x			
21	Accommodations for the disabled	x		x		x		x	
22	Protects or provides wildlife habitat	x		x	x	x		x	
23	Amenities close by for working parents (access to food/prepared meals, laundry, errands, etc.)	x							
23	Brownfield and infill development	x							
24	Property and visitor security	x		x		x		x	
24	Engaged in community relations and development				x	x		x	x
25	Disclosure and reporting of social and environmental performance					x			x
26	Stakeholder and community engagement					x	x	x	x
27	Solicits community input during all stages of development				x	x	x		
27	Affordable housing considerations (for housing) or access for low-income owners or minority-owned businesses for commercial property			x		x	x		
28	Tree planting and protection			x	x	x			
29	Buffering for wetlands and riparian areas			x	x				
30	Engagement on issues with suppliers					x		x	
30	Fair labour practices for construction and service workers				x	x	x		
30	Use of ozone depleting chemicals avoided			x		x			
31	Minimum negative impacts on local traffic, schools, and other infrastructure/services		x	x	x		x		
32	No involuntary displacement of homes and business				x				
33	Considerate construction practices				x		x		
33	Historic and landmark preservation			x		x	x		
34	Native landscaping			x	x	x	x		
35	Use of union construction and service workers				x	x	x		
36	Reduced runoff and nutrient/pesticide discharge from buildings and landscaping			x	x	x	x	x	
37	Protects ridge lines, view sheds	x		x					
38	Environmental restoration projects			x	x	x			
39	Low risk of injuries to workers and visitors			x	x	x	x	x	

(Table continued)

Table 4 Continued

Rank	Criteria	Location	Public services	Site/building design and engineering	Development	Operations & Maintenance	Removal	Occupant behaviour	Owner behaviour
40	Low risk from natural hazards	×		×		×		×	
41	Use of locally sourced materials			×	×	×			
42	Not built on prime farmland	×							
43	Gyms and showers			×		×			
44	Local and low income hiring and training				×	×	×	×	
44	Carpooling services			×		×		×	
45	Managed to promote multi-racial respect and participation					×			
46	Bicycle trails and facilities		×	×		×			
47	No undue influence by owners in local planning and zoning				×	×			×
48	Insurance for property visitors					×			×
49	Respect for indigenous people's rights, beliefs and traditions	×		×		×			
50	No 'pariah' tenants (e.g. tobacco or firearms-makers)					×			×
51	Public art			×		×			
52	Evacuation and first aid training					×		×	
53	Access to first aid equipment				×	×	×		
54	Health and safety signage			×	×	×	×		
55	Philanthropic endeavours and volunteering by owners and employees					×		×	×
56	Social Responsibility credentials of the property mortgagee								×
	Total number of criteria related to the category	17	9	43	25	52	18	22	10
	Percentage of top ten criteria related to the category	13	13	26	6	23	6	13	0
	Percentage of all criteria related to the category	9	5	22	13	27	9	11	5

total number of criteria related to each process is indicated along with pertinent percentages.

This analysis allows one to identify the processes that are most important for influencing the property characteristics described by the criteria. For the top ten criteria and for all the criteria, site/building design and engineering, and property operations and maintenance were the two most important processes. The relative importance of the other processes depends on whether the top ten or all the criteria are being considered. It is notable, however, that in either case it appears that owners can only influence the performance of their properties through processes that are generally the responsibility of other actors. This means that investors need to interact with the people making location, design, maintenance and other decisions if they hope to influence the social and environmental performance of their property investments.

Factor analysis

Factor analysis was used to summarize the large number of criteria with a smaller number of factors. It does so by sorting the criteria into groups whose ratings appear to be correlated with a more general common factor or

dimension (Wildt *et al.*, 1978). Ten dimensions were uncovered by this process, which explained 72.5% of the total variance in the data. In other words, the 66 criteria could be reduced to ten general dimensions without a substantial loss of statistical information. The results are given in Table 5. The dimensions are ranked in order of importance using the grand mean for the criteria within them, computed from their mean materiality and public interest scores. In general, for the panel, RPI would primarily emphasize the creation of less automobile-dependent and more energy-efficient cities and regions in which worker well-being and urban revitalization are priorities.

Relationship to LEED¹

In order to determine how well existing property rating tools might address these criteria and dimensions, the findings were compared with the Leadership in Energy and Environmental Design (LEED) New Construction, Existing Buildings, and (Pilot) Neighborhood Development rating tools, published by the US Green Building Council. In general, 45% of the criteria in this study are reasonably well covered by all three tools. Those that are not directly or indirectly covered by at least one of the tools are listed in Table 6. As shown, all

Table 5 RPI factor analysis dimensions and criteria

Dimension	Criteria sorted by panel rating (ratings are based on importance to both investment returns and the public interest, with 5 = most and 1 = least important)				Grand mean
	4th Quartile (> 3.70 out of 5)	3rd Quartile (3.42–3.70 out of 5)	2nd Quartile (3.07–3.41 out of 5)	1st Quartile (2.41–3.06 out of 5)	
Less auto dependent	Transit-oriented development, transit level of service, central location, dense mixed use and walkable			Carpooling, bike trails and facilities	4.30
Energy conservation	Energy efficiency, daylight and ventilation, renewable energy			Locally sourced materials	4.00
Worker well-being	Open space, parks and plazas nearby	Sense of community and place, childcare, accommodations for disabled, amenities for working parents			3.64
Urban revitalization	Benefits urban revitalization, flexibility to adapt to changing uses	Catalyses positive suburban or peripheral development, brownfield and infill		Not on prime farmland	3.63
Corporate citizenship	Regulatory compliance	Disclosure and reporting	Engagement with suppliers		3.48
Environmental protection	Water conservation, recycling	Low contributions to global warming, use of sustainable building materials, wildlife habitat	Trees, wetlands, ozone, historic/cultural, native plants, runoff, ridges and views, eco-restoration	Public art	3.38
Local citizenship	Aesthetics, fit, visual blending and quality public realm		Minimum local impacts, no involuntary displacement, considerate construction, no undue influence with local government		3.29
Social equity and community development		Community relations and development, stakeholder engagement, solicits community input during development, affordability	Fair labour practices, union construction and service workers	Local low-income hiring and training, promotes diversity, respect for indigenous people, philanthropy and volunteering	3.28
Credentialing		EPA (government) partner, green certified building		No SRI pariah tenants, SRI mortgagee	3.05
Health and safety		Property and visitor security	Low risk of injury, low risk from natural hazards	Gyms/showers, evacuation/aid training, first aid equipment, health and safety signage, visitor insurance	2.89

Note: grand mean is the average of the mean materiality and public interest ratings for the criteria listed within each dimension. EPA, Environmental Protection Agency.

Table 6 Criteria not well covered by LEED

Factor	Criteria not fully covered by at least one of the following LEED tools: New construction 2.2, Neighbourhood development pilot version, or existing buildings 2.0
Auto dependence	
Energy conservation	Locally sourced materials
Worker well-being	Sense of community and place, childcare, handicapped accessible, amenities for working parents
Urban revitalization	Flexibility to adapt to changing uses, catalyses positive suburban or peripheral development
Corporate citizenship	Disclosure and reporting
Environmental protection	Historic/cultural, ridges and views, public art
Local citizenship	Aesthetics, displacement, considerate construction, undue influence
Social equity and community development	Community relations and development, stakeholder engagement, solicits community input, affordability, fair labour practices, union, local low-income training, promotes diversity, indigenous people, philanthropy and volunteering
Credentialing	EPA partner, SRI pariah tenants, SRI mortgagee
Health and safety	Security, low risk from natural hazards, risk of injury, evacuation/aid training, first aid equipment, health and safety signage, visitor insurance

Note: EPA, Environmental Protection Agency

but one of the component criteria for the top two dimensions (less automobile dependent and energy conservation) are covered by the three LEED tools examined. Coverage is less complete for the other eight dimensions. Looked at another way, only two of the 15 criteria (13%) listed in Table 4 as fourth (or top) quartile criteria (building flexibility and aesthetics) are not in the LEED tools. However, seven of the 16 (44%) criteria in the third (or second highest) quartile are not in LEED. Overall, while many of the most highly rated criteria and dimensions are covered by the LEED New Construction, Existing Building, and Neighborhood Development tools, some dimensions and several criteria, particularly those related to social issues, are not part of the system. This finding is consistent with a similar finding by Sinou and Kyvelou (2006) in a recent assessment of building performance assessment tools.

A comprehensive assessment of the relative importance of various criteria in LEED as compared with the findings in this report was not conducted. However, a limited assessment indicates some significant differences. For example, the top rated criterion in this study – energy efficiency and conservation – is one of the most heavily weighted criteria in the LEED system. However, the second most important criterion in this study – high level of public transport services – is one of the least important topics in the LEED system.

Discussion

Implications

Given the complexity of this topic, it is encouraging that a moderate-to-strong degree of consensus was achieved by such a diverse set of panellists. Moreover, the scarcity of differences by sector, gender and nationality indicate that a broad, even global, agreement on RPI criteria may be achievable. The fact that few differences were found among the subgroups also helps to address one of the limitations normally associated with the Delphi Method. Delphi panels rely on smaller samples than those used in most scientific surveys and their members are usually not randomly selected. This raises uncertainty about the external validity or the ability to generalize, findings from Delphi studies because of possible sample bias. However, the lack of differences among the subgroups found in this study reduces the probability that there is a lack of external validity in this case.

When it comes to the ratings themselves, it is unsurprising that, in light of the recent attention it has received, energy conservation is the most highly rated issue. In fact, several of the criteria in the top quartile have implications for energy conservation. It is worth noting, however, that Sayce *et al.* (2004) assigned a lower weight to energy when undertaking a related exercise. In other respects, there is broad agreement between the findings here and their work.

Perhaps the items near the bottom of the list are more surprising, particularly that several of them are related to health and safety. However, it is important to understand that a low rating does not imply unimportance. Ratings were conducted using a relative scale of least to most important. The lowest average score for materiality and the public interest for any criterion was 2.41, and the lowest average score on public interest alone was just below 3.00 (both on a five-point scale). In other words, even the criteria with low scores were scored as moderately important. Moreover, nothing prevents organizations that might be more concerned with worker safety or other low ranked criteria, such as real estate funds supported by labour union pensions, from putting greater weight on selected issues. Nonetheless, the question of why some criteria were rated lower or higher than others remains unanswered. Unfortunately, the study was not designed to answer this question. Perhaps the panel viewed health and safety problems as events that potentially affect fewer people compared with global warming, traffic congestion, and urban decline.

The finding that, on average, public interest ratings exceeded materiality ratings highlights the fact that many issues may be more important to the public interest than to the financial bottom line. Consequently, as long as fiduciaries emphasize financial returns, it will probably be necessary to use regulations and subsidies to achieve all public interest priorities fully.

The factor analysis points to the less complicated common ground underlying the many different criteria that might be preferred by various individuals. Even when presented with several dozen potential criteria, the panel appeared to be fundamentally motivated by ten underlying dimensions. While each one can and probably should be measured using a variety of criteria, the present paper may be able to simplify the discussion and achieve greater consensus on the major issues by focusing on these ten RPI dimensions.

Finally, it is noteworthy that as far as these findings are concerned, green building rating tools, at least those similar to LEED, do not fully overlap with the criteria studied here. Green building tools are weighted toward the environmental bottom line and are not well suited to being the only metrics used for triple bottom line accounting.

Practical significance

There are several practical uses for these findings. First, property investors, fund managers and asset managers can use them to guide their efforts to develop the RPI field further. They can be used to plan new funds, audit current investments, design corporate sustainability and social responsibility reports, and plan future acquisitions and refurbishments. Second, the

findings can guide new data development needed to help investors and managers account for the social and environmental performance of their portfolios. For example, two of the world's leading for-profit property data organizations, the Investment Property Databank and The CoStar Group, are exploring ways to add sustainability information to their data products. Third, existing SRI research organizations, such as Innovest, Sustainable Asset Management, KLD, etc., can use the findings to design their next-generation property sector evaluation criteria which they use to rate property companies. Similarly, strategic management consultancies that work in the property field, such as Upstream, SustainAbility, and Mercer Investment Consulting, can use the findings to help property firms become more responsible, particularly those associated with or investing for institutions that are signatories to the Principles for Responsible Investing or the UN Environment Programme Finance Initiative. Fourth, the findings can contribute to a global consensus on the elements of a sustainability report for property companies. This is the objective of a new project being pursued by the Global Reporting Initiative and that project should consider these findings as it proceeds. Fifth, it may be possible to use the findings to inform the creation of an RPI certification process for property funds and fund managers, similar to the SRI Certification Programme offered by the Australia Ethical Investment Association (2007). It is the first programme in the world to certify 'sustainable responsible investment' providers and 'ethical investment products and services'. Sixth, existing green building rating systems might assess their criteria in light of these findings with an eye toward addressing social concerns and adjusting the weights given to environmental ones. And finally, there is a need to build an academic research agenda on RPI, particularly studies on the financial costs and benefits associated with making investments that promote energy conservation, transit-oriented development, urban regeneration, childcare and other RPI criteria.

Limitations

One limitation of this study is that it did not cover governance issues. The Principles for Responsible Investment encourage the consideration of environmental, social and governance issues. But this study explored new social and environmental criteria only. Nevertheless, studies of board composition (e.g. Ghosh and Sirmans, 2003) and executive compensation (e.g. Scott *et al.*, 2005) in the property sector suggest that governance is material to investments and should not be ignored by analysts as RPI criteria.

A second limitation is that in order to use the criteria, analysts will need more information on related measurements, standards, and benchmarks, and the economic costs and benefits of achieving them. With

better research along these lines it should be possible to determine how far private real estate investors should be expected to go, with and without government subsidies or regulations, toward the creation of more responsible property investments.

One other limitation of the study is that it is based on the views of the panel at a single moment in time. Changes in prices, regulations, public sentiment, and one's scientific understanding of the issues could well alter what they see as priorities in the future.

Conclusion

Several broad conclusions can be drawn from this project. First, it is possible to reach a moderately strong level of agreement on the criteria that should be used to rate the responsibility of property investments. Second, this agreement can be achieved with few differences across genders, industries and nationalities. Third, criteria are scored differently depending on whether they are rated in terms of their importance to the public interest or to investment materiality. Fourth, whether one rates the criteria from the perspective of materiality or the public interest, there is strong agreement that energy efficiency and conservation is the most important criteria, followed by a high level of public transport services, transit-oriented development, daylight and natural ventilation, and contributes to higher density, mixed-use walkable places. Fifth, the many criteria studied here can be reduced to ten underlying dimensions led by less automobile dependence, energy conservation, worker well-being, urban revitalization, and corporate citizenship. And sixth, the LEED green building rating system does not provide a comprehensive means of measuring the responsibility of buildings and portfolios. While it is very good with environmental issues, it is much less capable with social dimensions.

This project has built upon prior groundbreaking efforts to incorporate property investing into corporate social responsibility and socially responsible investing. As a first step, Mansley (2000), St. Lawrence (2004), Kimmel and Boyd (2004) and others raised the issue and suggested potential criteria for evaluating the social and environmental merits of property investments. Sayce *et al.* (2004, 2007) took another step by undertaking the first effort to weight the criteria in terms of their significance to property worth. This work takes further steps by expanding the number of criteria considered, rating their relative importance both in terms of financial returns and the public interest, grouping them into ten underlying dimensions, and comparing them with one of the leading building assessment tools.

Further efforts that build on this and prior work would be most useful. First, the rankings of the criteria could

be tested via additional Delphi panels and other research methods. Scientific surveys could be conducted of property and socially responsible investment professionals. Economic studies using hedonic modeling, willingness to pay, and contingent valuation methods could help establish the relative value that consumers place on the various criteria. And environmental research could help clarify which issues are the greater threat to public health, safety and welfare.

Beyond refining and broadening the agreement on the most important criteria, however, there also is a good deal of work to be done if one is to begin assessing the social and environmental performance of property portfolios. Existing databases and new data collection methods will need to be found which can provide the relevant information on the thousands of properties of interest to investors. Assessment methods that collect and analyse many buildings at one time will be needed. For example, geographic information systems can be used to compare the addresses of a large number of properties at once to digital maps of transit stations to determine their proximity to transit services. In addition, means of comparing properties to peers or standards will be needed in order to evaluate their relative merits. This is done now for the financial performance of properties (e.g. by the Investment Property Databank in Europe, Australia and Asia and by the National Association of Real Estate Investment Fiduciaries in the US). Similar methods are needed for social and environmental dimensions.

The good news is that there is a great deal of interest in both the investment and property industries in these issues and researchers with the capabilities needed to solve the related problems. By bringing these groups together, there is no reason why the social and environmental performance of real estate investments cannot some day be given just as much consideration by investors as their more conventional financial evaluations.

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References

- American Farmland Trust (2007) (available at: <http://www.farmland.org/programs/default.asp>) (accessed on 18 April 2007).
- Barrett, C. (2003) The ethics inspectors: has the need to tick boxes overtaken the property industry's attempts to become more socially responsible? *Property Week*, 68(29).
- Baue, W. (2005a) Wanted: socially responsible real estate investments. *Social Funds.Com*, 18 March.

- Baue, W. (2005b) Socially responsible property investing still on the drafting table. *Social Funds.Com*, 29 December.
- Boyd, T. (2005a) Can we assess the worth of environmental and social characteristics in investment property?, in *Proceedings of the Pacific Rim Real Estate Society (PRRES) Conference*, January 2005, Melbourne University, Melbourne, Australia.
- Boyd, T. (2005b) Assessing the triple bottom line impact of commercial buildings, in A.C. Sidwell (ed.): *The Queensland University of Technology Research Week International Conference Proceedings*, 4–5 July 2005, Brisbane, Australia.
- Boyd, T. and Kimmet, P. (2005) The triple bottom line approach to property performance evaluation, in Proceedings of the Pacific Rim Real Estate Society (PRRES) Conference, January 2005, Melbourne University, Melbourne, Australia.
- Bureau of Economic Analysis (BEA) (2007) *National Economic Accounts, Fixed Assets Table 2.1* (available at: <http://www.bea.gov/national/FA2004/SelectTable.asp>) (accessed on 15 May 2007).
- Estates Gazette* (2006) RPI: an index for measuring sustainability. *Estates Gazette*, 18 February, 27.
- Ethical Investment Association (2007) *SRI Certification* (available at: <http://www.eia.org>) (accessed on 21 May 2007).
- Fischer, R. (1978) The Delphi Method: a description, review and criticism. *Journal of Academic Librarianship*, 4(2), 64–70.
- Garriga, E. and Mele, D. (2004) Corporate social responsibility theories: mapping the territory. *Journal of Business Ethics*, 53, 51–71.
- Ghosh, C. and Sirmans, C. F. (2003) Board independence, ownership structure and performance: evidence from real estate investment trusts. *Journal of Real Estate Finance and Economics*, 26(2–3), 287–318.
- Hall, P. (2004) The plight of the Private Securities Litigation Reform Act in the post-Enron era: the Ninth Circuit's interpretation of materiality in *Employer-Teamster v. America West*. *Brigham Young University Law Review*, 2004(2), 863–892.
- Haughney, C. (2006) Real estate's latest movement. *Wall Street Journal*, 5 July.
- Hermes Real Estate (2006) *Responsible Property Investment: Defining the Challenge*, Hermes Real Estate, London.
- Intergovernmental Panel on Climate Change (2001) *Climate Change 2001: Working Group III: Mitigation. 3.3 Buildings and 3.4 Transport and Mobility*, UNEP and WMO (available at: http://www.grida.no/climate/ipcc_tar/wg3/089.ht).
- Keeney, S., Hasson, F. and McKenna, H. (2006) Consulting the oracle: 10 lessons from using the Delphi technique in nursing research. *Journal of Advanced Nursing*, 53(2), 205–212.
- Kimmet, P. and Boyd, T. (2004) An institutional understanding of triple bottom line evaluations and the use of social and environmental metrics, in Proceedings of the Pacific Rim Real Estate Society (PRRES) Conference, January 2004, Bangkok, Thailand.
- KPMG (2005) *KPMG International Survey of Corporate Responsibility Reporting 2005*, KPMG Global Sustainability Services, Amsterdam.
- Linstone, H. and Turoff, M. (1975) *The Delphi Method: Techniques and Application*, Addison-Wesley, Reading, MA.
- Lutzkendorf, T. and Lorenz, D. (2005) Sustainable property investment: valuing sustainable buildings through property performance assessment. *Building Research & Information*, 33(3), 212–234.
- Mansley, M. (2000) Into the ethics of things. *Estates Gazette*, 47(25 November), 170–171.
- McNamara, P. (2000) The ethical management of indirect control – an internal perspective of SRI. *Estates Gazette*, 47(25 November), 170–171.
- National Association of Real Estate Investment Trusts (2007) *Historical REIT Industry Market Capitalization* (available at: <http://www.nareit.org/library/industry/marketcap.cfm>) (accessed on 16 May 2007).
- Ndour, B., Force, J.E. and McLaughlin, W.J. (1992) Using the Delphi Method for determining criteria in agroforestry research planning in developing countries. *Agroforestry Systems*, 19, 119–129.
- Newell, G. and Acheampong, P. (2002) The role of property in ethical managed funds. Paper presented at The Pacific Rim Real Estate Society (PRRES) Conference, Christchurch, New Zealand, 2002.
- Okoli, C. and Pawloski, S. (2004) The Delphi Method as a research tool: an example, design considerations and applications. *Information and Management*, 42, 15–29.
- Pivo, G. (2005) Is there a future for socially responsible property investments? *Real Estate Issues*, Fall, 16–26.
- Pivo, G. and McNamara, P. (2005) Responsible property investing. *International Real Estate Review*, 8(1), 128–143.
- Portney, P.R. (2005) Corporate social responsibility: an economic and public policy perspective, in B.L. Hay, R.N. Stavins and R.H.K. Vietor (eds): *Environmental Protection and the Social Responsibility of Firms: Perspectives from Law, Economics, and Business*, Resources for the Future, Washington, DC, pp. 107–131.
- PRI (2006) *Principles for Responsible Investment* (available at: <http://www.unpri.org>) (accessed on 15 May 2007).
- Ritblat, J. (2003) *Chairman's Statement, 2003 Annual Report*, British Land Co., London.
- Sayce, S. and Ellison, L. (2003a) Integrating sustainability into the appraisal of property worth: identifying appropriate indicators of sustainability. Paper presented at the American Real Estate and Urban Economics Association Conference, Skye, UK.
- Sayce, S. and Ellison, L. (2003b) Towards sustainability indicators for commercial property occupiers and investors. Paper presented at the American Real Estate and Urban Economics Association Conference, Skye, UK.
- Sayce, S., Ellison, L. and Smith, J. (2004) Incorporating sustainability in commercial property appraisal: evidence from the UK. Paper presented at the 11th European Real Estate Society Conference, Milan, Italy, June 2004.
- Sayce, S., Ellison, L. and Parnell, P. (2007) Understanding investment drivers for UK sustainable property. *Building Research and Information*, 35(6), 629–643.
- Schmidt, R.C. (1997) Managing Delphi surveys using nonparametric statistical techniques. *Decision Sciences*, 28(3), 763–774.
- Schueth, S. (2003) Socially responsible investing in the United States. *Journal of Business Ethics*, 43, 189–194.
- Scott, J., Anderson, R. and Webb, J. (2005) The labor–leisure choice in executive compensation plans: does too much pay reduce REIT performance? *Journal of Economics and Business*, 57, 151–163.
- Sinou, M. and Kyvelou, S. (2006) Present and future of building performance assessment tools. *Management of Environmental Quality*, 17(5), 570–586.
- Social Investment Forum (2006) *2005 Report on Socially Responsible Investing Trends in the United States*, Social Investment Forum, Washington, DC.
- St. Lawrence, S. (2004) Review of the UK corporate real estate market with regard to availability of environmentally and socially responsible office buildings. *Journal of Corporate Real Estate*, 6, 149–161.
- Sustainable Property Appraisal Project (2005) *The Sustainability Factors* (available at: <http://www.sustainableproperty.ac.uk/sustainability-factors.htm>) (accessed on 19 May 2005).
- US Bureau of Labor Statistics (2005) *Injuries, Illnesses and Fatalities* (available at: <http://www.bls.gov/iif/home.htm>) (accessed on 25 May 2007).
- US Census Bureau (2000) *Census 2000, Summary File 4 (SF 4)* [generated by the author using American Factfinder] (available at: <http://factfinder.census.gov/>) (accessed on 23 April 2007).

Pivo

United Nations Environment Programme Finance Initiative (UNEPFI) (2007) *Property Work Stream* (available at: <http://www.unepfi.org/>) (accessed on 16 May 2007).

Upstream (2004) *Sustainability and the Built Environment: An Agenda for Action*, Upstream, London.

Waggle, D. and Johnson, D.T. (2004) Home ownership and the decision to invest in REITs. *Journal of Real Estate Portfolio Management*, 10(2), 129.

Wildt, A.R., Mueller, C.W. and Kim, J. (1978) *Introduction to Factor Analysis: What It Is and How To Do It*, Sage, Newbury Park, CA.

Wood, D. and Pivo, G. (2006) *Real Estate and Socially Responsible Investment: New Products, New Investment, New Value*. Conference Report (available at: <http://www.bcccc.net/index.cfm?fuseaction=document.showDocumentByID&nnodeID=3&DocumentID=1031>).

Endnote

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