Incorporating Green Building Features and Initiatives into Commercial Property Valuation

Authors Saul Nurick, Karen Le Jeune, Emma Dawber, Ryan Flowers, and Jennifer Wilkinson

Abstract The rapid acceptance of green buildings internationally has led to awareness of green building features and initiatives (GBFIs) in the South African property industry; however, among South African valuers, it seems the awareness is still in its infancy. Semi-structured interviews were conducted with valuers of varying degrees of experience in Cape Town, online surveys were completed by a sample of South African valuers, and a valuation simulation was conducted to determine the impact of GBFIs. The findings indicate that even though South African valuers have limited knowledge of green buildings, they recognize the importance of incorporating GBFIs in the valuation process.

Green buildings are increasingly being prioritized by owners and developers (Lang, 2008). Commercial property owners are starting to pay more attention to green building, which ties into the realization that buildings and their construction contribute to greenhouse gas emissions, water consumption, and other environmental impacts (Gardiner & Associates, 2010). The United States Energy Information Administration (EIA, 2012) forecasts the world energy consumption to increase by an average 47% from 2010 to 2035, with most of the increased demand coming from emerging economies due to robust economic growth, but with U.S. energy consumption to grow, by comparison, at a modest average annual rate of 0.3% from 2010 through 2035.

Yudelson (2009) suggests that the “green building revolution” is a global movement for energy-efficient, environmentally aware architecture and design. Global warming and the increasing accumulation of greenhouse gases (GHGs) in the atmosphere have proven to be a significant driver for the start of this movement (Lang, 2008). The property and construction industry is acknowledged as one of the largest contributors to global warming and environmental destruction. This industry contributes up to 33% of CO₂ emissions, 30%–40% of the world’s energy consumption, and 40%–50% of raw material usage (Kerr, 2008). Thus, the necessity for green building in the construction sector has become increasingly significant, and therefore has been better acknowledged in the last decade due to the major resource consumption involved (Korkmaz, Erten, Syal, and Potbhare, 2009).

In South Africa, the green building movement has been developing rapidly as the country starts to recognize the global acceptance of green. Frost and Sullivan
(2010) point to the fact that although the South African property market is still in its infancy with regards to green buildings, there are numerous indicators in the economy that suggest the market for green buildings is ready and capable of rapid growth in South Africa, and is responding well to green building features and initiatives (GBFIs).

The Green Building Council of South Africa (GBCSA) was established in 2007, making it one of the youngest green building councils compared to those in Europe, North America, and Australia (Buch, 2009). It could be argued that because the GBCSA is a relatively new entity, South African commercial property valuers have yet to incorporate green building features and initiatives (GBFIs) fully in their valuation models in a clinical and robust way; however, Warren, Bienert, and Warren-Myers (2009) suggest this is a global phenomenon.

The two main valuation techniques used by South African commercial property valuers, as recommended by the International Property Databank (IPD), are the income capitalization and discounted cash flow methods (IPD, 2010). These methods require input variables that are sensitive to changing market conditions, such as capitalization and discount rates (Peto, French, and Bowman, 1996). Valuers are currently unsure on how to account for the implementation of GBFIs in their valuation models (Madew, 2006; Warren, Bienert, and Warren-Myers, 2009), as currently there is limited evidence on the financial performance of green buildings with the economic rationale for developing green buildings being based on almost entirely anecdotal evidence (Eichholtz, Kok, and Quigley, 2009). Globally this has meant that valuers are unable to indicate clearly whether GBFIs affect market value, not necessarily because a link between the two does not exist, but rather because the ability of valuers to assess these features in commercial property, and identify the value of these features, is inherently difficult (Warren, Bienert, and Warren-Myers, 2009).

The aim of this paper is to establish, from the perceptions of South African commercial property valuers, which GBFIs they consider to be the most significant value-adding attributes of commercial green buildings and to establish how South African commercial property valuers could account for GBFIs within the valuation process.

**Green Buildings**

The history and trend towards green building has rapidly grown in status in response to the mounting concerns about climate change and environmental degradation. The most notable change has occurred within the corporate environment as companies become more aware of the need for increased environmental concern and green building (CB Richard Ellis, 2009).

In South Africa, the operation of the built environment accounts for 23% of GHGs, while emissions from the manufacturing of key materials required for use in this sector amount to approximately 18 million tons of CO$_2$ per year, which equates to about 4% of total CO$_2$ emissions (CIDP, 2009; Milne, 2012). South Africa is
ranked the 12th largest emitter of absolute CO$_2$ emissions in the world. Due to the developing nature of the economy, it is anticipated that the already elevated levels of GHGs are expected to increase as the economy develops and the country aims to achieve its national development goals (National Treasury, 2010). Despite the infancy of the market, South Africa’s green building movement is gaining momentum (Milne, 2012). Green buildings have become an area of key focus especially within the commercial sector, following the substantial increase in electricity prices, and the launch of the Green Star SA Rating tool (Milne, 2012).

Fuerst and McAllister (2011) identify that, internationally, green certified buildings tend to be newer, single tenanted or owner-occupied buildings and are mostly in the office sector. This trend is prevalent in South Africa where the majority of buildings certified as Green Star rated are still under development and therefore have not yet achieved an “as built” status (GBCSA, 2012).

Gunnell (2009) states that green building design has garnered increased momentum within the U.S., Australia, and Europe for many years. In contrast, green buildings in the South African corporate real estate market are still a relatively new concept (Gunnell, 2009). However, growth and awareness have dramatically increased in recent years due to: electricity shortages and prices; increased local awareness of possible water shortages; increased international awareness of climate change concerns; and increased demand from international bodies operating in South Africa (Milne, 2012).

**Drivers and Barriers to the Adoption of Green Buildings**

Reed and Wilkinson (2005) suggest that the international market for green commercial buildings is gaining momentum in the design and construction sectors; however, there is still minimal development and investment from the private sector. This is supported by Nelson (2008), who argues that although an exponential growth in development of green buildings has occurred, this has been mainly concentrated within wealthier nations.

Within South Africa, the support of green buildings has been strong, and building valuation and certification systems have been seen to be driving the growth of green building market. Furthermore, the establishment of the green building rating tools have allowed for common criterion and standards of measurements for green buildings to be developed. This has further driven and supported the development of GBFIs in South Africa (Frost & Sullivan, 2010). Bond and Perrett (2012) suggest that the training provided by the New Zealand Green Building Council (NZGBC) could clearly demonstrate the business case for green building to the property sector in New Zealand.

Mansfield (2009) argues that major economic benefits resulting from green buildings include improved building performance and durability as a result of a reduction in the maintenance and operational costs required during the buildings lifecycle. Evidence of this is presented in research conducted by RICS (2005)
across a section of building types in Canada and the U.S. (office buildings, industrial, retail, residential, educational), confirming that in the opinion of green building stakeholders, green buildings are leasing at above average rates (on average 3%–5% more), green buildings are able to attract tenants faster (on average 6%–10% better success), and have lower tenant turnover rates compared to that of conventional buildings. This is consistent with the findings of Das, Tidwell, and Ziobrowski (2011), who state that green office buildings yield superior rentals to non-green buildings in San Francisco and Washington DC.

Despite the awareness of these advantages and the growing emphasis placed on green, buildings with GBFIs remain relatively limited (CB Richard Ellis, 2009). The New Zealand property investment industry, when surveyed in the late 2000s, was hesitant to implement GBFIs, which has been especially evident from the private sector (Myers, Reed, and Robinson, 2008). Despite the significant role of the property industry, market players, such as valuers, are the slowest in responding to challenges imposed by green buildings (Lorenz, 2006), possibly due to the lack of convincing, quality, transparent, freely available data on the performance of commercial buildings with GBFIs (Gripne, Martel, and Lewandowski, 2012). Warren-Myers (2012) identified a missing factor to Cadman’s “vicious circle of blame,” whereby Australian investors, occupiers, constructors, and developers all blame each other for the lack of motivation to invest in green buildings, namely the role of valuers as advisors to the different stakeholders.

Mansfield (2009) argues that green buildings provide financial advantages. One of the foremost barriers to the adoption of green buildings is the perception that they are disproportionate with regards to initial capital expenditure (CB Richard Ellis, 2009). However, international cost-value studies from the U.K., France, U.S., Australia, and Japan contesting this view have been undertaken by Bartlett and Howard (2000), Frej (2003), Zhou and Lowe (2003), Pivo and McNamara (2005), Reed and Wilkinson (2005), and Matthiessen and Morris (2007), who have provided substantial research indicating that there is in fact no substantial variance in the average initial construction costs of commercial green buildings when compared with conventional buildings. Nicolay (2007) argues that although there may be 2%–3% additional costs associated with the incorporation of GBFIs within new commercial green building designs, these may recovered through operational savings, reduced maintenance costs, and reduced energy costs, which benefit not only investors but also tenants.

In South Africa, many professionals overvalue the costs of green design and construction by more than 17% (Frost & Sullivan, 2010). Early research by the GBCSA indicates that the South African property industry should expect a cost premium of 1%–10% to build a new commercial green building, based on data supplied by the initial eight Green Star rated buildings (Milne, 2012).

Milne (2012) argues that commercial green buildings in South Africa are still an emerging concept, and valuers are assigned the problematic task of navigating the effects of GBFIs on value. Additionally it is the initial cost of design and construction that is most often given the greatest attention, and little attention is
given to the possible cost and energy savings, which would occur over the entire lifecycle of the building (Frost & Sullivan, 2010). Through integrating green issues into property valuation theory and practice, it is argued that there will be greater success in achieving more green developments (Lorenz, 2006). Until valuers begin to account for GBFIs in the values of property, investment within green buildings will not expand (Pearce, 2005). Ellison and Sayce (2007) support this argument by stating that without the development and understanding of GBFIs to assess the effect on values and performance, the property sector will continue to struggle to successfully engage with the increase in green building development. Dermisi (2009) speaks of short-term data evidence in the U.S. where the degree of GBFI intervention has a positive effect on a property’s market value, but urges the establishment of long-term trends. This highlights the “chicken and egg” scenario, where valuers cannot value buildings with GBFIs without adequate comparable data (Warren-Myers and Reed, 2012), and therefore remain ignorant of the benefits of GBFIs. Without new perspectives, valuers will be unable to advise a new pool of investors wishing to invest in commercial green buildings (Nicolay, 2007).

Green Building Features and Initiatives

Mansfield (2009) contends that a commonly accepted group of features and initiatives need to be acknowledged in order for valuation professionals to be able to correctly assess the possible impact on market value. Muldavin (2010) and Runde and Thoyre (2010) concur that buildings need to be defined as “green,” and this could be done by incorporating three criteria: (1) a commonly recognized group of features founded on the principle of green; (2) independently verifiable features; and (3) modeled performance that is verifiable by actual results.

GBFIs need to be evaluated on the same basis as regular commercial buildings, in order to be considered relevant in valuation (Mansfield, 2009). Assessing how GBFIs affect and impact value can only be achieved when the GBFIs are identified and isolated, enabling green value to be interpreted and established (Ellison, Sayce, and Smith, 2007).

The selection of the four categories of GBFIs, which were chosen because they carried the most weight in the calculation of a Green Star rating by the GBCSA, is supported by Heerwagen (2000), Boyd (2005), Ellison, Sayce, and Smith (2007), and Muldavin (2010). These are: (1) energy efficiency, (2) indoor environmental quality (IEQ), (3) water and waste management, and (4) materials. Runde and Thoyre (2010) concur with the choice of the first three, but include site efficiency as opposed to materials as their fourth category. Boyd (2005) and Ellison, Sayce, and Smith (2007) suggest that the list should not be exhaustive, and should instead be able to change and adapt over time with the evolving green trends.

The Role of the Valuer

The valuer is perceived to be the custodian of property information as valuers are involved in every aspect of development, from feasibility and planning until the
property’s disposal or destruction at the end of its useful life (Motta and Endsley, 2003). Peto, French, and Bowman (1996) suggest that the most common objective of the valuer is the assessment of the market value of a property. Isaac (2002) highlights that this assessment is to take place prior to the transaction occurring, using the most appropriate valuation method.

**Commercial Valuation Methods**

We focused on the valuation methods that are applicable to the valuation of commercial property. The two methods that are predominantly used in valuing commercial buildings in the South African property market are the income capitalization and the discounted cash flow (DCF) methods. This is confirmed by the IPD (2010), who established that South African valuers predominantly used the DCF method to value commercial (retail, office, industrial) property (75.6% of valuations representing 62.1% of property by value), while the income capitalization method is used for 22.5% of the properties representing 37.1% of the capital value.

The investment method of valuation relies on the premise that a property’s income-generating value and its capital value are related; this method aims to establish this capital value through the assessment of the property’s annual income (Millington, 1982).

**Incorporating GBFIs into Valuations Methods**

The incorporation of GBFIs into traditional valuation methods, such as the income capitalization and DCF methods has yet to be done explicitly (Boyd, 2005; Jefferies, 2010). Babawale (2011) suggests that the incorporation of GBFIs into valuation methods could be done in the following two ways: (1) valuing properties that are built with GBFIs, while using a traditional valuation method, making adjustments for value using the various indicators of greening (valuation variables); and (2) assess buildings on the basis of their GBFIs with relation to their contribution to the triple bottom line. Robinson (2005) mentions that traditional models are in fact applicable to value green buildings, where Lorenz (2006) is of the opinion that the use of traditional methods will result in conflicting value assessments. However, Babawale (2011) states that quantifying the effects of GBFIs is still not reflected in the models that are in use. The author feels that change is imminent in the valuation profession. This change will embrace new valuation techniques, methods, and indicators of greening (valuation variables), which can be used to better assess the value of such property.

Bienert et al. (2010) state that the following five valuation variables are appropriate for an adjustment with regards to the impact of GBFIs: (1) potential gross income, (2) operating expenses, (3) lease terms and tenant retention, (4) remaining economic life, and (5) yield and capitalization rates. Boyd (2005) notes that it cannot be concluded that a positive effect on market value will frequently occur, as the degree and timing of the impact of GBFIs will differ according to the
GBFIs are seen to have the largest impact in reducing operating costs, resulting in a higher net operating income (NOI) (Lorenz and Lutzendorf, 2008). The comparative make-up of gross income between a conventional and green building is shown in Exhibit 1.

**Research Method**
Green building councils rely on case study analysis to provide data on green buildings (GBCSA, 2008), while researchers concerned with valuation of green buildings such as Boyd (2005), Bowman and Wills (2008), and Van den Tol (2010) used a combination of interviews, surveys, and/or a sensitivity analysis. Boyd
Nurick, Le Jeune, Dawber, Flowers, and Wilkinson (2005) used a comparative valuation simulation of a single case study in the Brisbane CBD using the DCF method to attempt to determine the possibility of quantifying the effect of GBFIs on investment property.

We used a mixed method research approach in order to consolidate both qualitative and quantitative data. Mixed methods attempt to bring together methods from different paradigms (Spratt, Walker, and Robinson, 2004).

The following three research methods were chosen to extrapolate data for analysis for the purpose of this research: (1) semi-structured interviews with a sample of professional valuers in Cape Town ($n_1 = 9$), (2) online survey of a sample of valuers in South Africa ($n_2 = 27$), and (3) a valuation simulation on a commercial building in Cape Town to determine how GBFIs impact the input variables, and therefore the final value when using both the income capitalization and DCF valuation methods. We define a professional valuer as individual registered with the South African Council for the Property Valuers Profession (SACPVP).

The interviewees ($n_1$) are professional valuers with experience ranging from 5 to 27 years. In order to maintain anonymity, each one is allocated a research code of VAL (number of years of experience). For example, the valuer with five years’ experience is referred to as VAL5. One of the interviewees is a non-practicing valuer who works as a developer and is referred to as VALDEV. Valuers who participated in the survey ($n_2$) are employed in a variety of organizations, from South Africa’s largest property investment companies, property management companies, private valuers, parastatals to local government. OWN1 is used to refer to the owner of the building used for the valuation simulation. Semi-structured interviews and surveys are considered to the optimum research methods. Both these methods have used extensively in green building research as can be seen by previous research in the field by Barlett and Howard (2000), Madew (2006), Myers, Reed, and Robinson (2008), and Milne (2012), among others. This research design involved underpinning qualitative data with quantitative data in order to display the integrity of the findings. From a methodological perspective, this speaks to the reliability and validity of the research methods/design. According to Yin (2003), validity is the link between the theoretical ideas derived from the literature and the researchers’ observations. The author defines a reliable research method as one that can be repeated by other researchers in order to draw similar conclusions. The research methods/design address both of Yin’s definitions concerning validity and reliability. Denzin and Lincoln (2011) state that the usage of qualitative and quantitative data is a form of mixed methods research where the two data types can be assessed either in parallel or sequentially. Simply put, mixed methods research is seen to be choosing the best tools for answering the research question.

Findings

The findings are categorized into various themes that were revealed during both the semi-structured interviews and as a result from responses from the online survey.
Motivating Factors

Motivators for the implementation of GBFIs are a mixture of property investors, building tenants, building owners, and government (Madew, 2006). Both the interviews and the online survey yielded similar results. This is partly due to interviewees and survey respondents having similar exposure to the South African commercial property market, as all respondents are members of the SACPVP. There is a view that all the above mentioned parties have an equal role to play with regards to the implementation of GBFIs, as all these parties can benefit, predominantly from a financial point of view from the successful implementation of GBFIs. Valuers are considered to be objective property professionals who base their valuations on a combination of historical and current data, which is projected into the future, and therefore do not play a role as motivators for the implementation of GBFIs.

Findings from the interviews indicated that large corporate tenants play a key role in driving the implementation of GBFIs. As Milne (2012) notes, this is due to the fact that there is feasible payback for these type of tenants as there is a higher probability of lease renewal. Corporate social responsibility was cited as a secondary driver by large corporate tenants.

Valuers also identified property owners as drivers for the implementation of GBFIs. Property owners are driven by return, and to remain competitive they need to offer a quality product that results in low vacancies and an acceptable NOI. VALDEV noted that tenant requirements will drive owners to provide green buildings in order to remain competitive in attracting tenants.

Government was not identified as a main driver with regards to the implementation of GBFIs. VAL23 felt very strongly that the government is not a driver of green development in South Africa, and indicated that they would never be. When queried further and presented with the argument of a carbon tax and legislation the government could implement to incentivize green building, the interviewee agreed that the government could definitely then become a driver. However, due to the South African government’s key priorities, which are focused on health care, welfare, and combating crime, green building does not feature as a prominent issue that currently needs to be addressed.

Impact of Rating Tools on Value

Findings from both the interviews and the survey indicated that valuers were aware of green building rating tools. We also found that South African valuers had limited knowledge of the Green Star tool, even though access to Green Star is easily accessible.

Perceptions on the relationship between green rating tools and the market value of commercial property varied. Of the negative responses, issues were that although a rating would impact value, currently, given the South African context, it will not have an impact due to the lack of exposure in the commercial property market. These valuers did, however, recognize the potential of green rating tools valuation on commercial property.
Nearly three-quarters of the surveyed valuers indicated that green rating tools would not have a significant impact on value. The main impact would be how the GBFI would affect the risk profile of the building. The risk profile is linked to the valuation variables, which are used to determine value, as stated by CB Richard Ellis (2009), Eichholtz, Kok, and Quigley (2009), and Fuerst and McAllister (2011).

**Green Certification**

Approximately three-quarters of the valuers that participated in the online survey said that green certified buildings would yield greater values compared to buildings that had not acquired a green rating, citing the improved marketability as the likely reason. Improved marketability may result in higher tenant retention, which may reduce the risk factor of the building and thus have a positive impact on the valuation variables, such as the capitalization and discount rates (Muldavin, 2010).

The type of tenant plays a role with regards to the importance of green certification. Large corporate tenants are ideal as firstly they are more likely to be attracted to a green certified building as GBFIs could potentially add value to the image of the company, and secondly blue chip tenants tend to sign longer leases, and therefore the incorporation of GBFIs would make financial sense from a lifecycle costing perspective (Milne, 2012). Tenants with relatively short leases (less than five years) are less likely to be attracted by green certification, as they will have to incur the costs of GBFIs without gaining many of the future long-term benefits.

VAL5, VAL6, VAL11, VAL21, and VAL23 are all of the opinion that the market acceptance for green building has grown in South Africa since the inception of green rated buildings in 2009. It was further noted by VAL23 that even though the building industry in South Africa has plateaued due to the global economic slowdown, there has been an increase, albeit a slow one, in the number of green certified buildings in South Africa.

**The Impact of GBFIs on Value**

There was a unanimous perception from the valuers that were interviewed that it was important to incorporate GBFIs into commercial property valuation. VAL27 noted that it was important that valuers have an understanding to what degree different GBFIs affect value.

There are varying opinions by valuers with regards to how GBFIs impact value and to what degree GBFIs are incorporated into the final valuation calculation. VAL21 has incorporated GBFIs into valuations by adjusting the capitalization and discount rates; however, VAL21 is aware that the market might not necessarily agree with these types of adjustments. When valuing a green building, VAL23 also adjusted the capitalization rate, as the reduction in operating costs (specifically electricity) reduced the risk of the building for investors. The improvement in capitalization rate can also be attributed to the decrease in vacancy rate due to the improved building grade A to grade A+, as noted by VAL23.
VAL5 and VAL27, who had not yet valued green certified buildings, agreed that non-green certified buildings with GBFIs attributes were valued similarly by adjustment to capitalization and discount rates.

VAL5 and VAL25 believe that GBFIs would increase the market value. VAL25 stated that GBFIs could have the potential of a 10%–20% sales premium. However, VAL27 felt that this premium would occur gradually, as it will require time for complete market acceptance. Twenty-two of the online survey respondents felt that a green building, which has not necessarily acquired green certification, would garner a higher market value than a conventional building. This is consistent with the findings of Madew (2006), Eichholtz, Kok, and Quigley (2009), and Fuerst and McAllister (2011).

**The Impact of GBFIs on Valuation Variables**

GBFIs are deemed to affect a variety of valuation variables. VAL25 insists that the two most important variables are net income and the capitalization rate. In theory, a green building will have a positive impact on both of these variables, as cost savings will increase the net income. Costs savings for the tenant will also result in a lower vacancy rate and therefore a lower risk profile with regard to the building, thus decreasing the capitalization rate. VAL27 predicted that as time passes there will be a greater desire for GBFIs, which will lead to an increase in the demand for green space, which will therefore result in continuity in rental and rental growth, which may increase prices. This will eventually result in a reduction in the risk profile of a given building, thus resulting in the application of lower capitalization and discount rates, as illustrated in Exhibit 2.

The valuers that participated in the online survey perceived the following three valuation variables to most likely be affected by the implementation of GBFIs in commercial property in South Africa: (1) lower operating costs in comparison to conventional buildings, (2) lower yield because risk premium is lower, and (3) higher rent due to a green premium. Exhibit lists the variables that valuers identified that would affected by the implementation of GBFIs.

**The Impact of GBFIs on Property Owners and Tenants**

There is mixed opinion amongst valuers whether tenants would be prepared to pay a green premium. Much of this conjecture is attributed to a lack of knowledge regarding GBFIs by both property owners and tenants. The impact of GBFIs on operating costs is vitally important to tenants. VAL20 stated that if GBFIs manage
### Exhibit 3 | Valuation Variable Impacts

<table>
<thead>
<tr>
<th>Valuation Variables</th>
<th>Most Likely (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>Least Likely (7)</th>
<th>No. of Responses</th>
<th>Rank</th>
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<tr>
<td>Lower yield because risk premium is lower</td>
<td>% 0%</td>
<td>33%</td>
<td>46%</td>
<td>0%</td>
<td>17%</td>
<td>4%</td>
<td>0%</td>
<td>100%</td>
<td>24</td>
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<td>n</td>
<td>0</td>
<td>8</td>
<td>11</td>
<td>0</td>
<td>4</td>
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<td>0</td>
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<td>Lower operating costs in comparison to conventional buildings</td>
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<td>13%</td>
<td>8%</td>
<td>8%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>100%</td>
<td>24</td>
</tr>
<tr>
<td>n</td>
<td>14</td>
<td>3</td>
<td>2</td>
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<td>1</td>
<td>24</td>
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<tr>
<td>Higher rent due to a green premium</td>
<td>% 25%</td>
<td>21%</td>
<td>8%</td>
<td>13%</td>
<td>8%</td>
<td>17%</td>
<td>8%</td>
<td>100%</td>
<td>24</td>
</tr>
<tr>
<td>n</td>
<td>6</td>
<td>5</td>
<td>2</td>
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<td>2</td>
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<td>24</td>
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<td>Lower vacancy rate in comparison to conventional buildings</td>
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<td>8%</td>
<td>17%</td>
<td>38%</td>
<td>13%</td>
<td>4%</td>
<td>13%</td>
<td>100%</td>
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<td>2</td>
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<td>3</td>
<td>24</td>
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<td>Lower exit yield due to slower depreciation</td>
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<td>8%</td>
<td>4%</td>
<td>25%</td>
<td>21%</td>
<td>17%</td>
<td>17%</td>
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<td>n</td>
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<td>2</td>
<td>1</td>
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<td>Lower discount rate applied</td>
<td>% 0%</td>
<td>8%</td>
<td>4%</td>
<td>17%</td>
<td>21%</td>
<td>42%</td>
<td>8%</td>
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<tr>
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<td>2</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>2</td>
<td>24</td>
<td>1.82</td>
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<tr>
<td>Expectation that rents would escalate at a higher rate</td>
<td>% 0%</td>
<td>8%</td>
<td>13%</td>
<td>0%</td>
<td>17%</td>
<td>13%</td>
<td>50%</td>
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<td>0</td>
<td>4</td>
<td>3</td>
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</table>

Problems Associated with Green Valuation

The lack of transactional data and the lack of knowledge (experience) with regard to accurately accounting for GBFIs in valuation models were identified as two major problems associated with green valuation, which is consistent with the Madew (2006), Eichholtz, Kok, and Quigley (2009), and Warren, Bienert, and Warren-Myers (2009). Due to the fact that green buildings are still in their infancy in South Africa, there is minimal if any robust transactional data that valuers can rely on for future valuations. Valuers expressed their concern with how to slow down operating cost escalations compared to conventional market escalations then tenants would be prepared to pay a rental premium. VAL11 felt that allowance should be made for the role the economic cycle would play in determining whether owners and tenants would embrace GBFIs. During an economic downturn there would be less enthusiasm by both parties to commit capital expenditure on GBFIs, as their main focus would be to minimize short-term spending. However, during an economic boom, both owners and tenants would be more inclined to engage with the idea of implementing GBFIs by investing upfront capital in order to accrue a long-term financial gain.
accurately incorporate GBFIs in their valuation models. With no current set method of accounting for GBFIs when valuing, VAL 20 noted that valuers are forced to intuitively apply what they think may be the most realistic adjustments. As a result, valuations of green building lack a standardized conceptual approach and well-defined terminology to valuing green building among the South African valuer profession.

**Valuation Simulation**

The purpose of the valuation simulation was to supplement the interviews and online surveys with an actual example of how GBFIs impact the valuation variables, and determine to what degree a change in the valuation variables will impact the final value. A subject commercial building in the Cape Town CBD was used in the simulation to determine the effects of GBFIs on value. The building was purchased by a prominent listed property fund in 2009 for 20 million ZAR. Eight million ZAR was spent on retro-fitting the building with 25% of this capital expenditure used to implement GBFIs (Exhibit 4). In its refurbished (green) state, the building was valued at 37 million ZAR, as of 2011 (Vunani Properties, 2010).

The owner-driven GBFIs that were implemented primarily focused on water and energy savings and included the use of natural lighting to reduce the demand for electricity, waterless urinals, dual flush toilets, and rain water reticulation. Further savings on energy costs occurred due to the implementation of low energy fittings and central air-conditioning systems. The open-plan layout of offices by the tenant also results in a more efficient energy use with regards to the air-conditioning system.

Using the most common commercial valuation techniques (IPD, 2010), the building was re-valued as if the GBFIs had not been implemented by making
adjustments for the following input variables: (1) net rental, (2) discount rate, (3) capitalization rate, (4) exit capitalization rate, and (5) net rental escalation. Both the Income capitalization and DCF methods were used to obtain the value for the building in its conventional (non-green) state. Exhibit 5 illustrates the percentage difference in value when all of the above input variables revert to conventional market values. An increase of 17.3% in value in the building occurs once GBFIs have been implemented, using both valuation methods. The detailed market-related assumptions for the valuation simulation obtained from IPD (2011) are listed in the Appendix.

A sensitivity analysis revealed that by keeping all the input variables equal except for the net rental amount, which increased by a notional amount of 13.35%, yielded an increase in the value of building in the range of 11.1%–13.34%, depending on the valuation method. Exhibit 6 illustrates how the implementation of GBFIs can influence the net rental, and how sensitive the final building value is to a change in this individual valuation variable.
Conclusion

The literature and the findings of both the interviews and surveys indicate that although the market for green buildings in South Africa is still in its early stages, it is growing at an exponential rate as is evidenced by the increase in Green Star SA rated buildings since 2009. Although few South African valuers we worked with had valued a green building, the importance of taking GBFIs into account within valuations was recognized. However, despite the acknowledged importance of accounting for GBFIs, incorporating them into valuations at present was perceived to be unwarranted due to the infancy of the green building market, current economic climate, and lack of market evidence.

The findings from the research study validated the imperative need for valuers to take into account GBFIs when conducting valuations. As GBFIs become increasingly more prominent in the commercial property sector, valuers will need to learn how to account effectively for GBFIs in order to demonstrate to their clients the value add compared to conventional buildings.

A further conclusion that has been drawn from the GBFIs identified (i.e., energy efficiency, indoor environmental quality, water and waste management and materials) is that energy efficiency is the most significant value-adding feature in commercial green buildings. This is consistent with Madew (2006), who found that energy reduction was also key in the Australian commercial property market. This has been attributed to increasing energy costs in South Africa (Gunnell, 2009; Milne, 2012) and the significant savings in operating costs that can be achieved with energy efficiency.

It was further established that valuers believe the effect of GBFIs are essential to valuations, even though they themselves are not actively taking action to further their own knowledge on green building and how to incorporate GBFIs into valuations. Therefore, the research illustrated that there is a potential link between the implementation of GBFIs and a change in the value of a commercial property. This link has potentially contributed to valuers becoming more aware GBFIs when conducting valuations of commercial buildings that contain components that have both a direct and indirect impact on the environment and building occupants.

Despite the limited involvement in green building, valuers are appreciative of the impact of GBFIs on valuation, and thus contributing to the momentum of the South African green building movement.

Based on the findings, the following recommendations are made for further research in the field of green building:

1. The impact of the recently formed sustainability index on South African property funds.
2. The impact of GBFIs on decision strategies within the South African commercial property market.
4. An investigation into the business case for green commercial buildings in South Africa by applying the principles of lifecycle costing analysis.

Appendix

Valuation Simulation Assumptions

General Assumptions

1. The information supplied to the authors and summarized in the valuations is substantially complete and correct.
2. The green building valuation was conducted by VAL21, a professional valuer in the industry, and the value attained is assumed to be of true market value. Although market value is not an exact science, it is assumed the quantities are relatively accurate.
3. All factors that were included in the green building valuation are correct and function appropriately.
4. The GBFIs within the report are present in the building and are functioning appropriately.

Specific Assumptions

1. Net rental income was used because the operating cost figures given by IPD (2012) were not consistent with the operating costs of the building. The operating cost assumptions are taken into account as net income figures used. Operating costs are also building-specific, thus it is essential that these be excluded as a market average for these costs may skew results. Therefore, the net rental, rather than a gross rental, will give a better indication of the overall performance of the building.
2. A net rental figure of 112.38 ZAR/m²/month was used for the conventional valuation. This information was based on actual cost data for the subject property, obtained from OWN1, and is assumed to be accurate.
3. The capitalization rate of 10.35% was chosen based on the VAL21’s opinion of the current capitalization rate in the market, and based on the individual’s 21 years of experience, it is assumed that this is a fair reflection of the market. VAL21 then applied a capitalization rate of 10.00% to the green building valuation, representing a decrease of 35 bps.
4. The discount rate of 15.5% applied was found by obtaining the average of the 75th and 95th percentiles from IPD (2012). As a green building would attract less risk, the discount rate applied by VAL21 was lower than that of the industry. In this case there is a 2% differential present.
5. The exit yield of 10.80% for the conventional building was applied by determining the average of the 75th and 95th percentiles from IPD (2012). The exit yield for the green valuation was 10.00%.
6. Net rental escalations in the market have been 5% for the past 17 years, calculated from the IPD (2011). As such, it is assumed that this trend will continue.

7. It has been assumed that the Department of Water and Sanitation will renew their lease irrespective of the fact that the building is conventional, as this is a government tenant and they and generally sign longer leases.

8. Being an A grade building, the property is assumed to be in good condition.

References


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