

VALUE BEYOND COST SAVINGS

*How to Underwrite
Sustainable Properties*

**Three Principles for Applying
Sustainable Property Market
Performance Research**

**Excerpt from Expanded Chapter IV:
Sustainable Property Performance**

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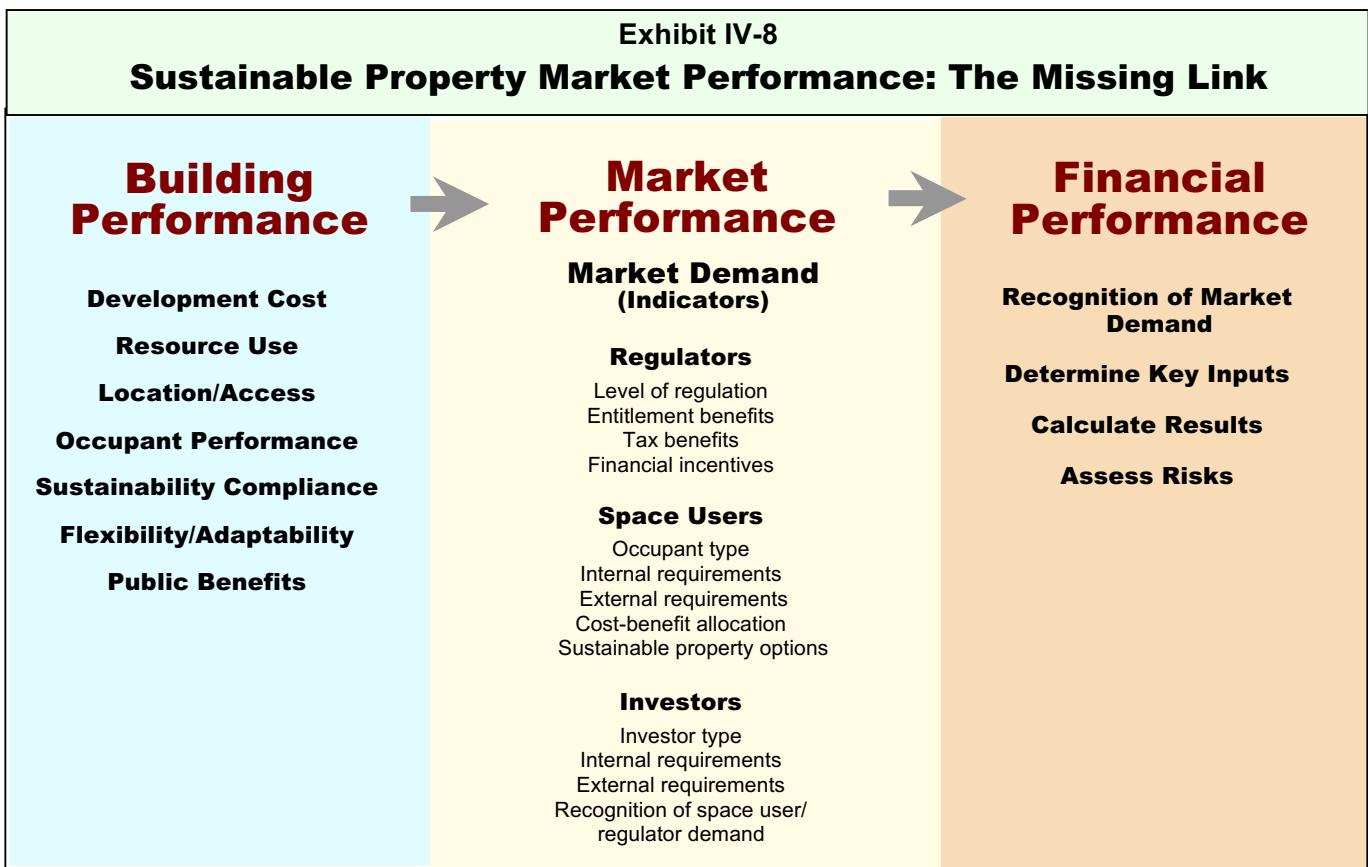
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F. Market Performance

There is substantial evidence to support enhanced regulator, space user, and investor demand for sustainable properties. The significant demand for sustainable properties is evidenced by expert-based financial analyses, statistical based analysis, survey/market research, and well-reasoned valuation theory.

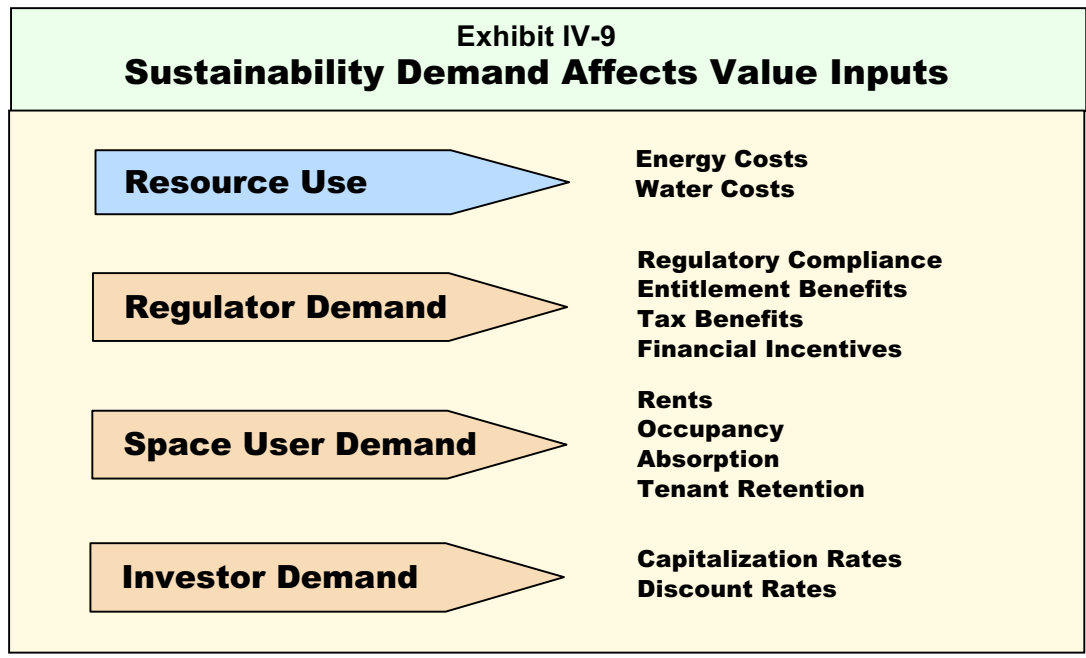
Market performance is the missing link that ties building performance information to financial performance. Historically, the green building industry has done a poor job of articulating the value of sustainable property investment because they have equated building performance (energy/water savings, health and productivity benefits, etc.) with financial performance, without taking the critical intermediary step of assessing of the response of the market to the building's performance (see Exhibit IV-8 below). Full consideration of the market's response to a building's performance ensures proper consideration of revenues, risks and the allocation of costs and benefits of sustainability between owners and tenants.



While downplaying market performance issues is a critical problem in general performance or cost-benefit studies, it is a fatal error in the ability to assess the financial implications of sustainable property investment for an individual property. As shown in Exhibit IV-8, to get from building performance to financial performance for a specific property, you must evaluate

the market demand for sustainable property by regulators, space users, and investors, then assess whether brokers, appraisers, and lenders in the specific markets where the property is located recognize the sustainable market demand. Finally, you must determine key financial model/valuation inputs factoring in both sustainable and non-sustainable issues.

Regulator, space user, and investor demand are critical to value, as shown below in Exhibit IV-9. If valuers only considered resource use (energy costs, etc.) and ignored market performance, as measured by demand, key value issues affecting entitlements, rents, cap rates and other issues would be ignored. In essence, revenue and risk considerations would not factor into decision-making, a recipe for long-term underperformance.



To better understand and ease the interpretation of sustainable property market and financial performance research, we segment and categorize the research into four key types:¹

- 1. Expert-based financial analyses.** Conducted primarily by valuers/market analysts on a property-by-property basis following traditional valuation practices.
- 2. Statistics/modeling-based financial analyses.** Conducted primarily by academics applying statistical modeling techniques to large databases of properties.
- 3. Surveys and market research.** Surveys and related market research studies addressing regulator, space user, and/or investor demand.
- 4. Foundational background and theory.** Foundational research and theoretical studies that address key issues in sustainable property valuation and financial analysis.

¹ We combine sustainable market and financial performance research together because much of the research in the field covers both these topics in their studies.

1. Three Principles for Applying Sustainable Property Market Performance Research

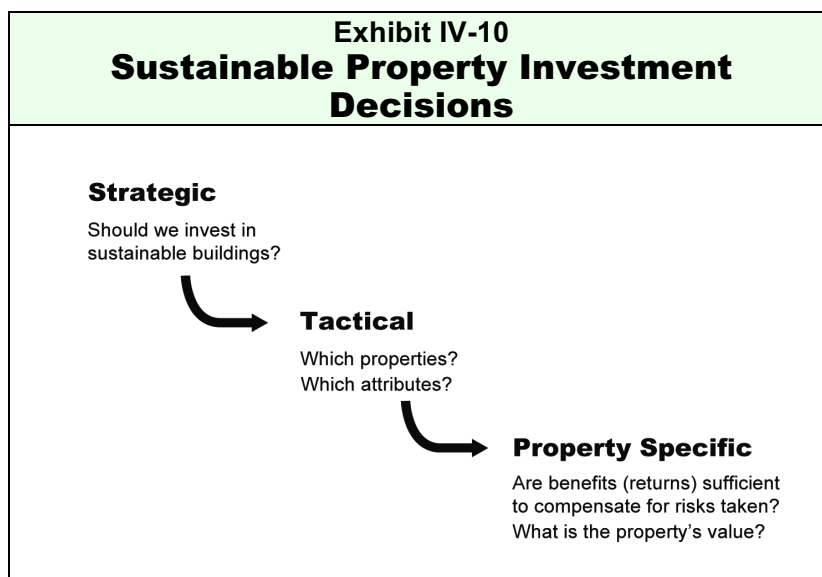
Prior to the presentation of the market performance evidence for sustainable properties, it is important to have guiding principles to assist in understanding how market performance evidence can be used to aid decision-making. Three important principles are discussed below:

- **Principle One:** Different decisions require different types of market data.
- **Principle Two:** Failure to understand types of market research will lead to failure in interpretation and application.
- **Principle Three:** Sweat the details when applying market research to property level decisions.

Principle One: Different decisions require different types of market data

Sustainable property market performance research can be interpreted and applied in many different ways. Unfortunately, if a user of market research does not understand the details of the market research, or the types of decisions that it is most applicable to, research results and conclusions can be misused and misunderstood, as happens frequently regarding sustainable properties in the industry and media.

One particularly important framework for differentiating sustainable property investment decisions is illustrated in Exhibit IV-10 below. This framework, based on traditional management consulting practice, differentiates strategic or enterprise decisions from business unit or operating decisions.



Strategic decisions are those made by pension fund boards, corporation boards, CEOs, and other leaders who must make decisions about how they are going to respond to the broader issue of

sustainability, and the more specific issue of sustainability within their real estate portfolios. Statistics/modeling-based research, surveys, valuation theory and other market/performance research that “generally” addresses the importance of sustainable property is important and applicable to these decisions.

Once a strategic decision is made that sustainable real estate is an important consideration, implementation is passed down to corporate real estate heads, pension fund portfolio managers, asset managers, and others who are charged with the tactical responsibility to determine the nature of the organization’s response. Should sustainability investments be phased? How should they be phased? Should we just work on our office portfolios, or are all property types of concern? Which properties should we focus on? Which sustainability attributes? How do we measure and assess where we currently stand and track progress moving forward? The types of research applicable to strategic decisions can help here in developing portfolio strategies, but more detailed “sustainability options analysis” (See Chapter V, Section C-2) and property level analysis become more important.

Property specific decisions are quite different than either tactical or strategic decisions. Key questions include: How do we underwrite the risks and returns of specific investments in sustainable features for a given property? Are the benefits (returns) sufficient to compensate for the risks taken for investment in a particular property? How will the market respond to sustainable property improvements?

Making property specific decisions requires different types of data and analytics than strategic or tactical decisions. As fully described in Chapter V: “Sustainable Property Financial Analysis,” general statistics/modeling-based research, surveys, and expert-based research can be helpful, but much more detailed and granular data and analysis is required. It is improper and inaccurate to directly apply the numerical results of statistics/modeling-based research done at a general level to any particular property-level analysis.

For a specific property, the selection of comparables, for either setting rents in a discounted cash flow analysis, or for making adjustments in the market comparables approach, is a much more detailed and specific analysis of those key competitors to a specific property. The selection, weighting, and adjustment of comparables to determine what a subject property will rent or sell for involves scores of qualitative judgments by professional real estate appraiser or due diligence analyst with experience in the market and a clear understanding of the factors influencing the tenants specific to a particular building.

Finally, property level decisions require appreciation of the fact that rent, value risk and other key financial performance and modeling assumptions require explicit consideration of non-sustainable demand factors, as highlighted below in Exhibit IV-11.

Exhibit IV-11
Sustainability Just Part of Factors Influencing Tenant Demand

Location Specific

- **Proximity to executive housing**
- Proximity to qualified employees
- Proximity to nearby amenities (restaurants, shops & services)
- Proximity to public transportation

Building Specific

- Paid versus free parking
- Age of building
- How modern is building
- Adequacy of building systems
- Operating expense costs
- Building ceiling heights
- **Floor plate size & configuration**
- Level of property mgmt service
- Level of building security

Space Specific

- **Location of space (lower, middle or upper floors)**
- Open versus built-out floor plan
- Common versus dedicated restrooms

Tenant Specific

- **Rental rate (cost) for space**
- Perceived building prestige
- Other tenants located in the building
- Proximity to clients/customers
- Adequate parking ratio
- Adequacy of lobby
- Curb appeal of building

Sustainability Specific

- Potential health benefits
- Potential productivity benefits
- Reduced energy/water cost volatility
- Improved recruiting
- Improved employee retention
- Leadership—improved corporate market value
- Reduced subleasing risk

Full appreciation of all the factors influencing value enables market performance research users to appreciate the relative importance of sustainable property investments.

Principle Two: Failure to understand types of market research will lead to failure in interpretation and application.

The strengths, weaknesses and purpose of sustainable property market research guide proper interpretation and application.

Expert-based financial analyses provide the most reliable results because the general conclusions offered by such studies are based on detailed property-by-property analysis following traditional real estate market analysis practices. Unfortunately, for those who still seek the “killer” study that will provide the “answer” to the question of whether sustainable properties are more valuable, the quantitative specificity of the conclusions of expert-based studies often fall short of what advocates desire.

The caveats and hedging of conclusions often found in these studies reflect a recognition by experts that general conclusions based on detailed property analysis are difficult and always subject to caveats. Failure to acknowledge forecasting risk makes research more difficult to interpret by decision-makers.

Expert-based valuers and market analysts are used to providing very definitive, and in the case of an appraisal, a specific single value estimate, for individual property analysis. Because of this

discipline, and the recognition of the uniqueness of each property, valuation and market research experts are always rightfully concerned about drawing general property conclusions.

Statistics/modeling-based financial analyses are primarily applicable to strategic decisions, where general conclusions about markets and properties can be quite valuable in moving enterprise level decision-makers to invest resources to better understand sustainable property investment, but have very limited use for property level decisions. In fact, due to the substantial difficulties in the data and modeling methodologies of these types of market performance studies, their primary benefit to date has been in establishing a strong relationship between superior financial performance and sustainability, while the numerical accuracy or applicability of the results is much more problematic.

Surveys and market research are different from expert-based or statistics/modeling-based performance studies because they typically focus on segments of market demand, rather than on predicting the specific financial contribution of sustainability on rents, occupancies or sales prices. Surveys and market research help valuers/underwriters understand key factors driving sustainable market demand by type of occupant, demographic or geographic characteristics, type of sustainable property attribute and other factors. This work is critical to enabling market demand estimates for specific properties.

Foundational background and theoretical research provides the necessary linkages and intellect required to develop sound market research methodologies and properly apply results.

Principle Three: Sweat the details when applying research to property level decisions.

The most important guidance in interpreting and applying any of the four types of sustainable property market performance research to property level decisions is to sweat the details. As discussed above and in more detail below, if one is to attempt to apply statistics/modeling-based financial analyses to a property level decision, it is critical to fully understand the data, sample size issues, control factors, and other details. At best, these types of studies will provide general confirmation for financial assumptions that should be derived from more property-specific methods, and may affect the risk or uncertainty of a particular financial assumption.

Sweating the details does not only apply to statistics/modeling-based financial studies but also to surveys and expert-based financial analyses. For surveys, it is critical to understand the date the survey was conducted, the specific context for the survey, the specific job classifications of the respondents, the date the survey was administered, the geographic regions and property types that were discussed, and the quality (lack of bias in its structure) of the survey questions and vehicle. For expert-based financial analyses, it is particularly important to understand potential researcher bias, the nature of researchers' expertise, and the depth and comprehensiveness of the analytic procedures that they performed in coming to their conclusions.

Data Issues: Statistics/Modeling-Based Research

Data problems are so significant; they limit the accuracy and reliability of most statistics/modeling-based studies. Data is not typically consistently available to allow the proper model specification of the key factors that would influence rent or sales price.

Sample size is also a significant problem, particularly if one is trying to draw statically significant conclusions for specific property types, markets, types of sustainable certification, for almost any smaller segment.² Fortunately, through the “marking” of properties that are LEED and EnergyStar certified in large databases such as the CoStar database, the sample size for non-certified properties is quite large. The most difficult sample size issues occur with certified property. While the number of EnergyStar certified properties is relatively large, LEED certified properties is a much smaller sample size. There is also the difficulty that the number of LEED certified properties was very small in the 2000 to 2005/2006 time period before becoming larger in more recent years. LEED existing building certifications, an important classification of study, is currently a significantly smaller sample, with LEED EB only really taking off as recently as 2006.³

Finally, any data voluntarily provided directly from building owners could be subject to self-selection bias. Since many of the early owners and developers of sustainable properties were promoters of sustainability, and have a financial stake in the market appreciating the value of sustainable investment, there is significant potential for any voluntary sample of certified buildings to include those buildings that performed best, and if the data is not audited or provided for an independent purpose, questions about the potential bias of the data need to be considered.

Control Issues: Statistics/Modeling-Based Research

Closely related to understanding the data and sample used in a study, is to understand the way the study authors control for the critical factors that would affect rent or sales price. The general structure of statistics/modeling-based studies is that they have a dependent variable (typically rent, occupancy, or sales price) that is dependent upon a whole series of independent variables including location, access, property age, property size, property quality, market conditions, and LEED or EnergyStar certification.⁴ The basic idea in these studies is that by including LEED or

² The way sample size works, when you try to specify a more specific conclusion, it significantly reduces sample size. Accordingly, if you wanted to look at a statistically significant conclusion for community shopping centers in a particular geographic area, the sample size of certified properties, particularly if you were looking for sales information, would typically be so small (based on sales to date) as to make conclusions unreliable.

³ LEED EB registrations have taken off during the last two years but some time will have to elapse to improve the ability to draw conclusions.

⁴ In our discussion and analysis in this section, we typically refer to LEED, the US Green Building Council’s environmental certification, and EnergyStar, an energy certification and rating system promulgated by the US Environmental Protection Agency. The reason to focus on these certifications is that most of the statistics/modeling-based market performance studies have been completed using the CoStar database, which is a large comprehensive US-based property level database that began “marking” its properties for their LEED or EnergyStar certification in recent years. Accordingly, due to the size of the database, and marking of certification level on properties that are certified, it enables statistics/modeling-based studies to be completed.

EnergyStar certification as one of the independent variables, you can estimate the contribution of the LEED or EnergyStar certification to the dependent variable (rent, sales price, or occupancy). The trick is to properly specify the model (include the key factors that would influence rent or sales price) and control for all the key factors such as age, size, time, location, market condition, and other factors, so you can get an accurate estimate of the contribution of a LEED or EnergyStar certification.⁵

In practice, it is very difficult to properly specify the model and control for important factors that might affect rent and sales price. You can only specify and include a factor as an independent variable if you have the appropriate granular data over the proper time period to include in the analysis. This is not possible for much key data used in real estate analysis. Given the unique nature of each property, micro location issues including the access, quality and mix of tenants in a building, lobby quality and security, access to transportation, and many other factors can affect rent or sales price. This information is not available on a building-by-building basis in a consistent fashion. Statistically, the problem this presents is less significant when trying to predict sales prices or rents, but more difficult when trying to reliably estimate the contribution of an independent variable like LEED or EnergyStar status.

Control becomes even more problematic when dealing with asking rents for specific spaces within a building. The specific asking rent for a particular space in a building can be significantly influenced by the configuration and flow of the space, the interior tenant improvements, co-tenancy issues, and other factors. For large office buildings, it is a well-accepted fact that lease rates vary as much as 30% within buildings based on floor height and views. Without specific controls or other statistical adjustment for these factors, which is difficult, if not impossible, significant control issues can arise.

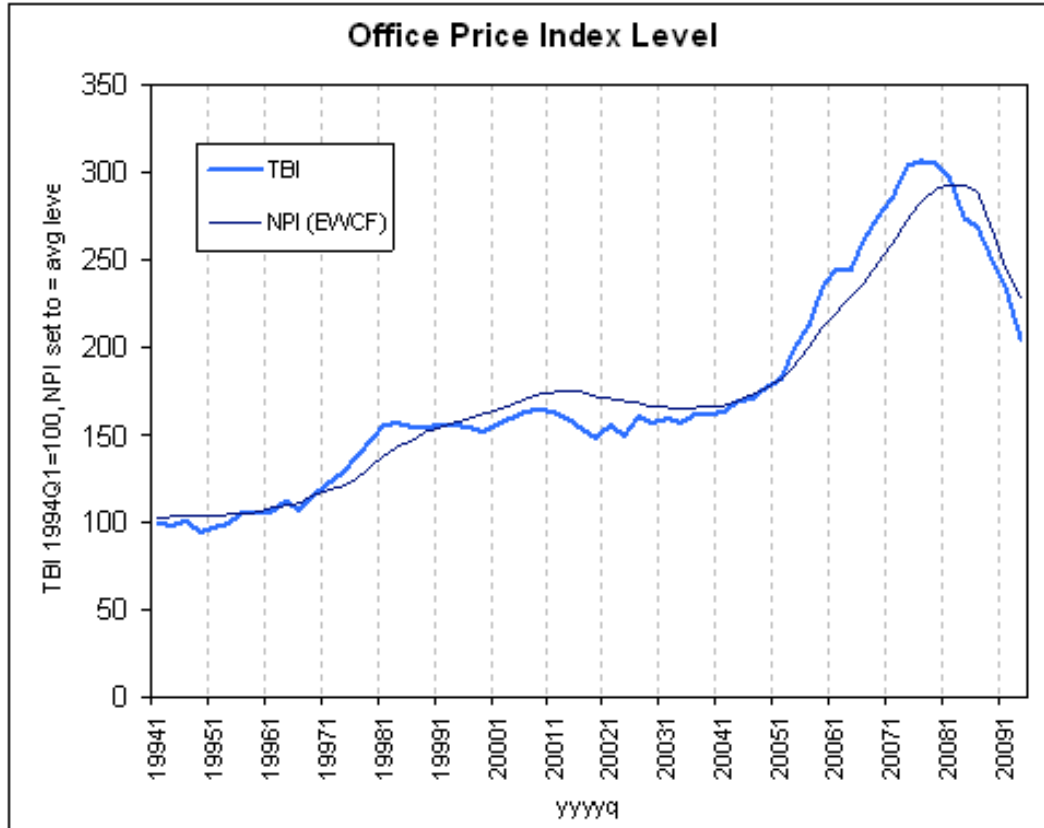
One of the most significant statistical issues involves time. As mentioned earlier, the distribution of certified buildings, particularly sales of certified buildings, is spread over just a few years, limiting strong time series analysis. More importantly, without a very explicit and effective control for time, on as frequent as a monthly basis, significant problems can exist in the numbers that come out of these type of analyses. As shown in Exhibit IV-12 below, property prices moved dramatically on a quarterly, and even a monthly basis during the last five years, the time period in which most sustainable property market performance studies are limited to. Office building sales prices increased approximately 100% from 2004 to 2007, and then just as dramatically declined in value. Prices are down nearly 40% from their peaks through the second quarter of 2009.

Rents moved equally dramatically, with rents in New York City down 50% or more in many sub-markets from their peaks in recent years. Accordingly, without a very specific and

⁵ These types of models are typically referred to as hedonic regressions. The term *regression* relates to the idea that when large amounts of data are examined, statistical measures of various characteristics should tend to regress to the true parameter values for the underlying populations. When applied to real estate valuation, regressions analysis is often called *hedonics* or *hedonic regression*. Auto industry analyst A.T. Courts coined the term *hedonic* in the late 1930s, borrowing from a psychological term suggesting pleasant states of mind, to convey the idea that an item's value is associated with features that give its users pleasure or utility. (Footnote language extracted from "Expert Testimony: Regression Analysis and other Systemic Methodologies," Peter Colwell et al., *The Appraisal Journal*, Summer 2009.)

conscientious control for time on a frequent interval basis, statistics/modeling-based market performance studies are difficult to rely upon, given the dramatic variability in rents and sales prices as a result of time.

Exhibit IV-12



Source: MIT/NCREIF Commercial Real Estate Transaction Based Index (TBI). NPI (EWCF) = NCREIF National Property Index equal weighted cash flow based returns.

Please note that the TBI is a statistical methodology that produces estimates of price movements and total returns based on transactions of properties sold from the NCREIF Index database. The purpose of this index is to measure market movements and returns on investments based on transaction prices of properties sold from the NCREIF Index database. This is a new type of index that offers advantages for some purposes over the median-price or appraisal-based indexes previously available for commercial real estate in the U.S.

Dependent Variable Issues: Statistics/Modeling-Based Studies

While not as frequently discussed as independent variable control and model specification problems, the dependent variables (typically rent or sales price) also have issues that must be considered.

Perhaps the most difficult is the issue of rent. As is fully discussed in Chapter V: “Sustainable Property Financial Analysis,” rent is not the only, or typically even the most important, variable that is influenced by increased demand by space users for sustainable properties. Other critical financial assumptions that have a significant influence on value that are also influenced by space user demand include tenant retention, speed of absorption, equilibrium occupancy, vacancy loss

at turnover, and lease terms. Accordingly, by focusing solely on rent, statistics/modeling-based market performance studies may be underestimating the influence of sustainable property investment on financial performance.

Other issues relate to what the term “rent” actually represents. If it is asking rent, there are sometimes significant differences between asking rent and actual negotiated lease rent. Asking rent may only represent an average for the rent on the type of space that is available in a property, and not fully reflect the true average value of all space in a building. If actual rent from signed leases is used as the dependent variable, then all the issues related to the specific configuration of the space, tenant improvements, floor height, and other issues become important. In down markets, effective rents (adjusted for free rent that comes in many forms) can be significantly below asking or even stated lease rent.⁶ While researchers are sometimes aware of these micro issues that are the bread and butter of expert-based valuation analysis, and sometimes endeavor to make adjustments to the data to compensate for these issues, the adjustments are often difficult to make and not possible in many cases, even if they do try.

Another key issue in looking at rents relates to the type of lease, whether it is a net lease, a gross lease, or one of the scores of hybrid variations of lease types. These issues are important because they influence tenants’ actual and perceived value relative to energy or related cost savings, and other issues.

Beyond the type of lease are the actual terms of the lease, lease length, lease options, tenant improvement budgets, and many other clauses affecting the use and flexibility of space affect the rent charged.

Problems With Environmental Certifications as Independent Variables: Statistics/ Modeling-Based Studies

Another key consideration in evaluating statistics/modeling-based studies are the definitions of the environmental (LEED and EnergyStar) certifications, which are the focus of these studies. For example, due to the intricacies of the certification process, LEED building A is not the same as LEED building B. For example, building A may have gone after different points to achieve the LEED rating than building B, and therefore possesses a very different set of design elements and technologies, which in turn may impact the building’s environmental and economic performance in different ways. By focusing simply on a LEED rating generally, without differentiation for the level or type of LEED certification, or the specific sustainable features within a building, limits the applicability of these types of studies.

The substantial changes in LEED ratings, due to the release in 2009 of LEED 3.0, further highlights the difficulty in interpreting generally what a LEED rating is. This problem is less a concern for EnergyStar certification. However, because most studies have not specifically

⁶ It should be noted that Eichholtz, Kok, and Quigley use the term “effective rent” in their studies to reflect their adjustment of asking rent for occupancy level, but the industry does not define effective rent the way they do.

addressed varying EnergyStar scores, care must be taken in interpreting and applying these results, because all EnergyStar certifications are not the same.⁷

Keeping the three principles in mind, we present a summary of the evidence of sustainable property market and financial performance to date.

Exhibit IV-14 Statistics/Modeling-Based Sustainable Property Financial Analysis				
	Rent Premiums		Sales Price Premiums	
	<i>EnergyStar</i>	<i>LEED</i>	<i>EnergyStar</i>	<i>LEED</i>
Fuerst & McAllister, April 2009 ¹	5%	6%	31%	35%
Eichholtz, Kok & Quigley, January 2009 ²	3.3%	0%	16% ²	0%
Miller, Spivey & Florance, Fall 2008	N/A ³	N/A ³	5.8%	9.9%
Wiley & Johnson (forthcoming)	7%-9%	15%-17%	\$30/sq.ft.	\$130 sq.ft.

¹ Fuerst & McAllister disclose many of the problems with their methodology and data, and conduct a more robust statistical analysis on a smaller, more comparable sample of office properties that results in a 3.7% rent and 19.6% sales price premium for LEED.

² The authors make an adjustment for occupancy level, which changes results to show a 6% premium for EnergyStar. The premium for LEED in this adjusted approach was 9%, but not statistically significant. The sales price calculation is not independently derived, but rather based on rent premium and cap rate assumptions using direct cap sales method.

³ No statistical analysis of rent premium included as part of their analysis.

Sales price premiums range from 5.8% to 31% for EnergyStar properties and 9.9% to 35% for LEED certified properties. Due more severe statistical, methodological, and data problems in sales price analyses, the Consortium places little confidence in these specific numerical results.

Based on interpretation of the statistical models, these results imply that LEED or EnergyStar certifications, independent of all the other factors that would affect sales price, are responsible for very significant sales price premiums, well beyond plausible premiums detected in tenant and investor surveys and case studies. We are particularly concerned about potential distortions due to insufficiently granular control for time, with value change during the time period studied increasing rapidly, with certified property sales, due to their very limited time series, happening during the periods of the most rapid value growth.⁸

The Consortium’s work confirms that sustainable properties can be more valuable, due to the increases in regulator, space user and investor demand and positive “net” risks, but do not believe that the numerical results from these studies of sales price premiums are reliable indications of potential value increases at this time.

⁷ EnergyStar certification is awarded for all properties that achieve the 75% percentile of results, or better.

⁸ Sustainable Real Estate Development: The Dynamics of Market Penetration by John Goering, published in the Fall 2009 Journal of Sustainable Real Estate, provides a good summary of statistics-modeling based research, and the issues involved in applying the conclusions of this research. He also looks at the key issues influencing the adoption of sustainable building in the industry.

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