

Supreme Green: The Effect of LEED Certification Levels on Net and Gross Lease Rental Rates in Commercial Offices

Authors: Jackson Cook, Chase Govett, Max Murray -- Faculty Advisor: Professor Marc St-Pierre

Introduction

- Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from location choice to design, construction, operation, maintenance, renovation, and deconstruction.
- Formal sustainability measures were established in the 1990's and the United States Green Building Council created the Leadership in Energy and Environmental Design (LEED) system in 1998 as a certification program for sustainable building standards in new developments. LEED has generated significant attention from owners and developers in the U.S. commercial real estate market.
- With companies further evolving their environmental, social, and corporate governance (ESG) priorities, we examine the effect of LEED certification levels on rental rates in the United States commercial real estate office market.

Background/Literature Review

- There are different levels of LEED certifications: **certified, silver, gold, platinum**. A building's certification level is evaluated on a point system based on categories relating to sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation in design, and regional priority (Fuerst, Reichardt, Rottke, Zietz, 2012).
- There are two main commercial office market lease types: **(1) Full-service gross lease** (tenant pays a flat rent to the landlord and is not responsible for financing any operating expenses of the building) and **(2) Triple-net (NNN) lease structure** (tenant pays a rent to the landlord and is financially responsible for all operating expenses that are associated with their proportional share of the building (Reichardt, 2013)).
- Reichardt (2013) found that LEED certified buildings have 5.4% lower operating expenses than non-certified buildings.
- McGrath (2013) explains that LEED certified properties have 18% to 39% lower energy costs than non-certified buildings in her study of the effect of eco-certification on cap rates.

Econometric Model & Variables

Model 1. Average Weighted Rent

$$AWR_i = \beta_0 + \beta_1 yrbuilt_i + \beta_2 taxpsf_i + \beta_3 Class_A_i + \beta_4 Class_B_i + \beta_5 SCTNL_i + \beta_6 SCE_i + \beta_7 SCMG_i + \beta_8 SCFSG_i + \beta_9 LEED_C_i + \beta_{10} LEED_S_i + \beta_{11} LEED_G_i + \beta_{12} LEED_P_i + \beta_{13} Houston_i + \mu_i$$

Model 2. Vacancy

$$Vacancy_i = \beta_0 + \beta_1 yrbuilt_i + \beta_2 taxpsf_i + \beta_3 Class_A_i + \beta_4 Class_B_i + \beta_5 SCTNL_i + \beta_6 SCE_i + \beta_7 SCMG_i + \beta_8 SCFSG_i + \beta_9 LEED_C_i + \beta_{10} LEED_S_i + \beta_{11} LEED_G_i + \beta_{12} LEED_P_i + \beta_{13} Houston_i + \mu_i$$

Table 4. Variables

Variable	Description
AWR	The rental rate per square foot, weighted by the total square feet of the corresponding space
vacancy	The amount of unrented space, expressed as a percentage of total rentable building area (RBA)
yrbuilt	Indicates the year the building was built
taxpsf	Property taxes per square feet
Class_A	Dummy variable that = 1 if the building is classified as Class_A
Class_B	Dummy variable that = 1 if the building is classified as Class_B
Class_C	Dummy variable that = 1 if the building is classified as Class_C
SCTNL	Dummy variable that = 1 if "Triple Net" Lease structure
SCE	Dummy variable that = 1 if "Plus Electric" Lease structure
SCU	Dummy variable that = 1 if "Plus Utilities" Lease structure
SCMG	Dummy variable that = 1 if "Modified Gross" Lease structure
SCFSG	Dummy variable that = 1 if "Full Service Gross" Lease structure
LEED_C	Dummy variable that = 1 if building is LEED Certified (40 - 49 points)
LEED_S	Dummy variable that = 1 if building is LEED Silver (50 - 59 points)
LEED_G	Dummy variable that = 1 if building is LEED Gold (60 - 70 points)
LEED_P	Dummy variable that = 1 if building is LEED Platinum (80+ points)
Houston	Dummy variable that = 1 if building is located in the Houston MSA and = 0 if located in the Dallas/Fort-Worth MSA

Results

Table 1. Linear Regression

AWR	Coefficient
yrbuilt	0.152*** (0.010)
taxpsf	0.235*** (0.076)
Class_A	6.623*** (0.369)
Class_B	2.306*** (0.272)
SCTNL	-0.885 (0.878)
SCE	1.624* (0.886)
SCU	-1.798 (1.160)
SCMG	0.648 (0.922)
SCFSG	2.687*** (0.879)
LEED_C	1.796 (1.403)
LEED_S	4.180*** (0.832)
LEED_G	1.575** (0.694)
LEED_P	2.371 (2.575)
Houston	0.032 (0.213)
Constant	-287.45*** (20.463)
R-squared	0.315
F-test	76.762
Number of Obs.	2838.000
Prob > F	0.000

*** p<0.01, ** p<0.05, * p<0.1

Table 2. Linear Regression

vacancy	Coefficient
yrbuilt	-0.020 (0.041)
taxpsf	-0.269 (0.041)
Class_A	-11.690*** (1.819)
Class_B	-3.093** (1.492)
SCTNL	-0.551 (1.838)
SCE	-11.212*** (2.000)
SCU	-1.968 (4.875)
SCMG	-7.180*** (2.478)
SCFSG	-13.773*** (1.893)
LEED_C	-1.965 (6.376)
LEED_S	-8.955*** (2.678)
LEED_G	-3.382 (2.303)
LEED_P	-1.004 (6.375)
Houston	-1.260 (1.010)
Constant	83.655 (81.320)
R-squared	0.065
F-test	15.631
Number of Obs.	3208.000
Prob > F	0.000

*** p<0.01, ** p<0.05, * p<0.1

- The empirical results listed in Table 1 are in line with our expectation that LEED certified buildings should command a rent premium. What is unexpected, however, is that LEED Certified and Platinum certifications commanded no statistically significant premium to AWR.
- Of the four certification levels, LEED Silver and LEED Gold were the only variables that commanded a statistically significant increase to AWR of \$4.180 and \$1.575 per square foot, respectively.
- Overwhelmingly, buildings that are LEED Silver certified command the largest reduction in vacancy than all other certification levels. Found in Table 2, this level of certification commanded a 8.995% reduction in vacancy.
- We find significant rental premia associated with Full Service Gross (SCFSG) and Plus Electric (SCE) lease structures. In addition to this, we find significant vacancy reductions associated with Full Service Gross, Plus Electric, and Modified Gross (SCMG) lease structures.

Data

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
AWR	3046	19.839	6.061	3.48	56.4
vacancy	3462	31.051	26.762	.007	100
yrbuilt	3462	1992.301	14.089	1970	2019
taxpsf	3208	2.882	3.395	0	82.69
Class_A	3462	.212	.409	0	1
Class_B	3462	.646	.478	0	1
Class_C	3462	.142	.349	0	1
SCTNL	3462	.362	.481	0	1
SCE	3462	.199	.4	0	1
SCU	3462	.01	.1	0	1
SCMG	3462	.069	.254	0	1
SCFSG	3462	.24	.427	0	1
LEED_C	3462	.004	.066	0	1
LEED_S	3462	.02	.14	0	1
LEED_G	3462	.031	.174	0	1
LEED_P	3462	.003	.054	0	1
Houston	3462	.413	.492	0	1

- We analyzed data from CoStar's national commercial property database that includes certified and non-certified properties. CoStar's database contains over 2.8 million buildings in the US. CoStar is a private data provider.
- The sample used is a cross section of the Houston and DFW MSAs in Q4 of 2019. We controlled for property status and only collected data on existing properties, leaving out those under construction.
- Overall, we found 4,429 commercial office properties that fit our requirements. We dropped 95 properties that were recorded as built after the year 2020, as well as 338 properties that were built before 1970 and 485 properties that had a recorded vacancy of over 100%. We then cleaned up the sample by dropping 18 properties with obscure direct services entries.

Conclusion

- Many property owners are incentivized to seek environmental certifications such as LEED to meet tenants' demand. LEED certified buildings command a significant rent premium and higher occupancy than comparable properties. We analyzed the Houston and DFW commercial real estate markets and found results that differ from prior research.
- First, we isolated five common lease structures to study their effect on Average Weighted Rent and vacancy and found significant rental premia associated with Full Service Gross and Plus Electric lease structures. There were significant vacancy reductions associated with Full Service Gross, Plus Electric, and Modified Gross lease structures.
- Second, we isolated the four levels of LEED certification to analyze their specific impact on Average Weighted Rent and vacancy. Unexpectedly, we find that LEED Silver and LEED Gold certified buildings command the only statistically significant increase in Average Weighted Rent. We also find LEED Silver to command a reduction in vacancy, the only statistically significant result of all four LEED levels.
- These results differ from previous studies which found significant rent premium for all LEED certification levels. Reasons for this disparity are unclear. The results listed should serve as a stepping stone for future research into the impact of eco-labeling in the commercial real estate sector and consumer choice.