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Do greener REITs show better performance?

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Dissertação apresentada à Escola de Economia de São Paulo da Fundação Getúlio Vargas, como requisito para obtenção do título de Mestre em Economia.

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RESUMO

Se empresas que exercem práticas socialmente responsáveis se beneficiam em relação a suas concorrentes é tema sob debate, no mercado e na academia, já há algumas décadas. O mercado imobiliário em particular constitui uma importante classe de ativos, pois ocupa fatia considerável da carteira de investidores e traz consigo relevantes impactos socio-ambientais. São exemplos destes a geração de lixo, o consumo energético e impactos no sistema de saúde: com o avanço da urbanização e do terceiro setor na economia, as pessoas passam cada vez mais horas de seus dias em escritórios ou em casa. Nesse artigo, exploro a seguinte questão: fundos de investimento imobiliários (FIIs) investindo em propriedades ambientalmente certificadas têm melhor performance financeira e/ou operacional? Extraio as propriedades e dados financeiros da CVM [1] e verifico na base dados USGBC [2] se há certificação para cada propriedade e qual foi a pontuação obtida. Rodo um conjunto de regressões de efeito fixo relacionando performance financeira (retorno contábil das cotas) e performance operacional (razão entre fluxo de caixa operacional e ativo/patrimônio líquido) à porcentagem de propriedades certificadas de cada fundo no período 2001-2017. Detecto um aumento de aproximadamente 1% no retorno financeiro dado 1% mais *greenness*, mas não encontro evidência de melhora operacional. Outro modelo, levando em consideração um potencial problema de endogeneidade de retornos passados é desenvolvido e não mostra qualquer relação significativa entre *greenness* e performance financeira ou operacional.

Palavras-chave: greenness. mercado imobiliario. performance de fundos.

[1] http://www.cvm.gov.br
[2] https://new.usgbc.org/leed

ABSTRACT

Whether firms benefit from socially responsible actions is under debate over the last few decades. Real estate is an important class of assets on investors portfolios and also largely contributes to waste generation, energy consumption and has a significant impact on health, because people spend several hours of their days at the office or at home. In this paper I explore whether brazilian FIIs (funds that invest in real estate just like american REITs) with greener portfolios show better stock returns and operating efficiency. I extract properties owned by each fund and its financials from CVM[3] and LEED scores of each property from USGBC[4]. I run a set of fixed-effects regressions of stock return, asset and equity turnovers on the share of green properties for each REIT over the 2001–2017 period and detect an approximate 1% increase in stock return given a 1% increase in portfolio greenness, but find no evidence of increased operating performance. Another model, accounting for endogeneity of past returns is developed and shows no relationship between greeness and returns or operating performance.

Keywords: greenness. real estate. fund performance.

[3]http://www.cvm.gov.br
[4]https://new.usgbc.org/leed

CONTENTS

1 INTRODUCTION

It is in the interest of companies, the government and society to know whether sustainable practices by each of them are rewarded. To companies, the concern is with profit and return to their shareholders: sustainable practices are costly and must be examined carefully in order to avoid eroding profit margins and making access to financial markets and cheap financing more difficult. Governments are also interested in the financial angle, because of severe budget restrictions they face, specially countries in development. The long-term character of the benefits brought by sustainability is another issue, since they do not blend well with rulers focus on elections, a shorter term mindset. Society obviously benefits from sustainable practices healthwise, but are people willing to pay higher rents and likely more taxes?

In this paper I examine real estate sustainability, focusing on whether brazilian real estate investment trusts (REITs) that invest in greener properties have better financial and operating performances than their counterparts. If that is the case, then tenants are probably willing to pay higher rents, which implies better cash flows and real estate valuations. Investors would be happy to see the potential of capital gains and cash flow strength which would translate into higher stock prices. That issue is examined in depth for the american REITs market by (EICHHOLTZ; KOK; YONDER, 2012), who detect that greenness is indeed related to better performance.

My dataset is an yearly unbalanced panel of funds comprised of their financials and greenness metrics. These are obtained by matching properties in a United States Green Building Council (USGBC[5]) database - which contains area, location and Leadership in Energy and Environmental Design (LEED) score for each property - with the properties each fund reports to have in a given year. The financials come from yearly balance sheets and cash flow statements. The resulting dataset contains 642 observations, 117 funds of which 16 (13.68%) have LEED-certified properties.

I run fixed-effects regressions over this panel and find out that a one percent increase in greenness measured by the ratio between certified area over total area is associated to a 1.39% increase in annual stock return. When greenness is measured by the ratio between number of certified properties over number of properties in the fund's portfolio, the increase is equal to 0.73%. I find no evidence of correlation between greenness and assets turnover or equity turnover. Because it is reasonable to suppose that funds that perform better at year *t* invest more on green properties at *t+1*, endogeneity deserves a detailed analysis, which is undertaken by using a Generalized Method of

[5] https://www.usgbc.org/projects

Moments (GMM) model. Although no evidence is found of better financial or operating performance in that case, the model suffers from a variety of problems casting doubt on its suitability. This paper is organized as follows: chapter 2 is divided in two sections: the first one looks at the literature regarding whether CSR is beneficial or harmful to firms financials; the second one explores the body of knowledge on REIT greenness. On chapter 3, I present the dataset and an econometric models aiming to determine the effect of greenness on fund performance. The results are explored on chapter 4 and chapter 5 recapitulates both the goal and the main findings.

2 LITERATURE REVIEW

2.1 CORPORATE SOCIAL RESPONSIBILITY: HARMFUL OR BENEFICIAL TO FINANCIALS?

Corporate social behavior and its impact on financials solidified as an academic topic during the 1970s. And these were times of disagreement. Although a good number of studies pointed towards a positive relationship between corporate social responsibility (CSR) and financial performance, some influent authors found equally convincing counter-evidence.

An example of highly regarded economist claiming the harmfulness of CSR is (FRIEDMAN, 2007), who argues that companies have one and only one responsibility: increasing their profits. Additionally, (VANCE, 1975) finds a negative correlation between CSR and stock performance.

Authors who find evidence supporting the benefits of CSR include (MOSKOWITZ, 1972), showing that CSR-intensive firms outperformed the Dow Jones industrial index. A good sum up of all research done in the 70s and early 80s in the field including criticism to methodologies employed in each study is presented by (AUPPERLE; CARROLL; HATFIELD, 1985), who contributes to yet another view stating that CSR is neither detrimental nor beneficial to financial performance.

More recently, proponents of CSR benefits seem to be winning the debate. According to (LINS; SERVAES; TAMAYO, 2017) CSR intensity was positively correlated to profitability, growth and sales per employee during the 2008-2009 financial crisis. (DENG; KANG; LOW, 2013) investigate mergers of companies with variable CSR intensity and document that CSR-intense companies, when acquired, yield better post-merger long-term operating performance to the acquirers.

2.2 LITERATURE ON REITS GREENNESS

As companies, REITs also face the decision of undertaking social responsible actions or not and their financials are also affected. Real estate is an important class of asset, providing significant diversification to portfolios (RAPPORT, 2015) and a hedge against inflation (BROUNEN; EICHHOLTZ; THEEBE, 2007).

Although valuable to every economy, important negative externalities come with buildings and their occupation: not only they require large amounts of money and natural

resources to be developed, but they also imply significant energy and water consumption as well as waste generation. A comprehensive body of information about the effects of buildings to the environment is presented by (SHARMA et al., 2011).

If we assume that society derives more utility from a less polluted environment and that economies running more efficiently (i.e using less natural resources and generating less waste) are better, then green buildings should be more valuable than standard buildings, trading at higher prices, producing more revenue via higher rents and lower vacancy, and operating under lower costs due to modest resource consumption and waste generation (EICHHOLTZ; KOK; QUIGLEY, 2013).

Multiple empirical studies about whether the theoretical mechanisms presented above hold in practice have been undertaken. (KOK; MCGRAW; QUIGLEY, 2011) show that green technologies employed in buildings is on the rise in multiple US metropolitan areas. (EICHHOLTZ et al., 2015) show that greener REITs are considered less risky, facing lower corporate debt spreads and that their properties attract better tenants, yielding lower asset-backed mortgage spreads. That trend is also detected in the housing market by (KAZA; QUERCIA; TIAN, 2014).

After taking into account all the evidence presented above, it is logical to predict that the greener REITs should have better financials. Is that really the case? (EICHHOLTZ; KOK; YONDER, 2012) study american REITs and show that the marginal effect of greenness on firms financial performance is positive and both economic and statistically significative. They also show that these companies are traded at lower betas as in (CARHART, 1997) modified (FAMA; FRENCH, 1993) equation. (SAH; MILLER; GHOSH, 2013) and (CAJIAS et al., 2014) also contribute with evidence on that direction.

However, there is no verification of the benefits of greenness on financial performance for Brazilian REITs. Although the body of evidence cited above suggests that same effect, there are reasons to suspect different results in Brazil and other developing countries. Despite the poor environmental quality, literature detected a low willingness to pay for improvements in these countries as presented in (GREENSTONE; JACK, 2015), who also suggest a framework to understand and explain this apparent puzzle.

3 DATA AND METHODOLOGY

I start out by collecting financial statements from Comissão de Valores Mobiliários (CVM[6]), which is the Brazilian Security and Exchange Commission. These documents contain not only financial data, from which I build a database of funds financials, but also the properties each fund has on a given year, allowing me to build annual portfolios for each fund. We know when a property is green and how green it is by checking if it has a LEED certification issued by USGBC[7] and what score was given. The certification takes into account the energy efficiency of each building along with its usage of water, walk score, waste generation and many more variables aggregated in a score. Currently, a minimum of 40 points is required for certification. Properties that score 40 to 49 points are given a standard certificate. A silver certificate is given to properties scoring between 50 and 59 points. A score of 60 up to 79 points is worth a gold certificate. Outstanding properties are awarded 80+ points and a platinum certificate.

The final database is built by computing some financial ratios from the financials database and adding greenness measures which I compute using the portfolio panel. These measures are as follows ((EICHHOLTZ; KOK; YONDER, 2012)):

$$SqmtCertified_{it}(\%) = \frac{(\sum_l Sqmt\ of\ Certified\ Property_l * StandardizedScore_l)_{it}}{(\sum_l Sqmt\ of\ Property_l)_{it}}$$

$$PropertiesCertified_{it}(\%) = \frac{Number\ of\ certified\ properties_{it}}{Number\ of\ properties_{it}}$$

The **StandardizedScore** is the score obtained by the property divided by the maximum possible score at the time of certification. The LEED grading scale has changed over the years and currently has a ceiling of 110 points.

The financial performance of a fund is tracked by the total return on stock, which I will simply call **Return**, and is defined as the percentage change in the book value of equity added to the annual dividend yield:

$$Return_{it} = \frac{Equity_{it}}{Equity_{it-1}} - 1 + \frac{Dividends_{it}}{Equity_{it-1}}$$

Equity comes from the balance sheet and Dividends from the cash flow statement.

[6] http://www.cvm.gov.br/menu/regulados/fundos/consultas/fundos.html
[7] https://www.usgbc.org/projects

There are two measures of operating performance: **AssetTurnover** and **Equity-Turnover**. Funds From Operations (FFO) is taken from the cash flow statement.

The control variables used in this study are:

ln(Assets), the natural logarithm of the fund's book value of assets has the goal of controlling for fund size.

Cash Flow from Investments (CFI)/Assets describing the cash devoted to capital expenditures, when negative, or earned by the liquidation of assets, when positive. The monetary value of assets owned by the fund is taken into account because a smaller fund will obviously devote less cash to investments in absolute terms but may be investing *more* in relative terms.

Age, since older funds could have access to better investment opportunities (experience factor) as well as financing options via potentially better credit rating and financial markets perception.

SqmtCertified, which is square meters certified (taking into account the LEED score) relative to the sum of the fund's properties area.

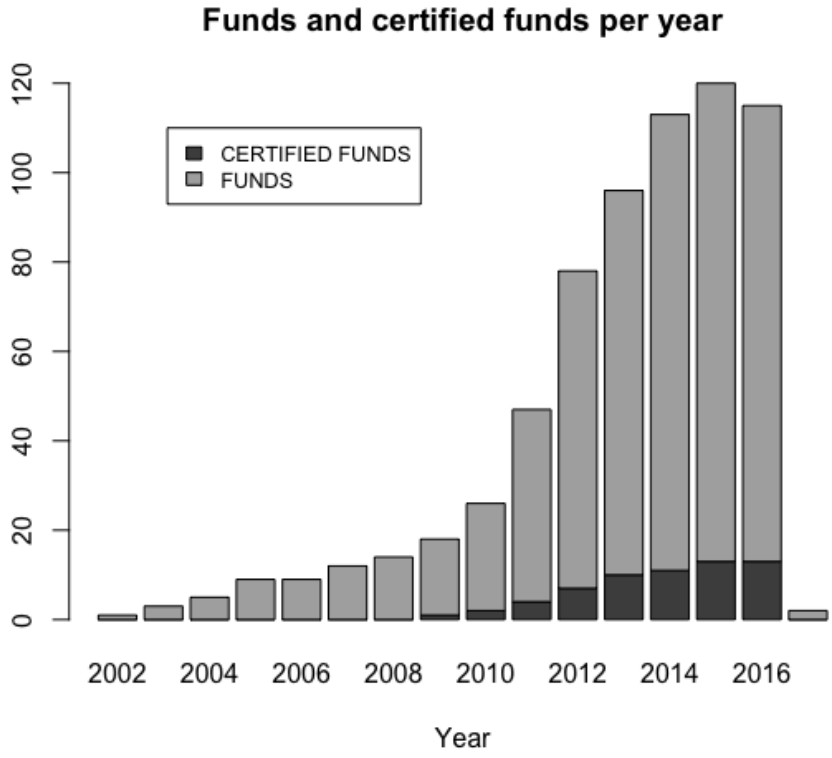
PropertiesCertified, the number of properties certified divided by the number of properties.

Year dummies, capturing year-fixed effects, such as a change in accounting practices in 2012 that positively affected assets and, therefore, equity book values.

Our panel is composed by 642 observations, with 117 funds of which 16 (13.68%) have LEED-certified properties. There are 28 certified properties owned by funds. As can be noticed in Figure 1, there is a positive trend in the number of REITs. Recently, the growth in REITs slowed down and the share of REITs with LEED-certified properties with respect to the total number of REITs remained constant. In 2017, I only have data on funds that present their annual financial statements in the first semester (less than 10), but the number of funds and certified funds is similar to the reported in 2016.

The average fund greenness is 0.037 (on a scale from 0 to 1) when measured by certified square meters and 0.073 (on a scale from 0 to 1) when measured by the number of certified properties. Funds own on average R$ 145,364,549 in assets, with a CFI-to-assets ratio of 0.13 (selling more assets than invests in properties). On average the funds have an annual stock return of 24.5%, which is largely positively affected by the 2012 change in accounting practices. Curiously, on average, funds have a slightly negative asset turnover ratio and slightly positive equity turnover, but with large standard deviations.

Figure 1 – Evolution in the number of funds and certified funds - own authorship



The **Return** variable has less observations because sometimes $Equity_{t-1}$ is not available, for example when the fund is on its first year of operation. This problem also occurs with **EquityTurnover**, but for another reason: some funds present both negative Equity and negative FFO in some years. When this is the case I discard this measure. Table 1 presents what has been discussed so far, including both explanatory and explained variable descriptive statistics.

Table 1 – Explained and explanatory variables descriptive statistics - own authorship

Explained variables					
Statistic	**N**	**Mean**	**St. Dev.**	**Min**	**Max**
Return	576	0.245	0.950	−1.000	12.827
AssetTurnover	642	−0.057	2.147	−50.000	2.461
EquityTurnover	636	0.009	0.968	−18.686	1.365
Explanatory variables					
Statistic	**N**	**Mean**	**St. Dev.**	**Min**	**Max**
ln(Assets)	642	11.887	1.451	1.099	15.659
CFI/Assets	642	0.131	3.903	−18.167	73.604
Age	642	5.590	4.768	0	21
Greenness (area)	642	0.037	0.124	0.000	0.719
Greenness (props)	642	0.073	0.249	0.000	1.000

My model describing the performance of a given fund on a given year is the following:

$$Performance_{it} = \beta_{Grenness} * Greenness_{it} + \boldsymbol{\beta_z^T} * \mathbf{z_{it}} + \boldsymbol{\beta_d^T} * \mathbf{d_t} + a_i + u_{it}$$

$Performance_{it}$ is the Return, AssetTurnover or EquityTurnover of fund *i* on year *t*.

$Grenness_{it}$ is the grenness of fund *i* on year *t* either measured by certified-to-total area (in square meters) or certified-to-total number of buildings.

The vector $\boldsymbol{z_{it}} = \langle ln(Assets), CFI/Assets_{it-1}, Age_{it} \rangle$ stores the control variables values for fund *i* on year *t*.

Year dummies are stored in a vector $\mathbf{d_t} = \langle d_{2002}, d_{2003}, \ldots, d_{2016} \rangle$, where $d_\tau = 0$ if $\tau \neq t$ and $d_\tau = 1$, otherwise.

Let a_i denote any unobserved fixed characteristic of fund *i* and u_{it} be homoskedastic and serially uncorrelated errors.

A fixed-effects transformation is applied to the model above and yields the following model:

$$\ddot{Performance}_{it} = \beta_{Grenness} * \ddot{Greenness}_{it} + \boldsymbol{\beta_z^T} * \ddot{\mathbf{z}}_{\mathbf{it}} + \boldsymbol{\beta_d^T} * \ddot{\mathbf{d}}_{\mathbf{t}} + \ddot{u}_{it}$$

In this model, $\ddot{Performance}_{it} = Performance_{it} - \overline{Performance_{it}}$ denotes the time-demeaned data on $Performance$. The same is done to the explanatory variables and errors.

The fixed effects estimators are obtained using an R[8] script, which executes the regression. I am specially interested in the marginal effect of greenness on performance, which is given by $\widehat{\beta_{Grenness}}$.

[8] https://www.r-project.org/

4 RESULTS

4.1 EFFECT OF GREENNESS ON FINANCIAL PERFORMANCE

Two regressions, with results reported in Table 2 and Table 3 show the effect of greenness on total stock return (capital gains added to dividend yield). The former uses greenness measured by certified square meters and the latter uses greenness measured by certified square properties. For both regressions I report all control variables coefficients, $\beta_z \in \boldsymbol{\beta_z^T}$, and the year-dummy, $\beta_d \in \boldsymbol{\beta_d^T}$, significant ones at the 95% confidence level.

The result sets show that funds investing more cash relative to their assets don't guarantee larger returns on year t, i.e. $\widehat{\beta_{CFI/Assets_{t-1}}} = 0$.

The **Age** variable has a slightly positive correlation with returns, but is not statistically distinguishable from zero at the 95% confidence level.

Regardless of the way greenness is measured, a positive correlation with returns is observed. Although it cannot be said that greenness *causes* better returns, it is possible to affirm that greener funds show better financial performance. A one percent increase in greenness measured by certified area is associated to a 1.39% increase in annual stock return. When greenness is measured by number of certified properties, then this increase is equal to 0.73%.

As predicted, the year of 2012 has a high correlation with improved returns. That is caused by a change in accounting practices as discussed in chapter 3.

4.2 EFFECT OF GREENNESS ON OPERATING PERFORMANCE

Table 4 shows the results of the regression using **AssetTurnover** as the dependent variable and the greenness variable measured by area. Table 5 shows the results when using the same explained and explanatory variables, but greenness is measured by number of certified properties.

I also run two more regressions, reported in tables 6 and 7, in a similar fashion, but using **EquityTurnover** as the dependent variable.

Regressions using **AssetTurnover** as the dependent variable show that only

Table 2 – Effect of greenness measured by certified area on Return - own authorship

	Dependent variable:
	Return
$ln(Assets)$	0.170^{**}
	(0.080)
$CFI/Assets_{t-1}$	0.003
	(0.046)
Age	-0.021
	(0.064)
$Greenness(area)$	1.394^{**}
	(0.669)
d_{2012}	0.991^{**}
	(0.412)
Observations	521
R^2	0.224
Adjusted R^2	-0.042
F Statistic	6.584^{***} (df = 17; 387)
Note:	*p<0.1; **p<0.05; ***p<0.01

ln(Assets) and **CFI/Assets** are significant at the 95% confidence level.

Surprisingly, **CFI/Assets** has a positive coefficient. That means funds investing more cash relative to their assets tend to have *lower* operating efficiency than funds *selling* its assets. One explanation could be that previous investments were not as good as initially thought and selling the underlying assets do not impact operating efficiency. On the contrary, liquidation of assets improves it, because of less assets generating the same cash flow. Also, we can argue that Brazilian funds rely on public debt and real estate backed securities (financial instruments) and these being sold do not affect operational cash flow, but do lower the level of assets and increase CFI.

Greenness measured by area or number of properties has no correlation with the dependent variable. Although not reported, all year dummies have non-significant coefficients.

Regressions using **EquityTurnover** show similar results. An important difference is that **CFI/Assets** coefficient is not significant. Again, regardless of the way I measure greenness there is no correlation with the dependent variable.

Table 3 – Effect of greenness measured by certified properties on Return - own authorship

	Dependent variable:
	Return
$ln(Assets)$	0.170**
	(0.079)
$CFI/Assets_{t-1}$	0.001
	(0.046)
Age	−0.021
	(0.064)
$Greenness(properties)$	0.731**
	(0.310)
d_{2012}	0.985**
	(0.411)
Observations	521
R^2	0.228
Adjusted R^2	−0.038
F Statistic	6.704*** (df = 17; 387)
Note:	*p<0.1; **p<0.05; ***p<0.01

4.3 THE ENDOGENEITY PROBLEM

One could argue that funds that perform better in year t would be willing to invest more in greenness and, therefore, earn a better result in $t+1$. If that is the case, then there is an endogeneity problem: an unobserved variable ($Performance_{t-1}$) would be having a positive effect on the explained variable, $Performance_t$, while being correlated to the *Greenness* variable.

The discussion above is worth an analysis and a new model is developed to take into account that auto-regressive effect of *Performance* ($Perf$):

$$\ddot{Perf}_{it} = \beta_{Perf_{it-1}} \ddot{Perf}_{it-1} + \beta_{Grenness} * \ddot{Greenness}_{it} + \boldsymbol{\beta_z^T} * \ddot{\mathbf{z}}_{\mathbf{it}} + \boldsymbol{\beta_d^T} * \ddot{\mathbf{d}}_{\mathbf{t}} + \ddot{u}_{it}$$

Note that all variables hold the same meaning as in previous models and the only difference is that the lagged *Performance* variable is now present.

This model is what econometrists call a dynamic panel model and new tools are needed to find the estimators, namely GMM (HANSEN, 1982; ANDERSON; HSIAO, 1982) and Arellano-Bond (ARELLANO; BOND, 1991) estimators with a systems strategy

Table 4 – Effect of greenness measured by area on AssetTurnover - own authorship

	Dependent variable:
	AssetTurnover
$ln(Assets)$	0.198^{***}
	(0.066)
$CFI/Assets_{t-1}$	0.698^{***}
	(0.013)
Age	-0.049
	(0.055)
$Greenness(area)$	-0.377
	(0.574)
Observations	525
R^2	0.883
Adjusted R^2	0.843
F Statistic	173.456^{***} (df = 17; 391)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5 – Effect of greenness measured by number of properties on AssetTurnover - own authorship

	Dependent variable:
	AssetTurnover
$ln(Assets)$	0.202^{***}
	(0.066)
$CFI/Assets_{t-1}$	0.698^{***}
	(0.013)
Age	-0.050
	(0.055)
$Greenness(properties)$	-0.297
	(0.266)
Observations	525
R^2	0.883
Adjusted R^2	0.843
F Statistic	173.865^{***} (df = 17; 391)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 6 – Effect of greenness measured by area on EquityTurnover - own authorship

	Dependent variable:
	EquityTurnover
$ln(Assets)$	-0.126^{***}
	(0.046)
$CFI/Assets_{t-1}$	-0.004
	(0.027)
Age	0.027
	(0.037)
$Greenness(area)$	-0.069
	(0.386)
Observations	521
R^2	0.045
Adjusted R^2	-0.277
F Statistic	1.077 (df = 17; 389)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 7 – Effect of greenness measured by number of properties on EquityTurnover - own authorship

	Dependent variable:
$ln(Assets)$	-0.126^{***}
	(0.046)
$CFI/Assets_{t-1}$	-0.003
	(0.027)
Age	0.027
	(0.037)
$Greenness(properties)$	-0.046
	(0.179)
Observations	521
R^2	0.046
Adjusted R^2	-0.275
F Statistic	1.108 (df = 17; 389)
Note:	*p<0.1; **p<0.05; ***p<0.01

(BLUNDELL; BOND, 1998). I run this new model using the **plm**[9] R package and the results are summed up on Table 8. The instrument variables are performance lagged from two to five periods. Changing the instrument variables, i.e. choosing different lags, changes the significance of the explained variables, but none of them shows the coefficient $\widehat{\beta_{Perf_{it-1}}}$ as being statistically different from zero. These results show two important things: firstly that the model is unstable, which means the lags are probably not very suitable instruments; secondly that $Perf_{it-1}$ is not statistically significant, showing there is no evidence of endogeneity caused by lagged performance on my fixed-effects model. Another reason to question this model is that it shows no effect of the dummy for year 2012 on performance. That effect, due to changes in accounting practices, is obvious in the data.

Table 8 – Dynamic panel (GMM) model - own authorship

Regression		Explanatory variable significance				
y	Greenness by	y_{t-1}	ln(Assets)	$CFI/Assets_{t-1}$	Green	Age
Return	area			***		**
Return	# of props			***		**
Asset Turnover	area					
Asset Turnover	# of props					
Equity Turnover	area			***		
Equity Turnover	# of props			***		

Note: *p<0.1; **p<0.05; ***p<0.01

[9] https://cran.r-project.org/web/packages/plm/vignettes/plm.pdf

5 CONCLUSION

In this paper I examine whether greenness, measured by both area and number of LEED-certified properties, impacts funds financial and operating performances. I use assets and equity turnovers to measure operating performance and return measured by capital gains added to dividend yields as the financial performance metric. The data is formed by 642 observations of funds characteristics through time, resulting in an unbalanced panel with 117 funds of which 16 (13.68%) have LEED-certified properties. There are 28 certified properties owned by funds. Two models are developed: a fixed effects one and a dynamic panel alternative to account for endogeneity. The former model shows that greenness is indeed related to better financial performance but not to operating performance. The latter model, accounting for endogeneity of past returns, shows no such effect. It is worth mentioning the instability of that model regarding the choice of instrument variables and the fact that it shows no evidence of returns in *t-1* impacting returns at *t*, thus casting doubt on the endogeneity hypothesis. Overall, via the fixed effects model, I detect that an increase of 1% on greenness measured by certified area represents a 1.39% increase in annual stock return. When greenness is measured by number of certified properties, then this increase is equal to 0.73%. I detect no evidence of an increase on operating performance via greenness on the short-run.

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