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# Occupier Satisfaction and its Impact on Investment Returns from UK Commercial Real Estate

## 1. Introduction

Businesses engage in Customer Relationship Management in the belief that good customer service results in satisfied customers, who in turn are more likely to remain loyal and recommend the service provider to others. With loyal customers and a good reputation, a business should be more profitable. This idea is known as the "Service – Profit Chain" (Heskett, Sasser, & Schlesinger, 1997). Such an idea is widespread in many industries, but rarely talked about in the real estate industry. This paper contributes to the literature on real estate investment performance by showing how the satisfaction of occupiers of rented commercial property can be an important influence on financial returns. Investment in improving property management service in order to increase occupier satisfaction appears likely to improve the total return of a property.

In the UK, most commercial properties are let on a triple net lease, whereby tenants are responsible for insuring and maintaining their own demise. Services are provided by the landlord or property manager, paid for by tenants through a service charge. The mechanism whereby increased satisfaction is postulated to increase profitability is via an increase in lease renewal rates without compromising rents, and an improvement in the reputation and trustworthiness of the landlord, making it easier to attract new tenants. The ability to attract and retain occupiers reduces void rates, and should result in enhanced real estate performance.

The research in this paper uses Investment Property Databank (hereafter MSCI IPD) property performance data from 2004 to 2014 for 240 commercial properties in the UK - mostly shopping centres, retail parks, offices and industrial estates. The performance data is compared with occupier satisfaction data obtained from interviews with tenants of those properties conducted between 2002 and 2013.[1] Excess total returns are computed using MSCI IPD segment returns as benchmarks and regressions are conducted to test whether a positive relationship between investment performance and occupier satisfaction exists. Using a single-index model with a smaller sample of properties, the research also tests whether such a relationship holds after controlling for differences in systematic risk between assets. The findings suggest that there is a positive correspondence between performance and occupier

[1] All data used for this study were accessed under strict confidentiality conditions and with the permission of asset owners in all cases.

satisfaction and that this is particularly evident for retail properties and in weaker market conditions.

The remainder of the paper is structured as follows. Section 2 reviews relevant literature and previous research, discussing the "service – profit chain" for businesses in general and its application to the commercial property industry. Section 3 states the research hypotheses and Section 4 describes the data. Section 5 then sets out the methods employed in this research. Results are given in Section 6 and a concluding discussion is presented in Section 7, together with suggestions for ways in which the research could be extended in future.

## 2. Literature Review

The Landlord – Tenant relationship is typically perceived as being confrontational (Crosby, Gibson, & Murdoch, 2003; Halvitigala, Murphy, & Levy, 2011). The role of the landlord's leasing agents and property managers has been to "maximise rents, with rapid recourse to legal process to resolve disputes between landlord and tenant" (Sanderson, 2015). Edington, an early proponent of customer-focused property management, points out (1997:xii) that this traditional approach "gives no glimpse of the notion that if a supplier (the landlord) is receiving substantial sums (rents) from the customer (tenant), then the customer has the right to receive exemplary service." Arguably, there has been a gradual shift in attitude and behaviour on the part of property owners and managing agents towards a more customer-oriented approach. Silver, (2000); Valley, (2001); and Worthington, (2015) advocate treating tenants as customers, whilst Palm, (2011); and Real Service & EPRA, (2012) show that this shift appears to be occurring. In the UK, the RealService Best Practice Group, formed in 2004, comprises property owners and managers "dedicated to helping the real estate industry improve customer service and generate improved property performance" (Morgan, 2010).

"Relationship Marketing" emphasises the enduring nature of an organisation's partnership with its customers, recognising that the sale continues after the contract has been signed (Levitt, 1983) and "the greater the level of satisfaction with the relationship – not just the product or service – then the greater the likelihood that the customer will stay" (Payne, et al., 1995:vii). The term "Relationship Marketing" has more recently been replaced by the broader concept of Customer Relationship Management - "the values and strategies of Relationship Marketing – with particular emphasis on customer relationships – turned into practical application" (Gummesson, 2002:3, 2004:137). The link between customer service and

customer satisfaction is crucial in Customer Relationship Management and in the "Service – Profit Chain". Yet service quality cannot be objectively measured but must be inferred from the customer's opinions and behaviour; for example, by obtaining feedback using an assessment tool such as the SERVQUAL instrument (Parasuraman, Zeithaml, & Berry, 1985, 1988, 1991).

Previous research into the "Service – Profit Chain" has lent support to the links between customer service, customer satisfaction, loyalty and advocacy, (Bolton & Drew, 1991; Buzzell, 2004; Fornell, 2001; Gale, 1992; Keiningham, Perkins-Munn, & Evans, 2003; Reichheld, Markey, & Hopton, 2000; Zeithaml, Berry, & Parasuraman, 1996). Studies demonstrating the final stage of the service – profit chain, the link with profitability, typically have been case studies of individual businesses, such as Keiningham et al., (1999). Case studies can demonstrate pre- and post- intervention improvements, but cannot easily control for other factors that might have affected the outcome, such as changes in economic conditions affecting supply and demand. Other research into customer satisfaction, loyalty and business profitability emphasises the need to focus on certain segments of the customer base and be ruthless about discarding unprofitable customers (Gee, Coates, & Nicholson, 2008; Reinartz & Kumar, 2002; Zeithaml, Rust, & Lemon, 2001), since "not all customers generate acceptable cost and revenue streams" (Söderlund & Vilgon, 1999, : 2). Ittner & Larcker (1998) show that American Customer Satisfaction Index (ACSI) scores can be a useful leading indicator of the stock market performance of a business. They suggest that "Customer satisfaction indicators [should be adopted for use] in *internal* performance measurement systems and compensation plans" (p.33).

Quantifying the benefit of relationship marketing is difficult and there have been few attempts to do so for real estate, particularly at the individual property level. In Sweden, the existence of a well-established Customer Satisfaction Index specific to property, the Swedish Real Estate Barometer (SREB), has enabled some analysis to be carried out into the relationship between property management quality, occupiers' loyalty and the willingness of occupiers to recommend their landlord (Westlund, et al., 2005). The criteria upon which the Swedish Real Estate Barometer is established are partly to do with the property and partly to do with the property management service. Customer satisfaction and other indicators from the SREB were found to show significant correlations with measures of real estate company profitability, and the links appeared to be not so much because of lease renewal, but rather through word-of-mouth recommendation and the reputation of the landlord.

Sanderson & Edwards (2014) show that, when looking to rent a commercial property, the primary considerations for potential tenants are the location, form and function of the building and the rent. However, their later research finds that satisfaction with property management has the greatest impact on occupiers' overall satisfaction (Sanderson & Edwards, 2016). This supports research by BOMA & Kingsley Associates (2013) and might be because, when asked about their satisfaction, occupiers disregard aspects of the property and location unless they fail to live up to their initial expectations, as they may feel that the responsibility for choosing the property lies with themselves (Sanderson, 2016).

For property management service delivery, the skills, attitudes and behaviour of service personnel are critical to occupier satisfaction (Levy & Lee, 2009; Phillips & Roper, 2009; Rasila, 2010; Sanderson, 2012). The empathy of the property manager – communication with occupiers and understanding of their business needs – has been found to be of the utmost importance in occupiers' satisfaction with property management (Sanderson, 2015). These were also the main determinants of occupiers' advocacy of their landlord (their willingness to recommend the landlord to others), whilst the main determinants of loyalty (lease renewal intentions) were found to be value for money and the trustworthiness and professionalism of the landlord or their property manager.

In theory, it should not be possible to achieve excess returns over time in an efficient market with correct pricing of an asset. In particular, if a property is valued by reference to comparables but without regard for occupier satisfaction, it might under- or over- estimate the future income stream and hence its value (British Council for Offices & RealService Ltd, 2015). Yet "real estate is notorious for its information asymmetries", potentially enabling investors to "use insider knowledge to generate abnormal profits" (Fuerst & Marcato, 2009: 105). This could be done through trading of assets, but investors also have the option of managing property assets in a manner that is not possible for mainstream financial assets where investors are divorced from the day-to-day running of individual organisations. For example, property owners can undertake expenditure, manage the lettings process and interact with tenants to influence performance outcomes. However, property performance depends upon many factors, including location, age, state of repair, specification and the amenities provided by the building, as well as the way it is managed. This makes it challenging to attribute improved performance to a particular factor. Nonetheless, this study attempts to demonstrate the applicability of the "Service – Profit Chain" to commercial property management.

An approach that is widely used in the finance literature is to see whether a fund manager is able to add value by achieving superior abnormal returns compared with the benchmark for their sector. Funds that track the market should achieve risk-adjusted returns which equal those of the market on average. Such funds are termed passive trackers, and charge relatively low fund management fees because they require the manager merely to include assets in proportions which mirror the market – a stratified sample of the market. Actively managed funds require more skill and effort from a manager who is supposed to seek arbitrage opportunities, predicting when stocks will rise or fall and buying or selling accordingly. In a fully efficient market, such opportunities ought not to occur, and consistent outperformance by fund managers should happen no more frequently than would occur by chance alone. The conventional formula for decomposing returns on assets and testing this assertion is as follows:

$$\boldsymbol{R_{it} = \alpha_i + \beta_i R_{Mt} + \varepsilon_{it}} \quad (1)$$

$R_{it}$ is the return rate for asset *i* in period *t* and $R_{Mt}$ is the market return rate in the same period. β captures the sensitivity of an asset's returns to the market and is considered to be a measure of the systematic risk of an asset that cannot be neutralised by diversification. ε is then the asset-specific risk, which is independently and identically distributed around a mean of zero. α is the element of return which is not explained by risk and which should be zero in an efficient market. However if a fund manager has extraordinary skill, s/he might be able to achieve "positive alpha".[2]

Jensen (1968) examined the performance of 115 funds over a 20-year period (1945 – 1964) to assess their riskiness and whether they achieved superior abnormal returns. In his sample, only five funds outperformed the market with a statistically significant α (t-stat > 2) before fund management costs were taken into account, and five funds underperformed. Once management costs were included, only one of the funds outperformed the market. Subsequently, a large literature on mutual fund performance using this and related frameworks has developed. This includes some studies of real estate funds. Bond & Mitchell (2010) review this work and they themselves study 280 UK property funds over the period

[2] The formula in its original form was derived by Jensen, (1968) as an extension to the Capital Asset Pricing Models (CAPM) of Lintner, (1965) and Sharpe, (1964). Jensen's model subtracted the risk-free rate from $R_{it}$ and $R_{Mt}$

1981 to 2006. Bond and Mitchell found limited evidence of the ability of real estate funds to generate systematic outperformance and abnormal positive alpha.

Although the concepts of abnormal returns, alpha and beta are normally associated with funds, they can be applied to the performance of individual assets. This is demonstrated by Mitchell (2015) for a sample of 859 properties studied over the period 2004 to 2013. Key sources of alpha were identified as rent review and lease negotiations. Baum & Farrelly (2009) note potential sources for alpha at the individual property level and these include both property management activities and the exploitation of mispricing at the asset level, either when buying or selling. Listed among the property management activities are maintenance, refurbishment, leasing strategy and tenant relationship management. If a property manager has exceptional skill in such activities, resulting in highly satisfied occupiers, low vacancy rates and strong cash flows, s/he may be able to outperform a benchmark for property returns on a risk-adjusted basis. This research explores individual property performance and assesses whether outperformance of benchmarks arises as a result of occupier satisfaction, a key indicator of property manager performance.

## 3. Research Questions

The analysis in this paper tests several hypotheses. The first of these hypotheses is as follows:

1. **Null hypothesis $H_0$**: The investment performance of a property is unrelated to the satisfaction of occupiers at that property.

   **Alternative hypothesis $H_1$**: The investment performance of a property shows a positive relationship with occupier satisfaction at that property.[3]

Occupier requirements and leasing practices vary across different types of properties. This may influence how occupiers respond to the service that is provided by their landlord. For this reason, the second hypothesis is as follows:

2. **Null hypothesis $H_0$**: The relationship between occupier satisfaction and property performance is the same for all sectors.

[3] This implies a one-tailed test of statistical significance, although the non-normality of the returns distribution means that tests of statistical significance need to be interpreted with caution.

**Alternative hypothesis $H_1$**: The relationship between occupier satisfaction and property performance differs between sectors.

Finally, the study tests whether any relationship between financial performance and occupier satisfaction is stable over time and in different market conditions. For example, dissatisfaction among existing occupiers might have more impact in a weaker market during which new tenants are harder to attract. So the third and final hypothesis is as follows:

3. **Null hypothesis $H_0$**: The relationship between occupier satisfaction and property performance is unaffected by the economic cycle and the supply of and demand for commercial property.

   **Alternative hypothesis $H_1$**: The relationship between occupier satisfaction and property performance differs according to the stage in the economic cycle.

The analysis was conducted in several ways to test these hypotheses and ensure robustness of findings. The first method adopted was the approach used by Jensen and subsequent authors to isolate abnormal returns, as discussed above. These abnormal returns were compared with occupier satisfaction levels in the properties concerned. However the Capital Asset Pricing Model is widely considered not to hold for private real estate markets (Hoesli, Jani, & Bender, 2006) or to work well for many other applications (Fama & French, 2004), so the main method of analysis involved calculating simple excess return rates and using these as the dependent variable in regressions where occupier satisfaction was tested as a determinant of these returns alongside other factors. The data used and methods adopted are now explored in detail.

## 4. Data

The study uses a sample of UK properties for which a time-series of occupier satisfaction data was available and where investment performance was measured by MSCI IPD. A number of investors were approached to participate in the study and three large UK real estate companies agreed, subject to non-disclosure of information that could identify individual assets. The sample consists of 240 UK property investments – a property being a shopping centre, retail park, industrial estate, business park or office building. The total floor area of the properties in the sample exceeds 6.8 million $m^2$. The owners are all rated either Tier 1 or Tier 2 for corporate social responsibility (Newell, 2009) and EPRA reporting (EPRA & Deloitte, 2014).

Although the sample is reasonable in size, it is not fully representative of the wider UK real estate market either in terms of assets or ownerships.

The occupier satisfaction data used for this research was gathered by RealService[4] consultants on behalf of landlords. The occupier satisfaction scores comprise the mean of the ratings given by occupiers at a property when asked to rate their overall satisfaction on an interval scale of 1 to 5, where '1' corresponds to a rating of 'very poor' or 'very dissatisfied' and '5' represents the highest satisfaction score. This question was asked of occupiers at the end of a series of questions about their occupancy. Examples of such questions can be seen in Sanderson & Edwards (2016).

At some properties, occupier satisfaction studies were conducted in every year from 2002 to 2013 whereas only occasional studies were carried out at others. The studies were not carried out at a fixed point in the year, although typically repeat studies took place approximately 12 months apart. The number of interviews at each property each year that were used to create a score for that year depended upon the total number of tenants. For a large Shopping Centre, typically around 30 store managers were interviewed each year that a satisfaction study took place, whereas at retail parks, which have fewer stores, only five to ten interviews were conducted. For large industrial estates, around 30 interviews with leaseholders took place each time an occupier satisfaction study occurred, whereas only 10 – 20 interviews were conducted on smaller estates. In multi-tenanted offices, the number of interviews ranged from four to ten, according to the size of office and the number of businesses located there.

Table 1 gives descriptive statistics for the occupier satisfaction data used for this study. The data exhibits negative skewness, meaning that scores are clustered towards higher values. Most values of kurtosis are positive, meaning that the distribution is clustered in the centre, with relatively long thin tails. The range of ratings that occupiers give to their overall satisfaction differs between sectors. For example, the median satisfaction for occupiers (store managers) in shopping centres in this sample is 3.98, whilst for retail parks the median is 3.67. For offices, the median satisfaction is 3.71, while for leaseholders on industrial estates, the median is 3.83. Occupier satisfaction scores change only slowly from year to year, with

[4] One of the authors was a consultant for RealService for several years, and conducted several hundred occupier satisfaction studies, as well as carrying out bespoke research projects for RealService clients and working as a Verifier for the RealService Best Practice Group Best Practice Index.

high correlations between scores for a particular year and those given for the same assets in the previous year.[5]

INSERT TABLE 1 HERE

The financial performance data for the properties in the sample was supplied by MSCI IPD after non-disclosure agreements had been signed with the property owners. The performance data is appraisal-based, which is an unavoidable limitation given the infrequency with which commercial properties are traded and the consequent lack of regular price observations. The relative performance of each property can be assessed by comparing individual property returns with those of an appropriate benchmark. MSCI IPD classifies UK properties into Portfolio Analysis Service (PAS) segments, which are listed in Table 2. Almost all the properties in this sample are in the shopping centre, retail warehouse, office and industrial segments. Indices for the aggregate performance of these segments are used to benchmark the performance of the properties in this study.

INSERT TABLE 2 HERE

Comparing returns with an appropriate PAS benchmark helps to control for the heterogeneity of property, since broad sector and regional influences on return rates are incorporated into the benchmark. However, it does not control fully for individual risk and micro-locational factors. For each property, the annual total return rate for each year from December 2003 to December 2013 or from March 2004 to March 2014, according to the appraisal year-end date used by the landlord, was analysed. The total rate of return is measured by MSCI IPD in the following manner:

$$TR_t = \left( \frac{CV_t - CV_{t-1} - CX_t + RC_t + NI_t}{CV_{t-1} + CX_t} \right) \times 100 \qquad (2)$$

$TR_t$ is the total rate of return in period t, $CV_t$ and $CV_{t-1}$ are the capital value of the property at the end of the current and previous periods, respectively, $CX_t$ is capital expenditure in period t, $RC_t$ is capital receipts and $NI_t$ is rent receivable during period t, net of ground rent and other irrecoverable expenditures (see MSCI, 2015). Other expenditures include property specific

[5] In cases where scores are available for consecutive years, the average correlation between the scores for a particular year and those for the year before is 0.69, with a range from 0.49 to 0.93.

management costs, so the return rates are net of any expenditure by the owner that might have been undertaken to ensure that satisfaction was high.[6]

Table 3 shows descriptive statistics for the annual total return rates used in this analysis. The total return rates are mostly positively skewed with large positive kurtosis, so the distribution is thinner and more peaked than a normal distribution. The non-normality of individual property returns has been widely noted in past research.[7] Ten outliers were removed in response, all of which were instances of return rates that exceeded twice their respective benchmark in the period concerned. This had the effect of reducing, but not removing, skewness and kurtosis from the returns data. Unlike mean ratings of occupier satisfaction, total return rates for a given asset show much less correlation from year to year.

INSERT TABLE 3 HERE

## 5. Methods

Annual total return rates were used as the dependent variable in estimation of equation (1), repeated below for ease of reference. This equation tests whether risk-adjusted return rates are related to levels of occupier satisfaction. PAS segment benchmarks are used to represent the market return rate. β captures the sensitivity of asset returns to changes in the benchmark. If β is less (more) than 1, the property is less (more) volatile than the benchmark and might, on average, be expected to give lower (higher) returns because of the lower (higher) risk. α captures abnormal return that is unrelated to market performance.

$$\boldsymbol{R_{it} = \alpha_i + \beta_i R_{Mt} + \varepsilon_{it}} \qquad (1)$$

For this analysis, properties were used only where there were return rates available for at least eight consecutive years. This duration reflects a compromise between needing enough time series observations for a credible estimation and enough observations in cross-section for any relationships with occupier satisfaction to be seen. Only 40 of the 240 properties in the sample had annual total returns data for the entire eleven year period, but 95 had data for at least eight years. Hence, 95 regressions were performed and the intercept term from each regression was

[6] They do not include portfolio-level management costs, only costs that can be attributed directly to each asset in question.

[7] See, for example, Bond & Patel (2003), Lizieri & Ward (2000), Stein, Piazolo, & Stoyanov (2015) and Young, Lee & Devaney (2006).

correlated with occupier satisfaction levels for those properties. Two measures of satisfaction were used: the mean of the occupier satisfaction ratings for each year and the maximum of these ratings over the period concerned.

This method of analysing the relationship between occupier satisfaction and performance has the advantage of allowing risk to be accounted for, since investors would expect to obtain higher returns for riskier assets. However, because there are only a few observations for each property (between 8 and 11) and these are of low frequency (annual), the estimates of alpha and beta may be unreliable. Furthermore, given the data constraints, this method of analysis does not enable any temporal link between occupier satisfaction and alpha to be explored. Therefore a second method of analysis was performed using simple excess return rates, and this enabled all 240 properties to be included.

Excess return rates were calculated by subtracting the appropriate PAS segment return from the total return rate for a property, taking into account the year and whether that landlord used a December or a March year-end.[8] As a robustness check, additional analysis was performed to establish how properties performed relative to their benchmarks over longer periods because the impact on financial performance of improved occupier satisfaction is unlikely to be realised immediately (Scarrett, 1995:56). For example, a five-year compounded excess return was computed using the following formula:

$$CXR_t = \left[\left(1+\frac{XR_{t-4}}{100}\right)\times\left(1+\frac{XR_{t-3}}{100}\right)\times\left(1+\frac{XR_{t-2}}{100}\right)\times\left(1+\frac{XR_{t-1}}{100}\right)\times\left(1+\frac{XR_t}{100}\right)-1\right]\times 100 \quad (3)$$

where XR is the excess return rate for the period indicated by the subscript and $CXR_t$ refers to the compounded excess return rate for periods up to and including period t.

The motivation for examining longer periods than one year was that the financial benefits of occupier satisfaction may not be realised immediately, but only at key points during a lease such as when a tenant has an option to exit or when a lease expires, at which point a renewal may be sought. Although there is now greater variety in UK lease terms, historically, it was common for rent to be reviewed at five year intervals and for lease lengths to be set at some multiple of five years. Even so, in a multi-let property, the dates on different leases may not

[8] These had very similar distributional properties to the annual total return rates reported in Table 3.

be synchronised and so a landlord might be dealing with lease events more often. This implies that any financial benefits from good management might be spread more evenly through time.

To test the hypotheses described earlier, a number of regressions were carried out using the excess returns data. Analysis was conducted using either the annual or five year compounded excess return rates as the dependent variable. The results using annual excess return rates are reported in the next section while the appendix contains the analysis of the compounded excess returns. The most basic model specification was as follows:

$$XR_{it} = א + ב\ OccSat_{it} + \varepsilon_{it} \quad (4)$$

$XR_{it}$ is the excess return rate for property *i* at time *t* and OccSat is the measure of occupier satisfaction.

Although broad market performance is subtracted out from the return rates, further control variables are likely to be necessary when testing whether satisfaction affects excess returns. Therefore, the model shown in Equation 4 was enhanced in a number of ways. Equations 5 to 7 incorporate a size variable and either property type dummies, landlord dummies or both type and landlord dummies for each property, alongside the occupier satisfaction measure:

$$XR_{it} = א + ב\ OccSat_{it} + \gamma\ Ln\ (SIZE)_i + \delta_1\ SC + \delta_2\ RP + \delta_3\ Off + \delta_4\ Ind + \varepsilon_{it} \quad (5)$$

$$XR_{it} = א + ב\ OccSat_{it} + \gamma\ Ln\ (SIZE)_i + \zeta_1\ LL2 + \zeta_2\ LL3 + \varepsilon_{it} \quad (6)$$

$$XR_{it} = א + ב\ OccSat_{it} + \gamma\ Ln\ (SIZE)_i + \delta_1\ SC + \delta_2\ RP + \delta_3\ Off + \delta_4\ Ind + \zeta_1\ LL2 + \zeta_2\ LL3 + \varepsilon_{it} \quad (7)$$

Ln (SIZE) is the natural log of the size in square metres of the property concerned. SC, RP, Off and Ind are dummy variables that take the value 1 when a property is in either the shopping centre, retail park, office or industrial sector, respectively, and zero otherwise, while LL2 and LL3 are dummy variables that are set to 1 when a property is owned by either landlord 2 or 3, and zero otherwise. Here, the omitted property type is any property in PAS Segment 1, 2 or 11 and the omitted owner is the arbitrarily numbered landlord 1. The

coefficients on the remaining dummy variables in each set show differences in the intercept relative to the omitted groups.

Size, sector and owner are the main control variables available to the study. When dummies for owner are included, this normalises the data for mean differences in satisfaction between the landlords represented in the sample and focuses the analysis on differences between individual assets. Other control variables would be desirable, but complete data on additional regressors such as age were not available. Therefore, in recognition of this, we estimate an alternative specification to use with properties where more than one satisfaction study was conducted over the period of analysis. This involved regressing excess returns on to occupier satisfaction scores and individual asset dummies, as shown in Equation 8:

$$XR_{it} = א + ב\ OccSat_{it} + \eta_1\ Property_{\mathbf{1}} + \ldots + \eta_{240}\ Property_{\mathbf{240}} + \varepsilon_{it} \quad (8)$$

## 6. Results

### 6.1. Relationship between occupier satisfaction and alpha

Table 4 contains summary statistics for the alpha and beta coefficients from 95 regressions, as well as for the occupier satisfaction scores used in this part of the analysis. From this, it can be seen that the mean alpha is 0.43, implying an outperformance of the benchmarks for this sample of nearly 0.5% per annum. The mean beta is 0.90, so this sample is slightly less risky than the respective PAS benchmarks against which each property is tested. However the volatility of the data and the small number of data points for each property (between 8 and 11) means that most of the intercept terms are not statistically significant. In fact, only 13 of the properties have a statistically significant alpha ($p < 0.05$), although this is approximately twice as many as would occur by chance alone if the returns followed a normal distribution. The distribution of the $R^2$ values for the 95 regressions is given in Panel B.

INSERT TABLE 4 HERE

From Panel A of Table 5 it can be seen that the correlation between the intercept terms and the average occupier satisfaction scores is 0.078, a weak, but positive effect. There is a positive and statistically significant correlation of 0.207 with the maximum occupier satisfaction scores recorded for each property. Panel B shows the correlation between occupier satisfaction and

benchmark outperformance for properties in different market segments. The correlation coefficients are generally positive, but not statistically significant except in the case of industrial estates where the correlation between alpha and the maximum annual satisfaction scores for each property is positive and statistically significant at the 10% level. Panel C shows results by landlord. Correlation coefficients are positive for landlords 1 and 3, and statistically significant for landlord 3 when using the maximum satisfaction variable. Hence, there is some, but limited, evidence from this approach that positive relationships between occupier satisfaction and property investment performance are present.

INSERT TABLE 5 HERE

The drawbacks of this analysis are the restricted sample size (in both cross-sectional and time series terms) and the fact that it cannot detect any temporal link between occupier satisfaction and performance. For these reasons, further analysis was carried out using occupier satisfaction data and excess total return rates as per the discussion above.

**6.2. Relationship between occupier satisfaction and excess returns**

The relationship between occupier satisfaction and the extent to which return rates exceeded their benchmark is now examined using all 240 properties in the sample. Many correlation and regression based tests were undertaken with different lags for the occupier satisfaction variable and with different forms of both the satisfaction and excess return rate variables (e.g. rolling and compounded versions). Correlation tests indicated a weak positive correspondence between excess return rates and occupier satisfaction, strongest when contemporaneous satisfaction and return variables were used. These correlation coefficients were not consistently statistically significant, though. Hence, the following discussion focuses on regression based tests, which convey more information than the correlation coefficients and which allow for control variables to be introduced, helping to remove confounding factors.

Tables 6 and 7 show the results of regressions of excess return rates on occupier satisfaction scores and control variables. Table 6 uses total returns to March of the year in which an occupier satisfaction study was conducted (i.e. contemporaneous return rates) while Table 7 uses total returns to March of the year after the occupier satisfaction data was collected.[9] In

[9] Analysis was also performed for longer durations between the satisfaction study and the year in which total return was measured and these found that the relationship between satisfaction and returns diminished with the

the latter case, the reasoning is that occupier satisfaction might not immediately translate into better financial performance. However, the statistical significance of the coefficient on occupier satisfaction, the adjusted $R^2$ values for the regressions and results the overall statistical significance of the models as captured by the F-statistics are broadly similar.

INSERT TABLES 6 AND 7 HERE

Focusing on Table 6, in Model 1, the only independent variable is occupier satisfaction, and its coefficient is positive (2.85) and statistically significant at the 10% level. This implies that an increase of 1 unit in the mean overall satisfaction of occupiers should increase total return by nearly 3%. An increase of 1 unit is a large increase as the typical range of satisfaction scores in the sample is from 2.5 to 4.5. Model 2 introduces a size variable and its inclusion reduces the coefficient on the satisfaction variable. Adding landlord dummies (Model 3) reduces the coefficient further to a non-significant 2.41. However, the use of sector dummy variables (Model 4) increases the coefficient to a statistically significant 3.86 (p=0.013) and it is increased further when both sector and landlord dummy variables are used (coefficient = 4.01; p=0.021). In all cases, though, the adjusted $R^2$ is very small. Only when individual asset dummy variables are used (Model 6) does the adjusted $R^2$ become substantial at 22.4%. For this model, the coefficient on occupier satisfaction is 4.93 and it is statistically significant at the 10% level (p=0.079). Thus, the best fitting model indicates that an increase in the mean satisfaction rating of 1 unit results in an increased total return of nearly 5%.

These results indicate that there is a positive relationship between occupier satisfaction and property performance over the short term. Thus, hypothesis 1, that the investment performance of a property is unrelated to the satisfaction of occupiers at that property, can be rejected.

To test Hypothesis 2, whether or not the relationship is the same for all sectors of the commercial property market, similar analysis was performed on the properties split by sector. The preceding analysis showed that the greatest explanatory power is achieved using a model with individual property dummy variables, so this approach is used for the analysis of returns by sector.

passage of time, perhaps because higher satisfaction had resulted already in higher cash flows that were then capitalised into subsequent property valuations.

Table 8 shows results for segment level analysis. In Panel A, results based on contemporaneous excess return rates are reported. In Panel B, results relate to excess return rates for the year after the occupier satisfaction scores were recorded. The results indicate that there are differences between property types in the response of total return to changes in occupier satisfaction, although the relationship is mostly positive. For shopping centres, the coefficient on occupier satisfaction is positive but not statistically significant for both contemporaneous returns and those one year later. For Retail Warehouses, a strong and statistically significant relationship with contemporaneous returns becomes a non-significant negative relationship the following year. For offices, a positive and statistically significant coefficient is found when buildings in the West End of London are omitted (16.180; p=0.096). West End Offices had the highest returns of any segment in the three years preceding and the three years following the Global Financial Crisis, making it more difficult to outperform the benchmark by delivering superior property management. For the Industrial Sector, the small sample of industrial estates outside the South East of England shows a very strong relationship between occupier satisfaction and property performance a year later (Panel B), but the regression has zero explanatory power (adjusted $R^2 = 0$). Only when this segment is omitted for the analysis is a reasonable $R^2$ achieved, albeit at the expense of a statistically significant coefficient on occupier satisfaction.

These findings might also hint at a regional dynamic to where occupier satisfaction matters most, but the sample sizes do not permit a thorough investigation of this possibility. Even for the segments as currently defined, the sample sizes are fairly small, hampering the detection of consistent and statistically significant results. In general, results are stronger in Panel A and an explanation for this might relate to the property valuation process. If a property with satisfied occupiers achieves a better cash flow than anticipated by its appraiser at the start of the year, then its appraised value will be adjusted upwards in the following year, all else equal, provided that the better cash flow is maintained. Returns in the subsequent year will be then based on this new, higher value, so return *rates* are then likely to drop.

An analysis of covariance was carried out to test whether differences in slope coefficient exist. The interaction term between sector and the occupier satisfaction variable was found to have a non-significant p-value of 0.138, indicating that the regression slopes are not heterogeneous. This implies that with these samples it is not possible formally to reject the second hypothesis, but the findings overall indicate the likelihood that there are differences between sectors in the response of total returns to changes in occupier satisfaction.

INSERT TABLE 8 HERE

The third hypothesis relates to the temporal stability of the relationship between occupier satisfaction and property performance. One might expect occupier satisfaction to have more of an impact on the returns from commercial property when there is a surfeit of property. At such times of supply exceeding demand, occupiers have more choice and may be able to negotiate favourable lease terms elsewhere. Thus, the relationship between occupier satisfaction and total returns might be expected to be more clear-cut at such times. The financial crisis and ensuing recession in the UK occurred during 2007, 2008 and 2009, during which time the average return rates for all types of commercial property were negative. To explore whether the relationship between satisfaction and investment performance changed in this period, regressions conducted earlier for different property types were repeated using occupier satisfaction data for the years 2007, 2008 and 2009 and financial returns for the years ending Mar 2008, Mar 2009 and Mar 2010. Occupier satisfaction is the only explanatory variable in these regressions because, in many cases, only a single satisfaction study was conducted in this period and any contribution of the occupier satisfaction variable to total return would be absorbed into the coefficient on the dummy variable for that property. Retail Warehouses are not included in this analysis, because most of the occupier satisfaction studies of Retail Parks were conducted prior to 2007.

INSERT TABLE 9 HERE

From Table 9, it is apparent that the magnitude of the coefficient of occupier satisfaction is larger for the years of the global financial crisis, and is statistically significant in spite of the smaller sample size compared with the full period sample.

As noted in the Data and Methods sections, robustness checks were performed using excess return rates observed over a longer period and these are discussed in Appendix A.

## 7. Discussion and conclusions

The main question examined in this study is whether properties that have highly satisfied occupiers produce higher investment returns than those where poor customer satisfaction has been recorded. The tests were conducted on a sample of 240 UK property investments where occupier satisfaction had been measured by RealService and where investment returns had been calculated by MSCI IPD. Different statistical methods were employed and the results

indicate that there is a positive relationship between occupier satisfaction and investment performance, giving some support for the premise that treating tenants as valued customers results in superior returns for their owners. The findings also suggest that valuers might not have taken occupier satisfaction fully into account. Properties with more satisfied occupiers should be valued more highly if satisfaction translates into a greater likelihood of lease renewal or recommendation of the landlord, reducing void periods and improving cash flows. A higher valuation would then reduce the chances of positive excess returns, but would reflect the likelihood of better financial performance more accurately.

The analysis was unable to reject the hypothesis that the relationship between occupier satisfaction and investment performance is the same across all property types, although with larger samples this might be possible. The retail warehouse sector showed one of the strongest relationships between satisfaction and contemporaneous performance, and the relationship for shopping centres was consistently positive. However, the caveat about correlation not necessarily implying causation should be borne in mind. It is possible that the relationship between store-managers' satisfaction and shopping centre or retail park performance might be attributable to high customer footfall. A shopping centre in which shops experience strong trading performance is likely to have strong total returns because stores will be able to afford higher rents and there will be fewer empty shops. In this case, the success of such a centre might be attributable to excellent centre management or it might be due to aspects such as location, accessibility and a lack of competition. Furthermore, in large retail organisations, the store manager might not be the decision-maker in matters relating to leases. Yet, the findings from this research indicate that the impact of occupier satisfaction is sufficiently strong that it is transmitted through an intermediary, the store manager, to the decision-maker.

The findings for offices were less clear-cut, with several models showing a negative coefficient for this sample of 31 London (West End) properties. During much of this period, demand and returns for London offices were very high, offering little scope for the effects of superior property management service to be observed. Nevertheless, in aggregate, and particularly during the recession, the relationship between occupier satisfaction and returns was positive.

Although the relationship between satisfaction and performance was positive for industrial estates, the coefficients were very different for South East estates and those in the rest of the UK. The sample size for the latter segment was too small for reliable analysis.

The magnitude and, for some sectors, even the sign of the coefficient changed according to whether contemporaneous return rates or rates for the year following were used. Such oscillations from year to year highlight once again that a large increase in total return one year might be followed by a return which is below the MSCI/IPD segment benchmark because of the way that return rates are calculated with reference to the previous appraised capital value, itself a function of expected cash flows. If income was higher than initially anticipated by the valuer, (perhaps because of high occupier satisfaction, lease renewal, low vacancy rates, etc., as predicted by the service – profit chain), the next year's valuation of the property will be higher, and return *rates* will be lower for the same income.

The impact of the property cycle and whether supply and demand affect the relationship between occupier satisfaction and returns was considered. In particular, the analysis isolated the years associated with the global financial crisis and compared results for those years against results generated from the entire sample. The null hypothesis that the relationship between satisfaction and performance is unaffected by the property cycle was rejected both for the sample as a whole and for several individual segments. Hence, the impact of good customer service and satisfied occupiers appears to be more important when there is an excess of space (supply exceeds demand), competition among landlords is higher and rates of return generally are low. Superior property management may act as a hedge against falling demand.

There are some limitations to the study. The analysis draws on an unbalanced panel of observations relating to only 240 UK property investments and a larger sample of both assets and landlords would be desirable for any future research. The data on investment returns is appraisal-based and each property in the sample is benchmarked against a broad segment-level series in the absence of more detailed data about each asset. Secondary data on occupier satisfaction is utilised and there was scope for variability in the quality of the surveys that underlie each satisfaction score. Yet, despite all these limitations, the importance and uniqueness of this analysis should not be understated given the paucity of quantitative analysis on whether or not occupier satisfaction has any meaningful impact on property investment performance over time.

It would be beneficial to investigate whether the same relationships apply to countries other than the UK. Differing lease structures and institutional arrangements might make the impact of satisfaction with property management more or less important in lease renewal and landlord advocacy by tenants, and mean that the effect on investment returns is stronger than

that indicated here. It would also be valuable to examine the impact of tenant satisfaction on returns in other sectors of the property investment market. For example, in other countries, residential property is a sizable proportion of institutional investment portfolios and the nature of any relationship with financial performance could be very different. Even in a UK context, assured short-hold tenancies and student accommodation offer scope for monitoring the effect of occupier (dis)satisfaction because lease lengths in these sectors are short compared with commercial property.

Another promising piece of research would be to assess whether the aggregated satisfaction of a property company's tenants overall, and their willingness to recommend the company, affect the property company's overall financial performance. This could apply both to landlords and to managing agencies. Such research would overcome the issue of the volatility of individual property returns, and the many confounding factors which affect them. Although occupier satisfaction data would have to be collected and agreement obtained from the companies concerned, the financial performance data that is needed is in the public domain because it consists of information published in annual reports such as asset values, profits and various financial ratios, as well as stock market information including share prices.

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## Appendix

Table A1 reports the results of OLS regressions using five-year compounded excess return rates as the dependent variable and occupier satisfaction as the key independent variable. Four separate specifications are presented in columns (1) to (4), beginning with a simple bivariate regression and then testing the relationship with the addition of dummies first for sectors (column 2), then for owners (column 3) and then for both sectors and owners (column 4).

The results consistently indicate a positive and significant relationship between performance and occupier satisfaction levels. For example, the coefficient for occupier satisfaction in column (1) suggests that a unit increase in mean satisfaction increases the compounded excess return rate by 10.8%, which equates to an annualised benchmark out-performance of 2%. Typically, a unit increase in satisfaction corresponded with a higher excess return in the order of 10% to 15% over a five-year period depending on the model used.

INSERT TABLE A1 HERE

Each model in Table A1 was estimated with a common slope parameter for the occupier satisfaction variable. However, mean occupier satisfaction ratings vary between sectors and this could distort the relationship with investment performance. Table A2 reports the results of regressions by Sector, using the same segments as in Table 8. The coefficients on occupier satisfaction are all positive and reinforce the findings of the earlier regressions of Table 8. As with those earlier regressions, an analysis of covariance to test for homogeneity of regression slopes found the interaction term between sector and the occupier satisfaction variable was non-significant (p-value = 0.694). Thus the hypothesis that the relationship between occupier satisfaction and property performance is the same for all sectors is not rejected. Investors should see a similar return on investment in improving occupier satisfaction for all sectors of commercial property.

INSERT TABLE A2 HERE

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**Table 1: Descriptive statistics for annual overall occupier satisfaction**

| | Count | Mean | Std. Dev | Skewness | Kurtosis | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| Overall Sat 2002 | 25 | 3.66 | 0.24 | -0.12 | -0.16 | 3.17 | 4.17 |
| Overall Sat 2003 | 37 | 3.85 | 0.31 | -0.73 | 0.97 | 2.90 | 4.33 |
| Overall Sat 2004 | 58 | 3.75 | 0.33 | -0.21 | -0.39 | 3.00 | 4.44 |
| Overall Sat 2005 | 75 | 3.82 | 0.33 | -0.86 | 0.85 | 2.75 | 4.46 |
| Overall Sat 2006 | 79 | 3.63 | 0.33 | -0.12 | -0.62 | 2.78 | 4.29 |
| Overall Sat 2007 | 80 | 3.82 | 0.33 | -0.80 | 0.19 | 2.75 | 4.37 |
| Overall Sat 2008 | 68 | 3.83 | 0.41 | -1.28 | 2.12 | 2.50 | 4.50 |
| Overall Sat 2009 | 30 | 4.04 | 0.23 | -1.04 | 0.97 | 3.40 | 4.45 |
| Overall Sat 2010 | 52 | 3.99 | 0.27 | -0.66 | 0.65 | 3.25 | 4.50 |
| Overall Sat 2011 | 59 | 4.02 | 0.24 | -0.25 | -0.15 | 3.42 | 4.50 |
| Overall Sat 2012 | 47 | 4.01 | 0.30 | -0.78 | 0.30 | 3.20 | 4.47 |
| Overall Sat 2013 | 39 | 4.09 | 0.26 | 0.96 | 2.51 | 3.56 | 5.00 |

Note: The total number of studies, at 649, is higher than the total number of properties because more than one study might be conducted for a particular asset.

**Table 2: Distribution of sample across IPD Portfolio Analysis Service segments**

| PAS no. | Segment name | Assets in segment |
|---|---|---|
| 1 | Standard Retails – South East | 1 |
| 2 | Standard Retails – Rest of UK | 4 |
| 3 | Shopping Centres | 61 |
| 4 | Retail Warehouses | 37 |
| 5 | Offices – City | 32 |
| 6 | Offices – West End | 31 |
| 7 | Offices – Rest of South East | 14 |
| 8 | Offices – Rest of UK | 0 |
| 9 | Industrials – South East | 47 |
| 10 | Industrials – Rest of UK | 11 |
| 11 | Other Property | 2 |
| | Total | 240 |

**Table 3: Descriptive statistics for annual total return rates**

| | Count | Mean | Std. Dev | Skewness | Kurtosis | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| Tot Ret to Mar 2004[1] | 96 | 11.6 | 17.8 | -.77 | 15.5 | -90.3 | 97.9 |
| Tot Ret to Mar 2005 | 124 | 19.0 | 29.6 | 5.41 | 40.4 | -43.1 | 263.0 |
| Tot Ret to Mar 2006 | 156 | 20.0 | 16.9 | 1.85 | 7.93 | -22.0 | 114.9 |
| Tot Ret to Mar 2007 | 163 | 14.6 | 14.3 | 1.22 | 4.67 | -32.9 | 77.6 |
| Tot Ret to Mar 2008 | 156 | -4.8 | 12.2 | .43 | 4.19 | -55.1 | 45.2 |
| Tot Ret to Mar 2009 | 144 | -27.8 | 12.2 | .75 | 1.18 | -57.9 | 16.3 |
| Tot Ret to Mar 2010 | 157 | 11.4 | 17.6 | .60 | 1.69 | -40.3 | 84.6 |
| Tot Ret to Mar 2011 | 158 | 12.7 | 10.4 | 1.02 | 2.92 | -14.8 | 57.1 |
| Tot Ret to Mar 2012 | 152 | 5.8 | 11.7 | -1.25 | 5.25 | -51.9 | 32.7 |
| Tot Ret to Mar 2013 | 141 | 2.6 | 9.9 | .60 | 5.96 | -29.1 | 55.8 |
| Tot Ret to Mar 2014 | 127 | 10.5 | 9.6 | -.96 | 9.00 | -44.1 | 48.0 |

Note: Returns for a March year-end include properties whose year-end is the preceding December.

**Table 4: Descriptive statistics for alpha, beta and satisfaction**

| Panel A | Count | Mean | Std. Dev | Skewness | Kurtosis | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| Alpha | 95 | 0.43 | 4.88 | 1.15 | 7.53 | -16.68 | 25.37 |
| Beta | 95 | 0.90 | 0.34 | -0.53 | 0.78 | -0.06 | 1.79 |
| Av Sat | 95 | 3.81 | 0.33 | -0.30 | -0.32 | 3.00 | 4.50 |
| Max Sat | 95 | 3.90 | 0.34 | -0.45 | -0.03 | 3.00 | 4.50 |

| **Panel B** | **$R^2$ Distribution for Regressions in Panel A** |
|---|---|
| **Mean** | **0.666118** |
| **SD** | **0.258942** |
| **Min** | **0.002** |
| **Max** | **0.965** |
| **Skew** | **-1.06196** |
| **Kurt** | **0.131117** |

**Table 5: Correlations between alpha and occupier satisfaction**

| | | Correlation | Sig. (2-tailed) | Observations |
|---|---|---|---|---|
| Panel A: correlations for all 95 properties | | | | |
| Full sub-sample | Average satisfaction | .078 | .453 | 95 |
| | Maximum satisfaction | .207 | .044** | 95 |
| Panel B: correlations by PAS segment | | | | |
| Shopping Centres | Average satisfaction | .067 | .750 | 25 |
| | Maximum satisfaction | .256 | .216 | 25 |
| Retail Parks | Average satisfaction | .024 | .908 | 25 |
| | Maximum satisfaction | .051 | .808 | 25 |
| Offices | Average satisfaction | -.032 | .862 | 31 |
| | Maximum satisfaction | .081 | .665 | 31 |
| Industrials | Average satisfaction | .464 | .110 | 13 |
| | Maximum satisfaction | .539* | .057 | 13 |
| Panel C: correlations by landlord | | | | |
| Landlord 1 | Average satisfaction | .026 | .844 | 61 |
| | Maximum satisfaction | .194 | .133 | 61 |
| Landlord 2 | Average satisfaction | -.119 | .648 | 17 |
| | Maximum satisfaction | -.112 | .668 | 17 |
| Landlord 3 | Average satisfaction | .446* | .072 | 17 |
| | Maximum satisfaction | .506** | .038 | 17 |

(Note Panel B includes 1 property, owned by LL1, that is a Standard Retail; ** and * denote that the correlation coefficient is significant at the 5% and 10% levels, respectively.)

## Table 6: Regressions of Excess Returns on Occupier Satisfaction

**(Satisfaction study conducted during Year t, Total Return to March of Year t)**

| Model | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Constant | -10.95 | -6.03 | -7.51 | -18.0 ** | -21.3 ** | -20.37 |
| Occupier satisfaction | 2.85 * (p=0.077) | 2.66 * (p=0.099) | 2.41 (p=0.136) | 3.86 ** (p=0.013) | 4.01 ** (p=0.021) | 4.93 * (p=0.079) |
| Individual Property Dummies | No | No | No | No | No | Yes |
| Nat_Log_Size | | -0.44 | -0.15 | -0.16 | 0.21 | |
| Sector | | | | | | |
| Shopping Centres | | | | 3.61 | 2.62 | |
| Retail parks | | | | 6.59 | 5.61 | |
| Offices | | | | 6.49 | 6.64 | |
| Industrials | | | | 3.02 | 7.34 | |
| Landlord | | | | | | |
| Owner 2 | | | 1.83 | | 0.67 | |
| Owner 3 | | | -2.36 | | -5.74 | |
| No of observations | 466 | 452 | 452 | 452 | 452 | 466 |
| No of properties | 240 | 218 | 218 | 218 | 218 | 195# |
| Adjusted R-squared | 0.7% | 0.7% | 0.9% | 1.0% | 1.2% | 22.4% |
| F-statistic | 3.132 | 1.582 | 1.586 | 1.741 | 1.711 | 1.686 |
| Probability > F | 0.077 | 0.207 | 0.177 | 0.110 | 0.094 | 0.000 |

# Number of properties in the model once those cases are omitted for which only a single occupier satisfaction study was conducted.

**Table 7: Regressions of Excess Returns on Occupier Satisfaction**

**(Satisfaction study conducted during Year t, Total Return to March of Year t+1)**

| Model | (7) | (8) | | (9) | | (10) | | (11) | | (12) |
|---|---|---|---|---|---|---|---|---|---|---|
| Constant | -9.76 | -3.28 | | -4.27 | | -11.8 | | -20.6 | ** | -14.04 |
| Occupier satisfaction | 2.63 (p=0.136) | 3.51 (p=0.043) | ** | 3.33 (p=0.055) | * | 4.60 (p=0.013) | ** | 5.02 (p=0.006) | *** | 3.27 (p=0.317) |
| Individual Property Dummies | No | No | | No | | No | | No | | Yes |
| Nat_Log_Size | | -0.99 | ** | -0.79 | | -1.11 | ** | -0.13 | | |
| Sector | | | | | | | | | | |
| Shopping Centres | | | | | | 4.24 | | 1.75 | | |
| Retail parks | | | | | | 5.85 | | 3.53 | | |
| Offices | | | | | | 6.41 | | 6.58 | | |
| Industrials | | | | | | 7.02 | | 18.26 | *** | |
| Landlord | | | | | | | | | | |
| Owner 2 | | | | 1.08 | | | | 0.55 | | |
| Owner 3 | | | | -1.67 | | | | -15.08 | *** | |
| No of observations | 478 | 462 | | 462 | | 462 | | 462 | | 478 |
| No of properties | 240 | 218 | | 218 | | 218 | | 218 | | 192# |
| Adjusted R-squared | 0.5% | 1.1% | | 0.9% | | 1.1% | | 4.6% | | 6.2% |
| F-statistic | 2.231 | 3.548 | | 2.059 | | 1.877 | | 3.761 | | 1.164 |
| Probability > F | 0.136 | 0.030 | | 0.085 | | 0.083 | | 0.000 | | 0.123 |

# Number of properties in the model once those cases are omitted for which only a single occupier satisfaction study was conducted.

**Table 8 Regression of Annual Excess Returns on Occupier Satisfaction, by Sector**

| Panel A Sat-Year$_t$ Return Year-End Mar $_t$ | Shopping Centres | Retail Warehouses | Offices | Offices excluding London West End | Industrials | South East Industrials |
|---|---|---|---|---|---|---|
| Occupier Satisfaction | 4.310 (p=0.343) | 17.435** (p=0.001) | -0.289 (p=0.958) | 16.180* (p=0.096) | 3.616 (p=0.561) | 5.965 (p=0.432) |
| Individual Property Dummies | YES | YES | YES | YES | YES | YES |
| No of observations | 185 | 78 | 134 | 79 | 81 | 65 |
| No of properties | 48 | 37 | 50 | 28 | 54 | 44 |
| Adjusted R-squared | 15.6% | 72.4% | 0% | 3.1% | 59.9% | 64.7% |
| F-statistic | 1.693 | 6.456 | 0.910 | 1.065 | 3.175 | 3.665 |
| Probability > F | 0.009 | 0.000 | 0.635 | 0.431 | 0.001 | 0.001 |

| Panel B Sat-Year$_t$ Return Year-End Mar $_{t+1}$ | Shopping Centres | Retail Warehouses | Offices | Offices excluding London West End | Industrials | South East Industrials |
|---|---|---|---|---|---|---|
| Occupier Satisfaction | 1.057 (p=0.810) | -6.152 (p=0.268) | 2.452 (p=0.605) | 2.074* (p=0.809) | 64.155* (p=0.056) | 1.600* (p=0.903) |
| Individual Property Dummies | YES | YES | YES | YES | YES | YES |
| No of observations | 189 | 77 | 135 | 71 | 68 | 52 |
| No of properties | 49 | 36 | 55 | 32 | 45 | 35 |
| Adjusted R-squared | 18.4% | 8.8% | 16.1% | 25.0% | 0% | 14.3% |
| F-statistic | 1.848 | 1.197 | 1.459 | 1.716 | 0.440 | 1.244 |
| Probability > F | 0.003 | 0.290 | 0.061 | 0.055 | 0.990 | 0.328 |

**Table 9: Comparison of results using the full period (2004-2014) and the Global Financial Crisis period 2007 – 2009 (without individual property dummy variables)**

| | GFC | Full Period | Shopping Centres GFC | S/C Full Period | Offices GFC | Offices Full Period | Industrial Estates GFC | Industrial Estates Full Period |
|---|---|---|---|---|---|---|---|---|
| Occupier Satisfaction | 6.170** (p=0.041) | 2.630 (p=0.136) | 13.65* (p=.059) | 5.419 (p=0.103) | 10.072** (p=0.033) | 4.085 (p=0.189) | 53.646* (p=0.060) | 6.836 (p=0.473) |
| No of observations | 178 | 478 | 71 | 185 | 69 | 134 | 19 | 67 |
| No of properties | 99 | 240 | 31 | 61 | 42 | 77 | 16 | 58 |
| Adjusted R-squared | 2.9% | 0.5% | 6.6% | 1.4% | 8.0% | 1.3% | 21.6% | 0.8% |
| F-statistic | 4.252 | 2.231 | 3.718 | 2.677 | 4.764 | 1.742 | 4.132 | 0.520 |
| Probability > F | 0.041 | 0.136 | 0.059 | 0.103 | 0.033 | 0.189 | 0.060 | 0.473 |

**Table A1: Regression of compounded excess returns on occupier satisfaction and control variables – full sample**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Constant | -41.18 *** | -63.40 *** | -41.57 *** | -70.55 *** |
| Occupier satisfaction | 10.76 ** | 13.28 *** | 11.57 ** | 15.13 *** |
| | (p=0.024) | (p=0.008) | (p=0.015) | (p=0.003) |
| Sector | | | | |
| Shopping Centres | | 10.70 | | 11.33 |
| Retail parks | | 19.70 | | 12.37 |
| Offices | | 20.96 * | | 24.06 * |
| Industrials | | 1.18 | | 20.99 |
| Landlord | | | | |
| Owner 2 | | | -12.06 * | -11.85 * |
| Owner 3 | | | -13.37 *** | -19.68 ** |
| No of observations | 397 | 397 | 397 | 397 |
| No of properties | 240 | 240 | 240 | 240 |
| Adjusted R-squared | 1.3% | 3.6% | 3.0% | 4.8% |
| F-statistic | 5.127 | 3.942 | 5.001 | 3.824 |
| Probability > F | 0.024 | 0.002 | 0.002 | 0.000 |

Notes: ***, ** and * denote 1%, 5% and 10% significance levels, respectively. The omitted categories for each set of dummy variables are as follows: sector – PAS 1, 2 and 11 (Standard Retails and "Other Property"); landlord – owner 1.

**Table A2: Regression of compounded excess returns on occupier satisfaction by Sector**

| | Shopping Centres | Retail Warehouses | Offices | Offices excluding London West End | Industrials | South East Industrials |
|---|---|---|---|---|---|---|
| Occupier Satisfaction | 20.52** (p=0.032) | 8.376 (p=0.185) | 12.982 (p=0.211) | 31.195* (p=0.100) | 11.060 (p=0.352) | 22.666* (p=0.065) |
| No of observations | 148 | 74 | 124 | 66 | 44 | 34 |
| No of properties | 48 | 37 | 54 | 30 | 29 | 22 |
| Adjusted R-squared | 3.1% | 2.4% | 1.3% | 4.0% | 2.1% | 10.3% |
| F-statistic | 4.684 | 1.794 | 1.580 | 2.651 | 3.175 | 3.657 |
| Probability > F | 0.032 | 0.185 | 0.211 | 0.100 | 0.352 | 0.065 |