Journal of Economic Geography **16** (2016) pp. 781–803 doi:10.1093/jeg/lbv018
Advance Access Published on 13 June 2015

The economic effects of owner distance and local property management in US office markets

Piet Eichholtz, Rogier Holtermans*,† and Erkan Yönder***

*Maastricht University, School of Business and Economics, P.O. Box 616, 6200 MD, Maastricht, The Netherlands
**Özyeğin University, Faculty of Business, Nisantepe Mh. Orman Sk. 34–36, Allemdag - Çekmeköy 34794, Istanbul, Turkey
†Corresponding author: Rogier Holtermans, Maastricht University, School of Business and Economics, P.O. Box 616, 6200 MD, Maastricht, The Netherlands. *email* <r.holtermans@maastrichtuniversity.nl>

Abstract

Using a large dataset of US offices we analyse the relationship between investors' distance to their assets and the effective rent of these assets, and study the extent to which property managers can influence this relationship. We construct hedonic rent models to control for other known rent determinants. It turns out that proximity matters: holding everything else constant, investors located closely to their office buildings are able to extract significantly higher effective rents from these assets, especially if these buildings are of low quality. This effect is due to significant differences in occupancy levels. Interestingly, property managers can affect this relationship, mitigating the adverse effects of investor distance on effective office rents. Especially if the owner does not reside in the same state as the building, external property management is of importance, most prominently so for class-B office buildings.

Keywords: Commercial real estate, investor proximity, real estate investment, rental value, property management
JEL classifications: G11, R12, R32, R33
Date submitted: 19 September 2014 **Date accepted:** 1 May 2015

1. Introduction

Home bias, local bias and investor proximity are different names for the same issue: investors like to invest their capital closer to their own location than investment theory predicts, especially if their risk appetite decreases or their risk perception increases (Levy and Sarnat, 1970; Coval and Moskowitz, 1999, 2001).

Investor proximity is well documented in the financial literature, but it has not been documented whether such a phenomenon is at play in the commercial real estate market. Since the private real estate market is opaque and illiquid, it is likely that local information is salient in the performance of investors' portfolios. This would imply that the physical distance of the owner to her assets may affect the rent level and subsequently the market value of the assets. By observing office rent levels, we are able to investigate the value of local market information in the direct real estate market and measure the added benefit of local ownership.

We also study whether the impact of owner distance is mitigated by the use of property managers, who may have the local market and tenant knowledge that

far-away landlords have less access to. Location is vital in real estate, and local market information is likely to be very valuable. The cost of not having access to it can be high, through missed opportunities and low performance. Retaining property managers can be a means to overcome such a lack of information, especially when investors are diversified across regions and the intermediary is local.

On the contrary, the use of an external property manager impairs the direct relationship of the owner to her buildings and its tenants, thereby possibly reducing the flow of performance-relevant information to the owner. On top of that, the use of an external property manager may create an agency conflict. So the effect of external property management on building performance is not clear ex ante. As far as we know, ours is the first study to analyse the economic utility of these ubiquitous service providers to the real estate industry.

We use a sample of 21,653 US office buildings from 2011 to empirically investigate these questions. We define investor proximity or distance in two ways: distance in miles and administrative closeness on four different levels, the zip code area, the city, the core based statistical area (hereafter, CBSA) and the state. This enables us to assess the possible impact of investor proximity in different degrees. We employ propensity score weighted hedonic rent models to analyse the effect of local ownership and to control for other factors known to be determining office rents.

The results are consistent and robust. First, we observe that investors tend to reside close to their assets. The median owner distance is only 5 miles. We also see clear patterns in owner proximity. Proximity is related to building quality, lower quality is associated with stronger proximity. Furthermore, we find a lower degree of investor proximity in buildings when external property managers are involved, so either out-of-town building owners are more likely to hire external property managers, or the involvement of a local property manager reduces the need to be close to one's assets.

Second, we find a highly significant effect of investor proximity on the effective rent level, and observe a substantial rent discount when an owner is far away from her assets, especially for lower-quality buildings. The results indicate that far-away ownership comes at an effective rent discount that varies from zero to 4.8% for class-A office buildings and 9.2% to 22.1% for class-C buildings. The discount also depends on the degree of proximity of the owner to the building. When measuring distance in miles, we see rents falling as distance increases up until an average distance of 80 miles. The effective rent is the result of the average contract rent and the occupancy rate of a building, and our results show that owner proximity and distance affect the latter far more than the former, suggesting that local information advantages are relevant in finding tenants rather than in negotiating a higher rent.

Third, we study the importance of the presence of external property management for the effective rent level of commercial real estate. The results of the analysis show that external property management adds value: we find a premium that depends on the specification, and which is most significant for class-B office buildings. This implies that property managers can partly offset the adverse effects of owner distance on effective rents for these buildings. If the owner is far away and hires a property manager, we find that the negative impact of distance is reduced. Moreover, our results show that smaller property managers, who are more closely located to the assets they manage than larger ones, add more value. Therefore, external property managers seem to make a difference especially when they have a local information advantage relative to their clients.

Our findings are important for real estate portfolio construction, since they show that regional diversification can have an adverse effect on performance. That does not imply that office investors should now revert to unreserved local specialization. Diversification still has beneficial risk-reduction effects, but these come at the price of a lower rent. So the real estate owner faces a trade-off between risk reduction and the rent level, and the retention of external property managers and the selection of better-quality buildings help investors make this trade-off.

In the next section we will first discuss the literature regarding investor proximity and performance. We will then present the data and the empirical method, and the subsequent section will present the results with respect to the base models and subsamples. The article ends with concluding remarks.

2. Local asset ownership and information access

Local market information is likely to be important in any asset market, and especially so in real estate. Throughout the ages, old hands in the market have taught their young colleagues that three things matter in real estate: location, location and location. That makes it all the more interesting that the role of investor proximity, which is likely to be salient for access to local market information, has hardly received any attention in the real estate literature.

Contrary to real estate, this topic has been investigated quite extensively in the stock market. The initial literature regarding home bias and the consequences of proximity concerned international investments, and showed convincingly that investors, both individual and professional, invest more in their own country and less internationally than investment theory would predict. That choice seems to be warranted by performance: national investors outperform international investors.[1]

More recently, researchers have started to investigate whether this home bias also holds on a more local level, i.e., within the same country. Such local biases in investor portfolios are indeed observed. Coval and Moskowitz (1999, 2001) perform an analysis on investment managers' portfolio choices in the US and find that mutual fund managers exhibit a strong preference for locally headquartered firms. This preference is reflected in improved performance: Coval and Moskowitz (2001) show that fund managers earn abnormal returns in nearby investment.

Ivkovic and Weisbenner (2001) investigate whether such a local bias also holds for individual investors and whether local investments outperform non-local investments. It turns out that they do, and the results are stronger when moving away from S&P500 companies. The authors attribute this result to reduced informational asymmetries when investors and their assets are close. When comparing the portfolio performance of these individual investors to professional money managers the authors find that professional managers share the same ability in filtering out local information.

Bodnaruk (2009) investigates a similar research question using Swedish stock ownership data for a large sample of individual investors between 1995 and 2001. Bodnaruk employs the geographic distance to the closest establishment of the respective

1 International studies such as Levy and Sarnat (1970), Solnik (1974), French and Poterba (1991), Kang and Stulz (1997), Huberman (2001), and Ahearne et al. (2004) are just a few examples of the extent to which this issue has been investigated in the finance literature.

company as a measure for proximity. He finds strong evidence for local specialization, and confirms that investing locally pays off. The relationship between performance and proximity is strongest for riskier local companies. Interestingly, investors change their portfolio composition when they move, apparently to reduce the distance to their investments. These results provide evidence that individual investors possess an information advantage with respect to local stocks.

Seasholes and Zhu (2010) study individual investor data in the US from 1991 to 1996 to provide further insight into the local bias puzzle. The authors create passive local indices at the state and zip code level and show that after controlling for the market excess return and the passive local index, individuals do not generate abnormal returns, on average. Therefore, the authors conclude that individual investors do not seem to possess value-relevant information.

The degree to which access to information influences the supply and pricing of external funds has been investigated in the banking literature as well. Degryse and Ongena (2005) document spatial price discrimination in bank lending. The authors find that loan rates are lower when the client is located closer to the bank.

Mian (2006) investigates the impact of distance within a bank on lending behavior. He concludes that greater cultural and geographic distance between a foreign bank's headquarters and local branches decreases lending to informationally difficult yet sound firms. Agarwal and Hauswald (2010) conclude that it is harder to obtain soft information on clients with increasing distance, which leads to reduced access to credit and more expensive loans.

There is also an emerging literature regarding firm-level performance and the effects of distance. Bronnenberg et al. (2009) find persistent distance effects in the market shares of consumer packaged goods industries: market shares are higher in markets close to a firm's city of origin. Landier et al. (2009) show that corporations are less likely to divest divisions located in the same state as their headquarters, and they find a negative relationship between employee dismissals and the distance between divisions and headquarters. They put this down to a combination of social considerations and information, and show that firms' geographical concentration increases with the difficulty to transfer information over long distances.

Giroud (2013) shows that a decrease in air travel time between a corporation's headquarters and its production plants leads to more investment in these plants, and an increase in total factor productivity. Bernstein et al. (2014) focus on the effects of distance between venture capital firms and the companies they invest in, and also use reductions in air travel time to identify these effects. They show that reductions in travel time lead to increased innovation and a higher initial public offering likelihood, and they attribute this to increased monitoring by the venture capital firm.

Dahl and Sorensen (2012) investigate the locational preferences of Danish startups, and find evidence that their ventures perform better—in terms of longevity, cash flows and profits—when they are located in regions where the entrepreneurs have lived longer. They attribute this to better access to local information and social capital. Kalnins and Lafontaine (2013) show that firm establishments located further away from headquarters have a lower survival rate. For the lodging industry specifically, they find that increased distance to headquarters is associated with lower revenue per hotel room. The authors put these findings down to monitoring and local information asymmetry problems.

With respect to real estate, Eichholtz et al. (2001) and Eichholtz et al. (2011) compare the performance of listed international property companies with portfolios of local property companies with the same country weights. They show that portfolios of locals significantly outperform the international investors. For directly held real estate assets, the only available paper studying this question is Ling et al. (2013), and it investigates the relationship between transaction prices of commercial real estate assets and seller and buyer proximity. The authors find that distant buyers tend to pay a premium relative to local buyers due to higher search cost and an informational disadvantage.

Our study makes three main contributions to this literature. First, we investigate whether local bias is present in direct real estate markets in the first place. Second, we study office rents and occupancy instead of transaction prices, so we look whether owner proximity affects the cash flow performance of office buildings. Third, we investigate the effect of external property managers on the performance–distance relationship. Real estate investors routinely employ external local property managers. This may be motivated by a desire to mitigate the possible adverse effects of distance to their assets. An important contribution of our article is to shed light on the impact of external service providers in this context.

In the next sections we will further explore the role of local ownership in commercial real estate markets and its relationship with performance, and we will investigate whether a possible disadvantage borne by owning commercial real estate far away can be overcome by means of intermediaries such as property managers.

3. Data description

3.1. Data and source

In order to investigate the relationship between proximity, rent levels and the impact of intermediaries, we retrieve US office market data from CoStar (CoStar Realty Information Inc., 2011).[2] CoStar Property comprises the world's largest commercial real estate database, both in terms of market coverage and in terms of the information available on the asset level. That alone is a strong reason to focus our analysis on the US. Besides that, we investigate the role of proximity for long distances, thus we need the largest possible market in terms of land area.

CoStar provides average rent information for a sample of 33,713 office buildings for 2011. However, we cannot employ all these observations. To mitigate the possibility that unobserved quality characteristics determine the impact of proximity on office rent levels we only include observations for which the most extensive set of hedonic characteristics is available. Moreover, in order to determine the degree of proximity of the owner to her asset, we need detailed information with respect to the owner's location, and we also need information on external property management, which is not available for all observations. Last, we need to have at least two observations per zip code area, which leads to a final sample of 21,653 observations spread over 2030 zip code areas, resulting in an average of 23.6 observations per zip code area.

2 CoStar Realty Information Inc. is a data vendor that provides information on more than 4.5 million commercial real estate assets in the US and the UK. CoStar Property is one of their product offerings that includes historic and current market information for multiple asset types, such as industrial, multi-family, office and retail buildings.

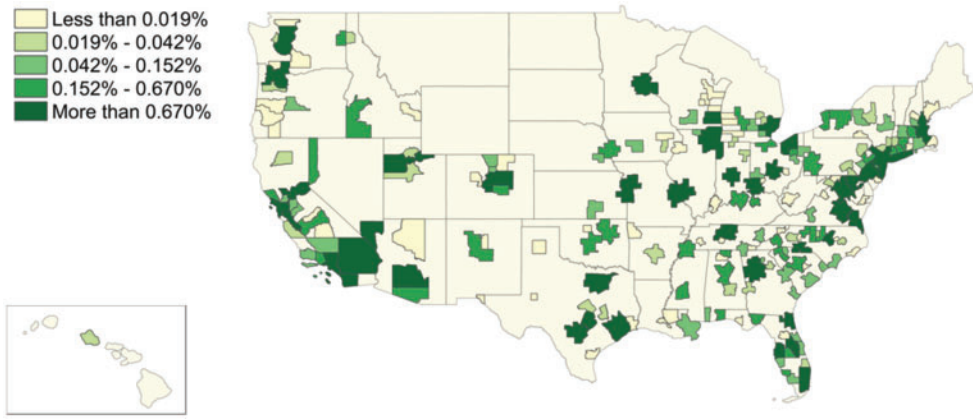

Figure 1. Quintiles of number of observations by CBSA.

The analysis involves 206 out of the 955 US CBSAs. On average, we have 105 observations per CBSA, with a minimum of 2 and a maximum of 1415. About 85% of the observations lie within the 50 largest CBSAs.[3] Figure 1 provides a map showing the location of the 206 CBSAs included in the study, and gives the weight in the final sample for each CBSA in terms of the number of buildings. Figure 1 displays that our observations are evenly distributed across the main office markets in the US, with a large representation of the coastal areas and the mid-west. The map does not offer surprises in terms of a possible mismatch between an office market's actual importance and its representation in our sample.

At a later stage in the analysis we differentiate between buildings with and without external property management. Exploiting detailed information regarding the asset owner and property manager we are able to distinguish internal from external property management. Of the 21,653 buildings we observe, 7465 are managed externally. A limitation of the article is that we have no information about the cost of property management, and we cannot control for the possibility that an observed premium for external property management is a reflection of the added cost of such a service provider.[4] Moreover, we do not observe the quality of a property manager directly. However, we can identify the property manager company, and we will use the estimated size of the company as a proxy for quality. We also know the location of the property manager, which we use as a proxy for local information access.

We use GIS techniques to determine the different degrees of owner distance to the asset, employing the geographical coordinates of the asset and the owner to calculate physical distance. Moreover, matching based on the geographical location of the asset and the owner enables us to define administrative closeness as well, on the zip code, city, CBSA and state level.

3 When we limit the subsequent analysis only to these 50 largest CBSAs, the results do not markedly differ from those reported in the article for the full set of 206 CBSAs. Table A1 in online Appendix A displays the main results for the analysis of the sample of the 50 largest CBSAs.

4 The property management fee depends on asset quality and size and in most cases is directly passed through to the tenant as an operating expense. Depending on asset size and the specific market, the fees are generally between 1% and 2.5% of the total rental revenue plus reimbursement for on-site staff for larger office buildings.

3.2. Descriptive statistics

This section provides information regarding the statistical properties of the sample. Table 1 compares the average characteristics of the internally managed sample with the externally managed sample, which are provided in the first and second column, respectively. The differences in average building characteristics between the two sub-samples are given in the third column.

The internally managed buildings in the sample command an average rent of some 18 dollars per square foot. When taking into account the average occupancy rate of 75% the effective rent, multiplying the occupancy rate with the average weighted rent, is about 14 dollars per square foot. With respect to size, the average building spans some 60,000 square feet divided over four stories. Most of the buildings have a class-B quality rating, whereas only 14% have a class-A rating and 31% of the buildings have a class-C quality designation.[5] The average building in our sample is about 37 years old. On average, 18% of the internally managed buildings have been renovated and 20% of them have on-site amenities.[6] Access to public transportation within a quarter mile is available for 13% of these buildings.

When we compare this with the externally managed buildings in our sample some interesting differences appear. On average, the buildings serviced by an external property manager command a substantially higher contract rent compared with the control buildings. Office buildings managed by an external property manager also have a higher and more stable occupancy rate, so the effective rent is significantly higher as well at almost 17 dollars per square foot.

However, we cannot conclude that these differences are due to the presence of a property manager, since the two sets of buildings also differ on a number of quality variables of which we know that they affect the rent per square foot. For example, with respect to building size, externally managed buildings are more than twice as large (133,000 sq. ft.) and almost twice as tall (7 stories) compared with buildings that do not enjoy their services. Concerning building quality, Table 1 shows that buildings with a property manager are of higher quality when compared with non-managed buildings, and the difference is largest in the highest and lowest quality segments: 32% of the externally managed buildings have a class-A rating compared with only 14% of the non-managed buildings. Only 15% of the externally managed buildings are rated as class-C while 31% of the non-managed buildings hold this rating. Buildings that have an external property manager tend to be somewhat newer as well, with an average age of about 35 years compared with an average age of about 37 years for non-managed buildings. Externally managed buildings are also more likely to have been renovated, and a larger fraction of the buildings with an external property manager have on-site amenities and access to public transportation.

Column (3) of Table 1 documents significant differences between the non-managed and managed sample and to account for that, we employ propensity score weighting. The weights are determined by estimating the propensity for each non-managed building to be managed based on a number of observable characteristics. The average

5 The definition of the building class designations as used by CoStar Realty Information Inc. are summarized in online Appendix B.

6 One or more of the following amenities are available on-site: banking, convenience store, dry cleaner, exercise facilities, food court, food service, mail room, restaurant, retail shops, vending areas, fitness centre.

Table 1. Descriptive statistics

Variables	Non-managed sample (1)	Managed sample (2)	Difference (1)−(2) (3)	Propensity score weighted sample (4)	Difference (4)−(2) (5)
Rent ($ per sq. ft.)	18.10	20.88	−2.79***	19.48	−1.40***
	[11.81]	[11.13]		[13.54]	
Effective rent ($ per sq. ft.)	13.91	16.72	−2.81***	15.41	−1.31***
	[11.43]	[10.65]		[13.18]	
Occupancy (percent)	75.07	78.48	−3.41***	77.24	−1.23***
	[23.12]	[19.27]		[21.75]	
Size (thousand sq. ft.)	59.85	132.77	−72.92***	102.26	−30.51***
	[111.23]	197.97]		[158.39]	
Building class (percent)					
Class A	0.14	0.32	−0.18***	0.23	−0.08***
Class B	0.55	0.54	0.01*	0.54	0.01
Class C	0.31	0.15	0.17***	0.22	0.08***
Age (years)	37.46	35.36	2.09***	37.46	2.09***
	[29.63]	[26.16]		[29.28]	
Age (percent)					
Less than 10 years	0.13	0.08	0.05***	0.12	0.04***
11–20 years	0.11	0.11	0.00	0.11	0.00
21–30 years	0.30	0.41	−0.11***	0.32	−0.09***
31–40 years	0.17	0.19	−0.02***	0.17	−0.02***
41–50 years	0.08	0.06	0.02***	0.08	0.02***
Over 50 years	0.20	0.15	0.05***	0.20	0.05***
Stories (number)	3.93	7.02	−3.10***	5.72	−1.30***
	[5.34]	[8.72]		[7.35]	
Stories (percent)					
Low (<10)	0.93	0.81	0.12***	0.86	0.05***
Medium (11–20)	0.05	0.12	−0.07***	0.09	−0.03***
High (>20)	0.02	0.07	−0.05***	0.05	−0.02***
Renovated (percent)	0.18	0.26	−0.08***	0.23	−0.03***
On-site amenities (percent)	0.20	0.39	−0.19***	0.31	−0.08***
Public transport (percent)	0.13	0.21	−0.08***	0.17	−0.04***
Observations	14,188	7465		14,188	

Notes: Standard deviations in brackets. Significant differences on the 0.10, 0.05 and 0.01 level are denoted by *, ** and ***, respectively.

building characteristics for the propensity score weighted non-managed sample are summarized in Column (4) of Table 1. Applying these propensity score weights reduces the difference between the managed and non-managed sample for almost every variable. Nevertheless, as the significant differences in the last column of Table 1 demonstrate, propensity score weighting is not able to completely neutralize the differences between the two samples.[7]

7 The estimation procedure for the propensity score weights that we apply in the analyses and the robustness of our results with respect to the propensity score specification are discussed elaborately in online Appendix C.

Table 2. Non-local ownership and distance

	Non-local ownership				Average distance (miles)	Median distance (miles)
	Out of the zip code area	Out of city	Out of the CBSA	Out of state		
Panel A: Building class						
Total	15.73%	22.98%	6.32%	24.23%	237.2 [537.8]	5.4
Class A	9.08%	17.70%	6.10%	49.79%	508.5 [745.8]	65.6
Class B	16.39%	23.70%	6.90%	21.89%	209.0 [490.8]	5.2
Class C	19.49%	25.52%	5.25%	9.25%	87.2 [323.8]	2.4
Panel B: External property management						
Total	15.73%	22.98%	6.32%	24.23%	237.2 [537.8]	5.4
Managed buildings	12.67%	19.41%	6.93%	40.07%	425.7 [685.1]	16.3
Non-managed buildings	17.35%	24.85%	6.01%	15.90%	138.0 [407.4]	3.5

Notes: Standard deviations in brackets. Local ownership for the total sample, by building class, and property management categories is displayed in percentages.

3.3. Investor proximity in the US office markets

The CoStar data allow us to take a first look at the extent to which office ownership is local, and whether that differs across segments of the office market. We define local ownership using administrative boundaries and with distance measured in miles. Taking the administrative angle, we define an owner as local when she is located in the same zip code area as her building, and then look incrementally at the effect of increased distance for owners located in that city, that CBSA, that state or in other states. We use a real estate owner's headquarters as the location for that owner.

Table 2 sheds some light on investor distances. The first row of Panels A and B of the table provide local ownership and owner distance information for the sample as a whole. We do not have data on the portfolio composition of these asset owners, so we cannot directly observe local bias in that perspective. Nonetheless, Table 2 does provide some intriguing indirect information regarding this issue as well. For example, if we define local as being in the same state, 76% of the offices in our sample are owned by local investors. The median owner distance for the sample as a whole is only 5.4 miles, but the average is 237 miles.[8] This big difference between the mean and the median distance is caused by a limited number of nation-wide owners that operate out of one central location.

8 Online Appendix D presents detailed distribution figures of owner distance across building classes and management types.

The bottom three rows of Panel A of the table differentiate across the three quality categories A, B and C, depicting the importance of local versus non-local ownership for each quality category. It turns out that no matter how we define local, the local investors tend to invest in lower-quality office buildings and vice versa. For class-C buildings, more than 90% of the owners reside in the same state. That number is much lower for better quality assets, but even if we look at the A-labeled office buildings (for which non-local ownership is most common) we observe that more than 50% of the owners are based in the same state. When we look at owner distance measured in miles, class-A buildings stand out. For B- and C-rated buildings, the median distance is just a few miles, but for class A-buildings, it is more than 65 miles. So far-away owners have a clear preference for the best buildings.

It can be argued that class-C buildings are of a more speculative kind when compared with A and B buildings, and the tendency to invest in higher quality buildings when being further away can be explained by a decreasing risk appetite or increasing risk perception. On the other hand, this finding might be explained by easier access to salient local information regarding such issues as the preferences and needs of existing and potential tenants and their willingness to pay for office space. Another issue that possibly plays a role here is that occupiers of class-A offices are often large nationwide organizations such as banks, consultancy companies and accounting firms, so local tenant information may matter less for these buildings.

Panel B of Table 2 compares the four degrees of local ownership and the distance measured in miles across buildings with and without an external property manager. The bottom two rows of Panel B clearly show that distant ownership is more likely when a building is externally managed and this holds for all four definitions of local ownership. Moreover, owners rarely invest outside of their home state without retaining a property manager. Less than 16% of the buildings without a property manager have an out-of-state owner. If an external property manager is present, this increases to 40%. The difference in distant ownership between the externally managed buildings and the other buildings in the sample is statistically significant for each of the four distance definitions.

These results provide an initial indication of a pattern in investor proximity in commercial real estate investments. They show a clear link between asset quality and investor proximity, and they also show that out-of-town investors are most likely to retain external property managers.

4. Empirical framework

To investigate how proximity relates to the rent level, we employ the standard hedonic valuation framework for real estate (Rosen, 1974). The sample of buildings is used to estimate a semi-log equation relating the average weighted rent, occupancy rate and effective rent to the characteristics and location of each building.

$$logR_i = \alpha + \sum_j \beta_j X_{i,j} + \delta L_i + \varepsilon_i. \quad (1)$$

In our base model in Equation (1), the dependent variable is the logarithm of R_i, which is either the effective rent per square foot, the average weighted rent per square foot or the occupancy rate of building *i*. $X_{i,j}$ is a vector of hedonic characteristics *j* (size, age, number of stories, etc.) and a location dummy for building *i* (based on the five-digit

zip code). L_i is the main variable of interest in our model. It is an indicator variable taking the value of 1 when building i is owned by an out-of-town investor and zero otherwise, where out-of-town ownership is defined as the owner residing in a different zip code area, city, CBSA or state relative to the building. α is a constant, β_j and δ are coefficients and ε_i is an error term. δ is thus the average effect associated with out-of-town ownership, in percent, when compared with otherwise similar buildings owned by local owners.

In a second set of estimates, we include additional terms in Equation (1), measuring the physical distance (in miles) between the asset and the owner to further disentangle the effect of out-of-town ownership.

Interaction terms to measure the impact of the use of external property managers are included at a later stage as well. To account for quality differences between the samples of externally and internally managed buildings we employ propensity score weighting. The approach applied here is similar to the one used by Eichholtz et al. (2010). We use propensity score weighting to reduce the selection bias between the managed sample and the non-managed sample by weighting on the hedonic characteristics of the individual buildings. Using a logit model, differences between the 'treated' buildings that have an external property manager and the 'non-treated' buildings are moderated by estimating the propensity of having a property manager for all buildings in the sample. Subsequently these propensity scores are used in a weighted least squares regression of Equation (1).[9]

5. Results

5.1. Proximity premium and distance discount

We test the impact of proximity and distance on the financial performance of office buildings in two ways: by defining distance based on four administrative levels and by the physical distance between the owner and the building. We assess administrative distance incrementally, and use local ownership (in the same zip code area) as the excluded category. We first study the effect of proximity and distance on the effective rent, which is the total gross cash flow received by a landlord. To get a more in-depth picture of the nature of the effects, we look separately at the average contract rent and the occupancy rate, the two building blocks of the effective rent. The analyses presented in this section control for all available building characteristics and include location fixed effects on the zip code level.

Columns (1) and (2) of Table 3 display the results for effective rent, first regarding administrative distance, and then distance in miles. Column (1) shows a consistent relation between owner distance and effective rent: a distant owner receives a rental discount relative to a local one, and the size of that discount depends on the definition of local ownership.[10] Landlords located in another zip code area than their building but within the same city receive a 6.8% rental discount relative to those residing in the same zip code area. The discount for those outside the city but within the same CBSA is not much different: 6.4%. When we go further, it drops to 10.1%, for owners residing outside of their building's CBSA, and 9.2% for owners outside of their building's state.

9 Online Appendix C provides a detailed discussion of the propensity score weighting procedure that we employ and the robustness of the results with respect to the specification of the propensity scores.

10 Of course, we can also interpret these results as a premium for local ownership.

Table 3. Local ownership and rent value (dependent variables: logarithm of effective rent, average weighted rent and occupancy rate per square foot)

Variables	Effective rent		Average rent		Occupancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Owner non-local	−0.068***		−0.007		−0.060***	
zip code area (1 = yes)	[0.016]		[0.007]		[0.014]	
Owner non-local city (1 = yes)	−0.064***		−0.012*		−0.051***	
	[0.013]		[0.006]		[0.011]	
Owner non-local CBSA (1 = yes)	−0.101***		−0.022**		−0.079***	
	[0.024]		[0.010]		[0.021]	
Owner non-local state (1 = yes)	−0.092***		−0.007		−0.085***	
	[0.013]		[0.007]		[0.011]	
Owner distance		−0.117***		−0.022		−0.095***
		[0.037]		[0.019]		[0.030]
Owner distance^2		0.070**		0.016		0.054**
		[0.029]		[0.016]		[0.022]
Owner distance^3		−0.011**		−0.003		−0.008**
		[0.005]		[0.003]		[0.004]
Log size (thousand sq. ft.)	0.126***	0.123***	0.039***	0.040***	0.086***	0.083***
	[0.008]	[0.008]	[0.003]	[0.003]	[0.007]	[0.007]
Stories (1 = yes)						
Medium (10–20)	−0.003	−0.002	0.006	0.006	−0.009	−0.008
	[0.018]	[0.017]	[0.010]	[0.010]	[0.015]	[0.015]
High (>20)	−0.010	−0.008	−0.016	−0.015	0.006	0.007
	[0.029]	[0.029]	[0.017]	[0.017]	[0.022]	[0.022]
Building class (1 = yes)						
Class A	0.195***	0.193***	0.212***	0.213***	−0.017	−0.019
	[0.024]	[0.024]	[0.010]	[0.010]	[0.020]	[0.020]
Class B	0.079***	0.078***	0.093***	0.093***	−0.014	−0.016
	[0.016]	[0.016]	[0.007]	[0.007]	[0.014]	[0.014]
Age (1 = yes)						
Less than 10 years	0.114***	0.114***	0.158***	0.158***	−0.044*	−0.044*
	[0.027]	[0.027]	[0.013]	[0.013]	[0.024]	[0.024]
11–20 years	0.085***	0.083***	0.083***	0.083***	0.003	0.000
	[0.027]	[0.027]	[0.013]	[0.013]	[0.023]	[0.023]
21–30 years	0.024	0.019	0.033***	0.032***	−0.009	−0.013
	[0.023]	[0.023]	[0.011]	[0.011]	[0.019]	[0.019]
31–40 years	0.001	−0.001	0.006	0.006	−0.005	−0.007
	[0.023]	[0.023]	[0.012]	[0.012]	[0.019]	[0.019]
41–50 years	0.001	−0.001	0.008	0.008	−0.007	−0.009
	[0.024]	[0.024]	[0.011]	[0.011]	[0.020]	[0.020]
Renovated (1 = yes)	−0.018	−0.021	0.012*	0.011*	−0.030***	−0.032***
	[0.013]	[0.013]	[0.006]	[0.006]	[0.011]	[0.011]
On-site amenities (1 = yes)	0.034***	0.033**	0.028***	0.028***	0.006	0.006
	[0.013]	[0.013]	[0.006]	[0.006]	[0.011]	[0.012]
Public transport (1 = yes)	0.021	0.021	0.028**	0.028**	−0.007	−0.007
	[0.027]	[0.027]	[0.013]	[0.013]	[0.024]	[0.024]
Location fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,653	21,653	21,653	21,653	21,653	21,653
R^2	0.41	0.41	0.70	0.70	0.15	0.15
Adjusted R^2	0.35	0.34	0.67	0.66	0.06	0.06

Notes: Standard errors clustered at the zip code level in brackets. Significance at the 0.10, 0.05 and 0.01 level is indicated by *, ** and ***, respectively.

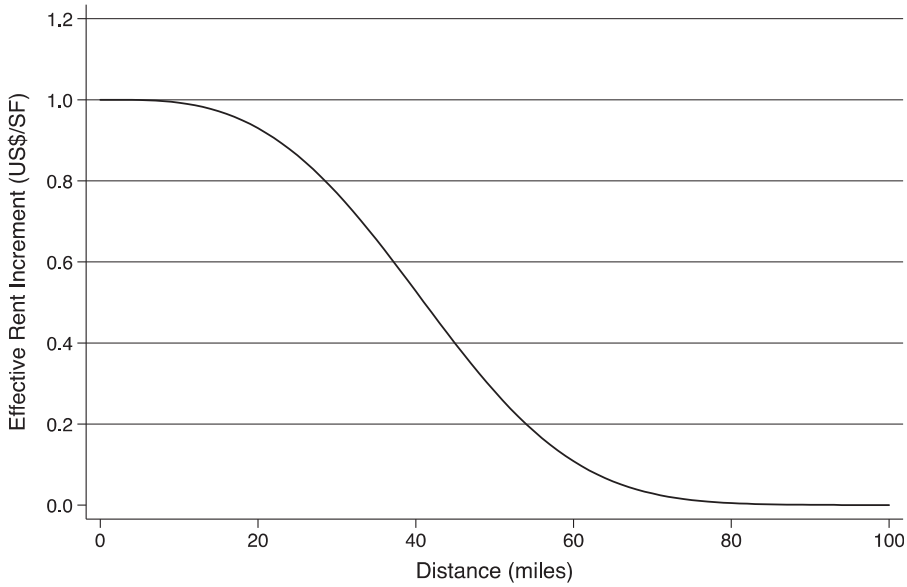

Figure 2. Effective rent and owner distance.

The discount is statistically significant in all cases. So investing very locally seems to be most beneficial in terms of rent level, and once an owner is located further than a building's CBSA borders, additional distance seems not to matter.

In order to grasp the economic implications of the 6.4–10.1% rent discount for distant ownership, we use the average building size to estimate the average rental discount (or premium) in dollars. This leads to an annual effective rent difference in the range of 81,000 to 128,000 dollars per building. By applying a capitalization rate of 6%, we estimate the value of a locally owned building to be 1.3 to 2.1 million dollars higher than an otherwise comparable non-locally owned building. This is interesting, since Ling et al. (2013) find that far-away owners, on average, buy buildings at a premium. Combining our findings with theirs, we can conclude that distant owners have a double handicap in the real estate market.

Column (2) of Table 3 reports the results for straight-line physical distance (in miles) between the owner and her asset. The results show a highly significant non-linear relationship between owner distance and the effective rent level as displayed by the coefficients for owner distance, owner distance squared and owner distance to the third power. This relationship can be translated into the gradient for the effective rent increment presented in Figure 2. As displayed, the effective rent increment first decreases at an accelerating rate when owner distance increases and then flattens out when the distance of the owner to her asset is large. For owner distances above 80 miles, the effective rent increment is zero.

Thus, local owners get consistently higher rents, the question is why. The effective rent is the result of the contract rent and the occupancy rate. It is possible that local landlords get higher contract rents, perhaps through better negotiation power deriving from superior local market knowledge. However, that would also price them out of the market, since rational tenants would then prefer out-of-town landlords to get better deals at the negotiation table. It is more likely that local landlords outsmart their

distant rivals by finding tenants in the first place, i.e., that local landlords have consistently lower vacancies in their buildings. Columns (3)–(6) of Table 3 provide the empirical evidence.

Columns (3) and (4) show that distance does not matter much for the average contract rent received by a building's owner. Although we do find a statistically significant distance effect for landlords located outside of their building's city and CBSA, the effect is economically small. Measured in miles, we find no significant effect at all.

For the occupancy rate, however, the effects are in line with those we document for the effective rent, both in terms of size and in terms of statistical significance. So the information advantage that local owners have does not seem to be relevant in rental negotiations, but rather in the maintenance of active knowledge about the needs and space preferences of the current and potential tenants and of a network of possible new tenants.

In Table 2, we show that investment decisions and building quality are related: investors apparently are more willing to invest in distant buildings when they are of high (A) quality, while they tend to stay closer to home for lower quality buildings. That choice may be driven by the premiums and discounts related to owner proximity and distance.

In order to test this, we re-estimate Equation (1) for each of the three building quality classes separately. The estimation outcomes reported in Table 4 are based on the effective rent model of Table 3, including building characteristics and location fixed effects, but for brevity we only report the variables of interest. The results are clear: the lower the quality of a building is, the bigger is the penalty for being far away from it. For class-A buildings, we find a significant distance discount only for out-of-state owners, and it is 4.8%. For class-B buildings, the discount is significant for all definitions of administrative distance, and varies between 4.8% and 10%, and for class-C buildings, it is even higher, varying between 9.2% and 22.1%.[11] Therefore, it seems that owners are justified to avoid low-quality buildings that are far away.

This finding is closely in line with Ivkovic and Weisbrenner (2001) and Bodnaruk (2009), who also find that the adverse effects of distance to one's assets are especially significant for lower quality and more risky assets. It may be caused by increased information asymmetries resulting from investment in such assets.

5.2. Owner distance and property management

In the previous section we establish that owner proximity has a significantly positive impact on the effective rent level of a building, or put in other words, that owner distance carries a rental discount. We also note that the rental difference between locally and non-locally owned buildings is largest for low-quality buildings. Given these findings, this section investigates whether an external property manager can mitigate the adverse effects associated with being far away from one's asset.

11 In contrast to the results documented for administrative distance in Column (5) the coefficients for owner distance, owner distance squared and owner distance to the third power in Column (6) are not significant. This is caused by dependence between the polynomial terms. In an alternative specification we only include owner distance and owner distance squared to test the non-linear relationship between owner distance and the effective rent per square foot for class-C buildings. This specification yields a significant coefficient for owner distance squared; the coefficient for owner distance is only borderline significant. However, for consistency reasons we report on all three measurements of distance in Column (6).

Table 4. Local ownership and rent value, by building class (dependent variable: logarithm of effective rent per square foot)

Variables	Class A		Class B		Class C	
	(1)	(2)	(3)	(4)	(5)	(6)
Owner non-local zip code area (1 = yes)	−0.031 [0.031]		−0.067*** [0.023]		−0.092** [0.041]	
Owner non-local city (1 = yes)	−0.033 [0.029]		−0.048*** [0.018]		−0.131*** [0.040]	
Owner non-local CBSA (1 = yes)	−0.043 [0.046]		−0.088** [0.039]		−0.221*** [0.064]	
Owner non-local state (1 = yes)	−0.048** [0.024]		−0.100*** [0.020]		−0.116* [0.069]	
Owner distance		−0.031 [0.056]		−0.184*** [0.064]		−0.449 [0.295]
Owner distance^2		0.008 [0.036]		0.140** [0.056]		0.403 [0.305]
Owner distance^3		0.001 [0.005]		−0.029** [0.012]		−0.079 [0.074]
Building characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Location fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4282	4282	11,849	11,849	5522	5522
R^2	0.54	0.54	0.40	0.40	0.43	0.42
Adjusted R^2	0.41	0.41	0.29	0.28	0.21	0.21

Notes: Standard errors clustered at the zip code level in brackets. Significance at the 0.10, 0.05 and 0.01 level is indicated by *, ** and ***, respectively.

In the commercial real estate market external property managers are often hired to manage the day-to-day operations of an asset. A specialized property manager might positively influence the quality of a building and subsequently the cash flow of the building due to superior skills and expertise. Ling and Archer (2010) define a property manager as the company or individual responsible for the day-to-day operations of a building. As such, property management is perceived as a means to preserve or enhance the quality of a building, thereby increasing tenant satisfaction, which may in turn affect rent levels and/or occupancy.

We establish the economic benefit of an external property manager by adding a dummy to Equation (1), taking the value of 1 if an external property manager is active in a building, and zero otherwise. We also interact these variables with the out-of-town ownership variables. We focus the analysis on the effective rent per square foot, and subsequently also distinguish between average contract rent and occupancy rate.

Table 5 displays the regression results, again distinguishing four sets of boundaries defining local ownership, as well as straight-line distance between the owner and her building. The table consistently shows a negative effect of out-of-town ownership, of which the magnitude is in line with the results we previously reported in Table 3. More importantly, however, the table also makes clear that external property management has a significantly positive impact on the effective rent level in some cases, partly mitigating the negative distance effect. The effect of the external property manager alone is highest in the specifications without the interaction terms between the property

manager dummy and the owner location dummies. In these cases, an external property manager is associated with a rental premium of 3.6–3.7%. When we do include these interaction terms, in Column (3), we find that property managers only add significant value for out-of-state owners. We find a premium of 5.4% associated with property management, considerably reducing the distance discount of 12.5% for these owners. Nevertheless, when we test the combined effect of non-local ownership and property management, it remains significantly negative in all cases.

If we look at distance as the crow flies (Column (4)), again using distance, distance squared and distance to the third power, we find a similar owner distance effect as before. However, we also find that both the effect of an external property manager alone and the interaction of the property management dummy with these distance terms significantly and consistently mitigate that effect. So an external property manager is able to partly offset the negative effects associated with far-away ownership.

In further analyses not reported in the table, we separate the effective rent into the average contract rent and the occupancy rate to see where external property managers add value. We only find a significant effect of external property management in the latter, and not in the former. This suggests that property managers are important in finding and retaining tenants rather than in the rent negotiations with these tenants.[12]

5.3. Building quality and property management

To further determine the factors that influence the observed impact of proximity we perform a set of subsample analyses based on the different quality categories of the buildings. Specifically, we use the same models as presented in Table 5 separately for each building quality class, A, B and C.

Table 6 displays the results for the building class subsamples, with the odd columns reporting results for administrative distance and the even columns distance in miles. The key results of Table 6 are those concerning the effects of external property management, which are very interesting. It appears that external property management does not add much value for distant owners of class-A buildings. We find that the coefficients for the external property manager dummy and its interaction with distance tend to have positive signs, but these coefficients are never statistically significant, no matter how we delineate local and distant ownership. Interestingly, despite the apparent inability for external property management to add value in this building class, this is the building class in which the service is most common: about 55% of class-A office buildings have an external property manager. That makes it likely that these property managers add value in another way, not reflected in our data.

For class-C buildings also, the manager dummy and interaction coefficients are not statistically significant. The general lack of significance may be caused by the fact that both far-away ownership and external property management are quite rare in class-C office buildings. The median distance between these buildings and their owners is only 2.4 miles, and less than 10% of class-C assets are owned out-of-state. Additionally, only 20% of these buildings have an external property manager.

External property management seems most salient and beneficial for class-B buildings. Salient, since external property management is quite common for that

12 Table E1 in online Appendix E displays the results using the average weighted rent per square foot and occupancy rate as dependent variables.

Table 5. Property management and local ownership (dependent variable: logarithm of effective rent per square foot)

Variables	(1)	(2)	(3)	(4)
Property manager (1 = yes)	0.037***	0.036***	0.013	0.022*
	[0.011]	[0.011]	[0.016]	[0.012]
Owner non-local zip code	−0.068***		−0.075***	
area (1 = yes)	[0.016]		[0.019]	
Owner non-local city (1 = yes)	−0.064***		−0.067***	
	[0.013]		[0.017]	
Owner non-local CBSA (1 = yes)	−0.104***		−0.103***	
	[0.025]		[0.035]	
Owner non-local state (1 = yes)	−0.099***		−0.125***	
	[0.014]		[0.020]	
Owner non-local zip code area,			0.024	
property manager (1 = yes)			[0.031]	
Owner non-local city,			0.014	
property manager (1 = yes)			[0.024]	
Owner non-local CBSA,			0.007	
property manager (1 = yes)			[0.042]	
Owner non-local state,			0.054**	
property manager (1 = yes)			[0.023]	
Owner distance		−0.135***		−0.254***
		[0.039]		[0.069]
Owner distance^2		0.079***		0.165***
		[0.030]		[0.057]
Owner distance^3		−0.012**		−0.024**
		[0.005]		[0.011]
Owner distance,				0.191**
property manager				[0.075]
Owner distance^2,				−0.136**
property manager				[0.062]
Owner distance^3,				0.019
property manager				[0.012]
Building characteristics	Yes	Yes	Yes	Yes
Location fixed effects	Yes	Yes	Yes	Yes
Observations	21,653	21,653	21,653	21,653
R^2	0.41	0.41	0.41	0.41
Adjusted R^2	0.35	0.34	0.35	0.35

Notes: Standard errors clustered at the zip code level in brackets. Significance at the 0.10, 0.05 and 0.01 level is indicated by *, ** and ***, respectively.

building class, and that also holds for distant ownership. Beneficial, since we find large and statistically significant effects of property management at the state level. Hence, when owners of class-B buildings are further away they benefit more from retaining external property managers. Furthermore, the significant effect we find substantially reduces the distance discount. For example, at the state level, where we find the strongest effect, the distance discount is 14.9%, and external property management reduces that discount by 11.2%.

When we look at physical owner distance in miles, we find that external property management only adds value for class-B buildings (Column (4)). Whereas the

Table 6. Property management and local ownership, by building class (dependent variable: logarithm of effective rent per square foot)

Variables	Class A		Class B		Class C	
	(1)	(2)	(3)	(4)	(5)	(6)
Property manager (1 = yes)	−0.007	0.037	0.040*	0.024	−0.009	0.015
	[0.032]	[0.023]	[0.022]	[0.017]	[0.049]	[0.032]
Owner non-local zip code area (1 = yes)	−0.034		−0.062**		−0.117**	
	[0.039]		[0.028]		[0.049]	
Owner non-local city (1 = yes)	−0.055		−0.037		−0.147***	
	[0.041]		[0.024]		[0.049]	
Owner non-local CBSA (1 = yes)	−0.111		−0.091*		−0.203***	
	[0.082]		[0.054]		[0.074]	
Owner non-local state (1 = yes)	−0.082**		−0.149***		−0.162*	
	[0.039]		[0.030]		[0.088]	
Owner non-local zip code area,	0.010		−0.015		0.108	
property manager (1 = yes)	[0.056]		[0.048]		[0.086]	
Owner non-local city,	0.055		−0.031		0.061	
property manager (1 = yes)	[0.050]		[0.035]		[0.076]	
Owner non-local CBSA,	0.122		0.003		−0.066	
property manager (1 = yes)	[0.090]		[0.055]		[0.128]	
Owner non-local state,	0.051		0.072**		0.138	
property manager (1 = yes)	[0.042]		[0.034]		[0.111]	
Owner distance		−0.086		−0.529***		−0.990*
		[0.099]		[0.163]		[0.513]
Owner distance^2		0.044		0.534***		1.126*
		[0.066]		[0.196]		[0.638]
Owner distance^3		−0.002		−0.139**		−0.302*
		[0.010]		[0.057]		[0.179]
Owner distance, property manager		0.040		0.434**		0.801
		[0.103]		[0.171]		[0.556]
Owner distance^2, property manager		−0.033		−0.463**		−0.925
		[0.073]		[0.199]		[0.671]
Owner distance^3, property manager		0.002		0.123**		0.271
		[0.011]		[0.057]		[0.184]
Building characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Location fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4282	4282	11,849	11,849	5522	5522
R^2	0.54	0.54	0.40	0.40	0.43	0.43
Adjusted R^2	0.41	0.41	0.29	0.29	0.21	0.21

Notes: Standard errors clustered at the zip code level in brackets. Significance at the 0.10, 0.05 and 0.01 level is indicated by *, ** and ***, respectively.

coefficients of the property manager interaction with owner distance, distance squared and distance to the third power always have signs opposing the distance effects, these coefficients are only statistically significant for class-B buildings. In that case, the size of the coefficients is of such magnitude that much of the owner distance effect is cancelled out. So when property management matters, it seems to matter a lot.

Figure 3 further illustrates the effects of property management by outlining the effects of owner distance measured in miles, on the basis of the functional form found in Table 6. The graph concerns class-B office buildings only. The solid line in Figure 3

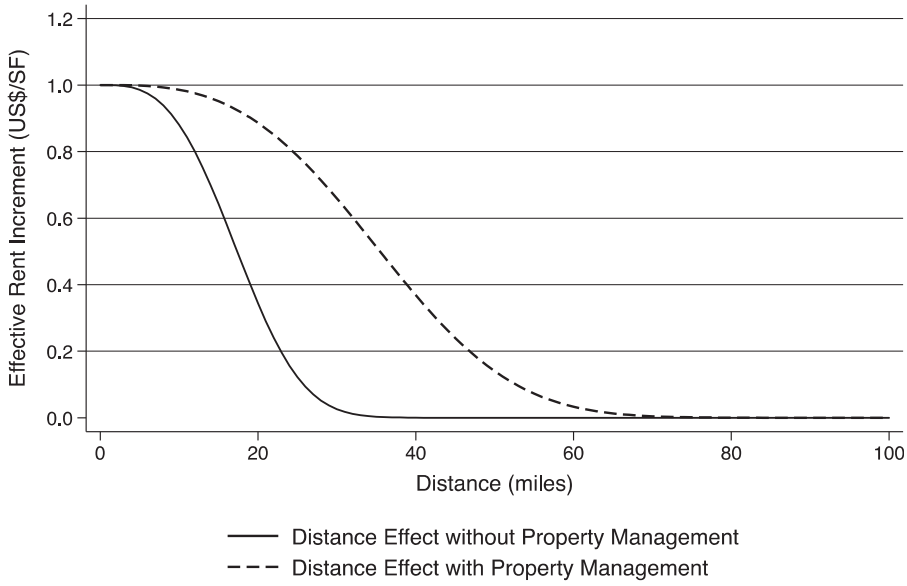

Figure 3. Effective rent, owner distance and property management—class B.
Notes: The above figure displays the non-linear relationship between the effective rent of an asset and owner distance including the mitigating impact of external property management for Class-B buildings only. Straight line, distance effect without property management; dashed line, distance effect with property management.

depicts the distance effect without property management, and has the same general shape as the one we reported for the total sample in Figure 2, albeit with a faster diminishing rent increment for increasing distances. The dashed line represents the distance effect with property management, i.e., the rent increment of distance and property management combined. That line suggests that property management allows owners to be located further away from their assets without suffering the consequences in rental discount. For example, an average owner of a building located 24 miles away receives a rent increment of 0.20 dollars per square foot, and if she would retain an external property manager, she would still get the same rent when located at a distance of approximately 42 miles. For any owner distance up until 70 miles, the services of an external property manager add value in terms of higher rents. Given that the median owner distance to a class-B office building is 5.2 miles, this is a very significant finding.

In our final analysis, we aim to shed more light on the importance of the quality of an external property manager. The CoStar database does not provide direct information on management quality, but we do have information about the size of the management companies, and size could be a proxy for quality. Larger property management firms, sometimes operating on a national scale, are likely to be more professional than smaller ones in terms of staff recruitment and training. Firms like Transwestern and Jones Lang LaSalle have a nationwide franchise and an excellent reputation, both in the real estate and in the job market. On the other hand, these bigger firms operate, almost by definition, less local than very small property management organizations, and this article shows how important local presence is in the office rental market. So it is not clear ex ante how property managers' size and added value are related.

Table 7. Property management categories and local ownership (dependent variable: logarithm of effective rent per square foot)

Variables	(1)	(2)
Property manager—small (1 = yes)	0.043***	0.044***
	[0.013]	[0.013]
Property manager—medium (1 = yes)	0.047***	0.043***
	[0.014]	[0.014]
Property manager—large (1 = yes)	0.019	0.017
	[0.016]	[0.016]
Owner non-local zip code area (1 = yes)	−0.068***	
	[0.016]	
Owner non-local city (1 = yes)	−0.064***	
	[0.013]	
Owner non-local CBSA (1 = yes)	−0.103***	
	[0.025]	
Owner non-local state (1 = yes)	−0.096***	
	[0.014]	
Owner distance		−0.127***
		[0.039]
Owner distance^2		0.075**
		[0.030]
Owner distance^3		−0.012**
		[0.005]
Building characteristics	Yes	Yes
Location fixed effects	Yes	Yes
Observations	21,653	21,653
R^2	0.41	0.41
Adjusted R^2	0.35	0.34

Notes: Standard errors clustered at the zip code level in brackets. Significance at the 0.10, 0.05 and 0.01 level is indicated by *, ** and ***, respectively.

We estimate the size of a property management organization by looking how often it appears in the dataset, and we have created three different property manager categories by size. Property managers who appear in our dataset only once are categorized as 'small'. For the remainder set of managers, we count the number of times they appear in the dataset, and then classify those appearing less than the median as 'medium' and the remainder as 'large'. These three groups comprise approximately 34%, 33% and 33% of the sample, respectively, counted by the number of observations.

We find a clear relationship between manager size and owner distance: for the small group, the average owner distance is 242 miles, and that goes up to 380 and 659 miles for the medium and large groups, respectively. We also find that the median distance between the small managers and the buildings they manage is 1 mile, while the median distance between the asset and the medium and large managers is approximately 2.5 miles.

Table 7 shows that only small- and medium-sized property managers add value, delivering an average rental premium of 4.3% and 4.7%, respectively. For the large managers, we do not find a significant rental premium. So even if larger property managers may be associated with more professional organizations, they do not add

more value. Local presence, likely leading to better access to local information, seems to be more important.[13]

6. Conclusion and discussion

The aim of this study is to investigate three unexplored questions related to owner distance and proximity in the direct commercial real estate market. First, does the US office property market exhibit patterns in owner proximity, and if so, what does that pattern look like? Second, is there a relation between the economic performance of office buildings and the proximity (or distance) of their owners? Third, do external service providers such as property managers affect that relation?

We address these central questions by analysing a dataset of 21,653 US office buildings in 2011. We find evidence for a clear pattern in investor proximity: about half the office buildings in our sample have owners located in the same city, and more than 75% are located in the same state. Also, if building quality goes up, so does the likelihood of distant ownership, no matter whether we demarcate distant and local owners at the zip code, city, CBSA or state level.

As for the effect of distant ownership on the economic performance of office buildings, we find results that are statistically and economically significant. Far-away ownership comes at a significant discount, varying between 6.4% and 10.1% for the sample as a whole, depending on the definition of distance. This implies that the average office building's value goes down with approximately 1.3 to 2.1 million dollars when the owner is far away. Building quality plays an important role in this: moving away from high-quality buildings increases the negative rent effects related to owner distance. For class-C buildings, average distance discounts are as high as 22.1%. When we measure owner distance linearly in miles, we also find a negative effect of distance on rent levels. The marginal effect is strong at short distances, and then gradually diminishes as distance increases, reducing to zero for distances of 80 miles and more.

Regarding our third research question, we find that external property managers are most likely to be employed by far-away property owners. This seems to be justified: we find that the premium associated with their presence tends to be higher if the owner is far away, but this effect is only visible in class-B office buildings. Moreover, we find that small property management firms, which are more closely located to the properties they manage, add more value. So certain property managers reduce the owner distance discount, enabling owners to be located further from their buildings while sacrificing less rent.

Our findings have important implications for the construction of office portfolios. Diversification has been called the only free lunch, but our results show that even this meal comes with a bill. Diversifying across the nation may still be best from a pure risk

13 It is possible that property managers engage in self-selection for certain buildings. Property managers are likely to prefer the management of buildings that are close by, for two reasons. The first is that they are probably aware of the fact that their information advantage is larger for these buildings, and the second is that it improves their quality of life, since it avoids travel time. This is analogous to Dahl and Sorensen (2012), in which entrepreneurs are assumed to stay close to home for informational as well as social reasons. If the latter motivation would be dominant, this would likely decrease the positive rental effect of (nearby) property managers, whereas the former motivation would strengthen the effect. Since we find that local managers add the most value, we infer that self-selection, if present at all, is likely to be motivated by informational considerations.

reduction point of view, but may not lead to optimal risk-return outcomes. Distant owners seem to receive lower returns on their asset, not just because they get a lower rent, but also because they overpay (Ling et al., 2013). This implies a trade-off between the risk reduction effect of regional diversification and the benefits of local specialization. Building owners manage this trade-off by selecting on asset quality and by retaining external property managers.

Supplementary material

Supplementary data for this paper are available at *Journal of Economic Geography* online.

Acknowledgements

The authors are grateful to Kristian Behrens, two anonymous referees, Brent Ambrose, Dirk Brounen, Stephen Cauley, John Clapp, Irem Demirci, Avis Devine, David Downs, Tommaso Gabrieli, Jay Hartzell, Nils Kok, David Ling, Mehmet Ozsoy, Kelly Pace, Anthony Pennington-Cross, David Pogue, Tim Riddiough, Bertram Steininger as well as participants to the Henley Business School seminar series, the European Real Estate Society Conference 2012, the 2013 Investment Choices and Performance in Indirect Property Investment Symposium at Maastricht University, the AREUEA International Conference 2013, the AREUEA Annual Conference 2014, the Financial Management Association European Conference 2014 and the Özyeğin University seminar series for their helpful comments. All errors pertain to the authors.

References

Agarwal, S., Hauswald, R. (2010) Distance and private information in lending. *The Review of Financial Studies*, 23: 2757–2788.

Ahearne, A. G., Griever, W. L., Warnock, F. E. (2004) Information costs and home bias: An analysis of US holdings of foreign equities. *Journal of International Economics*, 62: 313–36.

Bernstein, S., Giroud, X., Townsend, R. (2014) The Impact of Venture Capital Monitoring: Evidence from a Natural Experiment. *The Journal of Finance,* forthcoming. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id = 2341329.

Bodnaruk, A. (2009) Proximity always matters: Local bias when the set of local companies changes. *Review of Finance*, 13: 629–656.

Bronnenberg, B. J., Dhar, S. K., Dubé, J.-P. H. (2009) Brand history, geography, and the persistence of brand shares. *Journal of Political Economy*, 117: 87–115.

CoStar Realty Information Inc. (2011) CoStar Property. http://www.costar.com [accessed 25 November 2011].

Coval, J. D., Moskowitz, T. J. (1999) Home bias at home: Local equity preference in domestic portfolios. *The Journal of Finance*, 54: 2045–2073.

Coval, J. D., Moskowitz, T. J. (2001) The geography of investment: Informed trading and asset prices. *Journal of Political Economy*, 109: 811–841.

Dahl, M. S., Sorenson, O. (2012) Home sweet home: Entrepreneurs' location choices and the performance of their ventures. *Management Science*, 58: 1059–1071.

Degryse, H., Ongena, S. (2005) Distance, lending relationships, and competition. *The Journal of Finance*, 60: 231–266.

Eichholtz, P. M. A., Gugler, N., Kok, N. (2011) Transparancy, integration, and the cost of international real estate investment. *Journal of Real Estate Finance and Economics*, 43: 152–173.

Eichholtz, P. M. A., Kok, N., Quigley, J. M. (2010) Doing well by doing good: Green office buildings. *American Economic Review*, 100: 2494–2511.

Eichholtz, P. M. A., Koedijk C. G., Schweitzer, M. (2001) Global property investment and the costs of international diversification. *Journal of International Money and Finance*, 20: 349–366.

French, K. R., Poterba, J. M. (1991) International diversification and international equity markets. *American Economic Review*, 81: 222–226.
Giroud, X. (2013) Proximity and investment: Evidence from plant-level data. *The Quarterly Journal of Economics*, 128: 861–915.
Huberman, G. (2001) Familiarity breeds investment. *The Review of Financial Studies*, 14: 659–680.
Ivkovic, Z., Weisbenner, S. (2001) Local does as local is: Information content of the geography of individual investors' common stock investments. *The Journal of Finance*, 60: 267–306.
Kalnins, A., Lafontaine, F. (2013) Too far away? The effect of distance to headquarters on business establishment performance. *American Economic Journal: Microeconomics*, 5: 157–179.
Kang, J. K., Stulz, R. M. (1997) Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. *Journal of Financial Economics*, 46: 3–28.
Landier, A., Nair, V. B., Wulf, J. (2009) Trade-offs in staying close: Corporate decision making and geographic dispersion. *Review of Financial Studies*, 22: 1119–1148.
Levy, H., Sarnat, M. (1970) International diversification of investment portfolios. *American Economic Review*, 60: 668–675.
Ling, D. C., Archer, W. R. (2010) *Real Estate Principles: A Value Approach,* 3rd edn. Boston, MA: McGraw-Hill Irwin.
Ling, D. C., Naranjo, A., Petrova, M. (2013) Search Costs, Behavioral Biases, and Information Intermediary Effects. *Working Paper*. Retrieved from: http://www.reri.org/research/article_pdf/ling_naranjo_petrova_apr2013.pdf.
Mian, A. (2006) Distance constraints: The limits of foreign lending in poor economies. *The Journal of Finance*, 61: 1465–1505.
Rosen, S. (1974) Hedonic prices and implicit markets: Product differentiation in pure competition. *The Journal of Political Economy*, 82: 34–55.
Seasholes, M. S., Zhu, N. (2010) Individual investors and local bias. *The Journal of Finance*, 65: 1987–2010.
Solnik, B. H. (1974) An equilibrium model of the international capital market. *Journal of Economic Theory*, 8: 500–524.