XLI Incontro di Studio del Ce.S.E.T.: 5-40

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Heterogeneous Investors, Negotiation Strength & Asset Prices in Private Markets: Evidence from Commercial Real Estate*

We examine the impact of heterogeneous investors with asymmetric bargaining positions on transaction prices in private commercial real estate markets. Using a dataset that contains nearly 100,000 commercial real estate transactions during 1997-2009, we examine the extent to which common conditions of sale and buyer characteristics affect bargaining power and negotiated prices. We find that tax-motivated buyers seeking to complete a delayed Section 1031 exchange pay an average price premium of 12.5% when purchasing smaller properties. However, these price premiums for exchange motivated buyers are not observed among more expensive properties. We find strong evidence that out-of-state buyers pay significantly more (8 - 11% premium) for commercial properties than in-state buyers. Consistent with our expectations, we find that sellers of distressed properties negotiate significantly lower transaction prices (13 - 15% discount) than sellers of non-distressed properties, all else equal. Finally, we find evidence that REITs pay price premiums between 14 - 16% for office and industrial and retail properties. Our results strongly support the notion that relative bargaining power influences negotiated transaction prices.

Key words: *transaction prices, commercial real estate, bargaining power*

1. Introduction

In asset markets characterized by perfect competition and investment value revelation, all transactions take place at the true market value of the asset, as determined by the marginal buyer and seller. In such markets, there is no need for buyers and sellers to search for the "true" market value of an asset; it is continuously revealed by the transaction prices of perfect substitutes. Moreover, the heterogeneous investment motivations of potential buyers and sellers, and their relative negotiation positions and abilities have no role in the price formation process; all market participants are price takers. In fact, in the real estate appraisal literature, homogeneous investor motivations are central to the concept of market value.[1]

* We thank CoStar Group, Inc. and, especially Norm Miller, Jay Spivey and Iolaire McFadden, for providing the data used in this study. We also thank David Geltner and seminar participants at the University of Reading for valuable comments.

[1] Market value is defined as the following: "The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby: (1) buyer and seller are typically motivated: (2) both parties are well informed advised, and each acting in what he considers his own best interest: (3) a reasonable time is allowed for exposure in the open

Private real property markets, however, are far from perfect, often exhibiting significant segmentation, information asymmetries, and illiquidity. In such thin markets, the true market value of a property is not readily observable and bargaining is thought to be an important part of the price formation process (e.g., Harding, Knight, and Sirmans, 2003). A growing literature examines the extent to which differences across buyers and sellers in information availability, search costs, motivations, and bargaining power are priced in the market for owner-occupied homes.[2] However, the pricing of these imperfections in commercial real estate markets has received relatively little attention in the literature.[3]

The extent to which heterogeneous search costs and bargaining power are manifested in observed transaction prices is an empirical question. For example, although the reservation price of a buyer with high search costs may exceed the true market value of the property, he may not have to pay his reservation price to acquire the property if the real estate brokerage and research industries are able to mitigate information asymmetries and search costs across market participants. If not, however, impatient buyers may not be protected from overpaying for assets.

Using a dataset that contains nearly 100,000 commercial real estate transactions that occurred during the 1997-2009 time period, we conduct hedonic regression analysis to examine the extent to which three empirical proxies for high search costs affect bargaining power and negotiated prices: (1) buyers seeking to complete a delayed Section 1031 exchange; (2) distressed sales; and (3) acquisitions by out-of-state buyers. We also examine whether real estate investment trusts (REITs) pay price premiums when acquiring properties, a result found in several prior studies.

Our primary results can be summarized as follows. First, tax-motivated buyers seeking to complete a delayed Section 1031 exchange pay average price premiums that range from approximately seven percent to 20 percent when purchasing properties with acquisition prices less than $3.77 million, which is the mean transaction price in our sample. This result is consistent with our expectations that the time constraints associated with the successful completion of a delayed exchange increase the search costs, and therefore the reservation prices, of taxpayers seeking to complete a delayed exchange. Interestingly, these significant price premiums for exchange motivated buyers are not observed among our subsample

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market: (4) payment is made in terms of cash in U. S. dollars or in terms of financial arrangements comparable thereto; and (5) the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions by anyone associated with the sale." National Residential Real Estate Appraisal Institute, http://www.nraiappraisers.com.

[2] See, for example, Glower, Haurin and Hendershott (1998), Turnbull and Sirmans (1993), Geltner, Kluger and Miller(1988), Quan and Quigley(1991), Harding, Rosenthal and Sirmans (2003), and Harding, Knight and Sirmans (2003).

[3] Exceptions include papers by Colwell and Munneke (2006), Holmes and Slade (2001), Shilling, Benjamin and Sirmans (1990), Forgey, Rutherford and VanBuskirk (1994), Hardin and Wolverton (1996), Lambson, McQueen and Slade (2004), Ling and Petrova (2008), and Hardin and Wolverton (1999).

of properties with transaction prices greater than $3.77 million. We find consistent evidence that out-of-state buyers pay significantly more for commercial properties than in-state buyers and this result hold even in our subsample of properties with transaction prices greater than $3.77 million. This result is consistent with higher search costs among out-of-state buyers. Consistent with our expectations, we find that sellers of distressed properties negotiate significantly lower transaction prices than sellers of non-distressed properties, all else equal. With the exception of our office and industrial subsample, this result is found in both subsamples. Finally, we find evidence that REITs pay price premiums for office and industrial and retail properties ranging from approximately nine percent to 18 percent.

The paper proceeds as follows. Section 2 provides a conceptual framework for analyzing the effects of heterogeneous search costs and bargaining power on reservation prices. Section 3 discusses why reservation prices may vary from true market values, including the heterogeneous search costs and bargaining power. Section 4 describes our empirical model, while section 5 discusses the data and summary statistics. Our regression results are presented and discussed in section 6. Section 7 summarizes the analysis and offers some concluding comments.

2. Conceptual Framework

Consider two populations of potential investors for a given type of commercial real estate asset; for example, institutional quality shopping centers in the Buckhead submarket of Atlanta. One population of investors currently owns such a property; the other population consists of investors seeking to acquire such properties. Assume this property submarket functions as a well-ordered, double-auction market; that is, with an auctioneer calling out prices and potential buyers and sellers revealing their reservation prices through their bid and ask prices. In this hypothetical market characterized by perfect competition and investment value revelation, all transactions in a cross-section would take place at an equilibrium price of P^e, the true market value (MV) of such properties. Implicit in this equilibrium is that the supply of substitute properties for sale at any point in time is infinitely elastic, which renders buyer demand irrelevant. All transactions occur at a price equal to the estimated present value of the asset's expected net cash flows, as determined by the marginal buyer and seller. In such a market, marginal buyers and sellers are engaging in zero net present value (NPV) investment activities. Nevertheless, at the equilibrium price of P^e intramarginal investors may be engaging in positive or negative NPV acquisitions or dispositions.

Commercial real estate markets, however, do not embody the characteristics of a perfect auction market. Rather, buyers and sellers search for each other, interact, and consummate transactions in illiquid, highly segmented, informationally inefficient private markets. As a consequence, the true market value of a transacted property is not likely to be revealed in such a transaction. Moreover, we cannot observe the reservation prices placed on the transacted property by the buyer and seller. We simply know that the observed transaction price is equal to or less than

the buyer's investment value and equal to or greater than the seller's investment value. Nevertheless, observed transaction prices do provide valuable information to market participants about the true market value of the transacted property. In fact, rational buyers and sellers use transaction prices to determine their reservation prices, defined by Geltner et al. (2007) as "the prices at which they will stop searching any further for a willing partner and will agree to trade."

Figure 1 depicts the reservation price distributions for the buyer and seller populations in our hypothetical property market at a given point in time. The normal distribution to the left consists of potential buyers and the distribution to the right represents the reservation prices of potential sellers. The horizontal axis measures reservation prices on a per square foot basis. The vertical axis depicts the number of investors in each investor population with a reservation price equal to the price indicated on the horizontal axis. B^{min} and B^{max} represent the minimum and maximum reservation prices of potential buyers; S^{min} and S^{max} represent the corresponding reservation prices for potential sellers.

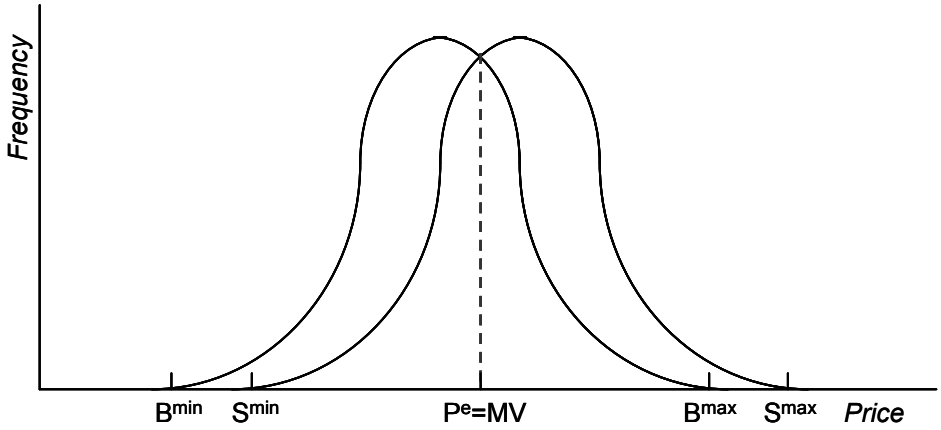
In such a market, observable transaction prices will range from S^{min} to B^{max}. If we observe a sufficient number of sale transactions in this property submarket, the frequency distribution of negotiated transaction prices would be represented by the area under the curve that is centered around P^e and bounded by S^{min} and B^{max}. The more numerous and frequent the transactions, the more homogeneous the transacted properties, or the easier it is to observe the details of a transaction, the greater is the probability that the price discovery process engaged in by buyers and sellers will produce a distribution of reservation prices, and an observed transaction prices distribution that is tightly centered around P^e. The implication of this statistical perspective of true market value is that the arithmetic average of observed transaction prices is a statistically unbiased estimate of true market value, as of a point in time. Moreover, it is easy to show that the precision of the MV estimate increases with the number of transactions included in the average.[4]

Although a buyer's reservation price in the presence of high search costs may exceed the true market value of the property, she may not have to pay her reservation price to acquire the property. A necessary condition for a sale to occur is that the buyer's offer price exceeds the seller's reservation price. However, the buyer's offer price must also equal or exceed the maximum bid price of other investors who are simultaneously bidding on the property. Thus, the supply of substitute properties for sale at any point in time, as well as information asymmetries about the income producing ability of the transacted property and its substitutes, may also impact unobserved reservation prices, and therefore observed transaction prices in the submarket.

In summary, heterogeneous search costs and negotiating strength represent a necessary, but not sufficient condition for deviations between observed transac-

[4] More formally, we require the mean of the potential transaction price distribution to equal its median which, in turn, requires that the buyer and seller reservation price distributions be symmetrical. It is also assumed that each transaction is independent of the others.

Figure 1. Buyer and Seller Reservation Price Frequency Distributions.



tion prices and (unobserved) true market values. The empirical question examined in our study is the extent to which segmentation, information asymmetries, and the resulting lack of liquidity in private commercial real estate markets, allow sellers (buyers) to abstract price premiums (discounts) from differentially motivated or less informed buyers (sellers).

3. Heterogeneous Motivations, Bargaining Power, and Reservation Prices

What causes reservation prices for a commercial property to vary from P^e? First, even given identical information about current and expected future market conditions, individual market participants will usually formulate varying expectations about future rental rates, resale values, operating expenses, and capital expenditures for a given property. Moreover, market participants may differ significantly in their cost of debt and equity capital, and therefore the discount rate they apply to future cash flows.

A second source of potential variation in reservation prices for a particular property is the operational advantage an investor may gain, or maintain, by controlling the productive capacity of the property. For example, ownership of an adjacent site may provide an owner-developer with a unique opportunity to profit from certain types of development due to synergy and spillover effects.[5]

Finally, reservation prices are also based on the cost to potential buyers of continuing to search for suitable alternative properties and the cost to sellers of continuing to search for buyers. Standard search models (e.g., Turnbull and Sirmans, 1993) predict that owners and sellers will continue to search for better "deals" un-

[5] See, for example, Geltner et al. (2007).

til the marginal benefit equals the marginal cost. Thus, buyers (sellers) with higher search costs search less and have higher (lower) reservation prices than competing investors with lower search costs, all else equal. For example, a potential buyer unfamiliar with the local real estate market may face higher search costs than do experts in the local market. As a result, the difficulty and cost of continuing to search can be significant and the reservation prices of such buyers will be higher, all else equal.[6] In contrast, distressed sellers may have lower reservation prices because of the high costs they incur by continuing to search for suitable buyers.

The data employed in this study (discussed in detail below) have several advantages. First, we are able to obtain a sample of nearly 100,000 commercial real estate transactions distributed across 13 years, ten major metropolitan markets, and over 100 submarkets. With the exception of Harding, Rosenthal, and Sirmans (2003), the limited empirical work in this area has been hampered by small, and possibly unrepresentative, samples. Second, the data contain several variables that, as we argue below, strongly indicate high search costs and reduced or enhanced bargaining power. We next discuss these heterogeneous investor motivations and their posited effect on reservations prices.

Tax-Deferred Exchanges

Realized gains from the sale of real property must generally be recognized for federal income purposes in the year of sale.[7] However, under Section 1031 of the internal revenue code (IRC), real estate owners who dispose of their investment property and reinvest the net proceeds in other "like kind" property are able to defer recognition of some or all of the capital gain realized on the sale of the relinquished property.[8] When the replacement property is subsequently disposed of, the realized gain will be larger to the extent of the deferred gain on the original disposition. However, if the subsequent disposition of the replacement property is also structured in the form of a Section 1031 exchange, the realized gain can again be deferred.[9] Ling and Petrova (2008) estimate that the maximum present value of this capital gain deferral ranges from five to ten percent of property value.

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[6] See, for example, Haurin (1988), Miceli (1989), Forgey, Rutherford and Springer (1996) and Arnold (1999).

[7] Internal Revenue Code Section 1001(c).

[8] Like kind means "similar in nature or character." In fact, virtually any real estate is like-kind to any other real estate. However, real property is not like-kind to personal property. Therefore, for example, a warehouse cannot be exchanged for jewelry. In addition, foreign property cannot be exchanged for U.S. property.

[9] Tax deferral turns into permanent tax savings upon the death of the taxpayer because the basis of the property is "stepped-up" to its current fair market value. Thus, the taxpayer's heirs can dispose of the property in a fully taxable sale and not have to pay taxes on gains deferred through the prior use of one or more Section 1031 exchanges.

Most Section 1031 transactions are "delayed" rather than simultaneous exchanges. Within 45 days of the sale of the relinquished property, the taxpayer making use of a delayed exchange must formally identify the replacement property.[10] Moreover, the taxpayer must acquire the identified replacement property within 180 days of the date of the closing of the relinquished property. There are no exceptions to these time limits and failure to comply will convert the transaction to a fully taxable sale.[11]

Investors face significant compliance risk when seeking to complete a tax-deferred exchange by identifying and purchasing a replacement property within the 45- and 180-day time limits. We posit that the strict time requirements imposed by IRS regulations on the buyers of replacement properties lead to buyer impatience and therefore higher search costs and reservation prices, all else equal. Therefore, buyers seeking to complete a delayed exchange are typically at a bargaining disadvantage relative to less time constrained buyers.

Distressed Sales

Harding, Knight, and Sirmans (2003) argue that sellers of vacant single-family homes are at a clear bargaining disadvantage relative to other sellers. In particular, vacant home sellers bear the full cost of carrying the property with no offsetting rental income. These high carrying costs increase sellers' search costs, thereby, thereby increasing their impatience toward prolonging the search for a buyer. Using data from Baton Rouge, Louisiana and Modesto, California, Harding, Knight and Sirmans find evidence that this weakened bargaining position reduces the negotiated sale price of vacant homes. Anglin (1999) also provides related evidence that seller impatience reduces negotiated prices, all else equal.

In our commercial data set, CoStar classifies some of the confirmed sale transactions in our data set as "distressed." This classification may include properties disposed in liquidation sales or as part of bankruptcy proceedings. This variable also captures transactions in which the borrower has defaulted on his mortgage note and is facing foreclosure. It is important to note that this variables does not capture the real estate owned (REO) by banks and other lenders as a result of the consummation of foreclosure proceedings.

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[10] To allow for the possibility that the taxpayer may not be able to come to terms with the owner of the potential replacement property, the taxpayer may designate more than one replacement property. More specifically, the taxpayer can (1) identify up to three properties of any value or (2) identify more than three properties so long as their combined values do not exceed 200 percent of the value of the relinquished property.

[11] Delayed exchanges are often referred to as "Starker" exchanges, which is a reference to the 1979 U.S. Supreme Court case that established the legal basis for non-simultaneous, tax-deferred exchanges: Starker vs. United States, 602 F. 2d 1341 (9th cir., 1979)

Out-of-Market Buyers

Prior research suggests that buyers more familiar with high-cost markets may begin their search for commercial properly acquisitions in lower cost markets with an anchoring-induced bias.[12] This bias may induce buyers from high-cost markets to outbid local market participants. Moreover, out-of-market bidders may face significant information asymmetries, and therefore higher search costs, when competing against local market participants. As discussed above, Turnbull and Sirmans (1993) argue that investors with higher search costs (out-of-market buyers) search less and have higher reservation prices than (local) market participants with lower search costs. The empirical question of primary interest in this study is whether commercial real estate markets are segmented enough, and market information flows impacted enough, to allow more informed local traders to extract price premiums from less informed out-of-market buyers.

REIT Acquisitions

Using data from the 1980s and 1990s, two empirical studies have concluded that REITs did pay significant acquisition premiums.[13] However, these studies employed very small datasets from three or fewer metropolitan areas. Thus, it is difficult to generalize the results, even for the limited time periods investigated. Moreover, in more recent years REITs have often been outbid for properties by private entities, as witnessed by the significant number of transactions during the early to mid-2000s in which private entities acquired publicly-traded REITs. For example, by 2005 the Blackstone Group had acquired more than $20 billion in hotel assets and proceeded to purchase Equity Office Properties, a publicly-traded REIT, for more than $39 billion in 2007. These "going-private" transactions appear to have been fuelled by relatively low interest rates, a "wall" of available mortgage capital, and rising commercial real estate values, at least through 2007. Another motivating factor for the payment of price premiums by private buyers often mentioned by real estate professionals is the ability of private owners to employ significantly more financial leverage than REITs to the acquired properties, thereby creating value and increased returns for investors. The anecdotal evidence suggests that the price premiums paid by private acquirers in recent years exceed the premiums offered by REITs to acquire assets. In short, a more comprehensive analysis of REIT acquisition premiums or discounts requires the use of a large, comprehensive sample of private commercial real estate transactions that includes a sufficient time series.

[12] See, for example, Lambson, McQueen, and Slade (2004) and the references contained therein.
[13] See, for example, Hardin and Wolverton (1999) and Lambson, McQueen, and Slade (2004).

4. Empirical Methodology

We use hedonic regression models to identify empirically the impact of atypical motivations and bargaining power on observed transaction prices. Griliches (1971), Rosen (1974), and Epple (1987) have developed the traditional hedonic framework for modeling the prices of heterogeneous assets, which views a property as a bundle of utility-generating characteristics, such as size, age, amenities, and location. The shadow prices of these hedonic characteristics are, in theory, revealed through the sale of properties with differing characteristic bundles. According to the hedonic valuation model, the value of a property is the sum of the values of each component in the bundle.

More specifically, following Harding, Rosenthal, and Sirmans (2003), let i denote a commercial property defined by a bundle of characteristics, C_i. The vector of shadow prices corresponding to C_i is defined as s. The market value, P^e, of property i is simply a linear combination of C_i and s:

$$\ln(P_i^e) = s' C_i. \tag{1}$$

Note that there is no role for differential buyer and seller motivations, search costs, or bargaining power in equation (1). Rather, the model predicts that transactions will occur at a price equal to the market value of the property, net of adjustments for the physical and locational characteristics of the property.

In practice, it is difficult for potential buyers and sellers to observe the relevant vector of characteristic prices because commercial real estate assets trade in thin, informationally inefficient markets. As a result, search costs increase and some market participants may gain a degree of market power which, in turn, creates incentives for bargaining.[14]

Assume bargaining power does not influence the underlying shadow prices of the physical and locational characteristics. Rather, bargaining increases or decreases the transaction price by a fixed percentage relative to P^e. Then, for property i we can write

$$\ln(P_i^e) = s' C_i + B_i, \tag{2}$$

where B_i denotes the impact of bargaining on the observed transaction price for property i. Positive values of B_i may obtain, for example, when a weak buyer negotiates with a strong seller.

The complete specification of our semi-log hedonic apartment regression model is as follows:

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[14] Discussions of the impact of search costs on buyer behavior can be found in Haurin (1988), Miceli (1989), Forgey, Rutherford and Springer (1996) and Arnold (1999).

$$\begin{aligned} LNPRICE_i = {} & \alpha_0 + \alpha_1 AGE + \alpha_2 AGE2 + \alpha_3 SQFT + \alpha_4 SQFT2 + \alpha_5 LANDSQFT + \alpha_6 LANDSQFT2 + \\ & + \alpha_7 FLOORS + \sum_{i=1}^{3} \beta_i BCLASS_i + \sum_{j=1}^{5} \lambda_j BMATER_j + \sum_{m=1}^{3} \mu_m COND_m + \alpha_8 EXCHANGE + \\ & + \alpha_9 BUYOUT + \alpha_{10} DISTRESS + \alpha_{11} BUYREIT + \alpha_{12} LONGITUDE + \alpha_{13} LATITUDE + \\ & + \alpha_{14} UNITS + \sum_{n=1998}^{2008} \chi_n YR_n \sum_{s=2}^{S} \delta_s SMDUM_s + \sum_{p=2}^{P} \sigma_p SPTDUM_p + \varepsilon_i \end{aligned} \quad (3)$$

where:

LNPRICE	is the natural logarithm of the sale price;
α_0	is a constant term;
AGE	is age of the structure(s) in years;
AGE2	is equal to the square of *AGE*;
SQFT	is the total square footage of improvements in thousands;
SQFT2	is equal to the square of *SQFT*;
LANDSQFT	is the land square footage in thousands;
LANDSQFT	is the square of *LANDSQFT*;
FLOORS	is number of floors in the structure(s);
BCLASS	indicates the class of the building (A, C, or missing); *BCLASS_B* (building class B) is the omitted variable.
BMATER	indicates the frame construction materials (metal, reinforced concrete, steel, wood, or missing); *BMATER_MASONRY* (indicating whether the frame construction material is masonry) is the omitted frame construction material variable.
COND	indicates the condition of the building (excellent, average or fair); *COND_G*, indicating a good structure condition is the omitted building condition variable
EXCHANGE	is a binary variable set equal to one if the transaction involves the acquisition of a replacement property by a taxpayer completing a delayed exchange;
DISTRESS	is a binary variable set equal to one if the transaction involves a distressed sale;
BUYOUT	is a binary variable set equal to one if the buyer resides out-of-state;
BUYREIT	is a binary variable set equal to one if the acquirer is a REIT;
UNITS	is the number of apartment units;
YR_n	is a binary variable indicating the year of the transaction; 1997 is suppressed;
$INTER_i$	is one of the nine atypical motivations interactions found in the data[15];

[15] These motivation interactions are *EXCHANGE*PORTFOLIO, EXCHANGE*DISTRESS, EXCHANGE*BUYOUT, EXCHANGE*BUYREIT, PORTFOLIO*BUYOUT, PORTFOLIO*BUYREIT, DISTRESS*BUYOUT, DISTRESS*BUYREIT*, and *BUYOUT*BUYREIT*. There are no cases of three of our motivations existing simultaneously in the data.

$SMDUM_s$	are binary variables indicating in which of the CoStar defined submarkets the property is located;
$SPTDUM_p$	are binary variables indicating the sub-property type of the building; and
ε_m	is an error term.

The regression models used to test for the existence of bargaining price effects in our retail, office and industrial samples are identical to equation (3) except that *UNITS* is not employed as an explanatory variable.

An advantage of using the log of sale price as the dependent variable is that less weight is given to extreme values than when using untransformed prices. With this semi-log functional form, unit sale price per unit change in a physical or locational characteristic is obtained by multiplying the characteristic's estimated coefficient by the observed selling price.[16]

We expect a negative relation between property age and sale price and a positive coefficient on age squared (*AGE2*). This expectation reflects the frequently observed quadratic relation between price and age, with a positive "vintage" effect frequently observed for historical properties. The estimated coefficients on *SQFT, LANDSQFT, FLOORS* and *UNITS* are expected to be positive. We control for the effects of location by including submarket fixed effects. The submarkets in each metropolitan area are defined by CoStar based upon discussions with local brokers. CoStar first identifies local submarkets and then aggregates submarkets into submarket clusters based on their perceived similarities.

5. Data

At year end 2008, the estimated value of investible U.S. commercial real estate was approximately $6 trillion, slightly larger than the market for U.S. Treasury securities and more than twice the size of the U.S. municipal bond market.[17] CoStar Group, Inc. attempts to include and verify every for-sale listing of commercial real estate in the U.S., as well as principal-to-principal deals and other sales not included in a listing service. To assure reliability of the data, CoStar requires its agents to physically inspect the site and photograph the property, call and interview the principals, confirm transaction details, and examine and consolidate documents and deeds. To keep our analysis manageable, we obtained transaction data for the following ten major metropolitan areas: Los Angeles, Chicago, Phoenix, San Di-

[16] The choice of functional form is extremely important in hedonic regression and little theory exists to guide the choice. Weirick and Ingram (1990) argue that the linear form has serious deficiencies from a market theory standpoint because the marginal contribution to value of variables such as square footage and lot size is not likely to be constant. The semi-log and log-linear models, in contrast, assume a nonlinear relation between sale price and the explanatory values.

[17] Ling and Archer (2010), page 435.

ego, Atlanta, Seattle, Washington, D.C., Dallas, Tucson, and Boston. Moreover, we focus on three major commercial property types: apartments, retail, and office and industrial with a sales price of at least $500,000. Hotels, mobile homes, and other special-use properties are not included in the analysis. Our initial 1997-2009 sample contains 169,126 sale transactions with confirmed sales prices.

We next exclude 22,598 transactions associated with a CoStar delineated "special condition;" for example, sales that were part of an auction, sales of apartments to be converted to condominiums, sale-leaseback transactions, or sales that involved damage from natural disasters, building contamination, or the threat of contamination. The removal of transactions associated with these special sale conditions yields a sample of 146,528 observations. Observations were also deleted if there were missing variables required for our hedonic regressions, including building age and square footage, land square footage, the state in which the buyers resides, number of floors, and the condition of the building. Apartment observations were also deleted if the record did not contain the number of units in the building(s).

In addition to a separate attribute field indicating whether the sold property was involved in a tax-deferred exchange, the *CoStar Comps Professional* database contains descriptive information on the type of the exchange in detailed notes. Inspection of these notes allows us to determine whether the exchange was a simultaneous exchange, a delayed exchange in which the seller was relinquishing the property to begin an exchange, or a delayed exchange in which the buyer was acquiring the property to complete an exchange. As discussed above, many taxpayers seeking to complete a delayed exchange by acquiring a replacement property within the allowed 180-day period are in a significantly impaired bargaining position due to the high cost of continuing to search. Properties acquired by buyers seeking to complete a delayed exchange are the exchanges transactions of interest in this study. We therefore exclude observations if they involved a direct exchange, a simultaneous exchange, or if the transaction involved the disposition of a relinquished property at the front end of a delayed exchange. These deletions further reduced our sample by 7,177 observations. This produced a final regression sample of 96,741 sale transactions. The steps taken to construct our regression sample are summarized in Table 1.

Our regression dataset contains 35,252 apartment, 33,937 office and industrial, and 27,552 retail sale transactions. Table 2 provides information on the percentage of these transactions that involved one of our three empirical proxies for high search costs, as well as the percentage of transactions that involved a REIT buyer. For example, of the 35,252 apartment sales in our dataset, 3,235 (9.2 percent) involved an exchange motivated buyer and 621 (1.8 percent) were categorized by CoStar as a distressed sale. In 4,668 (13.2 percent) of the apartment transactions, the buyer resided out-of-state; in 148 transactions the buyer could clearly be identified as a real estate investment trust (REIT). Overall, 8,672 apartment transactions involved atypical search costs or a REIT buyer, which is nearly 25 percent of total apartment sales.

Relative to the apartment sample, fewer office and industrial transactions (5.1 percent) involved a tax-deferred exchange buyer. In contrast, a somewhat larger

percentage of office and industrial properties (16.1 percent) were purchased by out-of-state buyers. The prevalence of atypical search costs in our retail sample is broadly similar to the office/industrial sample.

In addition to our ability to quantify the effects of high search costs and negotiating positions on transaction prices, the simultaneous existence of two atypical motivations in some transactions allows us to examine the interactive effect of multiple atypical motivations.[18] Panel A of Table 3 contains information on the percentage of transactions in our sample that involve simultaneously two of our empirical proxies for high search costs. A delayed exchange by an out-of-state buyer is the most common combination, accounting for 0.86 percent of all transactions in our sample. Out-of-state REIT buyers and acquisitions by out-of-state buyers of distressed properties account for 0.35 percent and 0.19 percent of the overall sample, respectively.

Panel B of Table 3 provides information on the incidence of each proxy for high search costs, conditional on the existence of a second motivation. For example, conditional on the sale being characterized by CoStar as "distressed," there is a 3.72 percent probability that the transaction also involved an exchange-motivated buyer. Panel B of Table 3 clearly reveals a significant strength of our dataset: the ability to control for and analyze the effects of multiple atypical search costs/motivations. For example, 61 percent of REIT acquisitions also involve an out-of-state buyer. We control for these interactions in our regression analysis.

Summary statistics for the variables in our apartment regression dataset are presented in the first two columns of Table 4. The average apartment property in our sample sold for $3,426,205 (*PRICE*), is 43 years old, contains nearly 40 thousand square feet of improvements (*SQFT)*, is built on approximately 107thousand square feet of land (*LANDSQFT*), and has 2.34 floors (*FLOORS*) and nearly 45 units (*UNITS*). Five percent of the apartment transactions occurred in 1997 and 2008; 6 percent in 1998. Eighty-two percent of the apartment properties in our sample were characterized by CoStar as being in average condition; the corresponding percentages for the office/industrial sample and the retail sample are 67 percent and 71 percent, respectively. The percentage of apartment transactions in our sample that occurred in 1997-2009 ranges from two percent (2009) to 14 percent (2004).

Table 4 also reveals that nine percent of apartment transactions involve the purchase of a replacement property to finalize a delayed exchange (*EXCHANGE*); 13 percent of the apartment properties in our sample were purchase by out-of-state buyers (*BUYOUT*); and two percent involved a distressed sale (*DISTRESS*). REITs were not actively involved in apartment transactions during our study period.

Corresponding summary statistics for our office/industrial sample are provided in columns three and four of Table 4. With an average sale price of $5,119,900, office/industrial properties transact at prices significantly higher than the average selling price of apartment properties. The average office/industrial property in our sample is 30 years old, contains 46 thousand square feet of improvements, is built

[18] None of the 96,741 transactions in our sample included more than two atypical motivations.

on approximately 132 thousand square feet of land, and has 2.18 floors. The average retail property in our sample sold for $2,546,876, is 36 years old, contains 17 thousand square feet of improvements, is built on approximately 153 thousand square feet of land, and has 1.35 floors. The distribution of both office/industrial sales and retail sales across the sample period is similar to the distribution of sales in the apartment sample. A smaller percentage of both office/industrial and retail sales (5 percent) involve the purchase of a replacement property to finalize a delayed exchange. However, the percentage of properties involved in a distressed sale is similar to the apartment sample. A larger percentage of retail buyers (17 percent) reside out-of-state.

6. Empirical Results

As buyers' level of sophistication may vary significantly for small vs. large properties, we hypothesize that impact of buyers' and sellers' search costs may be different whether we are dealing with a small or a large transaction. We expect greater effects for smaller properties in all cases, but with purchases by REITs. The anecdotal evidence suggests that REITs tend to invest in larger and more expensive properties; therefore, we expect any price effect due to the higher search costs faced by REITs, due to the number of restrictions they face, to be more prominent in our subsample of large properties. Tables 5 and 6 present our base-case regression results from the estimation of equation (3) by property type. The results in Table 5 are for transaction prices less than $3.77 million; Table 6 contains results for the sample of properties that sold for more than $3.77 million. For each property type, estimated coefficients are presented first, followed by the corresponding t-statistics. Table 5 reveals that the estimated coefficients on land and structural attributes are of the predicted sign and statistically significant in most of the regressions. For example, the estimated coefficient on *AGE* is negative and highly significant in all three property type models. However, the estimated coefficient on aged squared (*AGE2*) is positive and significant, indicating that the negative effect of property age on price increases at a decreasing rate. Similarly, the estimated coefficient on *SQFT* is positive in all three property type regressions; however, the coefficient on *SQFT2* is consistently negative and highly significant, indicating that the positive effect of square footage on price is nonlinear. Interestingly, the estimated coefficient on *LANDSQFT* is not significantly different from zero in any of the three equations. All else equal, the number of floors in an apartment building has a positive and significant effect on price, although this variable is not significant in the office/industrial or retail regressions. Finally, the number of units contained in an apartment complex has a positive and highly significant price effect, even after controlling for the square footage of the land and improvements. Retail properties deemed to be in Excellent condition transacted at significantly higher prices than properties listed to be in good condition (the omitted classification); all properties estimated by CoStar to be in average or fair condition sold for significantly less than properties in good condition.

The estimated coefficients on the year dummies, with 1997 as the omitted year, are consistently positive and significant, and their increasing magnitude until 2008 and 2009 reveals substantial nominal price appreciation over the 13-year study period relative to 1997. Finally, although the estimated coefficients on the submarket cluster dummy variables are not reported in Table 5, many are statistically significant and model fits are improved substantially by the inclusion of these submarket fixed effects. Even with controls for the location of the property within a CoStar delineated submarket, the estimated coefficients on latitude and longitude are also highly significant except in the retail regression.

Turning to the variables of primary interest, we note that the estimated coefficients on our three proxies for high search costs and impaired bargaining power all carry the expected sign and are highly significant. For example, tax motivated buyers completing a delayed tax-deferred exchange pay substantial price premiums, all else equal, to obtain their desired tax deferral benefits. The positive and significant coefficients on *EXCHANGE* are consistent with a weakened negotiating position among tax motivated and time-constrained buyers.

As discussed above, there exists limited evidence in the owner-occupied housing market that distressed sellers are forced to accept lower prices than non-distressed sellers (Harding, Knight, and Sirmans, 2003). The results reported in Table 5 largely confirm this finding. More specifically, the estimated coefficient on *DISTRESS* is negative and highly significant in all three property type regressions. Consistent with the findings of Lambson, McQueen, and Slade (2004), the estimated coefficient on *BUYEROUT* is positive and highly significant in the office/industrial and retail models, suggesting that out-of-state buyers are at a competitive disadvantage when competing for these properties with, presumably, better informed in-state buyers. In contrast, we find no evidence that out-of-state apartment buyers pay higher prices, all else equal, when purchasing properties with transaction prices less than $3.77 million.

Finally, the results presented in Table 5 suggest that REITs pay a premium when purchasing office and industrial properties. However, the estimated coefficient on *BUYERREIT* is not significant in the apartment and retail property regressions.

Table 6 contains the results from estimating equation (3) for properties with transaction prices greater than $3.77 million. The estimated coefficients on the structural characteristics are consistent with the corresponding results presented in Table 5. The coefficients on the year dummies suggest that larger properties did not experience as much price appreciation as smaller properties over the 2000-2007 period. Moreover, the estimated coefficients on latitude and longitude are no longer significant.

Among smaller properties, the estimated coefficient on *EXCHANGE* was positive and highly significant in all three property type equations. However, this result is not obtained with our sample of larger properties. That is, significant price premiums are confined to the tax motivated purchasers of properties with sale prices less than $3.77 million. This result may reflect a better understanding of the tax benefits associated with delayed exchanges among the purchasers of more expensive properties.

Similar to the results reported in Table 5, the estimated coefficient on *BUYEROUT* is positive and highly significant in the office/industrial and retail models, suggesting that out-of-state buyers are at a competitive disadvantage when competing for these properties with, presumably, better informed in-state buyers. Moreover, in contrast to the results for smaller properties, we find evidence that out-of-state apartment buyers also pay higher prices, all else equal, when purchasing properties with transaction prices greater than $3.77 million. The estimated coefficient on *DISTRESS* is negative and significant (at the 5 percent level) in the apartment and retail property regressions; this coefficient is not significant in the office and industrial regression. Overall, the results suggest that sellers of more expensive distressed properties are able to negotiate higher prices than sellers of less expensive distressed properties. Finally, we find evidence that REIT buyers pay more, on average, when acquiring office and industrial properties, as well as retail properties, with purchase prices greater than $3.77 million.

To control for the possible effects of multiple motivations on transaction prices, we also include interaction variables equal to the product of all combinations of our four atypical motivations that appear in the data. The models including estimated coefficients on the multiple motivations variable interactions are reported in Tables 7 and 8, for our subsample of properties with sale price less than $3.77 million and transactions at prices equal to or exceeding $3.77 million, respectively. Although several of these interactions are significant, generally their inclusion does not affect the magnitude or significance of the coefficients on *EXCHANGE*, *BUYEROUT*, *DISTRESS*, or *BUYERREIT*.

The regression results presented in Tables 5-8 strongly suggest that different search costs and bargaining strength affect negotiated transaction prices in commercial real estate markets. In this section we examine whether the extent to which the statistically significant price premiums and discounts reported above are economically significant.

To quantify the economic significance of our empirical findings, we transform the estimated regression coefficients on our five atypical motivation coefficients into percentage (i.e., price) effects. More specifically, following Halvorsen and Palmquist (1980), we calculate percentage price changes for the estimated coefficients on *EXCHANGE*, *DISTRESS*, *BUYOUT*, and *BUYREIT* in each of the property type models reported in Tables 5 and 6 using the following formula:

$$\text{Percentage Price Effect} = 100^{*}g = 100^{*}\{\exp(x) - 1\}.$$

g is the estimated effect on sale price of a condition and x is the type of atypical motivation. These marginal price effects by property type are reported in Table 9.

Panel A presents the marginal price effects in transactions with prices less than 3.77 Million. For example, in our apartment sample in panel A, the estimated price effect of *EXCHANGE* is 6.8 percent. The corresponding marginal price effects of *EXCHANGE* in our office and industrial, and retail sub-samples are 11.3 and 19.5 percent, respectively. Out-of-state buyers are associated with price premiums in office and industrial and retail transactions that range from 10 – 12.8%. Distressed

sales are associated with significant price discounts across property types, with an average magnitude of 13 percent. Finally, we observe a 16.7% price premium associated with REIT purchases in the office & industrial sub-sample.

Panel B of table 9 presents the percentage effects of heterogeneous search costs and bargaining power in large transactions (sale price equal to or exceeding $3.77 million). We note that apartment exchanges are associated with a small price discount (3.2%). Out-of-state buyers continue to pay premiums, but their magnitude is reduced compared to the premiums observed in smaller transactions. Distress sales are associated with a price discount of 10.7 and 18.8% percent in the apartment and retail sub-samples, respectively. Finally, REIT buyers pay on average 9 and 18 percent premiums when acquiring office & industrial, and retail properties, respectively. The observed price effects are economically significant and consistent with our predictions.

7. Summary and Conclusion

Heterogeneous cash flow expectations, capital costs, operational efficiencies, investment motivations, and search costs can create significant variation in buyer and seller reservation prices for a particular property. However, in asset markets characterized by perfect competition and investment value revelation, these heterogeneities have no role in the price formation process; all market participants are price takers.

Private real property markets, however, often exhibit significant segmentation, information asymmetries, and illiquidity. In such thin markets, the true market value of a property is not readily observable and search costs and bargaining power are thought to be an important part of the price formation process. However, the pricing of these imperfections in commercial real estate markets has received relatively little attention in the literature.

The extent to which heterogeneous motivations and bargaining power are manifested in observed transaction prices is an empirical question. If search costs and information asymmetries cannot be mitigated by the brokerage and research industries, impatient buyers may not be protected from overpaying for assets and impatient sellers may obtain lower transaction prices than sellers with lower search costs. Moreover, the extent to which differences in information availability and search costs create transaction price differentials in private real estate markets is relevant to the broader literature on information asymmetries and search costs.

Using a dataset that contains nearly 100,000 commercial real estate transactions that occurred during the 1997-2009 time period, we examine the extent to which three empirical proxies for high search costs affect negotiated prices: (1) buyers seeking to complete a delayed Section 1031 exchange; (2) distressed sales; and (3) acquisitions by out-of-state buyers. We also examine whether real estate investment trusts (REITs) pay price premiums when acquiring properties, a result found in several prior studies. Our dataset facilitates a comprehensive empirical investigation of search costs and bargaining power not possible with previous datasets.

Our primary results can be summarized as follows. First, tax-motivated buyers seeking to complete a delayed Section 1031 exchange pay average price premiums that range from approximately seven percent to 20 percent when purchasing properties with acquisition prices less than $3.77 million, which is the mean transaction price in our sample. This result is consistent with our expectations that the time constraints associated with the successful completion of a delayed exchange increase the search costs, and therefore the reservation prices, of taxpayers seeking to complete a delayed exchange. Interestingly, these significant price premiums for exchange motivated buyers are not observed among our subsample of properties with transaction prices greater than $3.77 million. We find consistent evidence that out-of-state buyers pay significantly more for commercial properties than in-state buyers and this result hold even in our subsample of properties with transaction prices greater than $3.77 million. This result is consistent with higher search costs among out-of-state buyers. Consistent with our expectations, we find that sellers of distressed properties negotiate significantly lower transaction prices than sellers of non-distressed properties, all else equal. With the exception of our office and industrial subsample, this result is found in both subsamples. Finally, we find evidence that REITs pay price premiums for office and industrial and retail properties ranging from approximately nine percent to 18 percent.

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Table 1. Sample Selection.

Initial Sample	174,491
Less Sale Conditions*	24,093
	150,398
Less Observations with Missing Data	
Missing Age	11,771
Missing Building SF	865
Missing Land SF	3,841
Missing Buyer State Information	4,622
Missing Number of Floors	1,990
Missing Building Condition	9,339
Missing Assessed Value	15,024
Missing Number of Units (*only for multi-family*)	193
	102,753
Less 1031 Exchange Downleg	6,965
Final Sample	**95,788**

Property level transaction data with sale prices exceeding $500,000 were obtained from the *CoStar Comps Professional* database for the following ten metropolitan areas: Los Angeles, Chicago, Phoenix, San Diego, Atlanta, Seattle, Washington, D.C., Dallas, Boston and Tucson. After the deletion of observations that involved special use properties, flex space and observations not confirmed by CoStar, our initial 1997-2010 sample contains 174,491 sale transactions. We next exclude 22,598 transactions associated with a CoStar delineated "special condition;" such as sales that were part of an auction, sales of apartments to be converted to condominiums, build-to-suit properties, buildings in shell conditions, properties with business value included, sale-leaseback transactions, portfolio sales or sales that involved damage from natural disasters, building contamination, or the threat of contamination. The removal of transactions associated with special conditions yields a sample of 150,398 observations. Observations were also deleted if they were missing variables required for our hedonic regressions, including assessed value, building age and square footage, land square footage, number of floors, building condition and buyer's state of residence. Apartment observations were also deleted if the record did not contain the number of units in the building or buildings. Observations were excluded if they involved a type of exchange other than the acquisition of a property by a buyer seeking to complete a delayed tax-deferred exchange, such as a simultaneous or reverse exchange, or transactions involving the disposition of a relinquished property at the front end of a delayed exchange. These deletions reduced our sample by 6,965 observations. This produced a final sample of 96,741 sale transactions. The observation breakdown by property type is apartment, 32,711; office, 15,911; industrial, 19,430; and retail, 27,736.

Table 2. Heterogeneous Search Costs Proxies by Property Type – 1997-2009.

Proxy	Property Type									
	Apartment 32,711		Office 15,911		Industrial 19,430		Retail 27,736		All Properties 95,788	
	N	% of sales	N	% of sales	N	% of sales	N	% of sales	N	% of sales
Out-of-state Buyer	3,824	11.7%	2,527	15.9%	2,558	13.2%	4,285	15.4%	13,194	13.8%
1031 Exchange	3,046	9.3%	951	6.0%	776	4.0%	1,418	5.1%	6,191	6.5%
Distress Sale	350	1.1%	180	1.1%	252	1.3%	413	1.5%	1,195	1.2%
Buyer REIT	114	0.4%	137	0.9%	183	0.9%	129	0.5%	563	0.6%
All Motivations	3,510	10.7%	1,268	8.0%	1,211	6.2%	1,960	7.1%	7,949	8.3%

See the notes to Table 1 for a detailed description of our sample selection procedure. The *CoStar Comps Professional* contains detailed information on sale conditions, which can be used as proxies for buyers' and sellers' heterogeneous search costs. In particular, we are able to determine whether the buyer was completing a delayed tax-deferred exchange, whether the seller was under distress, whether the buyer resides in a state different from the location of the property, and whether the acquiring entity is a real estate investment trust (REIT). Other tax-deferred exchange types and motives are excluded from the sample and analysis. Our final regression sample contains 95,788 sale transactions located in ten major metropolitan areas. The observation breakdown by property type is apartment, 32,711; office, 15,911; industrial, 19,430; and retail, 27,736.

Table 3. Percentage of Transactions Sample Involving Two Proxies for Search Costs.

Panel A. Percent of simultaneous motivations by property type

	All 95788		Apartment 32711		Office 15911		Industrial 19430		Retail 27736	
	Obs	% of all	Obs	% of Apt	Obs	% of Office	Obs	% of Industrial	Obs	% Retail
EXCHANGE&BUYEROUT	857	0.89%	305	0.93%	153	0.96%	94	0.48%	305	1.10%
DISTRESS&BUYEROUT	165	0.17%	30	0.09%	20	0.13%	42	0.22%	73	0.26%
BUYREIT&BUYEROUT	350	0.37%	71	0.22%	89	0.56%	91	0.47%	99	0.36%
EXCHANGE&DISTRESS	49	0.05%	21	0.06%	10	0.06%	12	0.06%	6	0.02%
EXCHANGE&BUYREIT	4	0.00%	2	0.01%	1	0.01%	0	0.00%	1	0.00%
DISTRESS&BUYREIT	1	0.00%	0	0.00%	0	0.00%	0	0	1	0.00%

Panel B. Percent of incidence of motivation with other motivation

	BUYEROUT	EXCHANGE	DISTRESS	BUYREIT
BUYEROUT	100.00%	6.50%	1.25%	2.65%
EXCHANGE	13.84%	100.00%	0.79%	0.06%
DISTRESS	13.81%	4.10%	100.00%	0.08%
BUYREIT	62.17%	0.71%	0.18%	100.00%

EXCHANGE is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange, *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT.

Table 4. Summary Statistics by Property Type.

	Apartment N=33711		Office N=15911		Industrial N=19430		Retail N=27736	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
PRICE	3,574,815	9,224,279	8,449,978	28,400,000	2,534,872	3,651,869	2,569,563	5,604,696
LNPRICE	14.27	1.01	14.68	1.32	14.30	0.84	14.20	0.87
LNASSESSED	13.51	1.27	14.06	1.49	13.55	1.12	13.32	1.19
AGE	43.56	25.14	33.82	29.21	29.41	21.14	36.14	30.42
SQFT	39.64	86.12	46.94	113.01	47.46	79.53	17.05	37.22
LANDSQFT	115.39	3,999.31	88.81	1,408.99	158.61	663.44	123.10	6,015.23
FLOORS	2.34	1.29	3.30	4.86	1.15	0.55	1.30	0.75
COND_E	0.01	0.11	0.06	0.24	0.03	0.17	0.02	0.16
COND_G	0.10	0.30	0.23	0.42	0.13	0.33	0.14	0.35
COND_A	0.88	0.33	0.70	0.46	0.82	0.38	0.81	0.39
COND_F	0.01	0.12	0.01	0.10	0.02	0.14	0.02	0.15
DUALBROKER	0.25	0.43	0.16	0.37	0.17	0.37	0.13	0.33
RENOVATED	0.00	0.03	0.00	0.05	0.00	0.05	0.00	0.05
LONGITUDE	-109.650	15.13	-100.02	18.54	-101.83	17.17	-99.977	17.83
LATITUDE	36.316	4.56	37.35	4.73	37.20	4.61	37.350	4.77
Binary Variables								
BUYEROUT	0.12	0.32	0.16	0.37	0.13	0.34	0.15	0.36
EXCHANGE	0.09	0.29	0.06	0.24	0.04	0.20	0.05	0.22
DISTRESS	0.01	0.10	0.01	0.11	0.01	0.11	0.01	0.12
BUYREIT	0.004	0.06	0.01	0.09	0.01	0.10	0.005	0.07
YR1997	0.00	0.05	0.00	0.06	0.00	0.05	0.00	0.05
YR1998	0.06	0.24	0.06	0.24	0.05	0.22	0.05	0.22
YR1999	0.07	0.25	0.07	0.26	0.07	0.25	0.06	0.23
YR2000	0.07	0.26	0.07	0.25	0.07	0.25	0.06	0.23
YR2001	0.08	0.27	0.07	0.25	0.07	0.25	0.06	0.24
YR2002	0.11	0.31	0.08	0.27	0.08	0.28	0.08	0.27
YR2003	0.12	0.33	0.10	0.29	0.10	0.30	0.11	0.31
YR2004	0.14	0.35	0.12	0.33	0.12	0.32	0.13	0.33
YR2005	0.12	0.32	0.12	0.32	0.12	0.32	0.12	0.32
YR2006	0.09	0.29	0.12	0.32	0.12	0.32	0.13	0.33
YR2007	0.06	0.23	0.09	0.29	0.10	0.30	0.09	0.29
YR2008	0.04	0.19	0.06	0.24	0.06	0.23	0.07	0.25

(Continued)

	Apartment N=33711		Office N=15911		Industrial N=19430		Retail N=27736	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
YR2009	0.02	0.15	0.03	0.16	0.03	0.17	0.03	0.17
YR2010	0.01	0.12	0.02	0.13	0.02	0.14	0.02	0.13
Apartment Specific Variables								
UNITS	45.81	93.22						

PRICE is the nominal sale price; *LNPRICE* is the natural log of the sale price; *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *SQFT* is total square footage of improvements in thousand square feet; *LANDSQFT* is land square footage in thousand square feet; *FLOORS* is number of floors in the building; *COND_E*, *COND_G*, COND_*A*, COND_*F* denote excellent, good, adequate and fair condition of the structure, respectively. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. LONGITUDE is the longitude coordinate of the property; LATITUDE is the latitude coordinate of the property. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT. *YRn* are indicator variables for each year; *UNITS* is the number of apartment units.

Table 5. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price.

	Apartment			**Office**			**Industrial**			**Retail**		
	32711			*15911*			*19430*			*27736*		
	Coef.		*T-Stat.*	Coef.		*T-Stat.*	Coef.		T-Stat.	Coef.		T-Stat.
CONST	5.349		0.83	10.537	***	6.30	15.824	*	1.82	8.894	***	41.56
LNASSESSED	0.459	***	44.93	0.547	***	*40.5*	0.362	***	24.75	0.403	***	42.82
AGE	-0.001	***	-3.10	-0.003	***	-6.94	-0.006	***	-9.44	-0.006	***	-16.32
AGE2	0.000		-0.25	0.000	***	4.87	0.000	***	4.59	0.000	***	10.22
SQFT	0.006	***	16.89	0.005	***	11.44	0.007	***	14.34	0.011	***	20.18
SQFT2	0.000	***	-6.66	0.000	***	-3.90	0.000	***	-5.40	0.000	***	-6.87
LANDSQFT	0.000	*	-1.81	0.000		3.65	0.000		1.57	0.000		1.55
LANDSQFT2	0.000	*	1.83	0.000		-3.63	0.000	*	-1.73	0.000		-1.52
FLOORS	0.042	***	8.56	-0.008	***	-2.46	0.022	**	2.03	-0.003		-0.34
COND_E	0.212	***	7.12	0.240	**	9.83	0.191	***	7.94	0.328	***	13.97
COND_G	0.100	***	12.93	0.103	***	9.34	0.038	***	3.60	0.125	***	13.54
COND_F	-0.054	***	-2.90	0.045		0.93	0.007		0.29	-0.055	***	-2.85
DUALBROKER	0.071	***	14.86	0.052	***	5.09	0.021	**	2.51	0.060	***	7.14
RENOVATED	-0.027		-0.27	0.148		2.01	0.159	***	2.73	0.138	**	2.29
BUYOUT	0.038	***	3.78	0.235	***	17.26	0.171	***	14.85	0.170	***	17.58
EXCHANGE	0.039	***	5.91	0.132	***	9.24	0.093	***	6.93	0.164	***	12.31
DISTRESS	-0.231	***	-11.91	-0.192	***	-5.35	-0.164	***	-5.69	-0.245	***	-9.65
BUYREIT	0.132	***	2.76	0.224	***	4.09	0.139	***	4.11	0.183	***	3.97
LONGITUDE	0.109	**	1.97	-0.041	**	-3.36	0.158	**	2.02	0.035		1.39
LATITUDE	0.388	***	5.16	-0.214	***	-2.83	0.246	***	2.71	0.081		1.29
YR1998	-0.007		-0.17	-0.069		-1.00	0.045		0.83	0.065		1.10
YR1999	0.055		1.42	-0.021		-0.31	0.097	*	1.80	0.107	*	1.81
YR2000	0.090	**	2.30	0.009	**	0.13	0.154	***	2.84	0.127	**	2.16
YR2001	0.121	***	3.10	-0.015	**	-0.22	0.164	***	3.05	0.149	**	2.53
YR2002	0.184	***	4.69	-0.021	**	-0.32	0.171	***	3.18	0.201	***	3.42
YR2003	0.272	***	6.93	-0.001	***	-0.01	0.206	***	3.83	0.240	***	4.08
YR2004	0.375	***	9.50	0.127	***	1.88	0.297	***	5.52	0.330	***	5.63
YR2005	0.483	***	12.27	0.214	***	3.15	0.436	***	8.07	0.482	***	8.21
YR2006	0.499	***	12.50	0.228	***	3.34	0.481	***	8.87	0.508	***	8.64
YR2007	0.494	***	12.22	0.192	***	2.79	0.519	***	9.51	0.532	***	8.99
YR2008	0.424	***	10.17	0.176	***	2.52	0.484	***	8.70	0.502	***	8.40
YR2009	0.278	***	6.40	-0.037	***	-0.51	0.290	***	5.03	0.316	***	5.17
YR2010	0.217	***	4.90	0.030	***	0.39	0.266	***	4.62	0.270	***	4.27
UNITS	0.001	***	5.63									
Submarket Fixed Effects	YES			YES			YES			YES		
Adjusted R-square	0.87			0.86			0.75			0.73		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE2* is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT2* is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT2* is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good

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structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT. *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property. *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 6. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price Including Interaction of Search Cost Proxies.

	Apartment			**Office**			**Industrial**			**Retail**		
	32711			*15911*			*19430*			*27736*		
	Coef.		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*
CONST	5.291		0.82	10.563	***	6.35	15.789	*	1.81	8.894	***	41.55
LNASSESSED	0.459	***	44.96	0.547	***	40.5	0.362	***	24.75	0.403	***	42.86
AGE	-0.001	***	-3.09	-0.003	***	-6.96	-0.006	***	-9.46	-0.006	***	-16.33
AGE2	0.000		-0.26	0.000	***	4.89	0.000	***	4.60	0.000	***	10.22
SQFT	0.006	***	16.90	0.005	***	11.44	0.007	***	14.34	0.011	***	20.19
SQFT2	0.000	***	-6.66	0.000	***	-3.9	0.000	***	-5.40	0.000	***	-6.87
LANDSQFT	0.000	*	-1.82	0.000	***	3.65	0.000		1.57	0.000		1.55
LANDSQFT2	0.000	*	1.84	0.000	***	-3.63	0.000	*	-1.73	0.000		-1.52
FLOORS	0.042	***	8.56	-0.008	**	-2.46	0.021	**	2.01	-0.003		-0.34
COND_E	0.212	***	7.11	0.239	***	9.78	0.191	***	7.94	0.328	***	13.95
COND_G	0.100	***	12.91	0.103	***	9.33	0.037	***	3.59	0.125	***	13.55
COND_F	-0.054	***	-2.91	0.045		0.93	0.007		0.28	-0.055	***	-2.85
DUALBROKER	0.071	***	14.86	0.052	***	5.06	0.021	**	2.50	0.060	***	7.13
RENOVATED	-0.027		-0.28	0.149	**	2.02	0.161	***	2.75	0.138	**	2.29
BUYOUT	0.040	***	3.83	0.242	***	17.08	0.169	***	14.11	0.169	***	16.86
EXCHANGE	0.041	***	5.85	0.147	***	9.43	0.098	***	6.90	0.164	***	11.16
DISTRESS	-0.217	***	-10.42	-0.168	***	-4.29	-0.184	***	-5.94	-0.247	***	-9.99
BUYREIT	0.177	**	2.49	0.274	***	4.87	0.127	***	2.67	0.199	***	2.63
EXCHANGE&BUYEROUT	-0.007		-0.33	-0.067	*	-1.72	-0.035		-0.81	0.005		0.16
DISTRESS&BUYEROUT	-0.086		-1.27	-0.088		-0.81	0.134		1.48	0.031		0.34
BUYREIT&BUYEROUT	-0.076		-0.80	-0.074		-0.77	0.026		0.39	-0.026		-0.28
EXCHANGE&DISTRESS	-0.110		-1.54	-0.252	**	-1.96	-0.040		-0.39	-0.250	**	-2.26
EXCHANGE&BUYREIT	0.028		0.12	-0.546	***	-5.67				0.301	**	2.31
DISTRESS&BUYREIT										0.232	**	2.09
LONGITUDE	0.109	**	1.96	-0.041	**	-3.39	0.157	**	2.00	0.035		1.39
LATITUDE	0.388	***	5.16	-0.215	***	-2.86	0.244	***	2.69	0.081		1.28
YR1998	-0.008		-0.21	-0.067		-0.98	0.044		0.81	0.065		1.10
YR1999	0.054		1.37	-0.020		-0.29	0.097	*	1.79	0.106	*	1.80
YR2000	0.089	**	2.27	0.010		0.15	0.153	***	2.83	0.127	**	2.15
YR2001	0.120	***	3.06	-0.014		-0.2	0.163	***	3.02	0.149	***	2.52
YR2002	0.183	***	4.65	-0.020		-0.29	0.169	**	3.15	0.201	***	3.41
YR2003	0.271	***	6.89	0.001		0.01	0.205	***	3.80	0.239	***	4.07
YR2004	0.374	***	9.45	0.128	*	1.9	0.295	***	5.49	0.330	***	5.62
YR2005	0.482	***	12.22	0.216	***	3.17	0.435	***	8.04	0.481	***	8.20
YR2006	0.498	***	12.46	0.230	***	3.37	0.480	***	8.84	0.508	***	8.64
YR2007	0.493	***	12.18	0.194	***	2.82	0.518	***	9.48	0.532	***	8.99
YR2008	0.423	***	10.13	0.179	***	2.54	0.484	***	8.67	0.501	***	8.40
YR2009	0.277	***	6.37	-0.035		-0.48	0.289	***	5.00	0.316	***	5.16
YR2010	0.216	***	4.88	0.031		0.4	0.266	***	4.61	0.269	***	4.27
UNITS	0.001	***	5.63									
Submarket Clusters Fixed Effects	YES			YES			YES			YES		
Adjusted R-square	0.87			0.86			0.75			0.73		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE2* is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT2* is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT2* is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a

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binary variables set equal to one if the acquirer is identified as a REIT; *EXCHANGE*DISTRESS* is an interaction variable between *EXCHANGE* and *DISTRESS*; *EXCHANGE*BUYREIT* is an interaction variable between *EXCHANGE* and *BUYREIT*; *DISTRESS*BUYOUT* is an interaction variable between *DISTRESS* and *BUYOUT*, *DISTRESS*REIT* is an interaction variable between *DISTRESS* and *BUYREIT*; *BUYREIT*BUYOUT* is an interaction variable between *BUYREIT* and *BUYOUT*; *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property; *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 7. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price, Based on Transactions with Sale Prices Less than the Mean Sale Price for Each Property Sub-sample.

	Apartment			**Office**			**Industrial**			**Retail**		
	27287			*13209*			*14316*			*23945*		
	Coef.		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*
CONST	-6.243		-1.04	12.563	***	9.23	19.004	**	2.44	18.438	***	3.81
LNASSESSED	0.270	***	32.38	0.328	***	24.15	0.230	***	21.03	0.229	***	29.79
AGE	-0.002	***	-7.32	-0.004	***	-9.81	-0.003	***	-5.09	-0.004	***	-14.35
AGE2	0.000	***	3.96	0.000	***	7.37	0.000	*	1.76	0.000	***	9.01
SQFT	0.015	***	7.80	0.024	***	14.77	0.008	***	9.27	0.015	***	12.38
SQFT2	0.000	***	-3.53	0.000	***	-5.17	0.000	***	-2.98	0.000	***	-4.57
LANDSQFT	0.000		1.49	0.000		-1.32	0.000	***	2.77	0.000	***	3.95
LANDSQFT2	0.000		-1.62	0.000		1.35	0.000	***	-2.65	0.000	***	-3.61
FLOORS	0.007		0.55	-0.028	***	-6.82	-0.017	**	-2.02	-0.017	***	-2.73
COND_E	0.135	***	2.97	0.079	**	2.23	0.137	***	5.87	0.188	***	8.94
COND_G	0.087	***	11.64	0.056	***	5.62	0.006		0.55	0.084	***	10.21
COND_F	-0.057	***	-3.20	0.008		0.18	0.001		0.02	-0.059	***	-3.80
DUALBROKER	0.034	***	7.55	0.032	***	3.47	0.013	*	1.70	0.040	***	5.22
RENOVATED	0.060		0.84	0.066		0.92	0.116	*	1.86	0.080		1.17
BUYOUT	0.003		0.27	0.158	***	11.38	0.074	***	6.55	0.086	***	9.74
EXCHANGE	0.042	***	7.30	0.114	***	8.37	0.051	***	3.73	0.088	***	7.27
DISTRESS	-0.230	***	-11.90	-0.195	***	-5.72	-0.158	***	-6.49	-0.157	***	-7.89
BUYREIT	-0.067		-1.29	0.257	***	3.48	0.057		1.17	-0.024		-0.43
LONGITUDE	0.052		1.02	-0.026	**	-2.47	0.171	**	2.47	0.107	**	2.30
LATITUDE	0.598	***	8.70	-0.160	***	-2.59	0.243	***	2.91	0.074		1.25
YR1998	0.067		1.53	0.051		0.70	0.007		0.13	0.075		1.61
YR1999	0.132	***	3.02	0.110		1.54	0.031		0.54	0.105	**	2.25
YR2000	0.190	***	4.41	0.149	**	2.09	0.083		1.46	0.137	***	2.93
YR2001	0.241	***	5.65	0.147	**	2.06	0.096	*	1.70	0.157	***	3.36
YR2002	0.320	***	7.56	0.174	**	2.45	0.110	**	1.96	0.181	***	3.90
YR2003	0.422	***	10.05	0.220	***	3.10	0.137	**	2.44	0.224	***	4.83
YR2004	0.540	***	12.87	0.332	***	4.70	0.204	***	3.66	0.300	***	6.49
YR2005	0.650	***	15.48	0.448	***	6.31	0.319	***	5.70	0.414	***	8.94
YR2006	0.657	***	15.62	0.459	***	6.46	0.345	***	6.15	0.434	***	9.34
YR2007	0.637	***	15.07	0.428	***	5.96	0.326	***	5.77	0.434	***	9.27
YR2008	0.603	***	14.14	0.454	***	6.29	0.318	***	5.55	0.411	***	8.72
YR2009	0.494	***	11.29	0.270	***	3.63	0.202	***	3.46	0.303	***	6.25
YR2010	0.441	***	9.81	0.310	***	4.03	0.217	***	3.68	0.269	***	5.41
UNITS	0.007	***	9.42									
Submarket Fixed Effects	YES			YES			YES			YES		
Adjusted R-square	0.66			0.71			0.45			0.40		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE*2 is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT*2 is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT*2 is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction

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represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT. *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property. *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 8. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price, Based on Transactions with Sale Prices Equal to or Exceeding the Mean Sale Price for Each Property Sub-sample.

	Apartment			**Office**			**Industrial**			**Retail**		
	5424			*2702*			*5114*			*6053*		
	Coef.		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*
CONST	14.986		1.17	43.299		1.24	38.102	**	2.37	10.705	***	20.54
LNASSESSED	0.259	***	15.81	0.254	***	7.88	0.171	***	8.35	0.273	***	18.27
AGE	-0.012	***	-9.38	-0.013	***	-11.18	-0.009	***	-9.43	-0.007	***	-9.96
AGE2	0.000	***	6.47	0.000	***	9.60	0.000	***	5.31	0.000	***	6.99
SQFT	0.003	***	14.21	0.003	***	11.89	0.004	***	17.49	0.006	***	12.84
SQFT2	0.000	***	-6.76	0.000	***	-5.26	0.000	***	-8.94	0.000	***	-5.73
LANDSQFT	0.000		0.21	0.000	***	3.13	0.000	***	4.33	0.000	***	5.11
LANDSQFT2	0.000		-0.25	0.000	***	-4.16	0.000	***	-5.87	0.000	***	-5.01
FLOORS	0.020	***	5.50	0.005	*	1.78	0.013		1.27	0.023	**	2.13
COND_E	0.229	***	8.70	0.164	***	7.40	0.060	**	2.20	0.257	***	9.48
COND_G	0.066	***	5.75	0.034	**	2.06	0.035	**	2.49	0.087	***	6.06
COND_F	0.004		0.05	0.114		1.24	-0.008		-0.15	0.027		0.48
DUALBROKER	0.025	***	2.77	0.014		0.78	0.000		-0.02	0.041	***	2.86
RENOVATED	-0.048		-0.42	0.113		1.13	0.093	*	1.76	0.088		1.41
BUYOUT	0.068	***	5.94	0.115	***	7.07	0.149	***	10.62	0.139	***	9.81
EXCHANGE	-0.029	**	-2.03	0.016		0.61	0.048	***	2.62	0.070	***	3.76
DISTRESS	-0.221	***	-5.00	-0.156		-1.48	-0.065		-1.55	-0.262	***	-4.15
BUYREIT	0.182	**	4.67	0.092	***	2.56	0.125	***	4.04	0.237	***	5.45
LONGITUDE	0.081		0.73	0.349		1.00	0.216		1.57	-0.051		-1.00
LATITUDE	0.131		0.84	0.054		0.11	-0.106		-0.61	-0.129		-1.01
YR1998	0.001		0.01	-0.114		-1.27	0.162	**	2.22	-0.066		-0.41
YR1999	0.095	**	2.04	-0.117		-1.30	0.200	***	2.86	-0.019		-0.11
YR2000	0.103	**	2.26	-0.050		-0.55	0.228	***	3.24	-0.031		-0.19
YR2001	0.125	***	2.73	0.004		0.05	0.251	***	3.56	-0.047		-0.29
YR2002	0.207	***	4.56	-0.100		-1.09	0.231	***	3.34	0.045		0.28
YR2003	0.230	***	5.04	-0.044		-0.49	0.275	***	3.99	0.074		0.45
YR2004	0.261	***	5.72	0.095		1.06	0.343	***	5.04	0.106		0.65
YR2005	0.341	***	7.52	0.135		1.49	0.437	***	6.40	0.211		1.30
YR2006	0.429	***	9.23	0.187	**	2.08	0.473	***	6.89	0.272	*	1.67
YR2007	0.491	***	10.37	0.263	***	2.93	0.576	***	8.36	0.291	*	1.79
YR2008	0.384	***	7.69	0.272	***	2.89	0.541	***	7.67	0.292	*	1.79
YR2009	0.260	***	4.68	0.002		0.02	0.396	***	5.40	0.141		0.85
YR2010	0.243	***	4.17	-0.044		-0.36	0.318	***	4.26	0.081		0.48
UNITS	0.001	***	9.10									
Submarket Fixed Effects	YES			YES			YES			YES		
Adjusted R-square	0.87			0.85			0.66			0.68		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE2* is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT2* is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT2* is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT. *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property. *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 9. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price, Based on Transactions with Sale Prices Less than the Mean Sale Price for Each Property Sub-sample, Including Interaction of Search Cost Proxies.

	Apartment			**Office**			**Industrial**			**Retail**		
	27287			*13209*			*14316*			*23945*		
	Coef.		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*
CONST	-6.402		-1.07	12.583	***	9.28	19.017	**	2.44	18.432	***	3.81
LNASSESSED	0.270	***	32.41	0.328	***	24.12	0.230	***	21.02	0.229	***	29.77
AGE	-0.002	***	-7.38	-0.004	***	-9.82	-0.003	***	-5.09	-0.004	***	-14.35
AGE2	0.000	***	3.99	0.000	***	7.38	0.000	*	1.76	0.000	***	9.01
SQFT	0.015	***	7.79	0.024	***	14.76	0.008	***	9.26	0.015	***	12.38
SQFT2	0.000	***	-3.53	0.000	***	-5.17	0.000	***	-2.98	0.000	***	-4.57
LANDSQFT	0.000		1.49	0.000		-1.31	0.000	***	2.77	0.000	***	3.95
LANDSQFT2	0.000		-1.62	0.000		1.34	0.000	***	-2.64	0.000	***	-3.61
FLOORS	0.007		0.54	-0.028	***	-6.83	-0.017	**	-2.05	-0.017	***	-2.72
COND_E	0.135	***	2.97	0.078	**	2.22	0.137	***	5.89	0.188	***	8.93
COND_G	0.087	***	11.66	0.056	***	5.60	0.005		0.50	0.084	***	10.20
COND_F	-0.058	***	-3.22	0.008		0.19	0.000		0.02	-0.059	***	-3.80
DUALBROKER	0.033	***	7.52	0.032	***	3.43	0.013	*	1.73	0.040	***	5.21
RENOVATED	0.060		0.83	0.066		0.91	0.116	*	1.86	0.079		1.17
BUYOUT	0.009		0.93	0.162	***	11.06	0.073	***	6.23	0.086	***	9.46
EXCHANGE	0.044	***	7.37	0.124	***	8.62	0.054	***	3.72	0.088	***	6.74
DISTRESS	-0.211	***	-11.21	-0.187	***	-5.09	-0.156	***	-6.20	-0.156	***	-7.36
BUYREIT	-0.077		-1.38	0.238	***	2.66	-0.025		-0.41	0.022		0.30
EXCHANGE& BUYEROUT	-0.033	*	-1.70	-0.060		-1.47	-0.018		-0.37	0.002		0.07
DISTRESS& BUYEROUT	-0.278	*	-1.94	0.026		0.23	0.004		0.04	-0.011		-0.18
BUYREIT& BUYEROUT				0.041		0.27	0.206	**	2.26	-0.073		-0.70
EXCHANGE& DISTRESS	-0.035		-0.62	-0.187		-1.37	-0.082		-0.75	-0.036		-0.19
EXCHANGE& BUYREIT	0.121	*	1.94									
DISTRESS& BUYREIT												
LONGITUDE	0.051		1.00	-0.026	**	-2.48	0.171	**	2.46	0.107	**	2.30
LATITUDE	0.598	***	8.72	-0.161	***	-2.62	0.242	***	2.90	0.074		1.25
YR1998	0.069		1.58	0.053		0.74	0.011		0.19	0.075		1.61
YR1999	0.133	***	3.07	0.113		1.58	0.035		0.63	0.105	**	2.25
YR2000	0.192	***	4.47	0.152	**	2.14	0.087		1.58	0.137	***	2.94
YR2001	0.244	***	5.72	0.149	**	2.10	0.099	*	1.82	0.157	***	3.37
YR2002	0.323	***	7.64	0.177	**	2.50	0.114	**	2.08	0.181	***	3.90
YR2003	0.425	***	10.13	0.222	***	3.16	0.140	***	2.58	0.224	***	4.83
YR2004	0.543	***	12.96	0.335	***	4.76	0.208	***	3.83	0.300	***	6.49
YR2005	0.652	***	15.58	0.451	***	6.38	0.323	***	5.93	0.415	***	8.94
YR2006	0.660	***	15.73	0.462	***	6.53	0.349	***	6.40	0.434	***	9.35
YR2007	0.640	***	15.16	0.430	***	6.02	0.330	***	6.01	0.434	***	9.28
YR2008	0.606	***	14.23	0.456	***	6.36	0.322	***	5.77	0.411	***	8.72
YR2009	0.497	***	11.38	0.273	***	3.69	0.206	***	3.61	0.303	***	6.25
YR2010	0.445	***	9.91	0.313	***	4.09	0.221	***	3.84	0.269	***	5.41
UNITS	0.007	***	9.65									
Submarket Fixed Effects	YES			YES			YES			YES		
Adjusted R-square	0.66			0.71			0.45			0.40		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE2* is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT2* is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT2* is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one

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if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a binary variables set equal to one if the acquirer is identified as a REIT; *EXCHANGE*DISTRESS* is an interaction variable between *EXCHANGE* and *DISTRESS*; *EXCHANGE*BUYREIT* is an interaction variable between *EXCHANGE* and *BUYREIT*; *DISTRESS*BUYOUT* is an interaction variable between *DISTRESS* and *BUYOUT*, *DISTRESS*REIT* is an interaction variable between *DISTRESS* and *BUYREIT*; *BUYREIT*BUYOUT* is an interaction variable between *BUYREIT* and *BUYOUT*; *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property; *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 10. Hedonic Regression Model where the Dependent Variable is the Natural Log of Apartment Sales Price, Based on Transactions with Sale Prices Equal to or Exceeding the Mean Sale Price for Each Property Sub-sample, Including Interaction of Search Cost Proxies.

	Apartment			Office			Industrial			Retail		
	5424			*2702*			*5114*			*6053*		
	Coef.		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*	*Coef.*		*T-Stat.*
CONST	15.041		1.17	44.888		1.29	38.252	**	2.38	10.713	***	20.55
LNASSESSED	0.259	***	15.81	0.254	***	7.84	0.171	***	8.35	0.273	***	18.37
AGE	-0.012	***	-9.38	-0.013	***	-11.19	-0.009	***	-9.43	-0.007	***	-9.95
AGE2	0.000	***	6.46	0.000	***	9.59	0.000	***	5.31	0.000	***	6.98
SQFT	0.003	***	14.21	0.003	***	11.88	0.004	***	17.48	0.006	***	12.81
SQFT2	0.000	***	-6.76	0.000	***	-5.26	0.000	***	-8.93	0.000	***	-5.71
LANDSQFT	0.000		0.20	0.000	***	3.12	0.000	***	4.32	0.000	***	5.11
LANDSQFT2	0.000		-0.25	0.000	***	-4.16	0.000	***	-5.86	0.000	***	-5.01
FLOORS	0.020	***	5.50	0.005	*	1.79	0.013		1.27	0.023	**	2.14
COND_E	0.228	***	8.64	0.163	***	7.33	0.060	**	2.20	0.257	***	9.47
COND_G	0.066	***	5.74	0.034	**	2.02	0.035	**	2.48	0.087	***	6.06
COND_F	0.004		0.06	0.114		1.24	-0.009		-0.16	0.028		0.49
DUALBROKER	0.025	***	2.80	0.014		0.79	0.000		-0.03	0.040	***	2.84
RENOVATED	-0.048		-0.42	0.114		1.13	0.094	*	1.77	0.088		1.41
BUYOUT	0.068	***	5.74	0.117	***	6.91	0.149	***	9.98	0.141	***	9.46
EXCHANGE	-0.035	**	-2.08	0.030		0.96	0.053	***	2.64	0.083	***	3.85
DISTRESS	-0.195	***	-3.58	-0.060		-0.40	-0.086	*	-1.72	-0.283	***	-3.62
BUYREIT	0.221	**	3.20	0.117	***	2.17	0.123	***	2.83	0.176		1.62
EXCHANGE& BUYEROUT	0.024		0.75	-0.026		-0.51	-0.020		-0.39	-0.042		-1.00
DISTRESS& BUYEROUT	-0.054		-0.62	-0.152		-0.77	0.067		0.68	0.067		0.50
BUYREIT& BUYEROUT	-0.063		-0.76	-0.033		-0.47	0.004		0.06	0.070		0.59
EXCHANGE& DISTRESS	-0.171		-1.01	-0.740	***	-4.06	-0.029		-0.31	-0.284	*	-1.80
EXCHANGE& BUYREIT	0.402		1.34	-0.074		-1.00				0.324	**	2.03
DISTRESS& BUYREIT										-0.127		-0.97
LONGITUDE	0.080		0.72	0.359		1.03	0.217		1.57	-0.051		-1.00
LATITUDE	0.128		0.82	0.038		0.08	-0.108		-0.62	-0.130		-1.02
YR1998	-0.006		-0.12	-0.113		-1.24	0.160	**	2.18	-0.074		-0.46
YR1999	0.089	*	1.86	-0.114		-1.25	0.198	***	2.81	-0.028		-0.17
YR2000	0.098	**	2.09	-0.047		-0.52	0.225	***	3.19	-0.040		-0.24
YR2001	0.121	***	2.57	0.011		0.12	0.248	***	3.51	-0.054		-0.33
YR2002	0.202	***	4.34	-0.098		-1.06	0.228	***	3.29	0.036		0.22
YR2003	0.224	***	4.82	-0.041		-0.45	0.272	***	3.93	0.065		0.40
YR2004	0.254	***	5.46	0.098		1.08	0.340	***	4.96	0.097		0.60
YR2005	0.335	***	7.24	0.138		1.50	0.434	***	6.33	0.202		1.24
YR2006	0.424	***	8.93	0.189	**	2.07	0.470	***	6.82	0.263		1.62
YR2007	0.485	***	10.06	0.267	***	2.93	0.573	***	8.29	0.282	*	1.74
YR2008	0.379	***	7.45	0.277	***	2.90	0.539	***	7.60	0.284	*	1.74
YR2009	0.255	***	4.52	0.006		0.06	0.393	***	5.34	0.131		0.79
YR2010	0.238	***	4.04	-0.048		-0.38	0.316	***	4.22	0.073		0.44
UNITS	0.001	***	9.10									
Submarket Clusters Fixed Effect	YES			YES			YES			YES		
Adjusted R-square	0.87			0.85			0.66			0.71		

*, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively. The dependent variable is the natural log of the sale price. *LNASSESSED* is the natural log of the property's assessed value; *AGE* is age of the property in years; *AGE2* is age squared; *SQFT* is total square footage of improvements in thousand square feet; *SQFT2* is *SQFT* squared; *LANDSQFT* is land square footage in thousand square feet; *LANDSQFT2* is *LANDSQFT* squared; *FLOORS* is number of floors in the building; *COND_E*, *COND_A*, *COND_F* denote excellent, average and fair condition of the structure, respectively. *COND_G*, indicating a good structure condition is the omitted building condition variable. *DUALBROKER* is an indicator variable, equal to one if the seller and the buyer broker were the same firm, and zero otherwise; *RENOVATED* is a dummy variable equal to one if the property has been renovated within the last 4 years prior to sale. *EXCHANGE* is a binary variable set equal to one if transaction represents the purchase of a replacement property by a buyer completing a delayed tax-deferred exchange; *DISTRESS* is binary variable set equal to one if the seller was classified by CoStar as distressed; *BUYOUT* is a binary variable indicating the property acquirer is an out-of-state resident; and *BUYREIT* is a

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binary variables set equal to one if the acquirer is identified as a REIT; *EXCHANGE*DISTRESS* is an interaction variable between *EXCHANGE* and *DISTRESS*; *EXCHANGE*BUYREIT* is an interaction variable between *EXCHANGE* and *BUYREIT*; *DISTRESS*BUYOUT* is an interaction variable between *DISTRESS* and *BUYOUT*, *DISTRESS*REIT* is an interaction variable between *DISTRESS* and *BUYREIT*; *BUYREIT*BUYOUT* is an interaction variable between *BUYREIT* and *BUYOUT*; *LONGITUDE* is the longitude coordinate of the property; *LATITUDE* is the latitude coordinate of the property; *YRn* are indicator variables for each year; *UNITS* is the number of apartment units; *CONST* is the constant.

Table 11. Percentage Effects of Heterogeneous Search Costs Estimated Based on Equation (3) by Property Type where the Dependant Variable is the Natural Log of the Property Sales Price.

Panel A: Full Sample

	Obs	BUYOUT	EXCHANGE	DISTRESS	BUYREIT
Apartments	32,711	3.8%	4.0%	-20.6%	14.2%
Office	15,911	26.5%	14.2%	-17.5%	25.1%
Industrial	15,911	18.6%	9.7%	-15.1%	14.9%
Retail	27,736	18.5%	17.9%	-21.7%	20.1%
Average		16.9%	11.4%	-18.7%	18.6%

Panel A: Transactions with Sale Prices Less than the Mean Sale Price for Each Property Sub-sample

	Obs	BUYOUT	EXCHANGE	DISTRESS	BUYREIT
Apartments	27,287	7.0%	-2.8%	-19.9%	19.9%
Office	13,209	12.2%	NS	NS	9.7%
Industrial	14,316	16.1%	4.9%	-6.3%	13.3%
Retail	21,683	15.0%	7.3%	-23.0%	26.8%
Average		12.6%	3.1%	-16.4%	17.4%

Panel B: Transactions with Sale Prices Equal to or Exceeding the Mean Sale Price for Each Property Sub-sample

	Obs	BUYOUT	EXCHANGE	DISTRESS	BUYREIT
Apartments	5,424	-3.2%	5.4%	-10.7%	NS
Office	2,702	NS	9.8%	NS	8.9%
Industrial	5,114	NS	9.8%	NS	8.9%
Retail	6,053	NS	8.2%	-18.8%	18.3%
Average		-3.2%	7.8%	-14.7%	13.6%

The observation breakdown by property type is apartment, 35,252; office and industrial, 33,937; and retail, 27,552. *EXCHANGE* represents the percentage price effect associated with the purchase being a replacement property of a buyer, completing a delayed tax-deferred exchange; *DISTRESS* represents the percentage price effect associated with the transaction being part of a distressed sale; *BUYOUT* represents the percentage price effect associated the purchase by an out-of-state resident; and *BUYREIT* represents the percentage price effect associated with a purchase by a REIT.

Percentage price effects are based on the coefficients estimated using equation (6) by property type and transforming the coefficients into percent using the following formula: Percentage Price Effect = $100^*g = 100^*\{exp(x) - 1\}$, where g is the estimated effect on sale price of a condition and x is the type of atypical motivation.