Sale-Leaseback Transactions: Price Premiums and Market Efficiency

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Abstract

Sale-leaseback transactions are ubiquitous in real estate markets in the United States with annual volume estimated to be greater than $7 billion. However, there is no evidence concerning the price impact of such transactional arrangements. Using a data set of sale-leaseback transactions, this study examines the price impact on commercial property transactions across seven markets. The findings reveal that transactions structured as sale-leasebacks occur at significantly higher prices than market transactions. In addition, after accounting for income differentials, buyers and sellers are appropriately pricing the transactions resulting in no undue advantage to either party, that is, the expected price premium is accounted for in the sale-leaseback prices.

The notion that real assets trade at the present value of the asset's discounted cash flows is a fundamental model of commercial property markets. However, within this framework transactional attributes can cause deviations from the ''equilibrium'' market price. This paper examines the impact of sale-leaseback arrangements on the transaction prices of commercial properties and determines if either buyers or sellers realize a comparative advantage or an excess return.

In a sale-leaseback transaction, the owner-occupant of a commercial property sells the asset and retains long-term operating control through a simultaneously executed lease. Sale-leaseback transactions have a number of potential advantages for both the seller and the buyer. Assuming that the pre-transaction owner has a book value below the transaction price, at least five benefits accrue. First, the gain realized on the transaction by the seller can be amortized onto the seller's income statement thus increasing reported earnings (Moyer and Krishman, 1995). The earnings impact will improve the firm's financial ratios/margins as the firm increases the use of off-balance sheet financing. Second, the asset is removed from the seller's balance sheet potentially leading to further financial ratio improvement. If the real property is low-yielding, the disposal of low-yielding assets may also increase the return on assets (Martinez, 1999; Barris, 2002). Third, the seller avoids debt restrictions associated with borrowing and effectively obtains favorable financing on the property. Fourth, the seller releases capital/borrowing

capacity for use in core operations (Horn, 2000; Barris, 2002). Fifth, the seller may transfer latent tax benefits to the buyer due to differentials in cost basis, remaining deprecation term, and tax rates.

The buyer also benefits from the transaction. The buyer in a sale-leaseback transaction obtains an asset occupied by a long-term tenant. Obtaining the property and tenant simultaneously has at least three advantages. First, the search costs associated with leasing the property are eliminated. Second, the buyer is able to evaluate the quality of the tenant before obtaining the property. Third, given the typical triple-net underlying lease (tenant pays all operating costs), the purchasing firm acquires an asset with characteristics very similar to a high-quality mortgage bond. Uncertainty associated with operating expenses and vacancies are muted increasing the investment value of the property to the buyer. Hence, the buyer may be acquiring an asset with superior characteristics when compared to many non-leaseback transactions.

Given the potential sale-leaseback advantages to both parties, an examination of the impact on transaction price and whether the transaction is ''appropriately'' priced is the purpose of this paper. Using a large data set for seven property markets in the Southwest United States, this article empirically estimates the impact of sale-leaseback structured transactions on commercial property prices. The data show that sale-leaseback transactions occur at significantly higher prices and that the pricing structure is efficient. Specifically, sale-leaseback transactions sell for a premium of about 13% relative to comparable non-sale leaseback properties. Further, the hypothesis that the *expected* SLB premium is accounted for in the transaction price cannot be rejected. Therefore, the transactions are efficiently priced and neither the buyer nor seller realizes an undue advantage.

Literature Review

Much of the existing literature on sale-leaseback transactions is provided by practitioners and accountants and deals primarily with transaction descriptions and accounting/tax implications (e.g., Castle, 1987; Valachi, 1999; Horn, 2000; Fiore, 2001; and Richard, 2003) or comes from the popular press (Martinez, 1999; and Shaw, 2002).

The academic contribution tends to focus on the issue of shareholder gains in response to the announcement of a sale-leaseback (SLB) transaction. Lewellen, Long, and McConnell (1976), Myers, Dill, and Bautista (1976), and Alvayay, Rutherford, and Smith (1995) argue that the presence of income taxes may allow equity holders of leasing firms to benefit at the expense of the government. For example, if the lessor has a higher tax rate than the lessee, the higher interest and depreciation tax shields resulting from asset ownership by the lessor will create tax advantages that can be shared by both parties. In this case the buyer may be willing to pay a premium because of the net benefit resulting from the tax shield. Thus, the tax advantages associated with the lease created in the SLB could be a

motivation for the transaction. In this case, there are two streams of SLB research that are relevant. First, Kim, Lewellen, and McConnell (1978) demonstrate with a theoretical model that SLB transactions create wealth transfers between capital providers. Essentially, SLB transactions have the potential to erode the collateral position of the bondholders resulting in a transfer of wealth to stockholders. Second, Polonchek, Slovin, and Sushka (1990, 1991), Rutherford (1990), Fisher (2004), and Elayan, Meyer, and Li (2006) empirically document positive stock price impacts associated with sellers/leasees in SLB transactions. These positive announcement effects are consistent with the notion of wealth gains by stockholders. As a whole, the existing theoretical and empirical evidence supports the idea that SLBs can have significant return advantages for seller/lessee equity holders either by creating wealth transfers between the providers of capital or between transaction participants and the government. Unfortunately, examination of stock price returns does not speak to the issue of asset price differentials since stock price announcement effects can be attributed to many variables including wealth transfers, tax advantages, or even signaling.

The most complete academic analysis of real estate leases is by Grenadier (2005), who provides a unified equilibrium approach to valuing commercial real estate leases including leases with purchase options, forward leases, gross and net leases, and sale leasebacks. As Grenadier notes: ''The (sale leaseback) transaction has two components: setting the sales prices and setting the lease terms (Grenadier, 2005, p. 1210).'' If the sales price for a sale leaseback differs from the ''market value,'' then the lease rental rate must be different than the market rental rate. This idea is examined in the following empirical section where we test for differences in sales prices and rental rates on sale leaseback transactions, compared to non-sale leaseback transactions.

Whereas the practitioner literature on sale-leasebacks is replete with articles that address transactional advantages of SLBs and a significant academic contribution addresses equity returns, we are aware of no studies that examine explicitly whether SLB transactions impact transaction price and whether these potential price differentials are efficient (correctly priced). This article seeks to answer these questions.[1]

Sale-Leaseback Transactions

For a SLB transaction to occur in an open market, both parties must be advantaged. To consider the price impacts of a SLB transaction, we first consider the transaction decision criteria for both seller and buyer.

The Seller/Lessee

For a transaction to occur, the benefits to the buyer must be greater than or equal to the benefits for the seller. First, consider the potential seller/lessee's position.

For the seller, the question of whether to enter into the SLB transaction is based on the benefit of selling compared to the benefit of continued ownership. Equation (1) presents the trade-off for the seller.

$$\left[(ATSP_0) - \sum_{t=1}^{LPer} \frac{LPmt_t * (1 - r_s)}{(1 + g_s)^t}\right] - \left[\left(\frac{cb_s}{d} * r\right)\left(\frac{1 - \frac{1}{(1 + g_s)^{RDT}}}{g_s}\right) + \left(\frac{ATSP_n}{(1 + g)^n}\right)\right] > 0, \qquad (1)$$

where:

$ATSP_0$ = After-tax sale proceeds;
$LPmt$ = Lease payment;
r_s = Seller tax rate;
g_s = Seller cost of capital;
$LPer$ = Lease period;
cb_s = Seller cost basis;
d = Length of straight-line depreciation for property type;
RDT = Seller remaining depreciation term;
g = Market discount rate; and
n = Holding period.

The first term in Equation (1) (first set of square brackets) represents the net benefits of selling the property and entering into a long-term lease. Specifically, the seller/lessee receives the after-tax sales proceeds (ATSP) at the initiation of the transaction and makes tax deductible lease payments for the life of the lease contract. The second term describes the prospects of continuing to own/occupy the property. Continued ownership will provide a depreciation tax shield over the remaining depreciable life of the asset. The annual benefit of the depreciation tax shield is specified in the first set of round brackets (cost basis, *cb*, divided by the depreciation term, *d*, multiplied by the tax rate, *r*). The second set of round brackets simply accounts for the present value of the annual depreciation tax shield over the remaining depreciation term. The final set of round brackets is the present value of the after-tax sale proceeds associated with selling the property in the future.

The obvious implication of the model is that the question of whether to enter the transaction will be decided by cost and benefit analysis. If the benefits/cash flows associated with selling are greater than the benefits/cash flows from holding, then the seller/lessee is motivated to proceed with the SLB transaction.

The Buyer/Lessor

For the buyer, the question of whether to enter the SLB transaction is based on the benefits of buying compared to the initial cash outlay, i.e., the purchase price.

$$\left[\left(\sum_{t=1}^{LPer}\frac{LPmt_t * (1 - r_b)}{(1 + g_b)^t}\right) + \left(\frac{cb_b}{d} * r\right)\left(\frac{1 - \frac{1}{(1 + g_b)^d}}{g_b}\right) + \left(\frac{ATSP_n}{(1 + g)^n}\right)\right] - (PP_0) > 0, \quad (2)$$

where:

$LPmt$ = Lease payment;
r_b = Buyer tax rate;
g_b = Buyer cost of capital;
LPer = Lease period;
cb_b = Buyer cost basis;
d = Length of straight-line depreciation for property type;
n = End of holding period;
g = Market discount rate; and
PP_0 = Initial purchase price.

The first term in Equation (2) (first set of round brackets) represents the present value of the after-tax income obtained from the lessee. The second and third set of round brackets combined represents the present value of the tax shield, while the fourth set of round brackets represents the present value of the after-tax sale proceeds associated with selling the property in the future (the reversion). In short, the terms in the square bracket represent the total financial benefit from owning the property. If the total benefit of owning exceeds the initial purchase price (PP_0), then the buyer/lessor is motivated to proceed with the SLB transaction.

Notice that in both Equations (1) and (2) the decision criteria depend in large measure on the transaction price, i.e., $ATSP_0$ and PP_0. Also note that for a transaction to occur, Equations (1) and (2) must be true and $ATSP_0$ must equal PP_0. If we assume the following equalities $r_s = r_b$, $g_s = g_b$, $cb_s = cb_b$, and $RDT = d$, then Equations (1) and (2) cannot both be true. Therefore, a transaction will only occur when one or more of the equalities are not true. In addition, a transaction will occur only if:

$$\left(\sum_{t=1}^{LPer}\frac{LPmt_t * (1 - r_b)}{(1 + g_b)^t}\right) + \left(\frac{cb_b}{d} * r_b\right)\left(\frac{1 - \frac{1}{(1 + g_b)^d}}{g_b}\right) > \left(\sum_{t=1}^{LPer}\frac{LPmt_t * (1 - r_s)}{(1 + g_s)^t}\right) + \left(\frac{cb_s}{d} * r_s\right)\left(\frac{1 - \frac{1}{(1 + g_s)^{RDT}}}{g_s}\right). \quad (3)$$

Assuming all else is equal, the above equation is true if $g_b < g_s$, or $r_b < r_s$, or $cb_b > cb_s$, or $d > RDT$.[2] There is no reason to believe that the cost of capital (g) or the tax rate (r) would be systematically different across buyers and sellers of SLB transactions to result in a consistent differential. There is, however, good reason to believe that the cost basis for the buyer will be greater than the cost basis of the seller ($cb_b > cb_s$) and that the remaining depreciation term will be greater for the buyer compared with the seller ($d > RDT$). The cost basis in a property is established at the time of purchase and does not change over time unless there are capital improvements to the property. Property values have tended to appreciate over time, therefore a buyer's cost basis is almost always higher than seller's cost basis. When a property is purchased the depreciation time clock is reset, therefore, the remaining term of depreciation for the buyer (d) will always be greater than the remaining depreciation term for the seller (RDT). Because both the cost basis and the remaining depreciation term decline intertemporally for the seller, the value of the tax shield also declines. A commercial property transaction basically transfers a latent tax shield to the buyer. This tax shield transfer can result in the buyer bidding away a property from a seller.

The Sales Price Differential

One question in this research is whether the sales price is impacted by the SLB nature of the transaction as compared with a simple asset sale (with no companion lease component). If a premium exists for properties purchased as part of an SLB, it must be the case that buyers who pay the premiums reap greater benefits from SLB transactions than from non-SLB transactions. That is, for an SLB premium to exist, the benefits from a transaction involving an SLB must be greater than the benefits from a comparable non-SLB transaction. Equation (4) compares the benefits of the SLB verses non-SLB acquisition from the buyer's perspective:

$$\left(\sum_{t=1}^{LPer}\frac{LPmt_t * (1 - r_{b,SLB})}{(1 + g_{b,SLB})^t}\right) + \left(\frac{cb_{b,SLB}}{d} * r_{b,SLB}\right)\left(\frac{1 - \frac{1}{(1 + g_{b,SLB})^d}}{g_{b,SLB}}\right) > \left(\sum_{t=1}^{LPer}\frac{LPmt_t * (1 - r_{b,NONSLB})}{(1 + g_{b,NONSLB})^t}\right) + \left(\frac{cb_{b,NONSLB}}{d} * r_{b,NONSLB}\right)\left(\frac{1 - \frac{1}{(1 + g_{b,NONSLB})^d}}{g_{b,NONSLB}}\right). \quad (4)$$

The first term in Equation (4) (first set of round brackets) represents the present value of the after-tax income obtained from the lessee in the SLB transaction. The second and third terms describe the present value depreciation benefits associated with the transaction. On the right-hand side, the income and tax benefits from a non-SLB transaction are given with similar interpretations of the variables. If this inequality holds, then competition among buyers would be manifest in a price premium on SLB transactions.

Please note that the transfer of tax benefits can be a primary justification of any transaction, but because the tax benefits are the same for both SLB and non-SLB transactions, this could not account for price differentials between SLB and non-SLB transactions. Therefore, the price premium (differential) could only be observed if there were differences in the expected cash flows (*LPMT*) and or the risk (g_b). In other words, one or both of the following inequalities would have to hold:

$$LPMT_{SLB} > LPMT_{NONSLB}$$

$$g_{b,SLB} < g_{b,NONSLB}$$

Assuming market rents, the expected cash flows for a SLB property could be greater because of the lack of anticipated periodic vacancy or tenant turnover typically observed in commercial property markets, whereas SLB properties typically encounter no vacancy. In addition, the credit profile for SLB tenants may be higher and the history of the firm (lessee) at the property location may lead to lower risk. The primary purpose of this research is to empirically determine if a price premium (differential) is observed in SLB transactions and then to determine

if this differential is appropriately priced. The above theory suggests it is highly likely that a price differential will occur and the efficient market hypothesis suggests that it will be correctly priced.

Data

To test the SLB effect on transaction prices for commercial properties, we use data for 3,978 office, industrial, and retail properties in seven southwest U.S. cities from January 1993 through December 2007 provided by CoStar Group, Inc.[3] The seven markets are Los Angeles, Orange County, Riverside, San Bernardino, San Diego, Las Vegas, and Phoenix. CoStar investigates commercial property transactions by physically inspecting each property and confirming the details of the transaction with the relevant parties, including buyer, seller, and broker. This includes verification of the SLB status of the transaction.[4] Exhibit 1 provides descriptive statistics of the data for the total sample and for the SLB and non-SLB transactions separately.

As shown in Exhibit 1, Panel A, sales prices for the total sample range from $200,500 to $45,000,000. The physical characteristics (building area, age, land area, and floor area ratio) of the SLB (Panel B) and non-SLB (Panel C) samples are very similar. The building size of the SLB transactions is only slightly larger (24,673 sq. ft. vs. 24,043 sq. ft.) than the non-SLB, building age slightly younger (20.53 years vs. 23.72 years), almost equal land area, and floor area ratio. Exhibit 2 contains difference in means test between various characteristics of the two samples. In general, the samples are very similar across most of the characteristics.

Comparing the SLB and non-SLB transactions does yield some interesting differences in sales price, capitalization rate, and net operating income per square foot. Although the minimum and maximum sales prices vary considerably, the means at $2,460,448 (SLB) and $2,264,535 (non-SLB) are quite similar. Using the mean data, SLB transaction prices are about 8% higher, and about 20% per square foot higher, than non-SLB transactions. The mean capitalization rate for the SLB properties is 52 basis points lower than non-SLB properties. In addition, the mean NOI per square foot is $1.70 higher for SLBs versus non-SLBs. Equation 4 showed that a price premium can exist only if either $LPMT_{SLB} > LPMT_{NONSLB}$ or $g_{b,SLB} < g_{g,NONSLB}$. The empirical data show both inequalities exist, increasing the expectation of a price premium for SLB transactions.

Exhibit 3 shows the frequency of other characteristics of the data. There are 163 SLB transactions (about 4% of the total sample). The data are distributed across property type, with retail properties comprising 45% of the data, industrial properties 29%, and office properties 26%. Los Angeles dominates the sample with 49%, while Orange County comprises 15%. Transactions in the remaining geographic areas range from 9% to 4% of the sample. Eleven percent of the buyers are located out-of-state, while 18% of the sellers are out-of-state. The availability of these data allows for an explicit examination of the impact of these buyer and

Exhibit 1 | Descriptive Statistics for SLB and Non-SLB Transactions

Variable	Mean	Std. Dev.	Minimum	Maximum
Panel A: All transactions (3,978 total observations)				
Sales Price	$2,272,563	$3,412,966	$200,500	$45,000,000
Price Per Square Foot	$105.02	$69.94	$25.09	$496.96
Net Operating Income	$206,435	$294,689	$12,169	$3,771,230
Capitalization Rate (%)	9.28	2.17	5.01	15.99
NOI Per Square Foot	$9.28	$5.50	$2.01	$33.97
Building Area (Sq. Ft.)	24,069	27,417	2,004	148,784
Building Age (Years)	23.59	17.34	0.00	79.00
Land Area (Acres)	1.48	2.05	0.03	20
Floor Area Ratio	0.51	0.41	0.10	3.98
Panel B: SLB transactions (163 observations)				
Sales Price	$2,460,448	$2,871,485	$260,000	$16,685,000
Price Per Square Foot	$126.12	$78.21	$26.00	$427.79
Net Operating Income	$217,087	$260,107	$22,230	$1,582,137
Capitalization Rate (%)	8.78	1.86	5.01	13.71
NOI Per Square Foot	10.90	6.66	2.42	31.36
Building Area (Sq. Ft.)	24,673	28,542	2,512	128,670
Building Age (Years)	20.53	15.78	0.00	75.00
Land Area (Acres)	1.47	1.72	0.07	12.25
Floor Area Ratio	0.47	0.40	0.10	3.19
Panel C: Non-SLB transactions (3,815 observations)				
Sales Price	$2,264,535	$3,434,291	$200,500	$45,000,000
Price Per Square Foot	$104.12	$69.44	$25.09	$496.96
Net Operating Income	$205,979	$296,089	$12,169	$3,771,230
Capitalization Rate (%)	9.30	2.18	5.01	15.99
NOI Per Square Foot	$9.21	$5.44	$2.01	$33.97
Building Area (Sq. Ft.)	24,043	27,371	2,004	148,784
Building Age (Years)	23.72	17.39	0.00	79.00
Land Area (Acres)	1.48	2.06	0.03	20.00
Floor Area Ratio	0.51	0.41	0.10	3.98

Exhibit 2 | *t*-Tests for Difference between Means for SLB and Non-SLB Commercial Property Transactions

	Mean			*t*-Stat.	*p*-value>|t|
Variable	Full Sample	SLB	Non-SLB	Difference Between Means	
Sales Price	$2,272,563	$2,460,448	$2,264,535	−0.72	0.4730
Price Per Square Foot	$105.02	$126.12	$104.12	−3.94	<0.0001
Net Operating Income	$206,435	$217,087	$205,979	−0.47	0.6375
Capitalization Rate (%)	9.28	8.78	9.30	3.00	0.0027
NOI Per Square Foot	$9.28	10.90	$9.21	−3.84	0.0001
Building Area (Sq. Ft.)	24,069	24,673	24,043	−0.29	0.7739
Building Age (Years)	23.59	20.53	23.72	2.30	0.0213
Land Area (Acres)	1.48	1.47	1.48	0.08	0.9383
Floor Area Ratio	0.51	0.47	0.51	1.28	0.2012

Notes: The full sample is 3,978 observations. The SLB is 163 observations. The non-SLB is 3,815 observations.

Exhibit 3 | Descriptive Statistics for a Sample of Commercial Property Transactions

Explanatory Variable	All Observations	SLB Observations	Non-SLB Observations
Total Observations	3,978	163	3,815
Property Type			
Office	1,046	45	1,001
Industrial	1,162	70	1,092
Retail	1,770	48	1,722
Geographic Area			
Los Angeles	1,955	67	1,888
Orange Co.	604	27	577
Riverside	209	5	204
San Bernardino	272	13	259
San Diego	367	17	350
Las Vegas	226	19	207
Phoenix	345	15	330
Conditions of Sale			
Sale Leaseback	163	163	0
Buyer-out-of-state	450	37	413
Seller-out-of-state	715	23	692
Time Distribution			
1993	396	2	394
1994	526	5	521
1995	410	12	398
1996	527	16	511
1997	436	20	416
1998	297	17	280
1999	205	12	193
2000	196	10	186
2001	156	5	151
2002	227	12	215
2003	197	20	177
2004	160	9	151
2005	88	7	81
2006	76	11	65
2007	81	5	76

Note: The data were obtained from CoStar.

seller characteristics on the transaction prices. Regarding the transactions across time, Exhibit 3 shows that the number of transactions in the sample decreased during the last five years. This decline is due to the screening of the data. The data suggests that CoStar has not been as actively gathering net operating income or capitalization rate data during these periods. Because both of these variables

were required in the initial data filtering process, the number of transactions available for study is diminished in the later years.

Empirical Models

SLB Price Differential

In order to determine if price differentials result from SLB transactions, we estimate a standard price equation for commercial properties. The dependent variable, *LNPRICE*, is regressed on property, transaction, location, and market condition (time) variables. The model is represented as follows:

$$\begin{aligned} LNPRICE = {} & \alpha_0 + \alpha_1 SLB + \alpha_2 LNSQFT + \alpha_3 AGE \\ & + \alpha_4 AGESQ + \alpha_5 FAR + \alpha_6 BUYEROUT \\ & + \alpha_7 SELLEROUT + \sum_{i=2}^{3} \gamma PROPTYPE_i \\ & + \sum_{i=2}^{7} \phi GEOAREA_i + \sum_{i=2}^{15} \lambda_i TIME_i, \end{aligned} \tag{5}$$

Where:

LNPRICE = Natural log of sales price;
SLB = A binary variable for the sale-leaseback status of the transaction (= 1 if the transaction is a SLB);
LNSQFT = The natural log of the square footage of building area;
AGE = Age of building(s) in years;
AGESQ = Age squared;
FAR = Floor area ratio (building area divided by site area);
BUYEROUT = A binary variable if the buyer resides out-of-state (= 1 if present); and
SELLEROUT = A binary variable if the seller resides out-of-state (= 1 if present).
PROPTYPE = Property type; property types include office, industrial, and retail. Each property type is included in the structural model as a binary variable, except office, which is suppressed.
GEOAREA = Geographic location of each transaction; geographic areas include Los Angeles, Orange County, Riverside, San Bernardino, San Diego, Las Vegas, and Phoenix. Each geographic area is included in the structural model as a binary variable, except Phoenix, which is suppressed.

MKTCON = Market conditions proxied by annual time dummies from 1993 through 2007. Each annual time period is included in the structural model as a binary variable, except 1993, which is suppressed.

The dependent variable is specified as the natural logarithm of the sales price for two reasons. First, this form gives less weight to extremely high values (potential outliers) than does an untransformed dependent variable (de Leeuw, 1993). Second, the sales price is truncated at zero on the left side of the distribution, but skewed on the right side of the distribution, similar to a lognormal distribution; therefore, the specification is consistent with the distribution of the sales prices in the sample.[5]

The primary variable of interest is the sale-leaseback variable (*SLB*). The model suggests that the parameter on *SLB* will be positive if the rental revenue is higher or the discount rate is lower, compared with arms-length transactions. If *SLB* is positive and significant, then we will conclude that sale-leaseback transactions occur at a price premium compared with arms-length transactions and we will reject the null hypothesis that sale-leaseback transactions have no impact on the purchase price.

The building size variable is specified as the natural log of building square feet (*LNSQFT*). This specification allows price to increase with building size, at either an increasing or decreasing rate. Generally, price increases with building size, but at a decreasing rate due to economies of scale in construction. This correlation, however, does not always hold. In some cases large tenants (occupants) pay a premium, on a per square foot basis, for space that will accommodate their physical requirements.

The *AGE* of the property is expected to be negatively related to sales price. Because properties typically depreciate at a non-linear rate over time, the *AGESQ* variable is included to capture the declining rate of depreciation and capture any vintage value that may exist with historic properties.

The floor-area-ratio (*FAR*), calculated by dividing the building area by the site area, is expected to be positively related to sales price because a larger FAR ratio typically results in vertical construction that is more costly to build and that commands higher rents.

The dichotomous variable *BUYEROUT* controls for any price impact that out-of-state buyers have on the transaction price. Lambson, McQueen, and Slade (2004) find that anchoring-induced bias and higher search costs can lead to out-of-state buyers paying a price premium. Within the dataset, out-of-state buyers represent 11% of the transactions. We expect the parameter on this variable to be positive and significant. Because of similar information asymmetries expected when the buyer is out-of-state, we expect the seller out-of-state (*SELLEROUT*) variable to be negative.

PROPTYPE specifies three property types included in the dataset including *OFFICE*, *INDUSTRIAL*, and *RETAIL*. The omitted category is office properties. We expect retail properties to sell at a premium over office properties because retail properties typically have superior locations and more costly tenant improvements. However, we expect industrial properties to sell at a discount to office properties due to inferior locations and interior build-out.

The data used in this analysis include transactions located in seven large metropolitan areas in the southwest area of the U.S. To control for the differences in location that may impact price, geographic (*GEOAREA*) dichotomous variables are incorporated into the model. Dichotomous annual time variables are also incorporated into the model to capture any intertemporal price changes that have occurred during the period under investigation. In this case we employed annual time variables ranging from 1993 through 2007.

Price Effect of Sale-Leaseback

Column 1 of Exhibit 4 shows the estimation results of Equation 5.

The model performs well with high R^2, high *F*-stat, and coefficients that carry a sign that is consistent with economic theory. The coefficient on SLB is positive and significant (*t*-stat = 3.88). The coefficient of 0.1298 can be interpreted to mean that SLB transactions occur at about 13.86% premium to non-SLB transactions.[6] In robustness checks, this result is robust to alternative specifications of the model and with the larger dataset from which the final data are drawn.[7] Thus, properties involved in an SLB transaction trade at a significantly higher price. All the other variables have the expected results: The building size effect (natural log of square feet) is positive and significant, indicating that the transaction price increases with property size; building *AGE* (negative) and *AGESQ* (positive) are both significant, indicating that older properties transact at lower prices but that the effect is at a declining rate.

Confirming the results from Lambson, McQueen, and Slade (2004), out-of-state buyers pay a significant premium of about 13% (*t*-value = 5.22). The *PROPTYPE* coefficients show that industrial properties transact at a significant discount to office properties and retail properties transact at a premium. The location variables (*GEOAREA*) also contribute to the model's explanatory power. With Phoenix as the suppressed area, the data indicate that San Bernardino has an inferior location for commercial property when compared to Phoenix; however, the remaining cities have a superior location.

The time variables also contribute to the explanatory power of the model by controlling for the significant temporal changes experienced in the southwest area during the sample period. Although not shown in Exhibit 4, the coefficients on the time variables indicate that property values increased 278% during the 15-year period of the study (1993–2007).

Exhibit 4 | Effect of SLB on Commercial Property Prices

Explanatory Variable	Total Sample	SLB Sample	Non-SLB Sample
Intercept	5.8966*	5.9158*	5.8797*
	(74.85)	(13.90)	(72.78)
Sale-Leaseback (*SLB*)	0.1299*		
	(3.88)		
Log of Building Area (*LNSQFT*)	0.8574*	0.8364*	0.8588*
	(115.47)	(22.48)	(112.88)
Building Age (*AGE*)	−0.0194*	−0.0193*	−0.0188*
	(−15.01)	(−2.94)	(−14.18)
Building Age Squared (*AGE2*)	0.0002*	0.0001	0.0002*
	(10.02)	(1.12)	(9.49)
Floor Area Ratio (*FAR*)	0.0003	−0.1319	0.0044
	(0.02)	(−1.57)	(0.24)
Buyer Out-of-State (*BUYEROUT*)	0.1264*	0.1669	0.1215*
	(5.22)	(1.83)	(4.84)
Seller Out-of-State (*SELLEROUT*)	−0.0360*	0.1658	−0.0456*
	(−2.03)	(1.66)	(−2.51)
Industrial Property (*INDUST*)	−0.4973*	−0.5994*	−0.4906*
	(−27.01)	(−6.79)	(−25.93)
Retail Property (*RETAIL*)	0.0882*	0.0502	0.0905*
	(5.14)	(0.55)	(5.17)
Los Angeles (*LA*)	0.3333*	0.4564*	0.3284*
	(11.98)	(3.46)	(11.52)
Orange County (*ORG*)	0.3534*	0.4745*	0.3454*
	(11.63)	(3.22)	(11.11)
Riverside (*RIV*)	0.0340	0.0986	0.0259
	(0.90)	(0.46)	(0.67)
San Bernardino (*SB*)	−0.1249*	0.0613	−0.1293*
	(−3.51)	(0.37)	(−3.54)
San Diego (*SD*)	0.2599*	0.4291*	0.2512*
	(7.94)	(2.83)	(7.49)
Las Vegas (*VEGAS*)	0.1863*	0.0655	0.1958*
	(5.22)	(0.48)	(5.29)
R^2	0.8394	0.8349	0.8400

Notes: The dependent variable is the natural log of sales price (LNPRICE). The suppressed dichotomous variables include *OFFICE*, *PHOENIX*, and *YEAR* 1993. The annual time variables are not shown, but are available upon request. The full sample is 3,978 observations. The SLB is 163 observations. The non-SLB is 3,815 observations. *t*-values are in parentheses.
*Significant at the 0.05 level.

Overall, the hedonic model explains most of the variation in prices in the data set. Columns 2 and 3 of Exhibit 4 show the regression results from the separate analysis of the SLB and non-SLB transactions. The data indicates that the regression results are stable across the two datasets. Thus it appears that the price differential is driven by the SLB effect.

More importantly, the results indicate that SLB transaction occur at a significant price premium relative to non-SLB transactions. But, is the premium ''correctly'' priced?

Market Efficiency

Since the *SLB* variable is positive and significant, it is important to determine if buyers and sellers are appropriately pricing the transactions so that neither party is realizing a comparative advantage. Efficient markets would lead us to believe that both parties should account for all unique characteristics of the SLB transaction so that there is no undue advantage for either party. Therefore, we formulate a testable hypothesis that the *expected* SLB premium is accounted for in the transaction price and that there is no separate unaccounted SLB effect.

Equation 4 showed that a price premium could occur if either $LPMT_{SLB} > LPMT_{NONSLB}$ or $g_{b,SLB} < g_{b,NONSLB}$. If either of these conditions exists, then the price premium could be accounted for and the transaction could be efficiency priced. The empirical dataset includes the net operating income (NOI) for each property; therefore, the hypothesis is testable by regressing the transaction price on NOI and SLB.[8] This specification accounts for both the *LPMT* (proxied by NOI) and *g* (proxied by the implicit capitalization rate).[9] Exhibit 5 summaries the results from this analysis, estimated both in a log-linear (Panel A) and unlogged (Panel B) form. Both models have high adjusted R-squares (.96 and .94).

Column 1 of Panel A of Exhibit 5 shows that the parameter on NOI is 0.93 with a *t*-value of 291.89. With the double log specification, this parameter is interpreted as an elasticity, i.e., a 1% increase in NOI leads to a 0.93% increase in transaction price. In the unlogged form (Panel B), the estimated coefficient (the NOI multiplier) is 10.9 (*t*-stat. of 236.92), implying a capitalization rate of 9.2%. Of particular interest is the SLB variable, which is insignificant in both specifications. These results suggest that there is no separate SLB effect, once we account for income and yield.

Column 2 of both Panels A and B in Exhibit 5 goes one step further by including an interaction term of both NOI and SLB in the model; however, the results are virtually the same, confirming the previous findings. Therefore, buyers and sellers are correctly pricing the characteristics of the SLB arrangement.

Omitted Variables Bias

In any empirical analysis without observable determinants, the possibility of omitted variable bias exists. For omitted variables to distort the findings on the

Exhibit 5 | OLS Regression Results with Net Operating Income

Explanatory Variable		
Panel A: Dependent variable is the natural log of sales price (*LNPRICE*)		
Intercept	3.0567* (77.27)	3.0584* (76.05)
Sale Leaseback (*SLB*)	0.0106 (0.65)	−0.0394 (−0.19)
Log of NOI (*LNNOI*)	0.9317* (291.89)	0.9315* (286.64)
Log of NOI*SLB		0.0042 (0.25)
Adj. R-Square	0.9611	0.9611
Panel B: Dependent variable is the sales price (*PRICE*)		
Intercept	−273,652* (−4.47)	−274,295* (−4.47)
Sale-Leaseback (*SLB*)	−93,453 (−1.38)	−78,681 (−0.90)
NOI	10.91* (236.92)	10.91* (232.99)
NOI*SLB		−0.0678 (−0.26)
Adj. R-Square	0.9402	0.9402

Notes: The full sample is 3,978 observations. The suppressed dichotomous variable includes YEAR 1993 and Phoenix. The annual time variables and location variables are not shown, but are available upon request. *t*-values are in parentheses.
*Significant at the 0.05 level.

price impact of SLB transactions, the omitted variable would have to have explanatory power, be correlated with SLB, and not be explained by the included set of independent variables in Equation (5). Viewing our inference structure as a standard omitted variable test for the impact of an SLB transaction (e.g., Holmes and Horvitz, 1994; Hunter and Walker, 1996; and Phillips-Patrick and Rossi, 1996), the potential impact of omitted variables is muted. While omission of a hedonic variable such as story height may impact other hedonic variables, such as parking, it is more difficult to see how omission of a hedonic variable would significantly impact the coefficient of non-hedonic variables, such as the variables of interest, namely SLB.

Conclusion

While previous studies have documented positive stock price reaction to the announcement of an SLB transaction, there has been no investigation of price differentials associated with this transaction structure. Using hedonic price estimation, the data show that SLB transactions occur at an economically and statistically significant price premium. The estimated equation indicates that, on average, a SLB transaction occurs at about a 13.86% premium compared to non-SLB transactions. The model does a nice job of explaining cross-section differences in transaction price. High R^2, high *F*-stats, and economically intuitive parameter signs all indicate that the hedonic price model is well-suited to speak to the issue of price premiums in SLB transactions.

Given the existence of price premiums documented in the data, the obvious need arises to explain why the premiums exist. The data suggest that NOI is higher (and thus, capitalization rates are lower) for SLB transactions compared with non-SLB transactions. There are two possible reasons for these differentials: (1) the expected cash flows for a SLB property may be greater because of the lack of anticipated periodic vacancy caused by tenant turnover typically observed in commercial property markets, and (2) the credit profile for SLB tenants may be higher and the history of the firm (lessee) at the property location may lead to lower risk. While it does appear that SLBs sell at a premium in the market relative to other properties, there is not a premium once adjustments are made to the comparables. That is, once income is accounted for, there is no price premium; therefore, the market appears to be efficient.

Endnotes

[1] Related literature on SLBs, price premiums, and market efficiency include Redman and Tanner (1991), Attebery and Rutherford (1993), Clayton (1998), Hardin and Wolverton (1999), and Elayan, Meyer, and Li (2006).

[2] For simplicity we drop the reversion, which is identical for buyer and seller.

[3] CoStar Goup, Inc. investigates and compiles real estate transaction data in many cities in the U.S. Summaries of the transactions are provided to interested parties on a subscription basis. We thank CoStar for their generous assistance with the data.

[4] The data used in this study are a subset from a larger dataset that included approximately 69,000 transactions located in the Southwest. The working dataset was filtered on available property characteristics including building area, building age, land area, net operating income, and direct capitalization rate. The top and bottom 1% of the data of all variables were then eliminated to reduce the possibility of outliers.

[5] Related literature on hedonic price analysis include Saderion, Smith, and Smith (1994), Des Rosiers and Theriault (1996), Berry, McGreal, Stevenson, Young, and Webb (2003), and Jud (2003).

[6] The coefficient on the *SLB* variable can be transformed into an indication of the percentage of price increase by using the relationship PERCENT INCREASE = $100[e^{0.12985} - 1]$ or 13.86% (Halvorsen and Palmquist, 1980).

[7] As one of the reviewers noted, the choice to SLB or non-SLB is potentially endogeneous leading to possible selection bias. To examine this, we employed Heckman's method to test for sample selection bias. The analysis found no evidence of sample selection bias.

[8] At the time a property sells, CoStar confirms the details of the transaction, e.g., sales price, with the buyer and seller and attempts to collect income and expense data on the property. A conversation with a CoStar representative found that the ''net income'' identified in the CoStar dataset is the net income that the property was generating at the time of sale. Although this is no doubt the case with most transactions reported in the dataset, there is evidence that the net income for some transactions is forecast, not historical. This is particularly the case with the SLB transactions. By definition, SLB properties are owner-occupied prior to the sale; therefore, the net income is forecast rather than historical.

[9] Once sales price and net operating income are known, the capitalization rate is known by definition.

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The authors wish to thank Ko Wang (the editor), Andrew Holmes, and anonymous referees for their helpful comments and suggestions. This work was supported by the J. Cyril Johnson Fellowship and a research grant from the Marriott School at Brigham Young University.

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